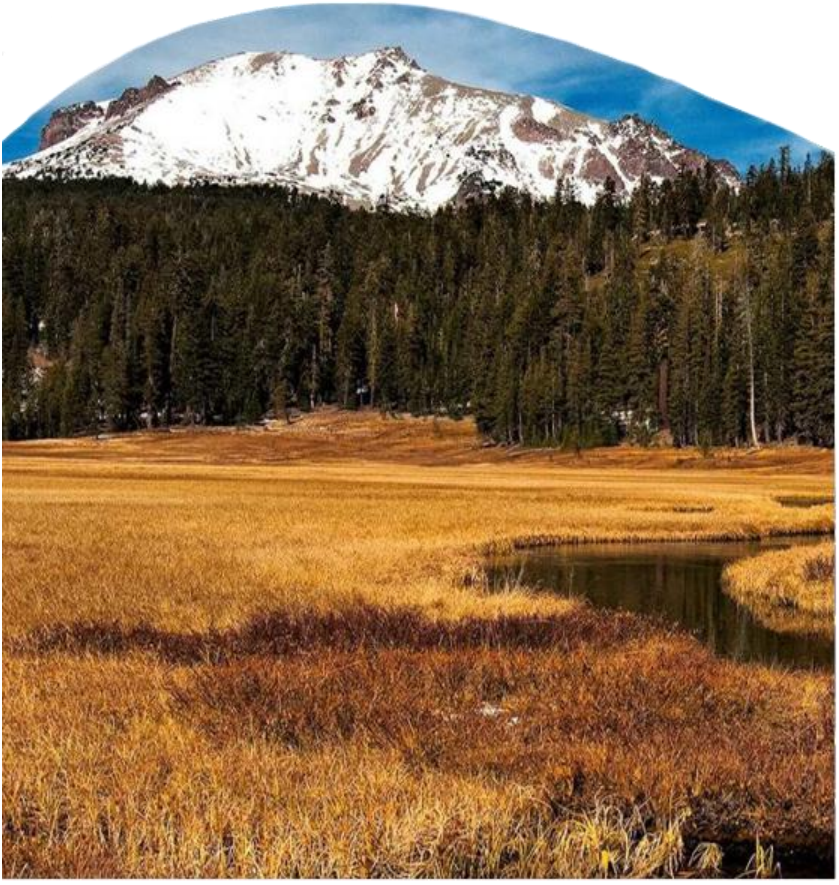
Plumas County
Multi-Jurisdictional Hazard Mitigation Plan

Public Review Draft – November 2025



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Executive Summary

Plumas County, the City of Portola, and seven special districts prepared this Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA) approved single jurisdictional 2020 Plumas County LHMP and the single jurisdictional 2019 City of Portola LHMP. This 2026 Plumas County LHMP is a multi-jurisdictional plan that geographically covers the entire area within Plumas County's jurisdictional boundaries (hereinafter referred to as the Planning Area). It melds the two previous LHMPs from Plumas County and the City of Portola. The following jurisdictions participated in the planning process and are seeking FEMA approval of the LHMP Update:

- Plumas County*
- City of Portola**
- Chester Public Utility District
- Feather River Resource Conservation District
- Gold Mountain Community Services District
- Indian Valley Community Services District
- Plumas Corp/Plumas Fire Safe Council
- Plumas Eureka Community Services District
- South Feather Water and Power Agency

* Participated in 2020 Plumas County LHMP

**Participated in the 2019 City of Portola LHMP

The purpose of this 2026 Plumas County LHMP Update and hazard mitigation planning process is to reduce or eliminate long-term risk to people and property, critical facilities and infrastructure, natural and historic and cultural resources, and other community assets from future hazard events and natural disasters. This LHMP Update demonstrates the participating jurisdictions' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP Update was also developed in order for the participating jurisdictions to be eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program.

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated through natural hazard mitigation.

2026 LHMP Update Plan Development Process

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This LHMP Update documents the 2026 hazard mitigation planning process

and identifies relevant hazards, community risk and vulnerabilities, and mitigation strategies the participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability in the Plumas County Planning Area.

This LHMP Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390), the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007, and current FEMA guidance. Plumas County jurisdictions followed a planning process prescribed by FEMA as detailed in Table ES-1.

Table ES-1 Plumas County Local Hazard Mitigation Planning Process

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

The planning process began with the organizational phase to establish the Hazard Mitigation Planning Committee (HMPC); comprised of key Plumas County, City of Portola, jurisdictional representatives, and other local and regional stakeholders; to involve the public; and to coordinate with other departments and agencies. A detailed risk assessment was then conducted followed by the development of a focused mitigation strategy for the Plumas County Planning Area and specific to each participating jurisdiction. Once approved by Cal OES and FEMA, this 2026 Plumas County LHMP Update will be adopted and implemented by the participating jurisdictions over the next five years.

Risk Assessment

A natural hazard risk assessment was conducted that identified and profiled hazards that pose a risk to the Plumas County Planning Area and to each participating jurisdiction, assessed the vulnerability of the Plumas County Planning Area and jurisdictions to these hazards, and examined the existing jurisdictional capabilities to mitigate identified hazards.

The Plumas County Planning Area is vulnerable to numerous hazards that are identified, profiled, and analyzed in this 2026 LHMP Update. Wildfires, floods, earthquakes, drought, dam failure, and other severe weather events are among the hazards that can have a significant impact on the Planning Area. Table ES-2 details the hazards identified for this 2026 LHMP Update.

Table ES-2 Plumas County Planning Area Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather/ Pests/Weeds	Extensive	Highly Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Unlikely/Occasional	Catastrophic	Medium	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Occasional/Unlikely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Hazardous Materials Transportation	Significant	Occasional	Critical	Medium	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Low
Volcano	Extensive	Unlikely	Critical	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Mitigation Strategy

Plumas County and the City of Portola successfully implemented numerous mitigation actions identified in the 2020/2019 LHMPs' mitigation strategies, thus working diligently towards meeting their 2020/2019 Plumas County and City of Portola goals and objectives, as follows:

2020 Plumas County Goals

Goal #1: Minimize loss of life and injuries and protect property and the environment from natural hazards

- Minimize loss from priority natural hazards to include wildfire, flood, earthquake, dam failure, drought, landslides, and severe weather hazards
- Minimize impact to existing and future development
- Minimize economic and natural resource impact
- Promote resiliency strategies
- Support mitigation planning and implementation in all County departments and operations

Goal #2: Reduce losses and provide protection for critical facilities, infrastructure, and services from hazard impacts

- Implement critical facility upgrades and mitigation measures to ensure reliability of services
- Update and maintain a GIS database of critical facilities to include: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Minimize the loss of agricultural and natural resource productivity (foundation of rural economy) from natural hazards

- Support education and training of private land managers on hazard mitigation and disaster preparedness
- Promote local research, education, and technical assistance on sustainable agriculture and forestry practices
- Foster agricultural and natural resource resilience to natural hazards through implementation of best management practices and restoration activities
- Provide training, technical assistance, outreach and education to private landowners on tree mortality, identification, management, and prevention strategies

Goal #4: Increase community awareness, education, preparedness, and self-reliance to natural hazards

- Enhance public and stakeholder outreach, education, and preparedness programs to include all hazards of concern
- Increase public and stakeholder knowledge about the risk and vulnerability to identified hazards and how to be more self-reliant in mitigating risks from natural hazards
- Provide public and stakeholder education and outreach specific to evacuation routes, various available emergency communication modes, and roles and responsibilities

Goal #5: Increase communities' ability to mitigate hazards and be prepared for, respond to, and recover from a disaster event in Plumas County

- Improve community capabilities to mitigate hazards and reduce losses
- Enhance community capabilities by improved coordination of local, state, and federal resources
- Increase capabilities to provide mitigation opportunities and assistance to Plumas County communities
- Increase the capacity to effectively respond to and recover from natural disaster events
- Enhance emergency communication capabilities (e.g., cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Increase capabilities for continuity of government
- Improve community's ability to be competitive/successful with grant funding opportunities from application development to project delivery

Goal #6: Minimize life safety issues, property loss, environmental damages, and economic impacts associated with wildfires, the #1 natural hazard of concern in Plumas County

- Reduce the wildfire risk and vulnerability
- Update, maintain, and implement Community Wildfire Protection Plans
- Develop a Countywide fuels management implementation strategy
- Coordinate comprehensive fire protection strategies among all federal, state, and local agencies and across all property boundaries to implement a fire-adapted community concept approach at broader county-wide geographic and policy scales
- Increase community education, outreach, and awareness of wildfire mitigation strategies, including those to be undertaken by private property owners
- Continue to seek establishment of Firewise USA sites (communities)
- Promote and develop a tree mortality action plan for monitoring, prevention and mitigation activities
- Promote and enhance fire-fighting capabilities (e.g., access roads, water supply, etc.)
- Improve community infrastructure for wildfire preparedness and response including locating safety zones, augmenting community water supplies, and reducing fire hazard along transportation and power infrastructure
- Enhance the county wildfire hazard codes, including enforcement capabilities, within areas of high wildfire risk
- Continue land use planning efforts to ensure increased fire safety in new developments
- Develop and implement outreach, education, and technical assistance to encourage "home hardening" and retrofitting of older residences and structures to increase community resilience to wildfire

Goal #7: Minimize the effects of climate change on natural hazards in Plumas County

- Develop a Climate Action Plan for Plumas County
- Consider and integrate climate change information and issues in future General Plan updates

City of Portola 2019 Goals

- Increase public awareness of potential natural hazards and self-reliant mitigation actions.
- Reduce risk of loss of life/injuries due to natural hazards
- Reduce risk of loss to property, both public and private
- Maintain and increase funding for natural disaster preparedness, planning and response

Based on the risk assessment review and goal setting process, the HMPC identified mitigation actions (Table ES-3), which provide direction for reducing future hazard-related losses within the Plumas County Planning Area and specific to each participating jurisdiction.

THIS TABLE IS FROM CHAPTER 5 – ANY UPDATES WILL BE PLACED IN THAT TABLE AND BROUGHT BACK HERE.

Table ES-3 Plumas County Planning Area Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Plumas County					
Multi-Hazard Actions					
Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 3. Back Up Power Redundancy Project – Resilient and Continued Outpatient Medical Services at Lake Almanor Clinic, and Continued Operation of a Cooling/Warming Station for the General Public during Electrical Power Disruptions as Needed.	New Action	X	X		Property Protection Emergency Services
Action 4. Resilient Community Systems Initiative	New Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services Public Information
Action 5. Designation of Minor County Roads and Forest Service Roads to be used as Alternate Routes around Road Closures during Wildfire and other Hazard Events. Plumas and Lassen National Forests have Funding for new Road Connections to Form Alternate Routes.	New Action	X	X		Property Protection Emergency Services
Action 6. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access.	Previous Action	X	X	X	Property Protection Structural Projects Emergency Services
Agricultural Hazard Actions					
Action 7. NEED					
Climate Change Actions					
Action 8. NEED					
Dam Failure Actions					
Action 9. NEED					
Drought and Water Shortage Actions					
Action 10. NEED DIRECT DROUGHT ACTION					

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Earthquake Actions					
Action 11. NEED					
Floods: 1%/0.2% Annual Chance, Floods: Localized Flooding, Landslide, Mudslide and Debris Flow, Severe Weather Heavy Rains and Storms Actions					
Action 12. Evaluate and implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 13. Identify and Implement Bank Stabilization Projects.	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 14. Develop a Countywide Drainage Master Plan	Previous Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 15. FEMA Mapping Update	Previous Action	X	X	X	Prevention
Action 16. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)	Previous Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 17. County Wide Stormwater Drainage and Grading Ordinance.	Previous Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 18. Ongoing Implementation of Stream Clearing and Culvert Maintenance Programs	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Hazardous Materials Transportation Actions					
Action 19. NEED					
Landslide Actions					
Action 20. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad	Previous Action	X	X		Property Protection Structural Projects Natural Resource Protection
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche) Cold Actions					
Action 21. NEED					
Wildfire, Drought, Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornadoes Actions					
Action 22. Promote and Implement Compliant Street/Address Reflective Signage for Public and Private Roads and Structures	Previous Action	X	X		Property Protection Structural Projects Emergency Services

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 23. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access	Previous Action	X	X		Property Protection Structural Projects Emergency Services
City of Portola					
Action 1. Public Education on Hazards in the City of Portola	Previous Action	X	X		Public Education
Action 2. Essential Facilities Retrofit and Redundant Power Sources	Previous Action	X	X	X	Property Protection Structural Projects Emergency Services
Action 3. Wildfire Risk and Impact Reduction	Previous Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 4. Gulling Street Bridge Structural Rehabilitation	New Action	X	X	X	Structural Project Emergency Services
Action 5. Fire Suppression Enhancements	New Action	X	X		Property Protection Natural Resource Protection Emergency Services
Chester Public Utility District					
Action 1. Asbestos Water Line Natural Disaster Hazard	New Action	X	X		Property Protection Structural Projects
Action 2. Backup Power	New Action	X	X		Property Protection Emergency Services
Action 3. Public Outreach Program	New Action	X	X		Public Information
Action 4. Tree and Brush Removal	New Action	X	X		Property Protection Natural Resource Protection
Action 5. Wastewater Infrastructure	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 6. Wireless Radio Meters	New Action	X	X		Emergency Services Property Protection
Feather River Resource Conservation District*					
Action 1. Ecological Restoration	New Action	X	X		Natural Resource Protection
Action 2. Plumas Public Emergency Outreach Program	New Action	X	X		Public Information
Action 3. Fuels and Vegetation Management	New Action	X	X		Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Plumas Backup Generator and Air Purifier Loan Program	New Action	X	X		Property Protection Emergency Services
Action 5. Tree Mortality Tracking and Removal	New Action	X	X		Property Protection Natural Resource Protection
Gold Mountain Community Services District					
Action 1. Drought Impact on CSD Service	New Action	X	X		Property Protection Structural Project Natural Resource Protection
Action 2. Flood/Landslide/High Wind Mitigation	New Action	X	X	X	Property Protection Structural Project Natural Resource Protection
Action 3. Fire Prevention Hazard and Impact on CSD Services	New Action	X	X		Property Protection Natural Resource Protection
Action 4. ADDITIONAL ACTIONS					
Indian Valley Community Services District					
Action 1. Public Outreach Project	New Action	X	X		Public Information
Action 2. Dam Failure Mitigation and/or Replacement	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. IVCSD Secondary Water Source Project and Storage	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 4. Earthquake Mitigation	New Action	X	X		Property Protection Structural Projects
Action 5. Landslide, Mudslide, and Debris Flow Mitigation	New Action	X	X		Property Protection Structural Projects
Action 6. Severe Weather Mitigation	New Action	X	X	X	Property Protection Natural Resource Protection
Action 7. Wildfire Mitigation	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Plumas Corp/Plumas County Fire Safe Council*					
Action 1. Update the Plumas County Communities Wildfire Protection Plan	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 2. Firewise Program Promotion and Public Education	Previous Action	X	X		Prevention Public Education
Action 3. WUI Map Project: Implementation of Fire Hazard Severity Zone, Insurance Rating, and Other Classification Systems for Wildfire Risk Management and Identification of Wildland Urban Interface Areas	New Action	X	X		Prevention
Action 4.					
Action 5. Biomass Management and Utilization Program	New Action	X	X		Property Protection Natural Resource Protection
Action 6. Community Encompassing Firelines and Shaded Fuel Breaks	New Action	X	X		Property Protection Natural Resource Protection
Action 7. Continue and Promote Defensible Space (PRC 4291) Projects including Assistance Efforts for Senior and Disabled Residents.	New Action	X	X		Property Protection Natural Resource Protection Public Information
Action 8. Improve Local Plumas County Fire Department Capacity and Response Capabilities	New Action	X	X		Emergency Services Property Protection Natural Resource Protection
Action 9. Countywide Green Waste Disposal and Utilization Program	New Action	X	X		Property Protection Natural Resource Protection
Action 10. Hazardous Fuels Reduction – Implementation, Monitoring, and Maintenance	New Action	X	X		Property Protection Natural Resource Protection
Action 11. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.	New Action	X	X		Property Protection Natural Resource Protection Public Information
Action 12. Last Chance Creek Watershed Floodplain Restoration Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 13. Mountain Meadows Watershed Floodplain Restoration Project	New Action	X	X	X	Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 14. Upper Feather River Watershed Post-Fire Water Quality Monitoring Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 15. Red Clover Creek Watershed Floodplain Restoration Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 16. Tree Mortality Action Plan – Monitoring, Prevention, and Mitigation	New Action	X	X		Property Protection Natural Resource Protection
Action 17. Tributaries Forest Recovery Project	New Action	X	X	X	Property Protection Natural Resource Protection
Plumas Eureka Community Services District					
Action 18. Establishment of Evacuation Routes and Resident Notification System	New Action	X	X		Emergency Services
Action 19. Flood Risk Reduction for Wastewater Treatment Plant 6 (WWTP6)	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 20. Recycled Water Use	New Action	X	X		Property Protection Natural Resource Protection
Action 21. Water Storage Tank Retrofit or Replacement	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
South Feather Water and Power Agency					
Action 1. Little Grass Valley Dam Spillway Northern Slope Stabilization and Rockfall Protection Project	New Action	X	X		Property Protection Structural Projects Natural Resource Protection

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Appendix I: Hazus Reports

Abbreviations and Acronyms TO BE FINALIZED

Acronym	Definition
AB	Assembly Bill
AF	Acre-feet
ALERT	Automated Local Evaluation in Real Time
APG	California Adaptation Planning Guide
AQI	Air Quality Index
ASTDR	Agency for Toxic Substances and Disease Registry's
BAM	Best Available Map
BCA	Benefit Cost Analysis
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BRIC	Building Resilient Infrastructure and Communities
CA-DWR	California Department of Water Resources
CAISO	California Independent System Operator
Cal EPA	Environmental Protection Agency
Cal OES	California Office of Emergency Services
CAP	Climate Adaptation Plan
CAS	Climate Adaptation Strategy
CAV	Community Assistance Visit
CBC	California Building Code
CCHPR	Climate Change and Health Profile Report
CCSM	Community Climate System Model
CDAA	California Disaster Assistance Act
CDBG	Community Development Block Grant
CDC	Center for Disease Control
CDFW	California Department of Fish and Wildlife
CEMP	Comprehensive Emergency Management Program
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
CGS	California Geological Survey
CIP	Capital Improvements Plan
CLOMR	Conditional Letter of Map Revision
CNPS	California Native Plant Society
CNRA	California Natural Resource Agency
COG	Continuity of Government
COO	Continuity of Operations

Acronym	Definition
CPUC	California Public Utilities Commission
CRS	(National Flood Insurance Program's) Community Rating System
CRV	Contents Replacement Value
CVP	Central Valley Project
CWPP	Community Wildfire Protection Plan
DAC	Disadvantaged Community
DFIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act of 2000
DOF	Department of Finance
DSOD	Division of Safety of Dams
EF	Enhanced Fujita
EOC	Emergency Operations Center
EPSS	Enhanced Powerline Safety Settings
ESPM	University of California, Berkeley's Department of Environmental Science, Policy, and Management
ETSU	Enhanced Treatment and Site Upgrade
F	Fujita
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance Program
FPA	Floodplain Administrator
FRA	Federal Responsibility Area
FRAP	Fire and Resource Assessment Program
FWS	US Fish and Wildlife Service
GFDL	Geophysical Fluid Dynamics Laboratory
GHG	Greenhouse Gases
GIS	Geographic Information Systems
GPH	Gallons per Hour
GRASP	Geospatial Research, Analysis & Services Program
HHPD	High Hazard Potential Dam
HI	Heat Index
HMGP	Hazard Mitigation Grant Program
HMPC	Hazard Mitigation Planning Committee
ICS	Incident Command System
IPCC	Intergovernmental Panel on Climate Change
IRWM	Integrated Regional Water Management
LHMP	Local Hazard Mitigation Plan
LOMA	Letter of Map Amendment

Acronym	Definition
LOMC	Letters of Map Change
LOMR	Letter of Map Revision
LRA	Local Responsibility Area
MHI	Median Household Income
MMI	Modified Mercalli Intensity Scale
MSL	Mean Sea Level
MW	Megawatt
NASA	National Aerospace and Science Agency
NAVD	North American Vertical Datum
NCDC	National Climactic Data Center
NDMC	National Drought Mitigation Center
NEHRP	National Earthquake Hazards Reduction Program
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NIDIS	National Integrated Drought Information System
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWS	National Weather Service
OHP	Office of Historic Preservation
PDM	Pre-Disaster Mitigation Program
PIT	Point-in-time Homeless Count
PM	Particulate Matter
PNAS	Proceedings of the National Academy of Sciences
PSPS	Public Safety Power Shutoff
RCP	Representative Concentration Pathway
RHNA	Regional Housing Need Allocation
SAC-SJ	Sacramento-San Joaquin Valley
SB	Senate Bill
SBA	Small Business Administration
SEMS	Standard Emergency Management System
SFHA	Special Flood Hazard Area
SGMA	Sustainable Groundwater Management Act
SHBC	State Historical Building Code
SRA	State Responsibility Area
SVI	Social Vulnerability Index
SWP	State Water Project
UAV	Unmanned Aerial Vehicle
UBC	Uniform Building Code

Acronym	Definition
UCERF	Uniform California Earthquake Rupture Forecast
UFMP	Urban Forest Management Plan
UHF	Ultra High Frequency
UNFCCC	United Nations Framework Convention on Climate Change
UPRR	Union Pacific Railroad
URM	Unreinforced Masonry
USACE	US Army Corp of Engineers
USDA	United States Department of Agriculture
USGS	United States Geologic Survey
UWMP	Urban Water Management Plan
VHFHSZ	Very High Fire Hazard Severity Zone
WCD	Water Control District
WRCC	Western Regional Climate Center
WSOC	Wildfire Safety Operations Center
WUI	Wildland Urban Interface
WWTP	Wastewater Treatment Plant

Chapter 1 Introduction

1.1 Purpose

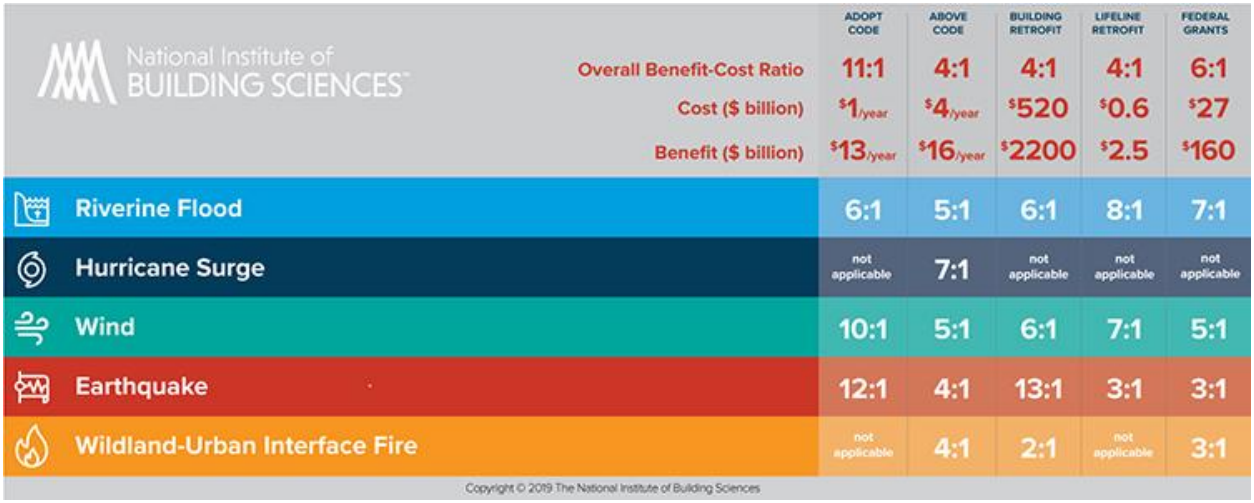
Plumas County, the City of Portola, and seven special districts prepared this 2026 Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA) approved single jurisdictional, 2020 Plumas County LHMP and the single jurisdictional 2019 City of Portola LHMP. The purpose of this LHMP Update is to guide hazard mitigation planning to better protect the people and property of the County from the effects of hazard events and natural disasters. This LHMP Update demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP Update was also developed, among other things, to ensure Plumas County and participating jurisdictions' continued eligibility for certain federal disaster assistance: specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program.

1.2 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because most expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Although the timing of natural disasters is unpredictable, their occurrence is largely predictable over time, and much of the damage caused by these events can be significantly reduced through hazard mitigation.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provide evidence that, overall, mitigation activities are highly cost-effective investments. On average, each dollar spent on mitigation saves society an average of $6 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report) (see Figure 1-1).

Figure 1-1 Natural Hazard Mitigation Savings by Hazard Type and Mitigation Type



Source: National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This plan documents Plumas County's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County and participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability in the community.

This Plumas County 2026 LHMP is a multi-jurisdictional plan that geographically covers the entire area within Plumas County's jurisdictional boundaries (hereinafter referred to as the Planning Area). The following jurisdictions participated in the planning process and are seeking FEMA approval of the LHMP Update:

- Plumas County*
- City of Portola**
- Chester Public Utility District
- Feather River Resource Conservation District
- Gold Mountain Community Services District
- Indian Valley Community Services District
- Plumas Corp/Plumas Fire Safe Council
- Plumas Eureka Community Services District
- South Feather Water and Power Agency

* Participated in 2020 Plumas County LHMP

**Participated in the 2019 City of Portola LHMP

This LHMP Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) This planning effort also follows FEMA's most current effective LHMP Preparation and Review Guidance, LHMP Policy Guide FP 206-21-0002 effective April 11, 2025. While DMA 2000 emphasized the need for mitigation plans and more coordinated mitigation planning and implementation

efforts, the regulations establish the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the Plumas County Planning Area is subject to many kinds of hazards, access to these programs is vital.

Information in this LHMP Update will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting public health and safety and critical community facilities; reducing liability exposure; and minimizing overall community impacts and disruptions. In the past, the Plumas County Planning Area has been affected by numerous hazards on multiple occasions. Plumas County, the City of Portola, and the seven participating jurisdictions are thus committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

1.3 Plumas County Profile

Plumas County is located in northern California, where the Sierra Nevada meets the Cascade Range. The County comprises 2,618 sq. mi., of which over 1 million acres (65 percent) is national forest land. There are approximately 1,000 miles of streams and 100 lakes, the 5,000-acre Plumas Eureka State Park, Lassen Volcanic National Park (southern part of Plumas County), ski areas, motels, and resorts throughout the County. Nearly 80 miles of the Pacific Crest National Scenic Trail passes through Plumas County. The City of Portola is located in the County. The nearest communities to Portola are Beckwourth, about 5 miles to the east and Blairsden/Graeagle, about 10 miles to the west. The Town of Quincy, the County seat, is about 35 miles to the west, and the City of Reno, Nevada, is about 50 miles to the southeast.

A map of Plumas County is shown on Figure 1-2. Multiple entities own land in Plumas County. Approximately 90.2% of the County is federal lands. A land ownership map can be seen on Figure 1-3 and is detailed in Table 1-1.

Figure 1-2 Plumas County Planning Area

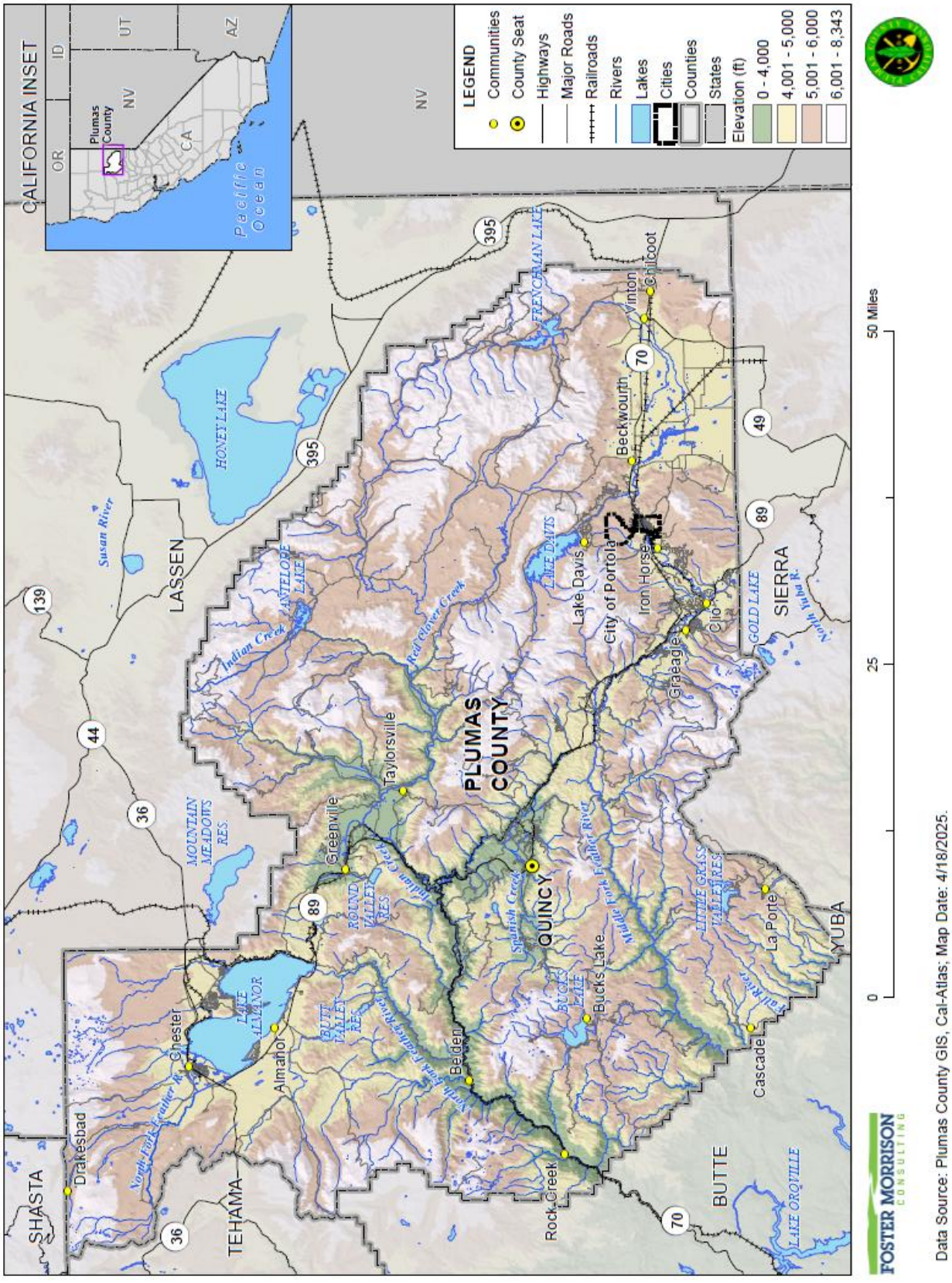


Figure 1-3 Plumas County Planning Area – Land Ownership

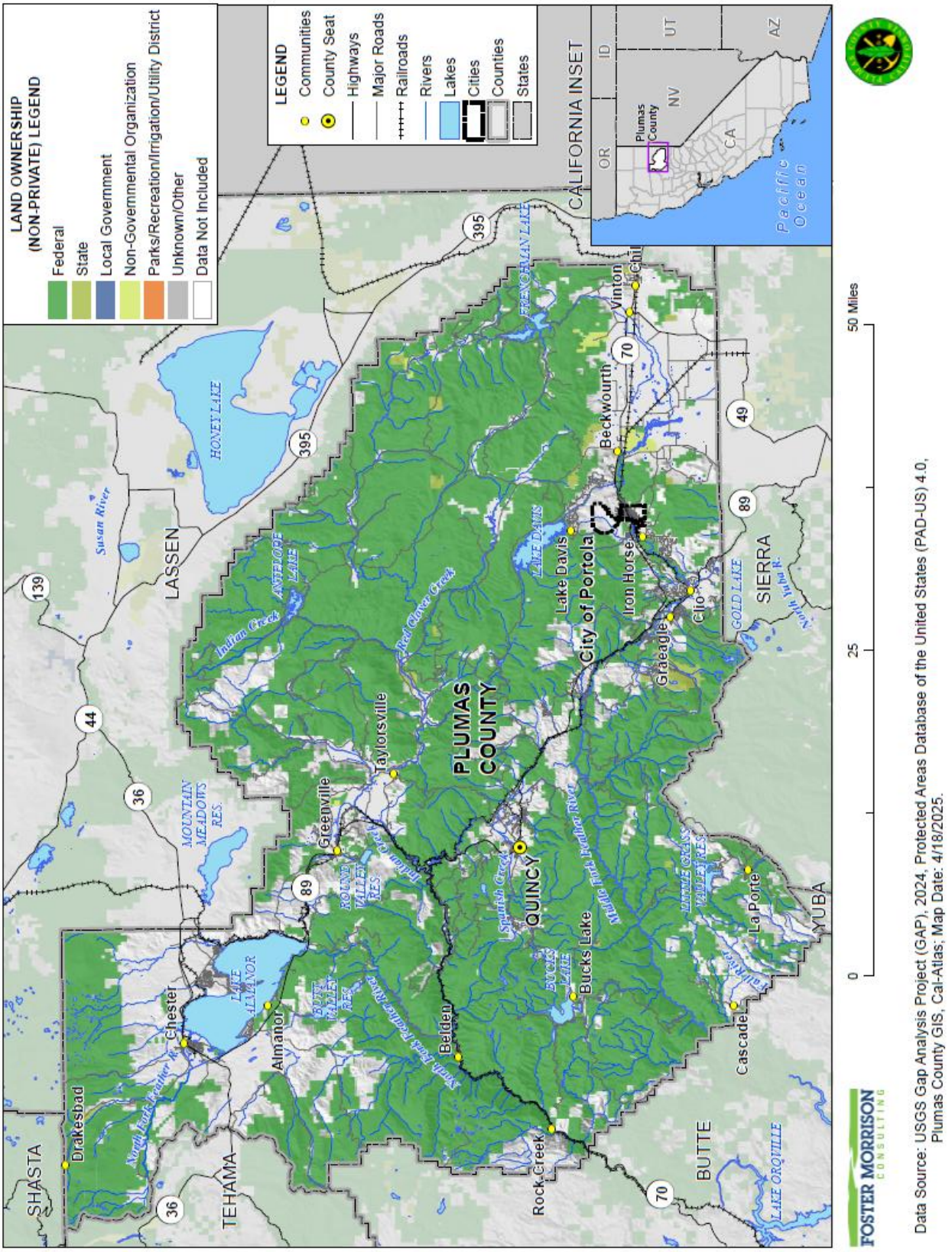


Table 1-1 Plumas County– Land Ownership

Jurisdiction / Land Ownership	Total Acres	% of Total Acres (by Jurisdiction)
City of Portola		
Federal	165	4.72%
Local Government	9	0.24%
Data Not Included*	3,323	95.04%
City of Portola Total	**3,497**	**100.00%**
Unincorporated Plumas County		
Federal	1,336,282	73.84%
State	11,965	0.66%
Local Government	67	0.00%
Non-Governmental Organization	6,811	0.38%
Parks/Recreation/Irrigation/Utility District	6	0.00%
Unknown/Other	70	0.00%
Data Not Included	454,382	25.11%
Unincorporated Plumas County Total	**1,809,583**	**100.00%**
Grand Total	**1,813,080**	**100.00%**

Source: USGS

*indicates privately held land

1.3.1. History

The area currently known as Plumas County has been a site for human activity since the Stone Ages approximately 8,000 to 10,000 years ago. As glaciers receded from the Sierra Nevada and the Cascades, humans migrated to the foothills and valleys protected by higher elevation. Since then, humans have become an integral part of the ecology in Plumas County. This is particularly apparent through documented use of fire to facilitate the propagation and gathering of plant species used for medicinal purposes, food, and other needs. Native peoples harvested or extracted and then processed stone, acorn, pine nut, basketry fiber, and other resources for their sustenance. This activity also resulted in visible alterations to the land and natural resources across Plumas County.

The Mountain Maidu were the last tribal group present in Plumas County when European migrants began to settle in the area. Some sources say the Mountain Maidu people have lived in various locations in Plumas County from hundreds to thousands of years ago and still do today. Other tribes, such as the Washoe and the Paiute, have also utilized the area but did not settle permanently. The existence of the Mountain Maidu people was disrupted in the 1850s by the gold-seeking miners, who, overnight, transformed Plumas County into a gold mining region. Rivers were diverted and ditches were dug to bring water from distant sources for mining purposes.

The North, Middle, and South forks of the Feather River were named in 1821 by Captain Luis Arguello as the Rio de las Plumas ("River of Feathers") after the Spanish explorer saw what looked like bird feathers floating in the water. "Plumas," the Spanish word for "feathers," later became the name for the county. The river and its forks were the primary sites of early mining activity, with many smaller camps located on their tributaries. Gold mining remained the main industry in the area for the next five decades. In March of 1854, Plumas County was formed from the eastern and largest portion of Butte County with the town of Quincy chosen as the county seat. A large part of Plumas County was carved off to form present day Lassen County in 1864, shortly after Plumas County annexed a small portion of Sierra County, which included the town of La Porte.

1.3.2. Geography and Climate

Plumas County is east of Interstate 5 and north of Interstate 80. U.S. Highway 395 passes to the east. State Highway (SH) 36 passes near Lake Almanor on its way from the coast to Susanville. The Feather River National Scenic Byway begins 10 miles north of Oroville at SH 70 and winds through the Feather River Canyon and along the North Fork of the Feather River.

Plumas County is uniquely located at the northern end of the granitic Sierra Nevada where the range intersects with the volcanic Cascade Range. It is this geology that has laid the foundation for the diverse mineral resources and forest lands that are second only to the North Coast forests in production. Plumas County is also home to the largest high elevation valley-meadow complex in California, and is characterized by a large network of streams and rivers that are all part of the greater Feather River Watershed. The Feather River Watershed is the largest watershed in the Sierra Nevada and includes almost all of Plumas County. This watershed contributes to the water supply of over 25 million Californians (60 percent of California's population).

The County has a total area of 2,613 square miles, of which 2,554 square miles is land and 59.8 square miles is water. It is bounded by Shasta County to the northwest; Lassen County to the north and east; Sierra County, Yuba County to the south, Butte County to the south and west; and Tehama County to the west. 65 percent of the County's land area is public lands managed by the United States Forest Service, the majority of which falls within the Plumas National Forest and other areas within the Lassen, Toiyabe, and Tahoe National Forests. Additionally, the County contains a portion of the Lassen Volcanic National Park and is home to the Plumas Eureka State Park.

Plumas County is topographically diverse. The elevation ranges from 1,180 feet in the Sierra Valley, to 8,376 feet in the Sierra Nevada range. The western portion of the County lies in the Sierra Nevada and is characterized by steep slopes, which become valleys and gentler rolling hills in the eastern portion of the County. This variation in topography drives the County's weather patterns, amount and type of precipitation, and overall vulnerabilities to natural hazards.

Plumas County has a Mediterranean climate, with a mean annual temperature of 49°F to 57°F. Temperature extremes in the County can be below 0°F to over 110°F, precipitation varies from 70 inches on the western slope to 12 inches on the eastern slope of the Sierra Nevada. Mean annual precipitation is 43 inches, which falls mostly as rain below 4,000 feet and as snow above 4,000 feet in elevation.

1.3.3. Population and Demographics

The California Department of Finance 2024 estimates for population of Plumas County and its jurisdictions are shown in Table 1-2.

Table 1-2 Plumas County Population by Jurisdiction, 2024

Jurisdiction	Total Population
City of Portola	2,099
Unincorporated County	16,894
Total	**18,993**

Source: California Department of Finance, 2024 E-1 Report

Select social and economic information for the unincorporated Plumas County are shown in Table 1-3.

Table 1-3 Unincorporated Plumas County – Select Social and Economic Statistics

Statistic	Number
Populations	
Population under 5	4.3%
Population over 65	29.8%
Median Age	52.1
White	87.1%
Black or African American	1.4%
American Indian or Alaska Native	1.7%
Asian	0.9%
Native Hawaiian or Pacific Islander	0.3%
Some Other Race	1.1%
Two or more races	7.6%
Median income	$64,946
Mean Income	$94,296
Poverty rate – All families	6.0%
Poverty rate – All people	10.7%
Unemployment Rate (February 2024)	8.1%

Source: 2020 US Census, 2023 US Census Bureau American Community Survey, California Employment Development Department

1.3.4. Economy and Tax Base

Plumas County has a diverse economy. US Census estimate show economic characteristics for the unincorporated County. These are shown in Table 1-4 and Table 1-5.

Table 1-4 Unincorporated Plumas County Civilian Employed Population 16 years and Over by Industry

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	554	7.8%
Construction	607	8.5%
Manufacturing	711	10.0%
Wholesale trade	78	1.1%
Retail trade	677	9.5%
Transportation and warehousing, and utilities	486	6.8%
Information	96	1.3%
Finance and insurance, and real estate and rental and leasing	206	2.9%
Professional, scientific, and management, and administrative and waste management services	385	5.4%
Educational services, and health care and social assistance	1,812	25.4%
Arts, entertainment, and recreation, and accommodation and food services	684	9.6%
Other services, except public administration	214	3.0%
Public administration	630	8.8%

Source: US Census Bureau American Community Survey 2023 Estimates

Table 1-5 Unincorporated Plumas County – Income and Benefits

Income Bracket	Percent
<$10,000	2.1%
$10,000 – $14,999	0.7%
$15,000 - $24,9999	4.2%
$25,000 – $34,999	4.7%
$35,000 – $49,999	11.3%
$50,000 – $74,999	18.2%
$75,000 – $99,999	14.7%
$100,000 – $149,999	23.4%
$150,000 – $199,999	8.6%
$200,000 or more	12.0%

Source: US Census Bureau American Community Survey 2023 Estimates

Major employers in the County are shown in Table 1-6.

Table 1-6 Major Employers in Plumas County Planning Area

Employer Name	Location	Industry
Beckwourth Ranger District	Blairsden	Ranger Services
C Roy Carmichael Elementary	Portola	Schools
Collins Co	Chester	Lumber-Wholesale

Employer Name	Location	Industry
Environmental Alternatives	Quincy	Foster Care
Feather River Family Dentistry	Quincy	Dentists
Graeagle Meadows Golf Course	Blairsden Graeagle	Golf Courses
P C SOS	Quincy	Attorneys
Plumas Bank	Chester	Banks
Plumas Bank	Quincy	Banks
Plumas Co Sheriff's Office	Quincy	Sheriff
Plumas County Board-Supervisor	Quincy	Government Offices-County
Plumas County Pubc Health Agcy	Quincy	Clinics
Plumas County Pubc Health Agcy	Quincy	Government Offices-County
Plumas County Public Works	Quincy	Government Offices-County
Plumas County Sheriff	Quincy	Government Offices-County
Plumas District Hospital	Quincy	Hospitals
Plumas Pines Golf Course	Blairsden	Clubs
Plumas Unified School District	Quincy	School Districts
Safeway	Quincy	Grocers-Retail
Seneca Health Care	Chester	Physicians & Surgeons
Seneca Healthcare District	Chester	Health Care Management
Sierra Pacific Industries	Quincy	Lumber-Manufacturers
US Forest Svc Ranger Station	Quincy	Ranger Services
USDA Forest Svc	Chester	Federal Government-Land/Mineral/Wildlife/Fore
Walton's Grizzly Lodge	Portola	Camps

Source: America's Labor Market Information System (ALMIS) Employer Database, 2025 1st Edition.

1.4 Plan Organization

The Plumas County 2026 LHMP Update is a multi-jurisdictional plan that geographically covers the entire Plumas County Planning Area, as previously described, and encompasses all participating jurisdictions. The 2026 Plumas County LHMP Update is organized as follows:

- Base Plan Chapters
  - ✓ Chapter 1: Introduction
  - ✓ Chapter 2: Community Profile
  - ✓ Chapter 3: Planning Process
  - ✓ Chapter 4: Risk Assessment
  - ✓ Chapter 5: Mitigation Strategy
  - ✓ Chapter 6: Plan Adoption
  - ✓ Chapter 7: Plan Implementation and Maintenance

- Jurisdictional Annexes
  - ✓ Annex A: City of Portola

- ✓ Annex B: Chester Public Utility District
- ✓ Annex C: Feather River Resource Conservation District
- ✓ Annex D: Gold Mountain Community Services District
- ✓ Annex E: Indian Valley Community Services District
- ✓ Annex F: Plumas Corp/Plumas Fire Safe Council
- ✓ Annex G: Plumas Eureka Community Services District
- ✓ Annex H: South Feather Water and Power

- Appendices
  - ✓ Appendix A: Planning Process
  - ✓ Appendix B: References
  - ✓ Appendix C: Mitigation Strategy
  - ✓ Appendix D: Adoption Resolution
  - ✓ Appendix E: Threatened and Endangered Species
  - ✓ Appendix F: Plumas County Historic Buildings and Places
  - ✓ Appendix G: Critical Facilities
  - ✓ Appendix H: FEMA National Risk Index
  - ✓ Appendix I: Hazus Reports

The **Base Plan** provides the overall framework for this multi-jurisdictional LHMP. It is the umbrella document that includes the planning process, methodologies, and process requirements for all participating jurisdictions (i.e., unincorporated County and all Jurisdictional Annexes). As such, Chapters 1-7 of the Base Plan apply to the unincorporated County, the City, and the seven special Districts as participants to this LHMP Update seeking FEMA approval of the Plan. Because this is a multi-jurisdictional plan, the Base Plan addresses the LHMP hazard mitigation planning elements specific to the Plumas County Planning Area which includes data, information and analysis specific to all participating jurisdictions and also includes data, information, and analysis specific to unincorporated Plumas County.

The **Jurisdictional Annexes** detail the hazard mitigation planning elements specific to each additional participating jurisdiction to this Plumas County LHMP Update. Each annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan document. As such, all Chapters 1-7 of the Base Plan, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction. The annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy.

The **Appendices** provide additional information, data, and planning process documentation that applies to all participating jurisdictions (i.e., unincorporated County and all jurisdictional annexes) to this Plumas County LHMP Update.

Chapter 2 What's New

44 CFR §201.6(d)(3) and §201.7(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The previous 2020/2019 Local Hazard Mitigation Plans (LHMP), being updated as part of this 2026 Plumas County LHMP Update, contained descriptions of planning processes, the risk assessments of identified hazards, and mitigation strategies for reducing the risk and vulnerability from these hazards. Since approval of the 2020/2019 Plumas County/City of Portola LHMPs by FEMA, progress has been made on implementation of the 2020/2019 mitigation strategies, by the County and City. As part of this LHMP Update, a thorough review and update of the 2020/2019 LHMPs was conducted to ensure that this 2026 Plumas County LHMP Update reflects current conditions and priorities in order to realign the updated mitigation strategy for the forthcoming five-year planning period. This chapter of the 2026 LHMP Update includes the following:

- **What's New in the LHMP Update**. Section 2.1 provides an overview of the approach to updating the previous LHMPs and identifies new analyses, data and information included in this LHMP Update to reflect current community conditions. This includes a summary of new hazard and risk assessment data as it relates to the Plumas County Planning Area and participating jurisdictions as well as information on current and future development trends affecting hazard vulnerability and related issues. The actual updated data, discussions, and associated analyses are contained in their respective sections within this LHMP Update.
- **Summary of Significant Changes to Current Conditions, Planning Area Vulnerability, and Hazard Mitigation Program Priorities**. Section 2.2 provides a summary of significant changes in current conditions, changes in hazard vulnerability, and resulting modifications to the Plumas County and City of Portola hazard mitigation program priorities.
- **2020/2019 Mitigation Strategy Status and Successes**. Section 2.3.2 provides a description of the status of mitigation actions from the 2020/2019 LHMPs and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated mitigation strategy. This section also highlights key mitigation success stories since the 2020/2019 LHMPs.

This What's New chapter provides documentation of Plumas County's and the City of Portola's, progress or changes in risk and vulnerability to hazards and overall hazard mitigation programs since their previous plans. Completion of this 2026 Plumas County LHMP Update further provides documentation of the County's, the City's and all participating jurisdictions' continued commitment and engagement in the hazard mitigation planning process.

2.1 What's New in the Plan Update

Preparing the 2026 LHMP Update involved a comprehensive review and update of each section of the 2020/2019 LHMPs and includes an assessment of the success of Plumas County and the City of Portola in

evaluating, monitoring, and implementing the mitigation strategy outlined in their 2020/2019 LHMPs. Only the information and data still valid from the 2020/2019 LHMPs was carried forward as applicable into this LHMP Update. In addition, new information obtained from the County, the City, and seven special districts to this LHMP Update were also integrated as appropriate.

Also to be noted, Chapter 7 Implementation and Maintenance of this LHMP Update identifies key requirements for updating future plans:

- Consider changes in vulnerability due to action implementation of mitigation actions;
- Document success stories where mitigation actions have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to inventories; and
- Incorporate new recommended mitigation actions or changes in the prioritization of mitigation actions.

These requirements and others as detailed throughout this Plan were addressed during this LHMP Update process.

As part of the comprehensive review and update of each section for this 2026 LHMP Update, the County, City, and all participating jurisdictions recognized that updated data, if available, would enhance the analysis presented in the risk assessment and utilized in the development of the updated mitigation strategy. Highlights of new data used for this LHMP Update are identified below and also sourced in context within both the Chapter 4 Risk Assessment and the jurisdictional annexes. Sources of specific data used are also provided throughout this LHMP Update and included in Appendix D References. This new data and associated analyses contributed to the development of the updated risk assessment and mitigation strategy presented in Chapter 4 and Chapter 5 of this LHMP Update, as well as within the jurisdictional annexes to this Plan.

Highlights of new information and analyses contained in this LHMP Update includes the following:

- A thorough countywide planning process was conducted for this multi-jurisdictional LHMP Update including outreaching and inviting a broad range of agency, public, and private stakeholders for all participating jurisdictions, including those supporting underserved and vulnerable populations in the Plumas County Planning Area.
- Disaster declarations were updated, including federal, state, and USDA disaster declarations. NCDC Storm Events and past historic hazard occurrences since the previous plans were added for each jurisdiction.
- A Local Concerns section was added to each jurisdiction's vulnerability assessment to capture local issues and to support the resulting mitigation strategy.
- Incorporation and analysis of the updated California Department of Finance population data was utilized for this LHMP Update.

- A detailed discussion of socially vulnerable and underserved populations were added to the Base Plan and to each jurisdictional annex and included a discussion of how these populations could be affected by each hazard.
- An updated critical facility GIS layer was provided by the County and jurisdictions for the Plumas County Planning Area. This allowed for an updated analysis of critical facilities for each mapped hazard in the Plumas County Planning Area.
- Community lifelines were added to the overall asset inventory.
- Economic assets and community activities of value were added to the overall asset inventory.
- Development since the last plan was analyzed in detail for each jurisdiction.
- Future development was gathered from each jurisdiction and analyzed using the most recent hazard data. This was included in each participating jurisdiction's annex.
- A new section on Power Shortage/Failure was added. Public Safety Power Shutoff events were also added.
- Impacts of climate change, changes in population patterns, and changes in land use and development was reviewed and discussed for each hazard and for each jurisdiction.
- Cal-Adapt and other state and local climate change data was added to the climate change section, as well as to other hazards that are exacerbated by climate change.
- Most hazards from the 2019/2020 LHMPs were profiled in this LHMP Update, with the exception of pandemic. Levee failure was placed inside the flood hazard. No new hazards were added.
- An updated and enhanced assessment of each participating jurisdictions' continued compliance with the NFIP was conducted and used to support additional flood risk reduction measures.
- FEMA National Risk Index data for the County was added to all of the natural hazards in the Base Plan.
- New dam data provided by Cal OES and CA DSOD was used for the dam inventory and analysis. This data included an updated hazard classification for identified dams and updated inundation mapping. Assets at risk to dam inundation was analyzed. Critical facilities at risk to dams were tabulated.
- Additional Hazus runs were performed on four separate earthquake shake scenarios for the Plumas County Planning Area.
- Deep seated landslide data was added to the landslide hazard profile and vulnerability analysis. An analysis was performed on values at risk (including populations, structures, critical facilities, and future development).
- New CAL FIRE mapping and analyses were conducted using the 2024 State Responsibility Area and the 2025 Local Responsibility Area Fire Hazard Severity Zones data.
- To better meet the revised FEMA plan review tool, a more extensive analysis of the extents to identified hazards was conducted and included in this LHMP Update for all jurisdictions.
- Special Districts' annexes include hazard maps and hazard extent tables for all mapped hazards of concern.
- A greater study of all jurisdiction's mitigation capabilities was added.
- All previous mitigation actions were updated, and many new actions were added to this LHMP Update, including mitigation actions to address issues related to mitigation planning for vulnerable and underserved populations.

2.2 Summary of Significant Changes to Current Conditions, Planning Area Vulnerability, and Hazard Mitigation Priorities

This section provides a summary by hazard of significant changes in current conditions, Plumas County and the City of Portola's hazard vulnerabilities, and resulting modifications to the Plumas County's and the City of Portola's mitigation program priorities since the 2020/2019 LHMPs. As well, current mitigation program priorities of the additional seven participating jurisdictions to this 2026 LHMP Update are also reflected in this section. As a result of this analysis of factors resulting in changes in community vulnerability since the last Plan, mitigation planning priorities were modified by the County and City and seven participating districts as reflected in each jurisdictions' 2026 lists of priority hazards of concern, LHMP goals and objectives, and the new list and prioritization of mitigation actions and projects for this 2026 LHMP Update.

PLACE AFTER FINAL MEETINGS

2.3 2020/2019 LHMP Mitigation Strategy Successes and Status

Plumas County and the City of Portola successfully implemented numerous mitigation actions identified in the 2020/2019 LHMPs' mitigation strategies, thus working diligently towards meeting their 2020/2019 Plumas County and City of Portola goals and objectives, as follows:

2020 Plumas County Goals

Goal #1: Minimize loss of life and injuries and protect property and the environment from natural hazards

- Minimize loss from priority natural hazards to include wildfire, flood, earthquake, dam failure, drought, landslides, and severe weather hazards
- Minimize impact to existing and future development
- Minimize economic and natural resource impact
- Promote resiliency strategies
- Support mitigation planning and implementation in all County departments and operations

Goal #2: Reduce losses and provide protection for critical facilities, infrastructure, and services from hazard impacts

- Implement critical facility upgrades and mitigation measures to ensure reliability of services
- Update and maintain a GIS database of critical facilities to include: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Minimize the loss of agricultural and natural resource productivity (foundation of rural economy) from natural hazards

- Support education and training of private land managers on hazard mitigation and disaster preparedness
- Promote local research, education, and technical assistance on sustainable agriculture and forestry practices

- Foster agricultural and natural resource resilience to natural hazards through implementation of best management practices and restoration activities
- Provide training, technical assistance, outreach and education to private landowners on tree mortality, identification, management, and prevention strategies

Goal #4: Increase community awareness, education, preparedness, and self-reliance to natural hazards

- Enhance public and stakeholder outreach, education, and preparedness programs to include all hazards of concern
- Increase public and stakeholder knowledge about the risk and vulnerability to identified hazards and how to be more self-reliant in mitigating risks from natural hazards
- Provide public and stakeholder education and outreach specific to evacuation routes, various available emergency communication modes, and roles and responsibilities

Goal #5: Increase communities' ability to mitigate hazards and be prepared for, respond to, and recover from a disaster event in Plumas County

- Improve community capabilities to mitigate hazards and reduce losses
- Enhance community capabilities by improved coordination of local, state, and federal resources
- Increase capabilities to provide mitigation opportunities and assistance to Plumas County communities
- Increase the capacity to effectively respond to and recover from natural disaster events
- Enhance emergency communication capabilities (e.g., cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Increase capabilities for continuity of government
- Improve community's ability to be competitive/successful with grant funding opportunities from application development to project delivery

Goal #6: Minimize life safety issues, property loss, environmental damages, and economic impacts associated with wildfires, the #1 natural hazard of concern in Plumas County

- Reduce the wildfire risk and vulnerability
- Update, maintain, and implement Community Wildfire Protection Plans
- Develop a Countywide fuels management implementation strategy
- Coordinate comprehensive fire protection strategies among all federal, state, and local agencies and across all property boundaries to implement a fire-adapted community concept approach at broader county-wide geographic and policy scales
- Increase community education, outreach, and awareness of wildfire mitigation strategies, including those to be undertaken by private property owners
- Continue to seek establishment of Firewise USA sites (communities)
- Promote and develop a tree mortality action plan for monitoring, prevention and mitigation activities
- Promote and enhance fire-fighting capabilities (e.g., access roads, water supply, etc.)
- Improve community infrastructure for wildfire preparedness and response including locating safety zones, augmenting community water supplies, and reducing fire hazard along transportation and power infrastructure
- Enhance the county wildfire hazard codes, including enforcement capabilities, within areas of high wildfire risk
- Continue land use planning efforts to ensure increased fire safety in new developments

- Develop and implement outreach, education, and technical assistance to encourage "home hardening" and retrofitting of older residences and structures to increase community resilience to wildfire

Goal #7: Minimize the effects of climate change on natural hazards in Plumas County

- Develop a Climate Action Plan for Plumas County
- Consider and integrate climate change information and issues in future General Plan updates

City of Portola 2019 Goals

- Increase public awareness of potential natural hazards and self-reliant mitigation actions.
- Reduce risk of loss of life/injuries due to natural hazards
- Reduce risk of loss to property, both public and private
- Maintain and increase funding for natural disaster preparedness, planning and response

2.3.1. Success Stories

Since the 2020/2019 LHMPs, progress has been made on the implementation of the mitigation strategies contained within these previous Plans. Beyond the mitigation strategy implementation from the 2020/2019 LHMPs, Plumas County, the City of Portola and the seven participating special districts also continue to implement additional hazard mitigation measures not contained within the previous Plans. This section highlights key mitigation success since the 2020/2019 LHMPs.

OTHER SUCCESS STORIES

City of Portola Success Stories

Fire Wise community certification, general education and outreach, and incorporation into the Countrywide plan so that all jurisdictions are working together.

2.3.2. 2020/2019 Mitigation Strategy Update

The 2020/2019 LHMPs contained separate mitigation strategies for each participating jurisdiction. These have been combined below. The 2019/2020 LHMPs contained 80 separate mitigation actions for the jurisdictions.

45 of these were County actions. Of these, 4 are complete, 22 are ongoing, and 19 have not been started. 24 actions have been identified for inclusion in this LHMP Update and have been carried forward in Chapter 5.

35 of these were City of Portola actions. Of these, 3 are complete, 24 are ongoing, and 8 have not been started. 12 actions have been identified for inclusion in this LHMP Update and have been carried forward in Chapter 5.

Table 2-1 and Table 2-2 provides a status summary of the mitigation action projects from the 2020/2019 LHMPs.

Table 2-1 Plumas County Planning Area 2020 LHMP: Mitigation Action Status Summary

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Plumas County				
All Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Public Health & Safety Element of General Plan	X			Y
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access		X		Y
Action 4. Companion Animal/Livestock/Horse/Equipment Trailer	X			Y
Action 5. Plumas County General Plan Public Health & Safety Element update to incorporate Senate Bill (SB) 379 requirements		X		Y
Action 6. Continue Telephone Emergency Notification System (TENS) Capability Enhancements Countywide		X		Y
Action 7. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.		X		Y
Action 8. Evaluate Coverage and Expansion for Broadband Services. Advance Grants and Projects Accordingly		X		N
Action 9. Harden Cell Tower Sites. Increase Cell Service Coverage by Increasing the Number of Cell Towers. Increase the Number of Repeater Sites. Install Backup Generators in Case of Power Failure.			X	Y
Action 10. Identify Critical Facilities Requiring Backup Generators		X		Y
Action 11. Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter	X			N
Action 12. Explore establishing a Community Emergency Response Team (CERT)			X	Y
Action 13. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access			X	Y
Action 14. PRC 4290 – Plumas County Code Title 9, Chapter 8. Street Address System. Promote and continue to implement compliant street/address reflective signage for public and private roads and structures		X		Y
Action 15. Designation of minor County roads and forest service roads to be used as alternate routes around road closures during wildfire and other hazard events. Plumas and Lassen National Forests have funding for new road connections to form alternate routes.			X	Y
Climate Change, Drought and Water Shortage Actions				
Action 16. Develop a Climate Action Plan			X	Y
Action 17. Water Shortage Preparedness and Contingency Planning Pilot Project		X		Y
Action 18. Water Supply Infrastructure Improvements			X	N
Dam Failure, Flood, Localized Flood, Levee Failure, Landslide, Mudslide, and Debris Flow, and Severe Weather Actions				
Action 19. Countywide Stormwater Drainage and Grading Ordinance		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 20. Develop a Countywide Drainage Master Plan		X		Y
Action 21. FEMA Mapping Update			X	Y
Action 22. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)			X	Y
Action 23. Ongoing Implementation of Stream Clearing and Maintenance Programs		X		Y
Action 24. Plumas Eureka CSD stream bank flood mitigation			X	N
Action 25. Evaluate and Implement Projects to Reduce Flooding in Plumas Eureka CSD			X	N
Action 26. Plumas Eureka CSD Sewer Plant Flood Mitigation			X	N
Action 27. Evaluate Options for Obtaining 100-year Level of Certification for the Diversion Dam (East and West Chester Levees)			X	N
Action 28. Review and Update, as Needed, Title 8 (Building Regulations), Chapter 17 (Flood) of the Plumas County Code re: Floodplain Ordinance and Applicable Title 9 (Planning and Zoning) Sections			X	Y
Action 29. Identify and Implement Bank Stabilization Projects		X		Y
Action 30. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad			X	Y
Action 31. Evaluate and Implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas			X	Y
Earthquake Actions				
Action 32. Conduct a Seismic Risk Evaluation of Critical Facilities and Public Buildings; Prioritize and Implement Seismic Retrofits: PECSD Water Storage Tank Replacement			X	Y
Action 33. Seismic Risk Evaluations to Prioritize and Implement Seismic Retrofits			X	Y
Pandemic Actions				
Action 34. Update and Refine Pandemic Plan			X	N
Wildfire, Drought and Water Shortage, and Tree Mortality Actions				
Action 35. Plumas County Agriculture, Forestry, and Natural Resources Resilience		X		Y
Action 36. Invasive Species Control and Eradication		X		Y
Action 37. Continue and Promote Defensible space (PRC 4291) Projects Including Assistance Efforts for Senior and Disabled Residents		X		N
Action 38. Establish Additional Firewise USA Sites (communities) and Promote Existing Ones		X		Y
Action 39. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects		X		N
Action 40. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.		X		N
Action 41. Identify and Implement Priority Wildfire Risk Reduction Projects from the Plumas County CWPP to Enhance Forest Health Including Detection, Prevention, and Mitigation of Tree Mortality		X		N

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 42. Plumas County General Plan Public Health & Safety Element update to address state law requirements for land classified as State Responsibility Areas (SRAs) and within Very High Fire Hazard Severity Zones (VHFHSZs)		X		N
Action 43. Local Adoption of State Responsibility Area Fire Safe Regulations	X			N
Action 44. Improve Funding and Response Capabilities of Local Fire Protection Districts and Expand Districts in Areas not Covered		X		Y
Action 45. Review and Update, as Needed, Plumas County Code to Address Defensible Space and Vegetation Management			X	N

* Actions not carried forward were determined by the jurisdictions to be no longer feasible, relevant, lacked funding and local resources to implement, and/or no longer considered a priority.

Table 2-2 City of Portola Planning Area 2019 LHMP: Mitigation Action Status Summary

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
City of Portola				
Action 1. Educate public about potential hazards and high hazard areas within the community in the event of a natural disaster. (1.1.1)		X		Y**
Action 2. Encourage property owners to actively participate in education programs, access resources, and develop personal mitigation measures as they relate to natural hazards specific to the community and personal property. (1.1.2)		X		Y**
Action 3. Provide online access to awareness/ protection materials relevant to City of Portola residents. (1.1.3)		X		N
Action 4. Educate the public on the Citywide Emergency Evacuation Plan and Emergency Action Plan. (1.1.4)		X		Y**
Action 5. Educate the public about living with fire and fire safe requirements in the General Plan Safety Element. (1.1.5)		X		Y**
Action 6. Create a public notification plan to provide a means to educate, inform, and alert the community regarding changes in hazard identification, occurrence, and mitigation processes and options. (1.1.6)		X		Y**
Action 7. Provide hazard warning and forecasting information to City residents & establish a rapid communication system for the community. (2.1.1, 2.1.2, 3.1.1, 3.1.2)		X		Y**
Action 8. Actively participate in the development of Plumas County's Safety Element to ascertain Portola's concerns are addressed. (2.1.3, 3.1.3)	X			N
Action 9. Coordinate with the California Department of Water Resources (Dam Safety Division) for mitigation measures within the community as a result of a dam failure inundation. (2.2.1)			X	N
Action 10. All Development within floodway shall meet FEMA Standards. (2.2.2)		X		N
Action 11. Mitigate the potential impacts to new structures by mandating compliance with California Building Code (CBC). (2.3.1, 3.5.1)		X		N
Action 12. Prioritize and evaluate essential facilities for seismic conditions and potential retrofit. (2.3.2, 3.5.2)		X		Y***

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 13. Monitor and continue to regulate grading and slope development standards to reduce potential landslide and slope movement impacts. (2.3.3, 3.5.3)		X		N
Action 14. Enforce compliance with open space and fuel break requirements set forth in the City of Portola General Plan Safety Element Wildland Fire section. (2.4.1)		X		N
Action 15. Review and update mutual aid agreements with Forest Service, CAL FIRE, and other surrounding fire departments and volunteer agencies. (2.4.2)			X	N
Action 16. Adopt California PRC 4290 and PRC 4291 code. (2.4.3)		X		N
Action 17. Adopt and complete steps to become a NFPA Fire-Adapted Community or a 'Fire Wise Community.' (2.4.5)	X			N
Action 18. Seek opportunities to reduce high fuel hazards and create fuel breaks. (2.4.6)		X		Y
Action 19. Evaluate potential impacts of identified hazards on existing utilities and facilities (water, sewer, power, public transportation routes & structures). Prioritize those utilities for mitigation based on risk level and criticality to community and/or criticality to emergency evacuation routes. (3.2.1)		X		N
Action 20. Continue to combine water quality, open space, and recreation projects within flood measures where feasible. (3.3.1)		X		N
Action 21. Maintain natural stream courses and adjacent habitat, where feasible during flood control improvements. (3.3.2)	X			N
Action 22. Establish zoning and land use ordinances that limit development in flood prone areas. (3.4.1)		X		N
Action 23. Ensure the impacts of flooding are adequately analyzed when considering areas for future urban development or significant improvements to existing facilities or structures. (3.4.2)		X		N
Action 24. Ensure that flood mitigation measures are incorporated into repairs, new development, major alterations, and new redevelopment applications. (3.4.3)		X		N
Action 25. Enforce compliance with the City of Portola Master Drainage Plan and Floodplain Management Ordinance. (3.4.4)		X		N
Action 26. Educate and encourage homeowners residents to adopt seismic safety protocols as their time and resources allow. (3.5.4)		X		Y**
Action 27. Secure a grant that would provide support staff to aid in the implementation and execution of the LHMP. (4.1.1)			X	N
Action 28. Apply for grants specific to identified action items, including scientific studies and evaluation of existing improvements. (4.1.2)			X	N
Action 29. Cross train staff with Plumas County personnel and adopt uniform protocols where applicable. (4.1.3)		X		Y
Action 30. Work toward securing multi-jurisdiction grants and funding for disaster planning and response. (4.1.4)			X	N
Action 31. Create a community network for emergency response alternatives including churches, and civic meeting halls. (4.1.5)		X		Y**

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 32. Apply for grants that may help fund improvements beyond the City limits; e.g. fire safety and wildfire hazard mitigation, channel and water quality improvements to the Middle Fork of the Feather River, etc. (4.2.2)		X		Y
Action 33. Review existing hazard response training protocol and update/upgrade as necessary. (4.3.1)			X	N
Action 34. Begin to search for grant/funding opportunities for upgrade of fire equipment & training opportunities. (4.3.2)			X	N
Action 35. Utilize County, State, and other regulatory agency opportunities for cross and specialty training modules. (4.3.3)			X	N

* Actions not carried forward were determined by the jurisdictions to be no longer feasible, relevant, lacked funding and local resources to implement, and/or no longer considered a priority.

** These have all been combined into one action being carried forward in this LHMP Update.

*** These have all been combined into one action being carried forward in this LHMP Update.

Chapter 3 Planning Process

44 CFR §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Plumas County, as the project lead for this 2026 Plumas County LHMP Update, recognized the importance and need of the update process for their single-jurisdictional 2020 LHMP and initiated the development of a Multi-Jurisdictional LHMP that included the City of Portola and seven participating special districts. As such, this 2026 LHMP Update is also an update to the City of Portola's single-jurisdictional 2019 LHMP; this is the first LHMP for the seven participating special districts.

After securing funding for this LHMP Update, Plumas County contracted with Foster Morrison Consulting, Ltd. (Foster Morrison) to facilitate and develop the Plan. Jeanine Foster, a professional planner with Foster Morrison, was the project manager in charge of overseeing the planning process and the development of this LHMP Update. Chris Morrison, also a professional planner with Foster Morrison, was the lead planner for the development of this LHMP Update. The Foster Morrison's team's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA);
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program (NFIP) and the Flood Mitigation Assistance (FMA) program;
- Facilitate the entire planning process;
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data;
- Assist in facilitating the public input process;
- Produce the draft and final plan documents; and
- Coordinate with the California Office of Emergency Services (Cal OES) and FEMA Region IX plan reviews.

3.1 Local Government Participation

Plumas County and the other participating jurisdictions made a commitment to this 2026 Plumas County Multi-Jurisdictional LHMP Update. The DMA planning regulations and guidance stress that each local government (participating jurisdiction) seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the Plumas County Planning Area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the Plan.

For all participating jurisdictions, "participation" meant the following:

- Attending and participating in the HMPC meetings;
- Completing and returning the Data Collection Worksheets;
- Collecting and providing other requested data (as available);
- Coordinating information sharing between internal and external agencies;
- Managing administrative details;
- Making decisions on LHMP process and content;
- Discussing their participation in the NFIP and any identified repetitive loss properties;
- Addressing changes in development since the 2020/2019 LHMPs and new development considerations;
- Providing status of 2020/2019 actions and identifying mitigation actions for the Plan;
- Identifying opportunities for integrating the completed Plan into other planning mechanisms;
- Identifying jurisdictional capabilities to support mitigation strategy implementation;
- Making decisions on LHMP process and content;
- Identifying mitigation actions for the Plan;
- Reviewing and providing comments on Plan drafts;
- Providing Draft documents of the LHMP for public review;
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them to comment on the draft Plan; and
- Coordinating the formal adoption of the Plan by the governing boards for each jurisdiction.

The participating jurisdictions seeking FEMA approval of this LHMP Update met all of these participation requirements. Multiple representatives from participating jurisdictions attended the HMPC meetings described in Table 3-3 and also brought together an internal planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on Plan drafts. Appendix A provides additional information and documentation of the planning process.

Individuals representing various departments and other representatives from the participating jurisdictions to this Plumas County LHMP Update were actively involved throughout the Plan Update process as identified in Appendix A in the sign-in sheets for the meetings and as evident through the data, information and input provided by HMPC representatives for the development of this LHMP Update. This Chapter 3 and Appendix A provide additional information and documentation of the planning process and participants to this LHMP Update, including members of the HMPC.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for updating the Plumas County and City of Portola LHMPs using the DMA planning requirements and FEMA's associated guidance. Specifically, the LHMP was developed pursuant to the requirements of DMA 2000, published at 44 CFR 201.6 and new FEMA LHMP guidance, LHMP Policy Guide FP 206-21-0002 effective April 11, 2025, as well as applicable California laws and mitigation requirements. This guidance is structured around a four-phase process:

1. Organize Resources;
2. Assess Risks;
3. Develop the Mitigation Plan; and
4. Implement the Plan and Monitor Progress.

Into this process, Foster Morrison integrated a more detailed 10-step planning process used for FEMA's CRS and FMA programs. The modified 10-step process used for this Plan meets the requirements of six major programs: FEMA's Hazard Mitigation Grant Program (HMGP); Pre-Disaster Mitigation (PDM) program; CRS program; Flood Mitigation Assistance (FMA) Program; Severe Repetitive Loss (SRL) program; and new flood control projects authorized by the U.S. Army Corps of Engineers (USACE).

Table 3-1 shows how the modified 10-step process fits into FEMA's four-phase process. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Processes Used to Develop the 2026 Plumas County Local Hazard Mitigation Plan Update

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

As part of this LHMP Update, all sections of the 2020/2019 LHMPs were reviewed and updated to reflect new data, processes, and resulting mitigation strategies. Only the information and data still valid from the 2020/2019 LHMPs were carried forward as applicable into this 2026 LHMP Update.

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With each participating jurisdiction's commitment to participate in the DMA planning process, Foster Morrison worked with Plumas County's Office of Emergency Services (County OES), as overall project lead, to establish the framework and organization for development of this LHMP. An initial meeting was held with County OES to discuss the organizational and process aspects of this 2026 LHMP Update.

An initial project kickoff meeting was held with participating jurisdictions on December 13, 2024, followed by the primary kickoff meeting with all participating jurisdictions and stakeholders on January 14, 2025. Invitations to the kickoff meeting were extended to key county and city departments and special districts, as well as to other federal, state, and local stakeholders, including representatives from the public, which might have an interest in participating in the planning process. Representatives from the HMPC members to the 2020/2019 LHMPs and other identified stakeholders were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The list of invites is included in Appendix A.

Hazard Mitigation Planning Committee

The HMPC was established as a result of these initial meetings, as well as through interest generated through the initial public meeting and outreach conducted for this project as detailed later in this chapter. The HMPC, comprised of county, city, special district, and other government and stakeholder representatives and the public, developed the Plan with leadership from County OES and facilitation by Foster Morrison. This list includes all HMPC members that were active participants in the Plan development process as evidenced through their attendance at one or more HMPC meetings, as well as those who provided key input into the Plan development process. The following individuals participated on the HMPC:

Table 3-2 Plumas County Hazard Mitigation Planning Committee TO BE PLACED

Agency	Name
Participating Jurisdictions and Agencies	

Utilizing a Common Planning Process

The County and all participating jurisdictions developed this LHMP Update utilizing a common Plan development process utilizing the "whole community" approach. This included establishing an HMPC that

included key stakeholders for all jurisdictions ensuring that the five required categories of stakeholders, specific to each jurisdiction, were identified and included. Utilizing a common planning process involving all jurisdictional stakeholders promoted better stakeholder participation for all jurisdictions. This approach respected the time and availability of stakeholders, while maximizing participation of a common group of jurisdictional stakeholders by not requiring them to come to duplicate (or really 9 separate meetings) on the same Plan development element(s), which for this Plan would have resulted in 45 separate meetings to cover the 5 primary HMPC topics and meetings. It also spurred conversations between jurisdictions, as well as their public stakeholders, who were invited to come to these meetings. Additional considerations and benefits for utilizing a common planning process for the development of the LHMP Update include:

- The small rural nature of Plumas County, the City of Portola, and participating special districts was best suited for a common plan development process.
- Common group of stakeholders to all participating jurisdictions necessitated a common plan development process.
- Several of the jurisdictions have shared or overlapping boundaries and economic ties, often work under the same authorities, and have similar needs and capabilities.
- A common plan development process brings key stakeholders together in the same meetings instead of siloing them to specific jurisdictional meetings. This adds value by getting different groups discussing key issues collectively with different experiences and perspectives to bring to the table.
- Improves stakeholder communication and coordination by increasing stakeholder attendance in support of all jurisdictions and not diluting their participation by requiring attendance at multiple, duplicate meetings that they won't be able to attend.
- Key public stakeholders invited to be part of the HMPC were better able to attend a limited set of meetings.
- All participating jurisdictions face similar threats and hazards which drive the resulting mitigation strategy that benefits the Plumas County Planning Area as a whole by promoting a comprehensive and regional approach to mitigation.

Utilizing this common planning process resulted in multiple entities being engaged and in the room at the same time. All of this is shown in detail throughout this chapter and in Appendix A.

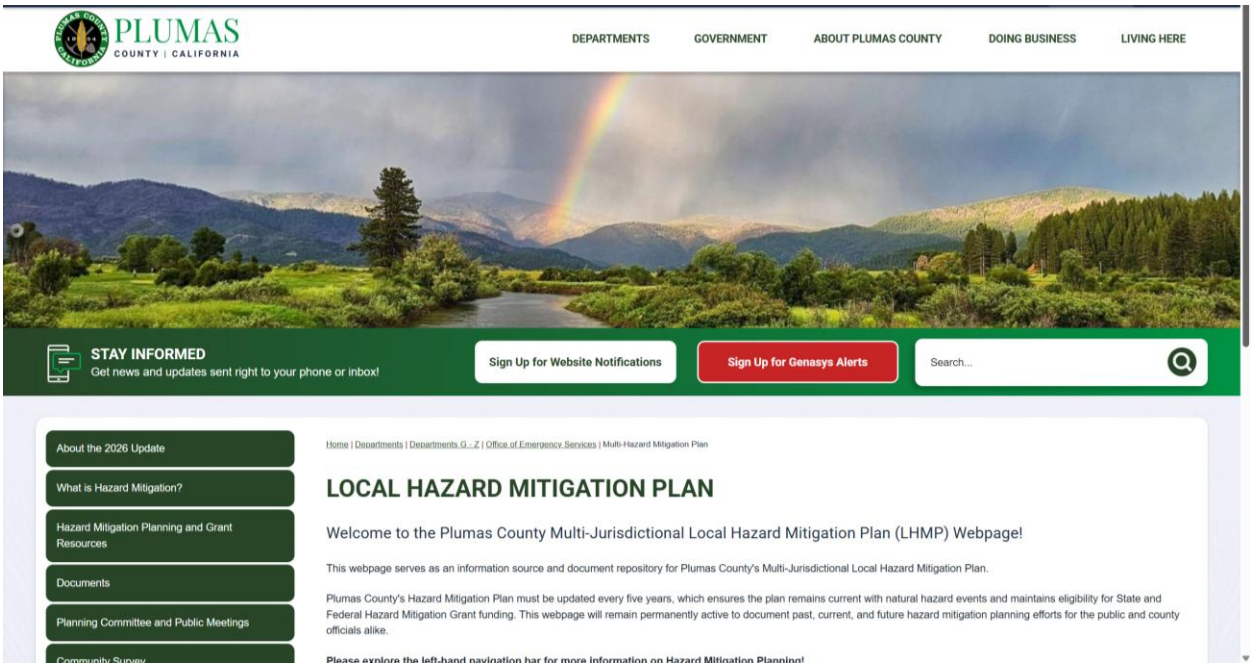
Meetings

The planning process officially began with a project planning call with Plumas County OES on December 10, 2024, with an initial project kickoff meeting of participating jurisdictions on December 13, 2024. The primary HMPC kickoff meeting for all participating jurisdictions and project stakeholders was held on January 14, 2025, followed by a public kickoff meeting held the same day at 5:30 pm. The meetings covered the scope of work and an introduction to the DMA requirements. During the HMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the Plan. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to each of the participating jurisdictions, identify values at risk to identified hazards, inventory existing capabilities, record possible mitigation actions, and to capture information on the status of mitigation action items from the 2020/2019 LHMPs. A copy of the worksheets for this project are included in Appendix A. Each participating jurisdiction seeking FEMA approval of this LHMP Update completed and returned the worksheets to Foster Morrison for incorporation into this 2026 LHMP Update.

During the planning process, the HMPC communicated through virtual Team and Zoom meetings, email, telephone conversations, Dropbox websites, and through a County developed webpage dedicated to the Plan development process. This later website was developed to provide information to the HMPC, the public and all other stakeholders on the LHMP process. Draft documents were also posted on these websites so that the HMPC members, stakeholders, and the public could easily access and review them.

The Plumas County LHMP website (as shown on Figure 3-1) can be accessed online at: https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan.

Figure 3-1 Plumas County Local Hazard Mitigation Plan Update Website



Source: Plumas County

The HMPC met formally five times during the planning period (December 2024 – January 2026) which adequately covers the four phases of DMA and the 10-Step CRS planning process. Internal jurisdictional meetings were held throughout the planning process to further support Plan development. The key meetings and topics discussed are described in Table 3-3. Invitations, agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-3 Plumas County Internal and HMPC Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Location(s)
Internal Project Planning Meeting	1) Overview of LHMP plan development process 2) Initial identification of participating jurisdictions and HMPC members 3) Discussion of GIS and other data needs	December 10, 2024	Virtual Zoom Meeting

Meeting Type	Meeting Topic	Meeting Date	Meeting Location(s)
Project Kickoff Meeting of Participating Jurisdictions	1) Overview of LHMP plan development process 2) LHMP requirements and resource overview 2) Jurisdictional participation requirements 3) Project schedule	December 13, 2024	Virtual Teams Meeting
HMPC #1 Kickoff Meeting	1) Introduction to DMA and the LHMP planning process 2) Organize Resources (CRS Steps 1,2&3): the role of the Planning Committee, planning for public involvement, coordinating with other agencies/stakeholders 3) Introduction to Hazard Identification	January 14, 2025	Quincy Branch Library, Quincy, CA
Risk Assessment Worksheet Meeting of Participating Jurisdictions	1) Review and discussion of Risk Assessment data needs	March 17, 2025	Virtual Zoom Meeting
HMPC #2	1) Risk assessment overview and work session -CRS Step 4: Assess the Hazard -CRS Step 5: Assess the Problem	May 8, 2025	Quincy Branch Library, Quincy, CA
HMPC #3	1) Review of risk assessment summary 2) Review and update of mitigation goals 3) Intro to Mitigation Action Strategy -CRS Step 6: Set Goals -CRS Step 7: Review possible activities	August 6, 2025	Quincy Branch Library, Quincy, CA
HMPC #4	1) Review of mitigation alternatives 2) Review and update of mitigation actions from the 2020/2019 LHMPs 3) Identify updated list of mitigation actions by hazard 4) Review of mitigation selection criteria 5) Update and prioritize mitigation actions 6) Mitigation Action Strategy Implementation and Draft Action Development -CRS Step 7: Review possible activities -CRS Step 8: Draft an Action Plan	August 7, 2025	Plumas-Sierra Co. Fairgrounds, Mineral Building, Quincy CA
HMPC #5	1) Review of final HMPC, jurisdictional and public comments and input to Plan 2) Review and documentation of changed conditions, vulnerabilities, and mitigation priorities 3) CRS Step 8: Draft an Action Plan 4) CRS Step 9 & 10: Plan Maintenance and Implementation Procedures	December 11, 2025	Quincy Branch Library, Quincy, CA

Planning Step 2: Involve the Public

Public stakeholders for all participating jurisdictions are generally defined as any stakeholder not attached to local government in the Plumas County Planning Area. Up-front coordination discussions with Plumas County established the initial plan for public involvement. Public involvement activities for this LHMP Update included press releases, social media communications, stakeholder and public meetings,

development of an LHMP webpage and associated website postings, and the collection of public and stakeholder comments on the draft Plan through a variety of mechanisms. This included other public outreach activities as further described below and targeted outreach to different groups of people and other agencies throughout the Plan development process. At the internal kickoff meeting, the HMPC discussed additional strategies for public involvement and agreed to an approach using established public information mechanisms and resources within the County.

Early Public Outreach Activities

Public outreach for this LHMP Update began at the beginning of the Plan development process with the development of an LHMP webpage and outreach on the LHMP development and continued throughout the process at key plan development phases through a variety of mechanisms as described below:

Project Kickoff

- Development of a Plumas County 2026 LHMP Update webpage
- Post on Plumas County Office of Emergency Services (OES) Facebook page, 12/20/2024 (estimated viewership of 1,865)
- Plumas County Firewise Leads email forward, 1/1/2025 (estimated viewership of 83)
- Plumas County VOAD email newsletter, 1/5/2025 (estimated viewership of 205)
- Plumas County News and Public Notices email newsletter, 1/6/2025 (estimated viewership of 224)
- Post on Plumas County OES Facebook page, 1/7/2025 and 1/10/2025 (estimated viewership of 1,119)
- Plumas Sun news article, 1/7/2025
- 20,000 Lives email newsletter, 1/8/2025
- Plumas County Fire Safe Council meeting announcement, 1/9/2025 (estimated viewership of 30)
- Plumas County Fire Chief's Association meeting announcement, 1/11/2025 (estimated viewership of 20)
- 20,000 Lives email newsletter, 1/14/2025
- Posting of LHMP Public Information Poster/Flyer on community bulletin boards:
  - ✓ Chester Post Office
  - ✓ Canyon Dam Post Office
  - ✓ Greenville Post Office
  - ✓ Crescent Mills Post Office
  - ✓ Taylorsville Post Office
  - ✓ Chilcoot-Vinton Post Office
  - ✓ Feather River Food Co-Op, Portola
  - ✓ Portola Post Office
  - ✓ Clio Post Office
  - ✓ Graeagle Store
  - ✓ Blairsden/Graeagle Post Office
  - ✓ Feather River Food Co-Op, Quincy
  - ✓ Quincy Post Office
  - ✓ Forest Stationers, Quincy
  - ✓ Rhythm and Grace Dance Studio, Quincy
  - ✓ Quincy Branch Library

Hazard Risk Assessment

- Plumas County OES Facebook Post, 4/25/2025 (estimated viewership of 7,002)
- Plumas County VOAD email newsletter, 4/29/2025 (estimated viewership of 223)
- Plumas County News and Public Notices email (estimated viewership of 238)
- Plumas County OES Facebook Post, 5/5/2025 (estimated viewership of 4,249)
- Plumas Sun news announcement, 1/7/2025
- Shared in Facebook Groups
  - ✓ Plumas and Lassen County Crime Concerns and Info
  - ✓ Plumas-Sierra County Fire Weather/Updates
  - ✓ Plumas, Lassen, Sierra Classified and open forum complaints
  - ✓ Portola Portal
  - ✓ 530 Fire
  - ✓ The Sierra Valley
  - ✓ GRAEAGLE California
  - ✓ Plumas County Hazard Watch
  - ✓ Sierra Plumas Community Events
  - ✓ Plumas County Volunteers
  - ✓ PLUMAS COUNTY EVENTS
  - ✓ Plumas County Hazard Watch
  - ✓ Dixie Fire Recovery Voices
  - ✓ The Sierra Valley
- Posting of LHMP Public Information Poster/Flyer on community bulletin boards:
  - ✓ Blairsden Sierra Suds Laundromat
  - ✓ Blairsden-Graeagle Post Office
  - ✓ Canyondam Post Office
  - ✓ Chester Laundromat
  - ✓ Chester Library
  - ✓ Chester Plumas Bank
  - ✓ Chester Post Office
  - ✓ Chilcoot-Vinton Post Office
  - ✓ Clio Post Office
  - ✓ Crescent Mills Crescent Country Antiques and Gifts
  - ✓ Crescent Mills Post Office
  - ✓ East Quincy East Side Laundromat
  - ✓ Graeagle Store
  - ✓ Greenville Evergreen Market
  - ✓ Greenville Plumas Bank
  - ✓ Greenville Post Office
  - ✓ Meadow Valley Post Office
  - ✓ Portola Feather River Food Coop
  - ✓ Portola City Hall
  - ✓ Portola Leanard's Market
  - ✓ Portola Library

- ✓ Portola Plaza Laundromat
- ✓ Quincy Plumas Bank
- ✓ Quincy Post Office
- ✓ Taylorsville Post Office
- ✓ Twain Post Office
- ✓ Twain Store

The purpose of this outreach was to inform the public and other stakeholders of the Plumas County LHMP Update project, how they could get involved, and how to provide comments on the draft LHMP prior to submittal to Cal OES/FEMA. The outreach also invited the public stakeholders to the HMPC meetings for the project. Information on these outreach efforts can be seen in Appendix A to this LHMP.

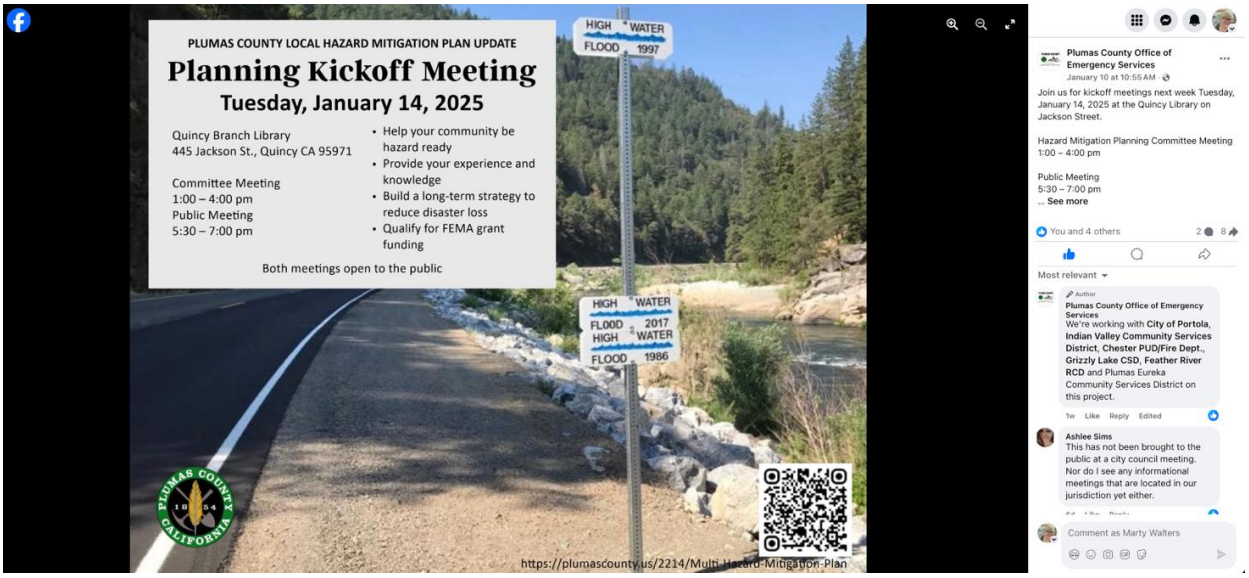
Public Meetings

Three public meetings were planned for this LHMP Update project, during key phases of the LHMP development process. Public outreach efforts for these public meetings are described above for the first two public meetings and detailed below for the final public meeting on the Draft Plan. The three public meetings include:

Public Meeting #1: LHMP Kickoff

Public outreach for this LHMP Update began at the beginning of the Plan development process with the early public outreach activities to inform the public of the purpose of the LHMP and the hazard mitigation planning process for Plumas County and all participating jurisdictions. A press release was also issued at the beginning of the project to invite the public to attend either the public meeting or HMPC meetings. Figure 3-2 captures the Plumas County (OES) Facebook page January10, 2025 post.

Figure 3-2 Plumas County Office of Emergency Services, Facebook Page, January 10, 2025



Source: Plumas County

Public Meeting #2: Hazard Risk Assessment

A second public meeting was held to provide an overview of the hazard risk assessment portion of the LHMP Update. This meeting was held in Plumas County the evening of the HMPC risk assessment meeting. This meeting was advertised through the Plumas County website and through other public outreach efforts mechanisms as previously described.

Public Meeting #3: On the Draft LHMP

The first draft of the LHMP Update was provided to the HMPC in October 2025, with a public review draft provided in November 2025. A public meeting was held on the evening of December 10, 2025, to present the draft LHMP and to collect public comments on the public review draft prior to finalization and submittal to Cal OES/FEMA. The public meeting was advertised in a variety of ways to maximize outreach efforts to both targeted groups and to the public at large and included an article in a local newspaper inviting the public to attend either the formal public meetings or the HMPC meeting at their convenience. The advertisement in the local newspaper included information on the date, location, and time of the meeting; where the draft Plan could be accessed in the community; and how to provide comments on the draft LHMP Update. In addition to a copy of the public review draft being placed on the Plumas County LHMP website in advance of these meetings, a hard copy of the draft Plan was made available in the Plumas County INSERT LOCATION. Documentation to support the final public meeting, including meeting outreach, can be found in Appendix A.

In addition to the advertisement for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders (including the public) with an interest in the Plumas County Planning Area. The majority of these people reside in the Plumas County Planning Area or in surrounding communities. Because this is a multi-jurisdictional planning effort, all public outreach activities for this LHMP Update were conducted in collaboration with and on behalf of the Plumas County and all participating jurisdictions to this 2026 LHMP Update. Additional outreach for review of the Draft LHMP and final meetings included:

- Issuing of a Press Release on the Final Meetings and how to provide comments on the Draft LHMP
- Website additions announcing the final HMPC and Public meetings and how to provide comments on the Draft LHMP
- An advertisement in the local Newspaper on the final meetings and how to provide comments on the Draft LHMP
- Posting of LHMP Public Information Flyer at the following locations:

The formal public meetings for this project are summarized in Table 3-4.

Table 3-4 Schedule of Public and Stakeholder Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Early Public Kickoff Meeting #1	1) Intro to DMA, CRS and mitigation planning 2) 2026 LHMP Update Process	January 14, 2024	Quincy Branch Library, Quincy, CA

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Public Risk Assessment Meeting #2	1) Risk Assessment Overview	May 8, 2025	Quincy Branch Library, Quincy, CA
Final Public Meeting #3 on the Draft LHMP	1) Presentation of Draft LHMP and solicitation of public and stakeholder comments	December 10, 2025	Quincy Branch Library, Quincy, CA

Where appropriate, stakeholder and public comments and recommendations were incorporated into the final LHMP throughout the Plan development process, including the sections that address the risk assessment and mitigation goals and strategies. Public comments were solicited throughout the planning process and prior to LHMP submittal to Cal OES and FEMA. Public comments were received as part of the 2026 LHMP Update project and were incorporated as applicable into the final Plan documents as detailed in Appendix A. All press releases, newspaper advertisements and articles, website postings, and public outreach efforts are on file with County OES and are included in Appendix A. The draft Plan is currently available online on the Plumas County website at: https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and LHMP review and approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the Plan development process. Based on their involvement in hazard mitigation planning, their landowner status in the Plumas County Planning Area, and/or their interest as a neighboring or involved jurisdiction, representatives from the following agencies were invited to participate on the HMPC:

- TO BE INSERTED

In addition, coordination with other key agencies, organizations, and advisory groups occurred throughout the planning process as needed to inform them on how to participate in the LHMP Update process and if they had any expertise or assistance, they could lend to the LHMP Update, including information on hazards, risks and vulnerability of the Plumas County Planning Area, and any input on possible risk reduction measures. As part of the overall stakeholder and agency coordination effort, the HMPC coordinated with and utilized input to the LHMP Update from the following agencies:

- Cal-Adapt
- Cal Atlas
- Cal OES
- CAL FIRE
- Cal Trans
- California Department of Conservation
- California Department of Finance
- California Department of Fish and Wildlife
- California Department of Food and Agriculture
- California Department of Parks and Recreation

- California Department of Water Resources
- California Division of Mines and Geology
- California Employment Development Department
- California Geological Survey
- California Invasive Plant Council
- California Natural Resources Agency
- FEMA Region IX
- Library of Congress
- National Drought Mitigation Center
- National Levee Database
- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Response Center
- National Weather Service
- Pacific Gas and Electric
- Public Policy Institute of California
- United States Army Corps of Engineers
- United States Bureau of Land Management
- United States Bureau of Reclamation
- United States Department of Agriculture
- US Department of Transportation
- United States Forest Service
- United States Geological Survey
- Western Regional Climate Center

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to many of these groups to actively participate on the HMPC. Specific participants from these groups are detailed in Appendix A. Others assisted in the process by providing data directly as requested in the Data Worksheets or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public and HMPC meetings and to review and comment on the draft LHMP prior to submittal to CAL OES and FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this LHMP Update. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Plumas County and the participating jurisdictions to this Plan use a variety of comprehensive planning mechanisms, such as general and master plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this LHMP Update establishes a credible and comprehensive Plan that ties into and supports other community programs. The development of this LHMP Update incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from

neighboring communities and other jurisdictions. This gives a general overall list of plans, studies, and reports. More can be found in Appendix B to this Plan Update.

- 2023 State of California Hazard Mitigation Plan
- CAL FIRE Plans and data
- CAL OES plans and data
- Cal-Adapt reports and data
- California Department of Finance demographic documents
- California Department of Public Health
- California Department of Water Resources plans and information
- California DWR Division of Safety of Dams plans and information
- California Geological Survey Plans
- Capital Improvement Plans for each jurisdiction
- Climate Change and Health Profile Report – Plumas County
- CWPPs
- Dam Emergency Action Plans
- Emergency Operations Plans
- Evacuation Plans
- FEMA mitigation planning documents
- Flood Insurance Studies
- General Plans for the County and City
- General Plan Background Reports
- Housing Elements for the County and City
- National Weather Service documents
- Stormwater Master Plans
- US Department of Agriculture Reports
- US Department of Interior Plans
- US Fish and Wildlife reports
- USDA reports
- USGS Reports

Specific source documents are referenced at the beginning of each section of Chapter 4 and in Appendix B. These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and documents were incorporated into the hazard risk assessment sections of the LHMP. Where data and information from the existing studies and reports is used in this LHMP Update, the source document is referenced throughout this Plan. The information was also used to identify potential hazard mitigation strategies for inclusion in this LHMP Update and in assessing the capabilities of the participating jurisdictions in implementing the resulting mitigation strategy. Appendix B, References, provides a detailed list of references used in the preparation of this LHMP Update.

Coordination with Underserved Communities and Socially Vulnerable Populations

As detailed in FEMA's new 2025 LHMP guidance, the LHMP development process should utilize the Whole Community approach to hazard mitigation planning. New 2025 FEMA guidance defines planning for the "Whole Community" as a focus on enabling the participation in national preparedness activities of

a wider range of players from the private and nonprofit sectors, including nongovernmental organizations and the general public, in conjunction with the participation of all levels of government in order to foster better coordination and working relationships.

In consideration of these new FEMA requirements as well as applicable California state laws and LHMP requirements, the plan development process focused on key sectors of public and private entities that would enhance hazard mitigation planning for Plumas County. Engagement and coordination with a variety of community-based organizations that work directly with or provide support to underserved communities and socially vulnerable populations was a critical component to Plumas County in addressing equity in mitigation planning and implementation.

For this LHMP project, significant efforts were made to identify and engage appropriate community members and groups to support the Plan development process. In Plumas County, vulnerable populations groups primarily include seniors, children and students, large households, low income, homeless populations, people with disabilities, those with lack of or limited mobility, and those with limited access to public transportation services in the more rural areas for evacuations and other hazard response needs. There is also a seasonal farmworker and local student population which can create challenges during hazard events. The concept of Plumas County being vulnerable due to its location and status as a small, rural, and remote community was determined to be a major descriptor of the County's underserved and vulnerable populations.

Given the small, rural nature of Plumas County, much of the support for these groups fell to applicable local government agencies, primarily the County. Thus, reaching out to the County departments providing these types of services was the initial step to meeting this element. These efforts were augmented by extensive coordination with the recently formed Voluntary Organizations Active in Disasters (VOAD) group in Plumas County as well as coordination with numerous other service oriented agencies supporting vulnerable populations in Plumas County. As part of the planning process, efforts made to identify and engage these groups in the Plumas County 2026 LHMP Update project included the following:

- **Plumas County Behavioral Health** – The mission of the Plumas County Behavioral Health Department is to provide respectful, culturally sensitive, and strength-based behavioral health services that promote wellness, self-sufficiency, and recovery from mental illness and/or addiction. The Department provides a wide range of services, from short-term to intensive, based on needs. These time-limited services are designed to foster resiliency in individuals and families and to promote wellness. Representatives from the Behavioral Health department were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Plumas County Environmental Health** – The mission of the Plumas County Environmental Health Department is to preserve the environment and enhance public health through outreach, education, collaborative planning, and sensible applications of environmental health principles, laws, and statutes. Representatives from the Environmental Health department were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Plumas County Animal Services** – The mission of the Animal Services Department is to Enforce Animal Control laws and regulations and to work cooperatively with other organizations to increase pet adoptions and reduce unwanted pet populations. As part of their mission, the Department also provides an Animal Preparedness Guide for Disasters. Representatives from the Animal Services

department were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.

- **Plumas County VOAD** - Plumas County Voluntary Organizations Active in Disaster, part of the broader VOAD movement, is a coalition of nongovernmental organizations with the aim of preparing for and alleviating disasters in Plumas County. VOAD representatives were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP. In addition, the VOAD platform, including member lists/meetings and newsletters, were utilized extensively to provide public information and outreach specific to the Plumas County 2026 LHMP Update project.
- **Plumas District Hospital** – Plumas District Hospital is located in Quincy and is owned and operated by a Plumas Hospital District. Representatives from PDH were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Seneca Healthcare District Hospital** – Formed in 1947, Seneca Healthcare District Hospital is a community-oriented critical access hospital and clinic, located in the Lake Almanor area with a full range of inpatient and outpatient care. Representatives from Seneca Healthcare were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Eastern Plumas Health Care** – Eastern Plumas Health Care is a small, non-profit, critical access hospital district formed in 1971which emphasizes access to care for all, and provides services focused on the particular needs of the rural community it serves. Representatives from Eastern Plumas Health Care were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **REMSA** - REMSA is a private nonprofit community-based service. Since 1986, REMSA has provided nationally recognized ground ambulance service within Washoe County, Nevada. Care Flight, a REMSA program, operates the ground 9-1-1 ambulance service for Plumas District Hospital in Quincy, California. Representatives from REMSA were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **NOR CAL EMS** – NOR CAL EMS provides services to Lassen, Modoc, Plumas, Sierra, and Trinity counties. Representatives from NOR CAL EMS were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Rural Community Assistance Corporation** – Rural Community Assistance Corporation's (RCAC) Building Rural Economies (BRE) Program supports rural and Indigenous communities across the western United States by fostering local entrepreneurship and strengthening small-town economies. Through training, technical assistance, and coaching, BRE empowers local leaders, aspiring entrepreneurs, and community-based organizations to develop and grow locally driven economic strategies. The program emphasizes asset-based economic development—leveraging local strengths, cultural heritage, and natural resources to create sustainable and resilient communities. BRE also helps build capacity by supporting business planning, facilitating access to capital, and encouraging collaboration among stakeholders. Ultimately, RCAC's BRE program is about more than just economic growth—it's about cultivating thriving, self-determined communities from the ground up. Representatives from RCAC were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Plumas Crisis Intervention and Resource Center (PCIRC)** – PCIRC is a 501 (c)(3) non-profit organization operating in the rural, frontier counties of Plumas & Sierra located in the Sierra Nevada Mountains of Northern California. The mission of the organization is to function as a safety net provider of countywide services that offers individuals and families the opportunity to live to their own potential and be treated with dignity and respect. The agency is now in its 40th year of providing services to the area's most vulnerable populations. PCIRC offers homeless prevention and rapid re-

housing programs to those experiencing homelessness in Plumas County. Representatives from PCIRC were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.

- **Connecting Point, community services central -** Connecting Point is a public agency dedicated to providing programs and services that promote the health and independence of the people of our community. Since 2003, Connecting Point (originally the Nevada-Sierra Regional IHSS Public Authority) has been connecting people to In-Home-Support-Services and IHSS employment in Nevada, Sierra, and Plumas Counties. Representatives from Connecting Point were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Red Cross** - Red Cross, Gold Country Region, covers multiple counties including Plumas. The Red Cross mission is to prevent and alleviate human suffering in the face of emergencies. This involves providing relief to individuals and communities impacted by disasters, teaching life-saving skills, and supporting those in need through various services. These services include disaster relief, including providing shelter, food, and health services during emergencies. They also offer training in first aid, CPR, and other life-saving skills. Local Red Cross representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.
- **Feather River College** – Established in 1968, Feather River College is a small community college located in Quincy, California. Covering 256 acres, it serves as estimated 1,500 full time students. Feather River College makes every effort to provide a safe and secure environment for all members of the college community, including providing students with information on hazard issues and disasters. Representatives from Feather River College were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.
- **Plumas County Unified School District** - Plumas Unified School District, covering 2,613 square miles, serves the student and families in four distinct communities in rural Plumas County. PUSD serves over 1600 students in the 2,613 square miles through four elementary schools, three comprehensive high schools, and eight alternative education sites. The school locations range from Chester in the Lake Almanor north-west region, to Greenville in Indian Valley, to the county seat in Quincy in American Valley and to Portola in the East in Sierra Valley. The student population includes approximately: 78% Caucasian, 12.6% Hispanic, 1.2% Asian, 1.9% African American, and 6.3% other students. Representatives from PCUSD were invited to be on the HMPC and provide input into the Plan development process, including input on the Draft LHMP.

In addition to inviting the above groups to be part of the HMPC and LHMP development process, numerous other individuals, organizations, and agencies were included in the extensive outreach efforts conducted for the 2026 LHMP Update as described above. This includes news articles, newsletters, numerous Facebook Group postings and posting of LHMP posters and flyers in key locations throughout the County. All of these combined efforts provided notice of and an opportunity for participation by all groups in the 2026 Plumas County LHMP Update development process.

3.2.2. Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

Foster Morrison led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact to the Plumas County Planning Area. Starting with the 2020/2019 LHMPs, natural hazards of concern were added, deleted, and modified for this LHMP Update. Data collection

worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the Plumas County Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

The HMPC also conducted a capability assessment to review and document Plumas County's and each participating jurisdictions' current capabilities to mitigate risk and vulnerability to identified hazards. By collecting information about existing County/City/District programs, policies, regulations, ordinances, and emergency plans, the HMPC could assess those activities and measures already in place that contribute to mitigating some of the hazard risks and vulnerabilities. A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 4 Risk Assessment.

NFIP Participation

Also addressed in the risk assessment and mitigation strategy of this 2026 LHMP is an assessment of the County's and City of Portola's floodplain management programs and participation in the NFIP, including a discussion of their continued compliance with NFIP requirements. However, it should be noted that this applies only to eligible NFIP communities. Participating special districts to this LHMP Update do not address their compliance with the NFIP as they are not eligible jurisdictions for purposes of the NFIP.

3.2.3. Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

Foster Morrison facilitated brainstorming and discussion sessions with the HMPC that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 5 Mitigation Strategy. Additional documentation on the process the HMPC used to develop the goals and mitigation strategy is in Appendix C.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, a complete first draft of the LHMP Update was developed. This complete draft was provided for HMPC review and comment via a Dropbox web link. HMPC comments were integrated into the second public review draft, which was advertised and distributed to collect public input and comments. The HMPC integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for CAL OES and FEMA Region IX to review and approve, contingent upon final adoption by governing boards of all participating jurisdictions.

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the LHMP Update, the Plan was adopted by the governing boards of each participating jurisdiction using the sample resolutions contained in Appendix D.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions and projects. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the Plumas County Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the implementation and ongoing success of this plan and mitigation in the Plumas County Planning Area and is addressed further in Chapter 7.

Implementation and Maintenance Process: 2020/2019 Plumas County/City of Portola LHMPs

The previous 2020 Plumas County and 2019 City of Portola LHMPs included a process for Plan maintenance and implementation of the mitigation strategy as well as formal updates to the LHMP. The 2020/2019 maintenance processes called for annual reviews, including a review of the status of mitigation strategy implementation and reviews after disasters. In addition, the 2020/2019 processes called for a formal plan update as required by DMA regulations every 5 years. With respect to the 2020/2019 LHMPs, Plumas County held an annual review in April of 2024 on their 2020 LHMP as part of the Plumas County Disaster Council agenda. This annual review focused on assessing and documenting progress on meeting LHMP goals and the status of mitigation action implementation. No other formal annual reviews were conducted on the 2020/2019 LHMPs ; although, both the County and City checked in on their LHMPs and potential mitigation actions post disaster to determine what funding might be available to implement priority projects. This 2026 LHMP Update, once approved and adopted, will meet the DMA formal 5-year update requirement for Plumas County and the City of Portola, as the previous participating jurisdictions.

In addition, the 2020 Plumas County LHMP was relied on and integrated into other planning mechanisms in the Plumas County Planning Area. Table 3-5 lists the planning mechanism the 2020 Plumas County LHMP was integrated into by unincorporated Plumas County. Specific to City of Portola, their jurisdictional annex addresses integration of their 2019 LHMP with other planning mechanisms.

Table 3-5 Unincorporated Plumas County - Incorporation of 2020 Plumas County LHMP into Other Planning Mechanisms

Planning Mechanism 2020 LHMP Was Incorporated or Implemented Through	Details
General Plan Annual Progress Report	https://www.plumascounty.us/DocumentCenter/View/50845/PlumasCounty_2035GP_2024-AnnualReport_4125
2021 Plumas County Wildfires Long Term Recovery Plan	https://plumascounty.us/2964/2021-PLUMAS-COUNTY-WILDFIRES-DIXIE-FIRE-

Planning Mechanism 2020 LHMP Was Incorporated or Implemented Through	Details
Plumas County Regional Transportation Plan	https://plumascounty.us/1900/Regional-Transportation-Plan
Plumas County Community Health Assessment	Oct 2020 https://plumascounty.us/DocumentCenter/View/44000/PCPHA-Strategic-Plan-Update-2022-PUBLIC-VERSION_121322?bidId=
Plumas & Sierra Counties Plan to address Homelessness	June 2020 https://www.plumascounty.us/DocumentCenter/View/28278/Plumas-Sierra-Final-Plan-to-Address-Homelessness-061620_ADOPTED?bidId=
Plumas County Housing Study	June 2020 https://chpc.net/wp-content/uploads/2024/05/Plumas_Housing_Report.pdf
Sierra Valley Subbasin Groundwater Sustainability Plan Adoption	https://www.sierravalleygmd.org/gsp-documents

The plan implementation and maintenance process as set forth in the 2020/2019 LHMPs have been updated for this LHMP Update. The revised update implementation and maintenance process for the Plumas County 2026 LHMP Update is set forth in Section 7 of this Plan document. A strategy for continued public involvement for this update process is also included in Chapter 7.

Chapter 4 Risk Assessment

44 CFR Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a community's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down into a four-step process:

1. Identify Hazards;
2. Profile Hazard Events;
3. Inventory Assets; and
4. Estimate Losses.

Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 4.1 Hazard Identification** identifies the natural hazards that threaten the Plumas County Planning Area and unincorporated Plumas County and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Plumas County Planning Area Assets Inventory and Growth and Development Trends** identifies the populations; structures and values; critical facilities and community lifelines; cultural, historical, and natural resources; and economic and community activities of value. It also identifies past growth in the Plumas County Planning Area and reviews future development trends. This information is not hazard specific and covers the entire Plumas County Planning Area and unincorporated Plumas County.
- **Section 4.3 Hazard Profiles and Vulnerability Assessment** provides an overview of each hazard, its location and extent, and discusses the risk, vulnerability, and impacts of each natural hazard to the Plumas County Planning Area and unincorporated Plumas County. The hazard profile also describes previous occurrences of hazard events and the likelihood of future occurrences. The vulnerability assessment evaluates the Plumas County's exposure to natural hazards considering: populations;

structures and values; critical facilities and infrastructure; natural, historic, and cultural resources; and future development trends, and where possible, estimates potential hazard losses.
- **Section 4.4 Capability Assessment** inventories existing mitigation activities and policies, regulations, plans, and programs that pertain to hazards and mitigation in the Plumas County Planning Area and unincorporated Plumas County and can affect net vulnerability.
- **Section 4.5 Natural Hazard Summary** summarizes the results of the risk assessment and whether a hazard is considered a priority for mitigation strategy planning.

This risk assessment covers the entire geographical extent of Plumas County (i.e., the Plumas County Planning Area) and unincorporated Plumas County. And as required by FEMA, this risk assessment for the Plumas County Planning Area also includes an evaluation of how the hazards and risks vary across the Planning Area.

This LHMP Update involved a comprehensive review and update of each section of the 2020 LHMP, as well as the relevant portions of the 2019 City of Portola LHMP. Information from the 2019 and 2020 LHMPs was used in this Update where valid and applicable. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this risk assessment update are summarized in Chapter 2 What's New and are also detailed in this risk assessment portion of the Plan Update.

4.1 Hazard Identification

44 CFR Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The Plumas County Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification study to determine the hazards that threaten the Planning Area. This section details the methodology and results of this effort.

Data Sources

The following data sources were used for this Hazard Identification portion of the plan:

- National Climatic Data Center Storm Events Database
- 2020 Plumas County Hazard Mitigation Plan
- 2013 Plumas County General Plan
- 2019 City of Portola Hazard Mitigation Plan
- 2023 State of California Hazard Mitigation Plan
- FEMA Disaster Declaration Database
- HMPC input

4.1.1. Results and Methodology

Using existing hazards data and input gained through planning meetings, the HMPC agreed upon a list of hazards that could affect the Plumas County Planning Area. Hazards data from the California Office of

Emergency Services (Cal OES), FEMA, California Department of Water Resources, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the Planning Area.

The following hazards in Table 4-1, listed alphabetically, were identified and investigated for this LHMP Update. As a starting point, the 2020 Plumas County LHMP Update, the 2019 City of Portola LHMP, and the 2023 California State Hazard Mitigation Plan were consulted to evaluate the applicability of new hazards of concern to the State to the Plumas County Planning Area. Building upon this effort, hazards from the past plans were identified, and comments explain how hazards were updated from the previous plans. Most hazards from the 2020 and 2019 plans were profiled in this LHMP Update, with the exception of pandemic. Compared to the 2020 Plumas County LHMP, avalanche was added to the Severe Weather: extreme cold, freeze, and snow hazard, levee failure was placed inside the flood hazard, and agricultural hazards were added. Multiple hazards that were not profiled in the 2019 Portola LHMP were added, while none were dropped from consideration for this LHMP Update.

Table 4-1 Plumas County Hazard Identification and Comparison between 2020, 2019, and 2026 LHMPs

2026 Hazards	2020 Plumas County Hazards	City of Portola 2019 LHMP	Comment
Ag Hazard: Severe Weather/ Pests/Weeds	–	–	New hazard.
–	Avalanche	–	This was added to a Severe Weather hazard.
Climate Change	Climate Change	–	This hazard was kept.
Dam Failure	Dam Failure	Dam Failure	This hazard was kept.
Drought & Water Shortage (w/tree mortality)	Drought and Water Shortage	–	This hazard was kept.
Earthquake	Earthquake	Earthquake	This hazard was kept.
Flood: 1%/0.2% annual chance (w/levee failure)	Flood: 100/500-year	Flood	This hazard was kept and levee failure was added.
Flood: Localized Stormwater	Flood: Localized/Stormwater	–	This hazard was kept.
Haz Mat Transportation	–	–	This is a new hazard.
Landslide, Mudslide, and Debris Flow	Landslide, Mudslide, and Debris Flows	–	This hazard was kept.
–	Levee failure	–	This was put into the flood hazard.
–	Pandemic	–	This hazard was dropped.
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Severe Weather: Winter Storms and Freeze	Winter and Extreme Cold	This hazard was renamed and avalanche was added.
Severe Weather: Extreme Heat	Severe Weather: Extreme Heat	Extreme Heat	This hazard was kept.

2026 Hazards	2020 Plumas County Hazards	City of Portola 2019 LHMP	Comment
Severe Weather: Heavy Rains and Storms	Severe Weather: Heavy Rains and Storms (winds, hail, lightning)	Severe Weather	This hazard was kept.
Severe Weather: High Winds and Tornadoes	Severe Weather: High Winds/Tornadoes	Severe Weather	This hazard was kept.
Volcano	Volcano	-	This hazard was kept.
Wildfire (w/smoke and air quality)	Wildfire	Wildfire	This hazard was kept, and smoke and air quality subhazards were added.

Certain other hazards were excluded from consideration for this Plan Update. They are shown in Table 4-2.

Table 4-2 Plumas County – Excluded Hazards

Hazard Excluded	Why Excluded
Coastal Flooding, Erosion, and Sea Level Rise	The County is not on the coast.
Hurricane	The County is not on the coast.
Tsunami	The County is not on the coast.

Table 4-3 was completed by the County and HMPC to identify, profile, and rate the significance of identified hazards. Those hazards identified as a high or medium significance in Table 4-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in Plumas County were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage.

Table 4-3 Plumas County Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather/ Pests/Weeds	Extensive	Highly Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Unlikely/Occasional	Catastrophic	Medium	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Occasional/Unlikely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Hazardous Materials Transportation	Significant	Occasional	Critical	Medium	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Low
Volcano	Extensive	Unlikely	Critical	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

4.1.2. Disaster Declaration History

One method used to identify hazards was the researching of past events that triggered federal and/or state emergency or disaster declarations in the Plumas County Planning Area. Federal and/or state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors.

A USDA declaration will result in the implementation of the Emergency Loan Program through the Farm Services Agency. This program enables eligible farmers and ranchers in the affected county as well as contiguous counties to apply for low interest loans. A USDA declaration will automatically follow a major disaster declaration for counties designated major disaster areas and those that are contiguous to declared counties, including those that are across state lines. As part of an agreement with the USDA, the SBA offers low interest loans for eligible businesses that suffer economic losses in declared and contiguous counties that have been declared by the USDA. These loans are referred to as Economic Injury Disaster Loans. Disaster declarations for these programs are discussed in Section 4.3.6.

Based on the disaster declaration history provided in Table 4-4, Plumas County is among the many counties in California susceptible to disaster. Details on federal and state disaster declarations were obtained from FEMA and Cal OES and compiled in chronological order in Table 4-4. A review of state declared disasters indicates that Plumas County received 35 state declarations between 1950 and 2025. Of the 35 state declarations: 22 were associated with severe winter storms, heavy rains, or flooding; 8 were for fire; 2 were from pandemic, 1 was for drought; 1 was for freeze and severe weather conditions; and 1 was from economic disaster. A review of federal disasters shows 30 federal disaster declarations. Of these 30 federal declarations: 19 were associated with severe winter storms, heavy rains, or flooding; 6 for fire; 2 were from pandemic, 1 for drought; 1 was for seismic sea wave (which was declared for the entire State of California); and 1 was for hurricane (a nationwide declaration for Katrina evacuations). A summary of these events by disaster type is shown in Table 4-5.

Table 4-4 Plumas County Federal and State Disaster Declarations, 1950-2025

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2023	California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	Storms	Storms	3/1/2023-3/8/2023	DR-4699 4/3/2023
2023	California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	Flood	Storms	3/1/2023-3/8/2023	EM-3592 3/10/2023
2021	California Wildfires	Fire	Fire	2021-04 7/16/2021 (Lava Fire) 7/16/2021 (Beckwourth Complex) 8/6/2021	DR-4610 8/24/2021
2021	Dixie Fire	Fire	Fire	2021-03 7/23/2021	FM-5400 7/20/2021
2021	2021 Northeast Wildfires	Fire	Fire	2021-04 2021-03 8/6/2021 8/10/2021 (Monument Fire)	–
2020	Bear Fire	Fire	Fire	2020-06 8/18/2020	FM-5363 9/9/2020
2020	California Wildfires	Fire	Fire	–	DR-4558 8/22/2020
2020	Covid-19	Pandemic	Pandemic	2020-01 3/4/2020	DR-4482 3/22/2020
2020	Covid-19	Pandemic	Pandemic	2020-01 3/4/2020	EM-3428 3/13/2020
2017	Severe Winter Storms, Flooding, Mudslides in California	Flood	Storms	2017-03 3/7/2017	DR-4308 4/1/2017
2017	Severe Winter Storms, Flooding, Mudslides in California	Flood	Storms	2017-01 1/23/2017	DR-4301 2/14/2017
2014	California Drought	Drought	Drought	2014-03 9/18/2014	–

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2008	California Wildfires	Fire	Fire	–	EM-3287 6/28/2008
2007	Severe Freeze	Freeze	Freeze	2007-02 01/12/2007-1/26/2007	–
2005/2006	Severe Storms, Flooding, Mudslides, and Landslides in California	Flood	Storms	2006-01 1/12/2006	DR-1628 2/3/2006
2005	Hurricane Katrina Evacuations	Hurricane	Hurricane	–	EM-3248 9/13/2005
2001	Energy Emergency	Economic	Greed	1/1/2001	–
1999	California Extreme Fire Hazards	Fire	Fire	99-05 8/26/1999	EM-3140 9/1/1999
1997	California Severe Storms/flooding	Flood	Storms	97-01 1/2/97-1/31/97	DR-1155 1/4/1997
1996	Torrential Wind and Rains	Flood	Storms	GP 96-01 1/2/1996	–
1995	California Severe Winter Storms, Flooding, Landslides, Mud Flows	Flood	Storms	95-03 03/12/95 – 03/24/95	DR-1046 3/12/1995
1995	1995 Severe Winter Storms	Flood	Storms	95-01, 95-02, 95-03, 95-04 1/6/95-3/14/95	DR-1044 1/13/1995
1993	California Severe Storm, Winter Storm, Mud & Landslides, Flooding	Flood	Storms	–	DR-979 2/3/1993
1992	Late California Severe Storm, Winter Storm, Mud & Landslides, Flooding	Flood	Storms	93-01 2/12/92, 2/19/92	DR-979 2/25/1992
1992	1992 Late Winter Storms	Flood	Storms	93-01 1/7/93 - 2/19/93	DR-979 1/15/1992
1987	1987 Wildland Fires	Fire	Fire	9/10/1987, 9/3/1987	–
1986	California Severe Storms, Flooding	Flood	Storms	86-01 2/18-86-3/12/86	DR-758 2/21/1986

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
1980	April Storms	Flood	Storms	80-01–80-25 4/1/1980	–
1977	California Drought	Drought	Drought	–	EM-3023 1/20/1977
1970	California Severe Storms, Flooding	Flood	Flood	1/27/1970 - 3/2/1970	DR 283 2/16/1970
1969	California Severe Storms, Flooding	Flood	Storms	1/23/69, 1/25,69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	DR-253 1/26/1969
1964	California Heavy Rains & Flooding	Flood	Storms	12/22/64, 12/23/64, 12/28/64, 1/5/65, & 1/14/65	DR-183 12/24/1964
1964	Seismic Wave	Other	Other	–	DR-169 4/1/1964
1963	1963 Floods and Rains	Flood	Storms	2/7/63, 2/26/63, 2/29/63, & 4/22/63	DR-145 2/25/1963
1963	1963 Floods	Flood	Storms	2/14/1964	–
1960	1960 Widespread Wildfires	Fire	Fire	8/16/1960	–
1958	1958 April Storms and Floods	Flood	Storms	4/2/1958	DR-52 4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	2/26/1958	CDO 58-03
1955	1955 Floods	Flood	Flood	12/22/1955	DR-47 12/23/1955
1950	1950 Floods	Flood	Flood	11/21/1950	OCD 50-01

Source: Cal OES, FEMA. Retrieved April 2025.

Table 4-5 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1997
Economic	1	2001	0	–
Fire	8	1960, 1987, 1999, 2020 (twice), 2021 (three)	6	1999, 2008, 2020 (twice), 2021 (twice)

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)
Freeze	1	2007	0	–
Hurricane	0	–	1	2005
Pandemic	2	2020 (twice)	2	2020 (twice)
Seismic Sea Wave (Tsunami)	0	–	1	1964
Totals	**35**		**30**	

Source: Cal OES, FEMA. Retrieved April 2025.

Plumas County Disasters since 2019 City of Portola and 2020 Plumas County LHMP

- 2020 California Covid-19 Pandemic (2 state and 2 federal declarations)
- 2020 California Wildfires (federal declaration)
- 2020 Bear Fire (state and federal declaration)
- 2021 Northeast Wildfires (state declaration)
- 2021 Dixie Fire (state and federal declaration)
- 2021 California Wildfires (state and federal declaration)
- 2023 California Severe Winter Storms, Flooding, Landslides, and Mudslides (2 federal and 2 state declarations)

EOC Activations

It was noted that the County EOC has been activated since the 2020 LHMP. This occurred during the following events:

- North Complex (Claremont, Bear, Sheep) – 8/14-9/26/2020
- Dixie Fire – 7/14-8/30/2021
- Winter Storms – 2/21-7/10/2023
- COVID – 1/20/2020-5/11/2023

4.2 Plumas County Asset Inventory and Growth and Development Trends

As a starting point for analyzing the Plumas County Planning Area's vulnerability to identified hazards, a variety of data was used to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur in the Plumas County Planning Area, this section describes significant lands, assets, and other resources at risk. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the Plumas County Planning Area's and unincorporated Plumas County's total assets, including the people and populations: structures; critical

facilities and infrastructure, and community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the Plumas County Planning Area and unincorporated Plumas County, potentially at risk to identified hazards as discussed in Section 4.3 Hazard Profiles and Vulnerability Assessment.

- **Growth and Development Trends** – A discussion of growth and development trends in the Plumas County Planning Area with a focus on unincorporated Plumas County, both current and future, is presented.

Data Sources

- ADD OTHERS
- CalAtlas
- California Department of Conservation
- California Department of Finance
- California Department of Fish and Wildlife Service
- California Department of Parks and Recreation Office of Historic Preservation
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- California Environmental Protection Agency (Cal EPA) Disadvantaged Communities
- California Environmental Quality Act (CEQA)
- California Natural Diversity Database
- Center for Disease Control (CDC) Social Vulnerability Index
- Plumas County Building Department and Planning Department
- Plumas County GIS
- FEMA National Risk Index
- Hazus-MH 6.1
- National Environmental Policy Act (NEPA)
- State of California Department of Conservation
- US Census Bureau

4.2.1. Assets Inventory

If a catastrophic disaster was to occur in the Plumas County Planning Area, this section describes populations, structures, critical facilities and infrastructure, and other key assets and resources at risk that comprise the existing built environment. Assets inventoried in this baseline assessment include:

- People and Populations
- Structures
- Critical Facilities and Infrastructure,
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

Populations

Life safety is a priority issue for hazard mitigation planning. The people that work and recreate in the Plumas County Planning Area, and those that live and work in surrounding communities are also potentially at risk during a natural hazard event.

The estimated population of Plumas County (both incorporated communities and the unincorporated County) for January 1, 2024, was 18,841. Populations potentially at risk are described in the Table 4-6 based on California Department of Finance estimates. The most recent estimates are dated 1/1/2024, which are shown in the table below.

Table 4-6 Plumas County Planning Area – Populations

Jurisdiction	Population
City of Portola	2,098
Unincorporated Plumas County	16,787
Total	**18,885**

Source: Cal DOF E-1. 1/1/2024

Table 4-7 illustrates the pace of population growth in Plumas County dating back to 1940. Major growth in the County occurred in the 1970s, with other decades seeing small growth and small losses. There has been a recent downturn in population size since 2000. Details on population growth in the City of Portola is included in its respective annex to this LHMP Update.

Table 4-7 Plumas County Planning Area – Population Growth 1940-2024

Year	Population	Percent Increase
1940	11,548	–
1950	13,519	17.1%
1960	11,620	-14.0%
1970	11,707	0.7%
1980	17,340	48.1%
1990	19,739	13.8%
2000	20,824	5.5%
2010	20,007	-3.9%
2020	19,790	-1.1%
2024	18,885	-0.4%

Sources: 2019-2024 Plumas County Housing Element Background Report, California Department of Finance, US Census Bureau

Vulnerable and Underserved Populations

Vulnerable populations include those who may be disproportionately affected by hazards or may need additional help or accommodation during a hazard event or disaster. The vulnerable and underserved populations discussion for the Plumas County Planning Area is based on the following sources:

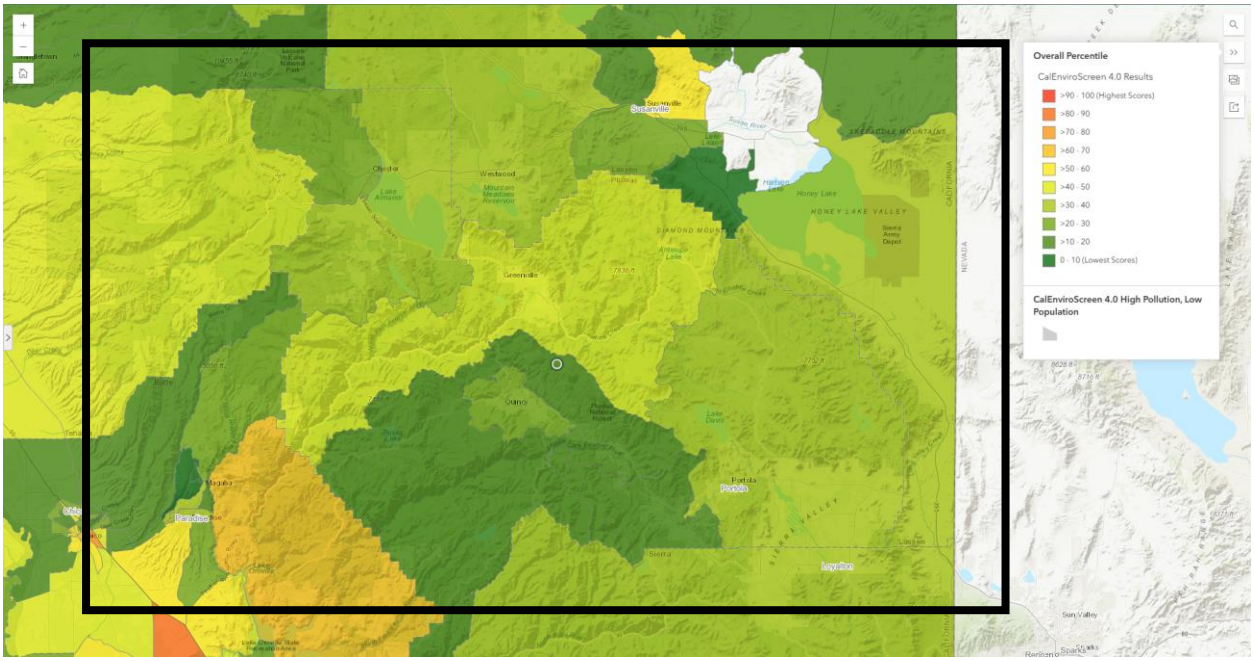
- California Environmental Protection Agency (Cal EPA) Disadvantaged Communities
- Center for Disease Control (CDC) Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA National Risk Index
- Local Input

Note: These sources below show information for the Plumas County Planning Area and unincorporated Plumas County. Information on specific data for the incorporated jurisdictions can be found in their respective annexes to this Plan Update.

Cal EPA Disadvantaged Communities

Disadvantaged communities are defined by CalEPA as the top 25 percent of communities experiencing disproportionate amounts of pollution, environmental degradation, and socioeconomic and public health conditions according to the Office of Environmental Health Hazard Assessment's CalEnviroScreen tool. CalEPA is responsible for identifying disadvantaged communities for the purposes of the Cap-and-Trade funding program. This uses the CalEnviroScreen 4.0 Tool. Maps showing these areas in the Planning Area are shown on Figure 4-1.

Figure 4-1 Plumas County Planning Area – Cal EPA Disadvantaged Communities



Source: Cal EPA, map retrieved 01/29/2025.

Cal EPA has another way to track disadvantaged communities. California Climate Investments are funds (Greenhouse Gas Reduction Fund and appropriated by the Legislature) from the proceeds of the State's Cap-and-Trade Program specifically targeted for investment in disadvantaged communities in California. These funds must be used for programs that further reduce emissions of greenhouse gases. Senate Bill 535 directed that at least a quarter of the proceeds go to projects that provide benefit to disadvantaged

communities and at least 10 percent of the funds go to projects located within those communities. Cal EPA has also mapped these communities. Those communities that fall inside this program in Plumas County are shown on Figure 4-2. As shown, these areas are very limited in Plumas County.

Figure 4-2 Plumas County SB 535 Disadvantaged Communities (2022)

Source: Cal EPA, map retrieved 01/29/2025.

CDC Social Vulnerability Index

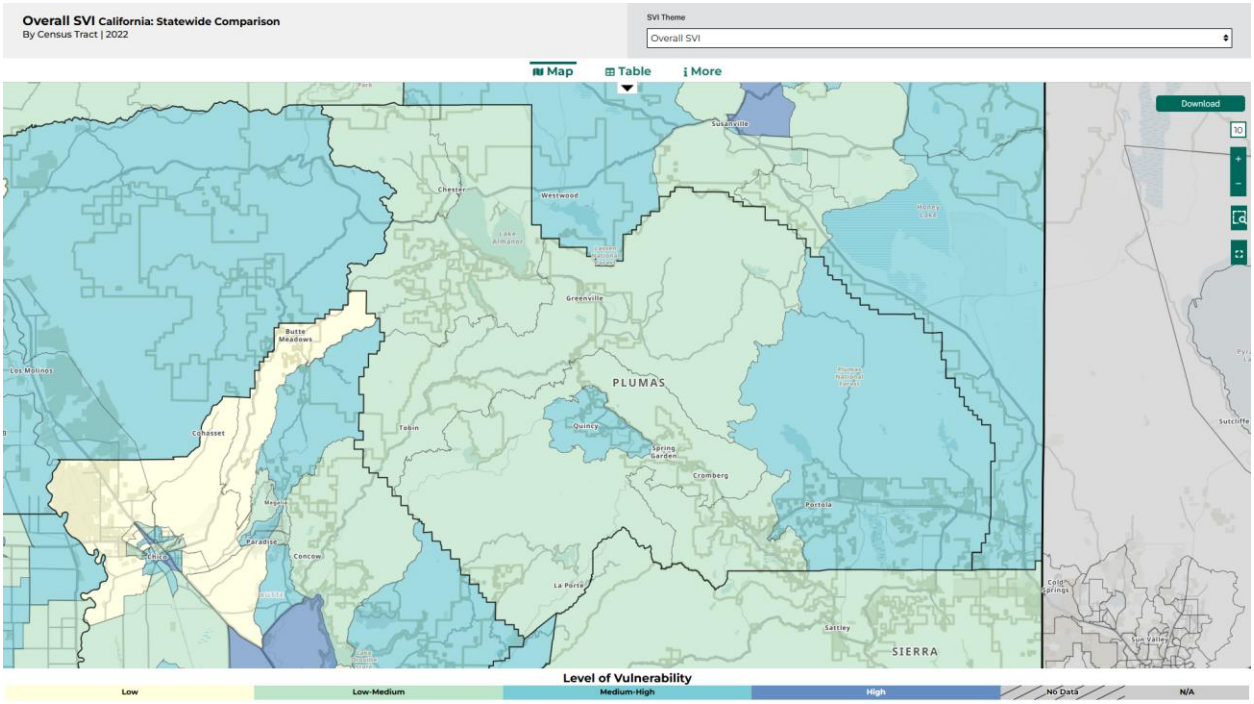
Every community must prepare for and respond to hazardous events, whether a natural disaster like a tornado or disease outbreak, or a human-made event such as a harmful chemical spill. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. CDC Social Vulnerability Index (CDC SVI) uses 15 U.S. census variables to help local officials identify communities that may need support before, during, or after disasters.

The Agency for Toxic Substances and Disease Registry's (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes are shown in the Plumas County Planning Area below. The overall SVI map is shown in Figure 4-3; the socioeconomic SVI for the Planning Area is shown in Figure 4-4; the household composition SVI is shown in Figure 4-5; the minority and language SVI is

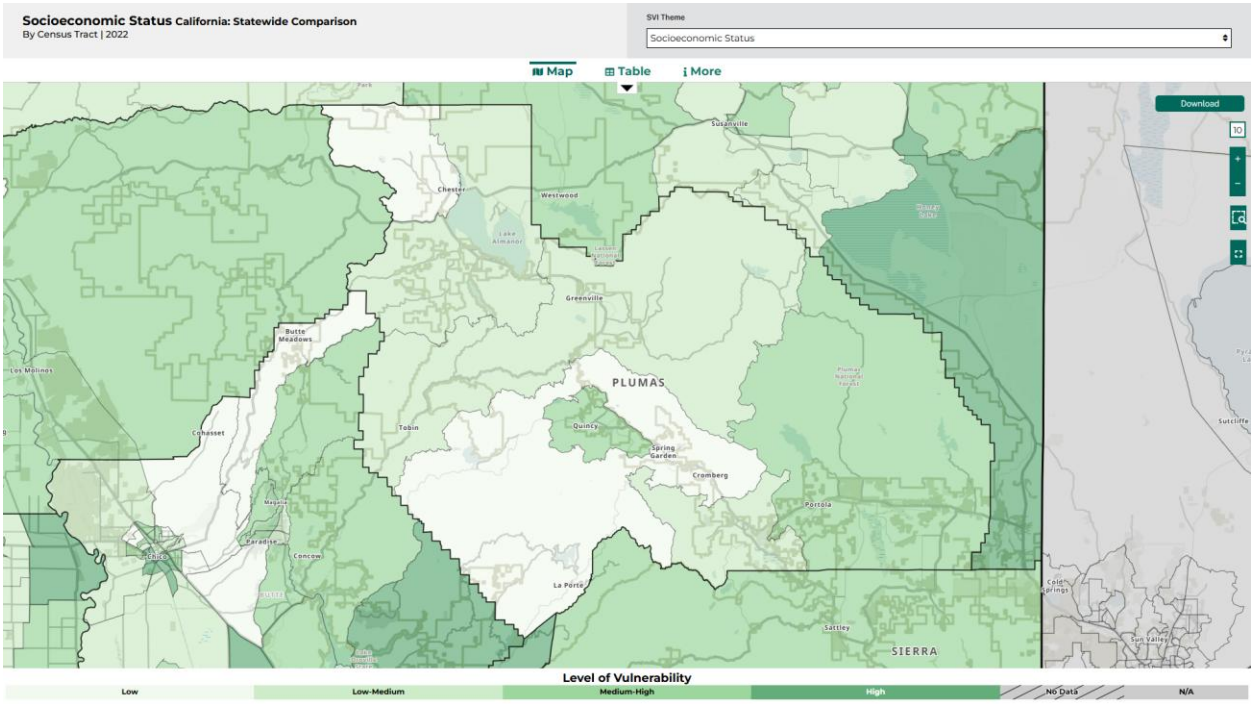
shown in Figure 4-6; and the housing and transportation SVI is shown in Figure 4-7. As shown on all of these maps, the County shows moderate changes across the County in social vulnerability.

Figure 4-3 Plumas County Planning Area – Overall Social Vulnerability



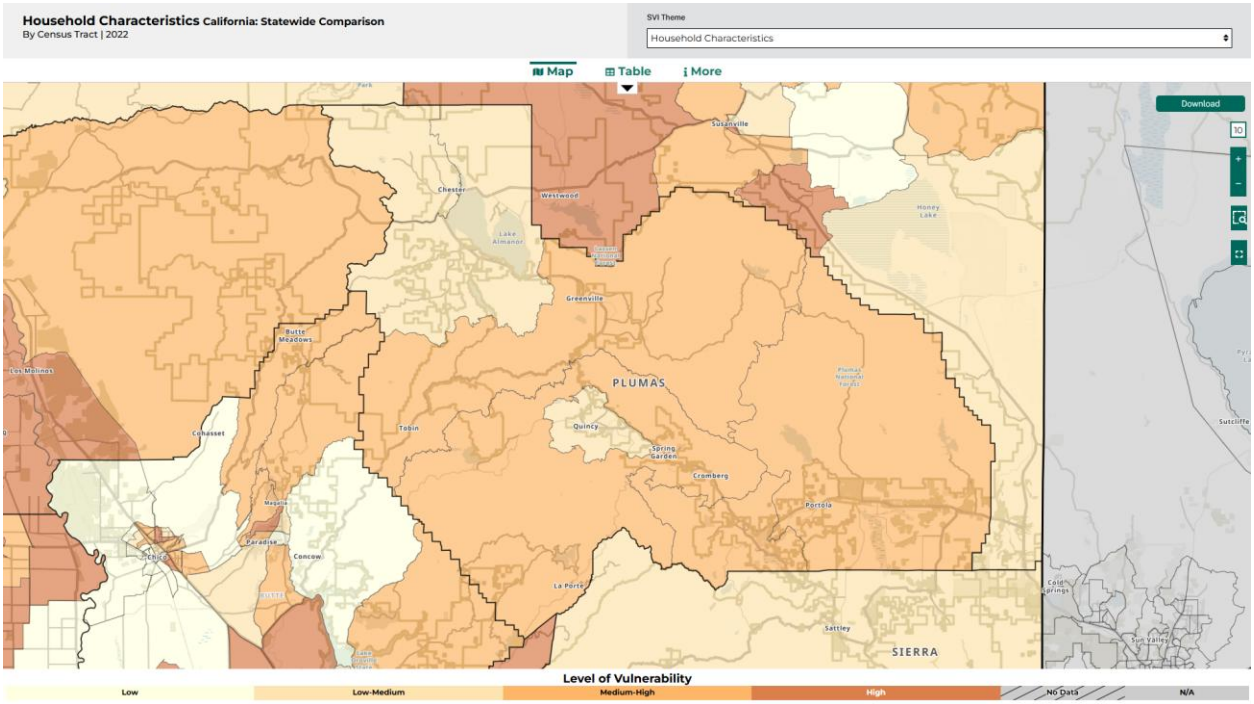
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure 4-4 Plumas County Planning Area – Socioeconomic Status Vulnerability



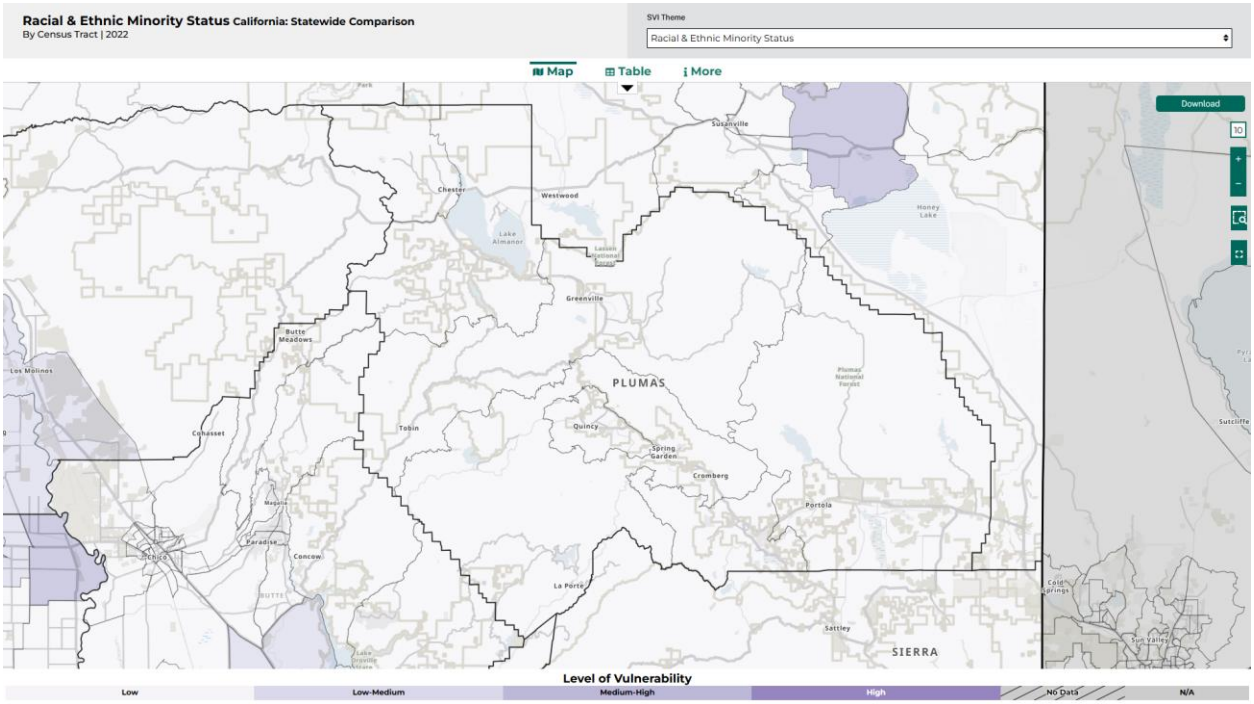
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure 4-5 Plumas County Planning Area – Household Composition and Disabilities Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

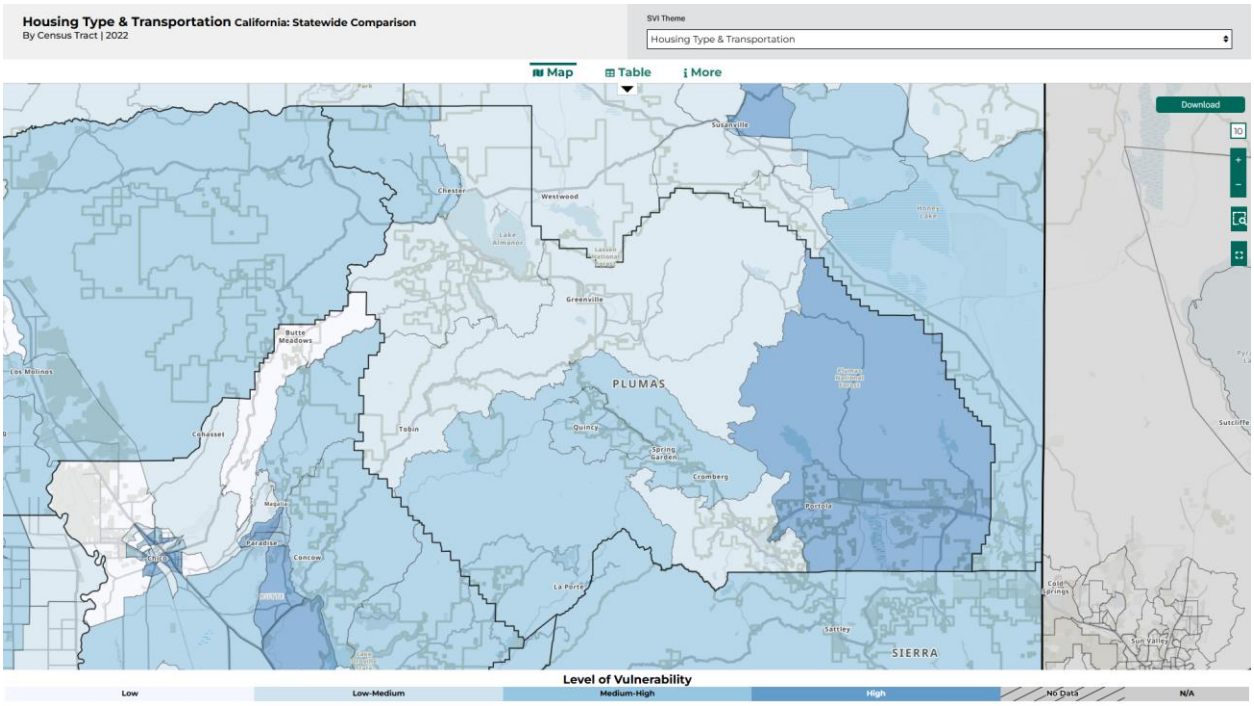
Figure 4-6 Plumas County Planning Area – Minority/Language Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.

Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure 4-7 Plumas County Planning Area – Housing/Transportation Social Vulnerability

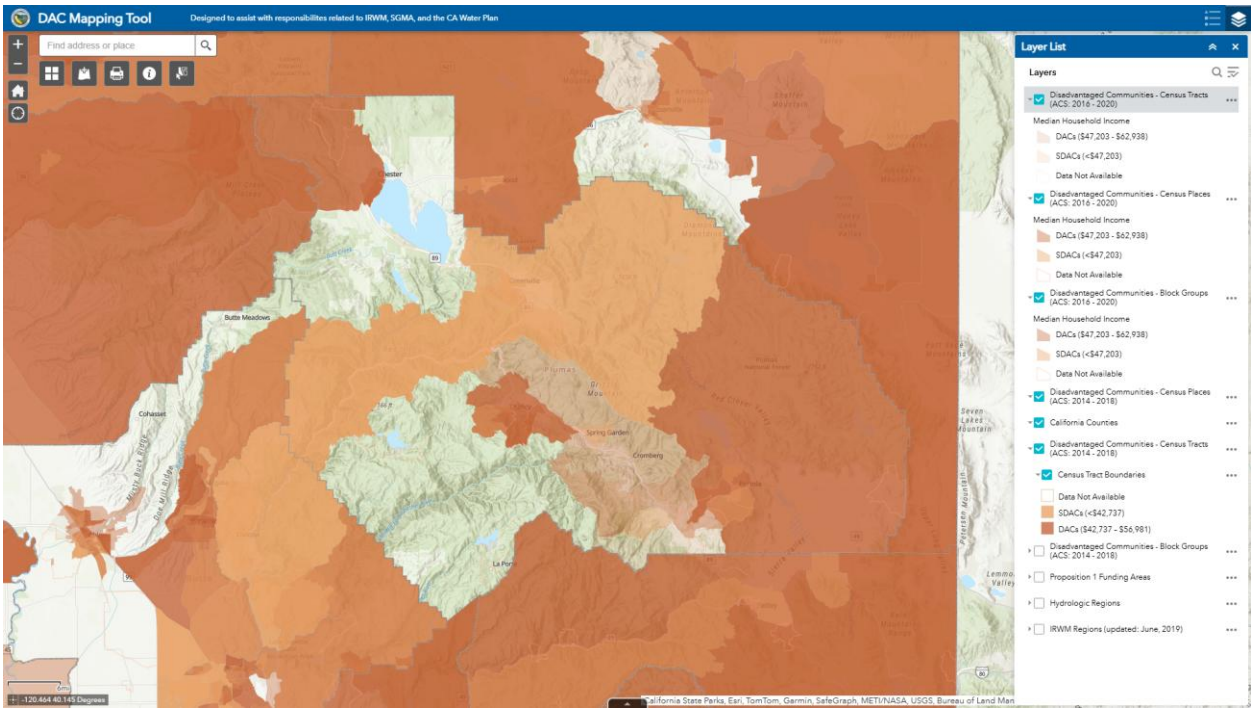


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the Planning Area considered disadvantaged are shown in Figure 4-8.

Figure 4-8 Plumas County Planning Area – Disadvantaged Areas



Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024.

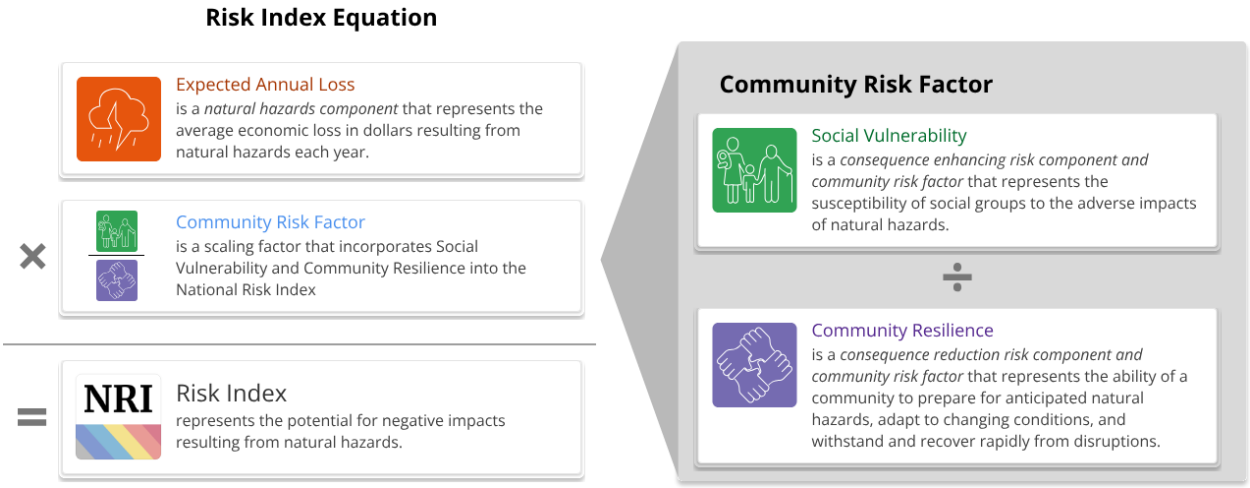
FEMA National Risk Index

Beginning in 2016, FEMA's Natural Hazards Risk Assessment Program (NHRAP) started work on the National Risk Index by adopting an established vision for a multi-hazard view of risk that combines the likelihood and consequence of natural hazards with social factors and resilience capabilities. The goal was to take a broad, holistic view and create a nationwide baseline of natural hazard risk.

A community's susceptibility to natural hazards varies from location to location. The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards. It was designed and built by FEMA in close collaboration with various stakeholders and partners in academia; local, state, and federal government; and private industry. In the National Risk Index, risk is defined as the potential for negative impacts as a result of a natural hazard.

The risk equation behind the Risk Index includes three components (see Figure 4-9): a natural hazards component (Expected Annual Loss), a consequence enhancing component (Social Vulnerability), and a consequence reduction component (Community Resilience).

Figure 4-9 National Risk Index Equation



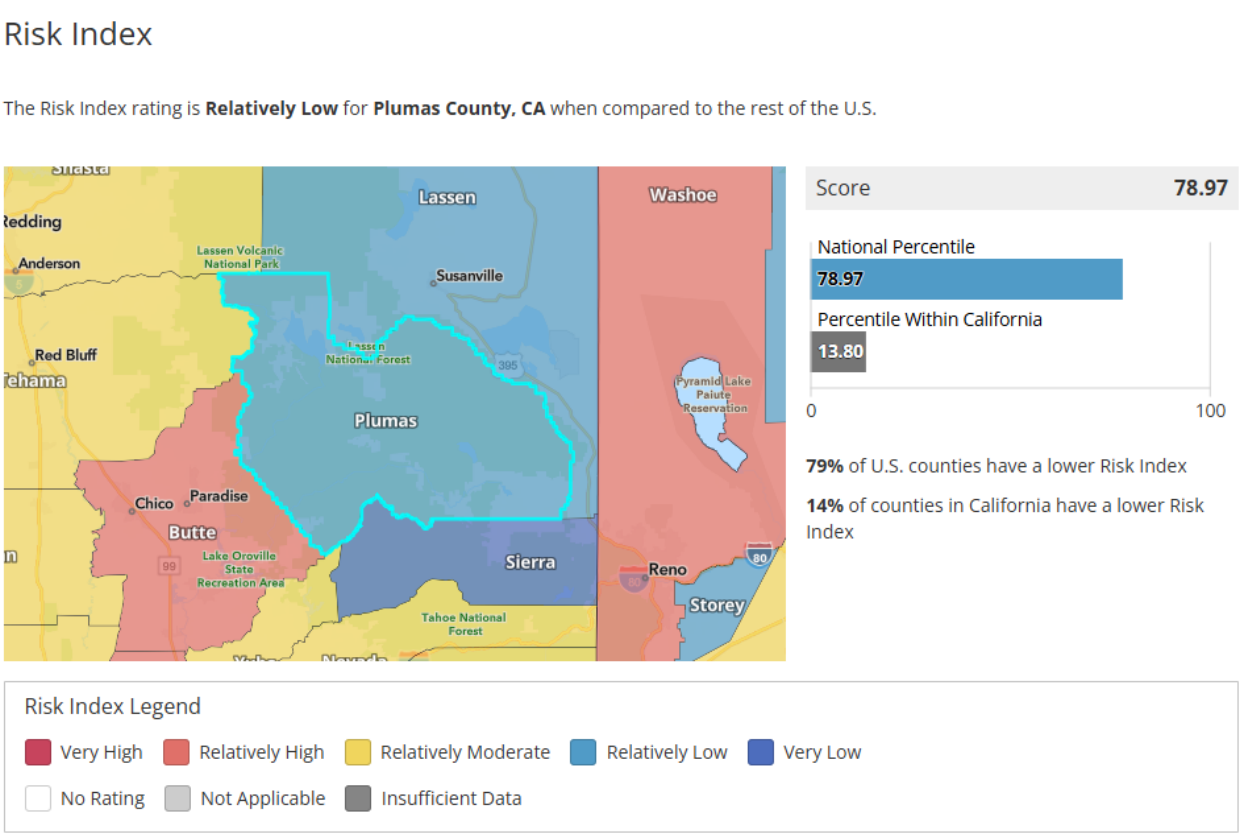
Source: FEMA National Risk Index

Using these three components, composite Risk Index values and hazard type Risk Index values are calculated for each community (county and Census tract) included in the Index. Risk Index values form an absolute basis for measuring Risk within the National Risk Index, and they are used to generate Risk Index percentiles and ratings across communities.

Data from the National Risk Index for the Plumas County Planning Area is seen below. Figure 4-10 shows a summary map and score for the County. As shown, Plumas County's Risk Index rating is Relatively Low. Figure 4-11 shows the expected annual loss map and score. As shown, Plumas County's expected annual loss rating is Relatively Low. Figure 4-12 shows the social vulnerability map and score. As shown, Plumas County has a Relatively Low social vulnerability. Figure 4-13 shows the community resilience map and score. As shown, communities in Plumas County have a Relatively High ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

The Plumas County FEMA National Risk Index Report is included in its entirety in Appendix H.

Figure 4-10 FEMA National Risk Index – Summary Map and Score for Plumas County

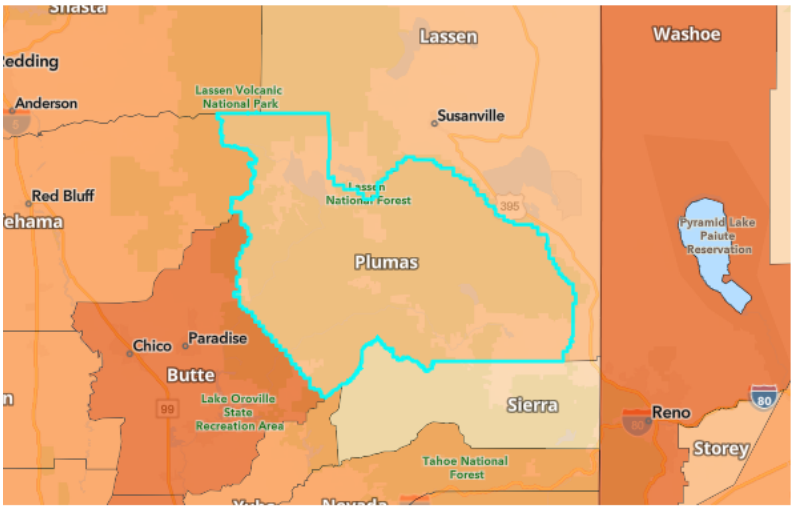


Source: FEMA National Risk Index, retrieved 01/09/2025.

Figure 4-11 FEMA National Risk Index – Expected Annual Loss Map and Score for Plumas County

Expected Annual Loss

In **Plumas County, CA**, expected loss each year due to natural hazards is **Relatively Low** when compared to the rest of the U.S.



Score **77.93**

National Percentile
77.93

Percentile Within California
15.50

0 100

78% of U.S. counties have a lower Expected Annual Loss

16% of counties in California have a lower Expected Annual Loss

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

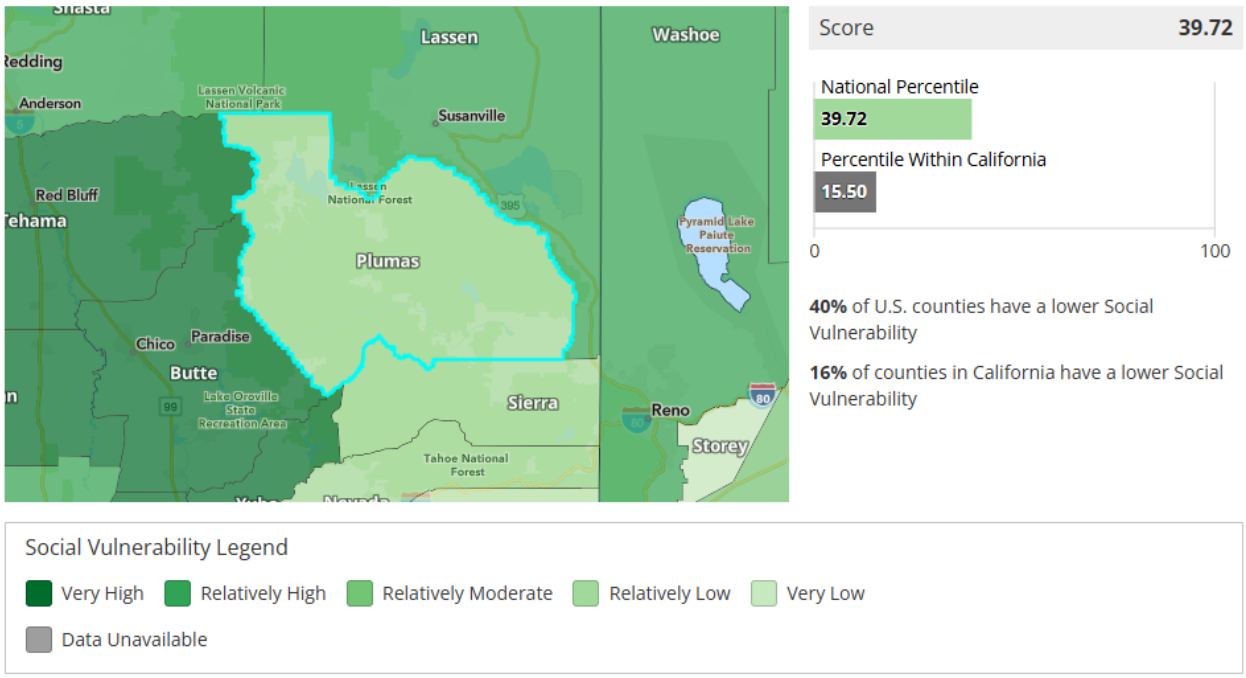
No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss	**$16,253,626.34**
Composite Expected Annual Loss Rate National Percentile	**87.7**

Building EAL	**$14,930,347.87**	Population EAL	**0.08** fatalities
Building EAL Rate	**$1 per $562.97 of building value**	Population EAL Rate	**1 per 244.77K people**
Agriculture EAL	**$387,504.16**	Population Equivalence EAL	**$935,774.31**
Agriculture EAL Rate	**$1 per $28.40 of agriculture value**		

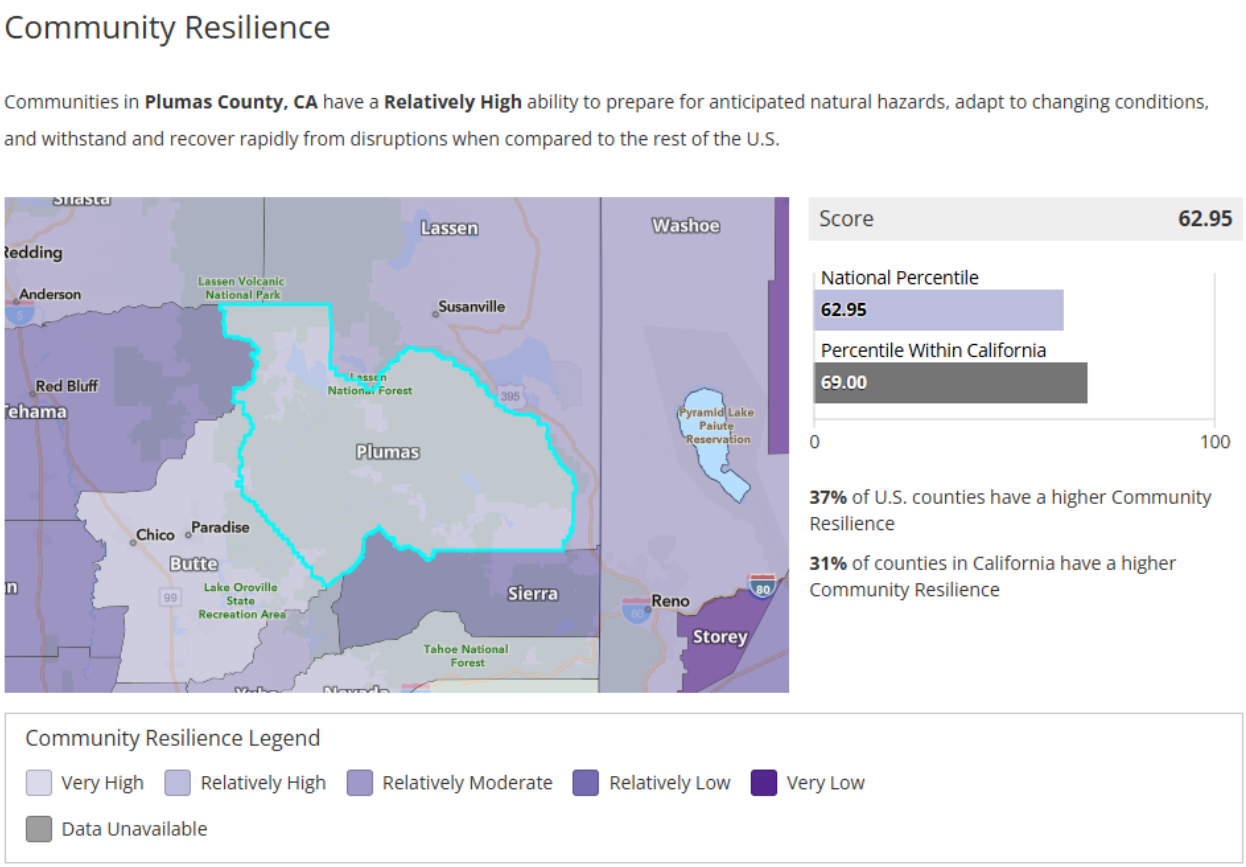
Source: FEMA National Risk Index, retrieved 01/09/2025.

Figure 4-12 FEMA National Risk Index – Social Vulnerability Map and Score for Plumas County



Source: FEMA National Risk Index, retrieved 01/09/2025

Figure 4-13 FEMA National Risk Index – Community Resilience Map and Score for Plumas County



Source: FEMA National Risk Index, retrieved 01/09/2025.

Local Input

In Plumas County, vulnerable populations groups primarily include seniors, children and students, large households, low income, homeless populations, people with disabilities, those with lack of or limited mobility, and those with limited access to public transportation services in the more rural areas for evacuations and other hazard response needs. There is also a seasonal farmworker population and a local student population which can create challenges during hazard events. The concept of Plumas County being vulnerable due to its location and status as a small, rural, and remote community was determined to be a major descriptor of the County's underserved and vulnerable populations. CAN THE COUNTY CONFIRM OR ADD TO THIS DESCRIPTION?

Plumas County noted that the County has two homeless day shelters (Quincy and Portola) and a group home (Quincy) that were recently funded for backup generators. The facilities are used for sheltering during times of cold, as these facilities are heated, but there is no air conditioning at these facilities. These are facilities operated by PCIRC, a non-profit. IS THIS ALL STILL ACCURATE?

The Plumas Crisis Intervention and Resource Center noted that a Point in Time count of homeless in the County is done in January of every odd calendar year. The 2025 data was still being processed due to

changes in HUD guidelines, making the 2023 data the most recent fully available information. This can be seen in Table 4-8.

Table 4-8 Plumas County – 2023 Homeless Count

Homeless Type/Cause	Number	Percentage
Overall Count		
Sheltered	58	43.28%
Unsheltered	76	56.72%
Total Homeless	**134**	**100.00%**
Count Subtypes		
Chronically Homeless	13	9.70%
Veteran	3	2.23%
Domestic Violence Victim	5	3.37%
Felony Conviction	25	18.66%
COVID-19	0	0.00%
Fire	29	21.64%
Mental Health	9	6.72%
Eviction	35	26.12%
Drug Abuse	8	5.97%
Family Break Up	15	11.19%
Youth (18 to 24)	4	2.99%
Children (under 18)	18	13.43%
Male	76	56.72%
Female	49	36.57%
No Single Gender	0	0.00%
Transgender	0/1	0.00/0.75%
Questioning	0	0.00%

Source: Plumas County Intervention and Resource Center

PLACE ANY OTHER LOCAL INPUT HERE

Housing Element Special Populations

The County Planning Team noted that the Plumas County 2019-2024 Housing Element discusses special populations in the County. Discussions for seniors, those with disabilities, developmental disabilities, people experiencing homelessness, large households, female headed households, farmworkers, and students were included. These are discussed below.

Seniors

Many elderly individuals face challenges in securing affordable housing, given their fixed and often limited incomes. Physical disabilities and dependency needs further narrow their housing options while increasing the necessity for accessible healthcare and transportation. Despite Social Security and retirement benefits providing a guaranteed minimum income, many older adults still experience heightened poverty rates.

As of 2017, the American Community Survey estimated there were 4,364 seniors aged 65 years and over, living in unincorporated Plumas County, which represented over one-quarter of the total unincorporated County population, and approximately 6.8 percent of those 65 and older were below the poverty rate. When looking at senior household tenure, 87 percent of households were owner-occupied, and 13 percent were rented.

Disabled Citizens

As defined by the California Government Code, disabilities include physical and mental disabilities. A "mental disability" involves any mental or psychological disorder or condition, such as mental retardation, organic brain syndrome, emotional or mental illness, or specific learning disabilities that limit a major life activity. A "physical disability" includes any physiological disease, disorder, condition, cosmetic disfigurement, or anatomical loss of body functions. Physical disabilities include those that are neurological, immunological, or musculoskeletal in nature as well as those that involve the respiratory, cardiovascular, reproductive, genitourinary, hemic and lymphatic, or digestive systems and those involving the special sense organs, speech organs, skin, or endocrine system.

Cognitive difficulties and Ambulatory living difficulties are the most common forms of disability among residents ages 5 to 64 in Plumas County. Seniors aged 65 and above in unincorporated Plumas County are more likely to have either ambulatory difficulties or hearing difficulties. Persons aged 5–64 with a disability account for 1,975 individuals (10.0%) while persons aged 65 + with a disability account for 1,472 individuals (7.4%) residing in the County. The total sums to 3,447 individuals suffering from one or more disabilities (17.4%).

People with Developmental Disabilities

A developmental disability is a disability that occurs before an individual reaches 18 years of age, is expected to continue indefinitely, and constitutes a substantial disability for that individual. Developmental disabilities include mental retardation, cerebral palsy, epilepsy, autism, and disabling conditions closely related to mental retardation or requiring similar treatment. However, since data is collected by zip code, the exact number of developmentally disabled individuals is challenging to get an exact number. For 0-17 years-old, it's estimated there are 87 individuals while the 18+ years-old account for estimated 126 persons.

Homeless Persons

Homeless individuals and families have the most immediate housing need of any special needs group. Their needs are difficult to meet because of the diversity and complexity of the factors that lead to homelessness. California state law requires that housing elements estimate the need for emergency shelter for homeless people. The Plumas Crisis Intervention & Resource Center (PCIRC) offers homeless prevention and rapid

re-housing programs, based on an evidence-based Housing First Model, utilizing available annual funding to those experiencing homeless in Plumas County.

In 2019, the NorCal Continuum of Care Point-in-Time count identified 1,249 homeless people in Del Norte, Lassen Modoc, Plumas, Shasta, Sierra, and Siskiyou counties. In Plumas County specifically, the Point-in-Time count identified 53 homeless people, or 4 percent of the homeless population counted in the seven-county region—11 had been experiencing chronic homelessness, and 24 were female, though only 5 of the women were unsheltered.

Large Households

Large families are defined by the US Census Bureau as households containing five or more persons. They are considered a special needs group because there is a limited supply of adequately sized housing to accommodate their needs. According to the 2012–2016 US Census American Community Survey, 366 households (4.9%) in unincorporated Plumas County included five or more persons. Of those, 154 (42.1%) were owner-occupied large households, and 212 (57.9%) were renter-occupied large households.

As of 2017, there was no shortage of housing for large families in Plumas County due to the availability of housing by bedroom size. There are 7,591 three-bedroom housing units, 1,611 four-bedroom units, and 166 units with five or more bedrooms, respectively comprising 48.2 percent, 10.2 percent, and 1.1 percent of all housing in the county. Since the population of Plumas County changes gradually and the average household size was 2.06 persons per household in 2017, it can be presumed that the current supply of housing is sufficient to accommodate large families.

Female Headed Households

Female-headed households are households headed by a single female parent with children under the age of 18 living at home. Single-parent households generally have lower incomes than two-parent households and often require special attention due to their need for affordable childcare, health care, housing assistance, and other supportive services. Additionally, female-headed households generally tend to have lower incomes and higher living expenses, often making the search for affordable, decent, and safe housing more difficult.

Poverty is typically an issue with female-headed households. As of the 2012–2016 American Community Survey, approximately 11% of households in unincorporated Plumas County were female-headed households with children, and 3% of households were female-headed households under the poverty level.

Farmworkers

Agricultural workers earn their primary income through permanent or seasonal agricultural labor. The number of persons employed in agriculture (including forestry, fishing and hunting, and mining), according to the United State Department of Agriculture (USDA) 2017 Census of Agriculture, there were 173 hired farm laborers and 211 unpaid farm laborers in Plumas County. This population represents nearly 10 percent of the job market in Plumas County in 2017.

Most farmworkers earn relatively low wages, and thus they fall into the extremely low– and very-low-income categories. Housing opportunities for migrant farmworkers may include employee housing (i.e., dwelling units or manufactured homes) and other congregate living facilities as well as affordable multifamily or single-family rental units (Housing Element Program 20). Year-round farmworkers typically need affordable rental or ownership housing, which is available in the County's existing residential zoning districts.

Students Residences

Feather River College (FRC) in Quincy is a public community college, which is fully accredited by the Western Association of Schools and Colleges, and offers two-year associate degrees, in addition to offering a four-year Bachelor of Science in Equine and Ranch Management. FRC, as of October 2019, operated the following student housing: On-Campus Dormitories – 64 apartments housing 160 students, the Meadows Apartments – 11 apartments housing 27 students, and the Pines Apartments – 25 rooms housing 46 students. This inventory consists of 77 one-bedroom apartments, 19 two-bedroom apartments, and 4 studio apartments across the three locations.

The FRC resident housing capacity is set at 233 students; however, the college has added extra bunks to some of the larger rooms, increasing the overall capacity to approximately 250 students. While the unmet need for student housing is difficult to track, FRC estimates the resident housing needs gap to be approximately 70+ students. Based on a waitlist reaching 65 names during the summer of 2019, FRC was able to accommodate 25 additional students, leaving approximately 40 who could not be served with student housing. FRC received another 40+ inquiries about student housing during the summer of 2019, but these potential students never turned in an application after they learned about the waitlist.

Structures

Structures include buildings used for a variety of purposes and reflect the Plumas County Planning Area's existing built environment. Depending on the nature and extent of a hazard event or disaster, all structures may be exposed to some level of risk, where certain buildings or concentrations of buildings are more vulnerable. This section captures the structures, and associated land and contents values, which comprise the Plumas County Planning Area's and unincorporated Plumas County's existing built environment.

Parcel and Structure Inventory and Assessed Values

An inventory of structures located within the Plumas County Planning Area and unincorporated County was developed utilizing data from the Plumas County Assessor's Office. It is based on the 2024 Assessor's data/Parcel layer provided by Plumas County GIS. This data represents best available data.

While conducting an inventory of structure assets within the Plumas County Planning Area is a key element of this asset inventory, understanding the total assessed value of structures and built environment is a starting point to understanding the overall value of identified assets in the Plumas County Planning Area. When the total assessed values are combined with potential values associated with other community assets such as area populations, public and private critical infrastructure, historic and cultural resources, and natural resources, and other identified assets, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the Plumas County Planning Area.

Methodology

The 2024 Plumas County Assessor's data and County Parcel Layer was utilized as the basis for the inventory of assessed values for both improved and unimproved parcels within the Plumas County Planning Area. This data provides the land and improved values, and personal property values assessed for each parcel, along with key information such as property use. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Plumas County and CalAtlas to support mapping and analysis of the existing built environment.

Data Limitations & Notations

Although based on best available data, the resulting information should only be used as an initial guide to overall values in the Plumas County Planning Area. In the event of a disaster, structures and other infrastructure improvements are at the greatest risk of damage. Depending on the type of hazard and resulting damages, the land itself may not suffer a significant loss. For that reason, the values of structures and other improvements are of greatest concern. Also, it is critical to note a specific limitation to the assessed values data within the Plumas County Planning Area, created by Proposition 13. Instead of adjusting property values annually, no adjustments are made until a property transfer occurs. As a result, overall property value information is likely significantly low and does not reflect current market, replacement, or true potential loss values for properties within the Plumas County Planning Area.

Another limitation to this data is found in the Williamson Act, also known as the California Land Conservation Act of 1965, that enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. This further affects the County's overall values for assessed taxable lands and structures.

Property Use Categories

The Plumas County Planning Area Assessor data included property use categories which provides detailed descriptive information about how each property is generally used, such as residential, commercial, or industrial. The property use codes were refined and categorized into the following property use categories and linked back to the Assessor data. The final property use categories for the Plumas County Planning Area include:

- Agricultural
- Commercial
- Federal Lands
- Government
- Industrial
- Institutional
- Miscellaneous
- Recreational
- Residential

- ROW/Utilities

Once property uses were grouped into categories, the number of total and improved parcels, land, personal property, and improved (structure) values were inventoried for the Plumas County Planning Area by property use.

Estimated Content Replacement Values

The Plumas County Planning Area assigned property use categories were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards. FEMA's standard CRV factors, derived from Hazus, were utilized to develop more accurate loss estimates for the total assets inventory and for all mapped hazard analyses. FEMA's CRV factors estimate content values as a percent of improved structure value by property use. Table 4-9 shows the breakdown of the different property uses in the Plumas County Planning Area and their estimated CRV factors.

Table 4-9 Plumas County Planning Area – Content Replacement Factors by Property use

Plumas County Property Use Categories	Hazus Property Use Categories	Hazus Content Replacement Values
Agricultural	Agricultural	100%
Commercial	Commercial	100%
Federal Lands	Federal Lands	100%
Government	Government	100%
Industrial	Industrial	150%
Institutional	Institutional	100%
Miscellaneous	Miscellaneous	100%
Recreational	Recreational	100%
Residential	Residential	50%
ROW/Utilities	ROW/Utilities	100%

Source: Hazus 6.1

Parcel and Structure Asset Inventory with Values Results

Values associated with land and improved structures and personal property were identified and summed in order to determine total assessed values at risk in the Plumas County Planning Area. Together, the land and improved structure values make up the majority of assessed values associated with each identified parcel or asset. Improved parcel counts were based on the assumption that a parcel was improved if a structure value was present. Content replacement values were then added to the assessed values, as described below, to provide an estimate of total values at risk in the Planning Area.

Table 4-10 shows the total values or exposure for the entire Plumas County Planning Area broken out by jurisdiction. Table 4-11 shows the values for the unincorporated Plumas County broken out by property use. Tables showing the property use breakouts for the incorporated communities are included in their respective annexes to this LHMP Update.

Table 4-10 Plumas County Planning Area – Total Parcels and Structures by Jurisdiction

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola	1,643	1,021	$37,950,371	$151,251,034	$1,915,072	$94,642,209	$285,758,686
Unincorporated Plumas County	24,234	13,427	$1,664,994,728	$3,202,945,278	$141,527,563	$1,734,158,622	$6,743,626,191
Grand Total	**25,877**	**14,448**	**$1,702,945,099**	**$3,354,196,312**	**$143,442,635**	**$1,828,800,830**	**$7,029,384,876**

Source: 2024 Plumas County Parcel/Assessor Data

Table 4-11 Unincorporated Plumas County – Total Parcels and Structures by Property Use

Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Agricultural	1,310	118	$70,282,817	$24,979,645	$2,766,527	$24,979,645	$123,008,634
Commercial	853	556	$78,599,880	$164,344,412	$32,275,885	$164,344,412	$439,564,589
Federal Lands	217	0	$0	$0	$0	$0	$0
Government	599	0	$124,956	$0	$0	$0	$124,956
Industrial	140	85	$10,733,621	$18,449,533	$33,550,208	$27,674,300	$90,407,662
Institutional	80	39	$2,145,116	$13,936,169	$196,380	$13,936,169	$30,213,834
Miscellaneous	26	0	$9,591	$0	$0	$0	$9,591
Recreational	519	91	$18,190,148	$25,212,673	$1,814,124	$25,212,673	$70,429,618
Residential	19,424	12,538	$1,484,908,599	$2,956,022,846	$70,924,439	$1,478,011,423	$5,989,867,307
ROW/Utilities	1,066	0	$0	$0	$0	$0	$0
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**

Source: 2024 Plumas County Parcel/Assessor Data

Critical Facilities and Infrastructure

For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health, safety, and the environment or interrupt essential services and operations for the community at any time before, during, and after the hazard event.***

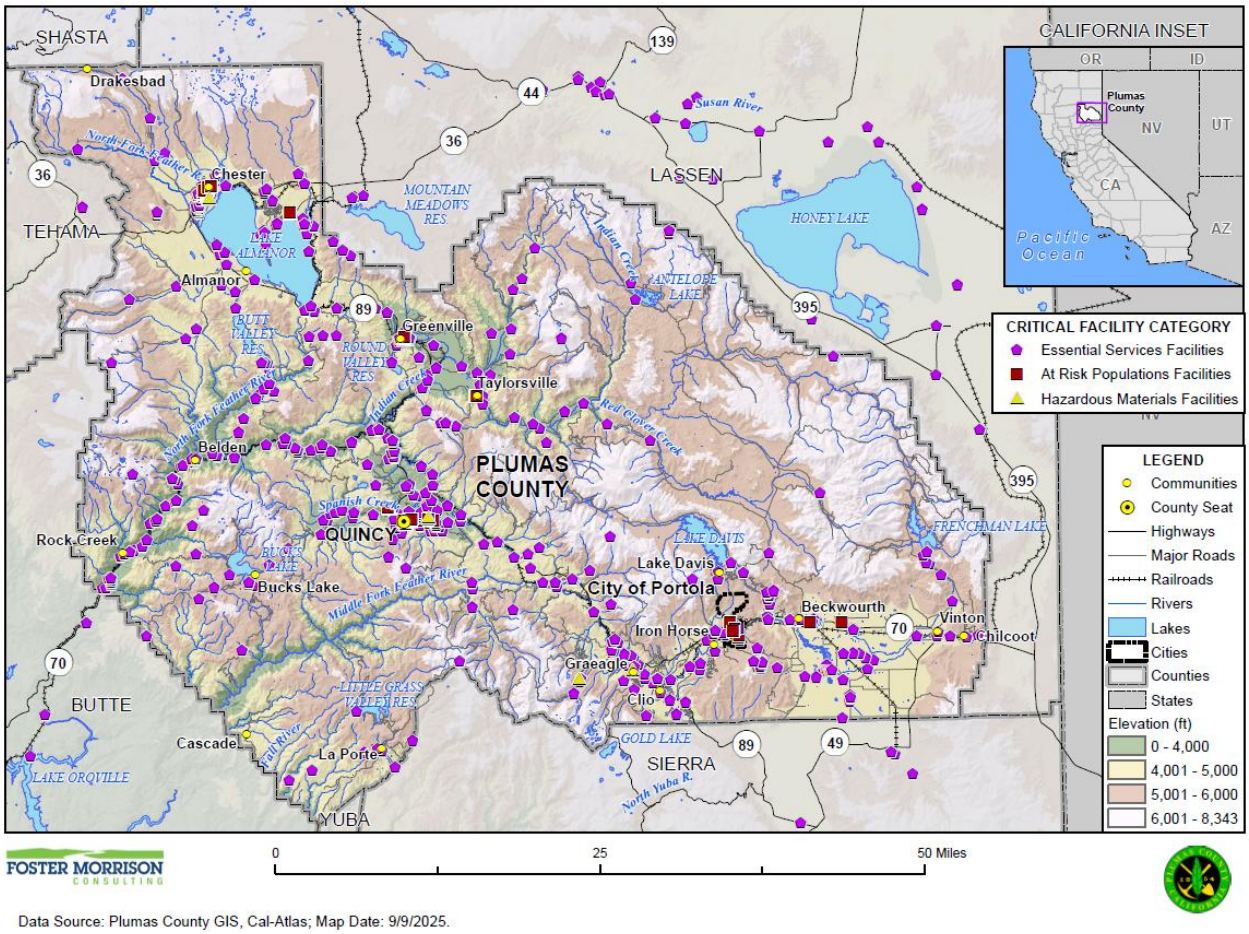
A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility facilities and equipment, and government operations. Sub-Categories include:
  - ✓ Public Safety – Sheriff station and substations, California highway patrol stations, fire and rescue stations, emergency operations centers, and any facility deemed critical or leased by PG&E for the purposes of a community resource center during Public Safety Power Shutoff (PSPS) events.
  - ✓ Emergency Response – Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
  - ✓ Emergency Medical – Hospitals, emergency care, clinics, wellness centers, pharmacies, and ambulance services.
  - ✓ Designated Emergency Shelters – Fairgrounds, memorial/veterans halls, and schools.
  - ✓ Communication Sites and Facilities – Main broadcasting equipment and systems, cell towers, data transmission, and other emergency warning systems (hubs for telephone, television, cable, radio, and internet).
  - ✓ Public Utility Plant and Substation Facilities – Equipment for treatment, generation, storage, pumping, and distribution (hubs for surface water, groundwater, wastewater, power, and fuel).
  - ✓ Essential Government Operations – County Courthouse (public records, elections, government administration and risk management, information technology, and courts), jails, probation, building permitting and inspection services, Public Works (maintenance and equipment yards), Child Support Services, Assessor, and County Annex (public health, behavioral health, social services, and environmental health).
  - ✓ Transportation Lifeline Systems – Airports, heliports, helipads, critical highways, critical roadways, bridges, railroads, and other transportation infrastructure.[1]
- **At-Risk Populations Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release hazardous material(s) in sufficient amounts during a hazard event that would significantly impact public health, safety, and the environment. For the purposes of this plan, those facilities storing threshold quantities of regulated substances subject to the California Accidental Release Response Plan (CalARP) program as specified in 19 CCR § 2770.5 are considered as meeting this criteria.

Critical facilities in the Plumas County Planning Area are shown on Figure 4-14. A summary of critical facilities in the Planning Area is shown in Table 4-12 and detailed in Table 4-13. Additional details of individual critical facilities can be found in Appendix G of this Plan Update.

[1] Note: critical linear transportation routes and systems such as highways and roadways will be determined during any hazard-specific evacuation planning and, for those reasons, are not specifically identified in this plan.

Figure 4-14 Plumas County Planning Area – Critical Facilities



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table 4-12 Plumas County Planning Area – Critical Facilities by Jurisdiction and Critical Facility Category

Jurisdiction / Critical Facility Category	Facility Count
City of Portola	
Essential Services Facilities	16
At Risk Populations Facilities	8
Hazardous Materials Facilities	0
City of Portola Total	**24**
Unincorporated Plumas County	
Essential Services Facilities	829
At Risk Populations Facilities	33
Hazardous Materials Facilities	4
Unincorporated Plumas County Total	**866**
Unincorporated Butte County	

Jurisdiction / Critical Facility Category	Facility Count
Essential Services Facilities	4
At Risk Populations Facilities	0
Hazardous Materials Facilities	0
Unincorporated Butte County Total	**4**
Unincorporated Lassen County	
Essential Services Facilities	34
At Risk Populations Facilities	0
Hazardous Materials Facilities	0
Unincorporated Lassen County Total	**34**
Unincorporated Sierra County	
Essential Services Facilities	4
At Risk Populations Facilities	0
Hazardous Materials Facilities	0
Unincorporated Sierra County Total	**4**
Unincorporated Tehama County	
Essential Services Facilities	2
At Risk Populations Facilities	0
Hazardous Materials Facilities	0
Unincorporated Tehama County Total	**2**
Grand Total	**934**

Source: Plumas County GIS

Table 4-13 Plumas County Planning Area – Critical Facilities by Jurisdiction and Critical Facility Category and Facility Type

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
Portola		
Essential Services Facilities	Emergency Medical	1
	Essential Government Operations	3
	Public Safety	2
	Public Utility Plant and Substation Facilities	8
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	**16**
At Risk Populations Facilities	Designated Emergency Shelter	1
	Public Safety	1
	School	6
	At Risk Populations Facilities Total	**8**

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
Portola Total		**24**
Unincorporated Plumas County		
Essential Services Facilities	Communication Sites and Facilities	495
	Designated Emergency Shelter	3
	Emergency Medical	11
	Emergency Response	5
	Essential Government Operations	14
	Nursing, Congregate or Assisted Living	1
	Public Safety	42
	Public Utility Plant and Substation Facilities	119
	Transportation Lifeline Systems	139
	Essential Services Facilities Total	**829**
At Risk Populations Facilities	Nursing, Congregate or Assisted Living	2
	School	31
	At Risk Populations Facilities Total	**33**
Hazardous Materials Facilities	Hazardous Materials Facilities	3
	Industrial	1
	Hazardous Materials Facilities Total	**4**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
Essential Services Facilities	Public Utility Plant and Substation Facilities	4
	Essential Services Facilities Total	**4**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
Essential Services Facilities	Communication Sites and Facilities	1
	Public Safety	2
	Public Utility Plant and Substation Facilities	31
	Essential Services Facilities Total	**34**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
Essential Services Facilities	Public Utility Plant and Substation Facilities	4
	Essential Services Facilities Total	**4**
Unincorporated Sierra County Total		**4**
Unincorporated Tehama County		
Essential Services Facilities	Public Safety	2
	Essential Services Facilities Total	**2**
Unincorporated Tehama County Total		**2**

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
Grand Total		**934**

Source: Plumas County GIS

Community Lifelines

Assessing the vulnerability of the Plumas County Planning Area to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety and/or economic security. Information on community lifelines include:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

For this Plan, Community Lifelines includes the following (as defined by FEMA):

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

In the Plumas County Planning Area, these community lifelines are all in place and functional as part of regular government operations. It should also be noted that these community lifelines collectively include many of the individual components of other community assets inventoried for this LHMP including structures and critical facilities and infrastructure.

After the HMPC reviewed the list of hazards from Table 4-3, it was determined that most hazards that occur would not overwhelm the community lifelines in the Plumas County Planning Area. A matrix was put together in Table 4-14 for the hazards in the County. As shown, only earthquake, volcano, and wildfire are thought be able to (temporarily) overwhelm the community lifelines in the Plumas County Planning Area.

Of the remaining hazards, only very extreme events of dam failure, flood, and hazardous materials transportation may have a chance of temporarily overwhelming community lifelines. Events associated with the remaining hazards would likely not overwhelm community lifelines.

Note: This inventory of community lifelines and hazard analysis only occurs in this overall asset inventory for Plumas County. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section 4.3 below.

Table 4-14 Plumas County Planning Area – Hazards and their Potential to Overwhelm Community Lifelines

Hazard	Potential to Overwhelm Community Lifelines	Hazard	Potential to Overwhelm Community Lifelines
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Limited	Earthquake	High
Severe Weather: Extreme Heat	Limited	Flood: 1%/0.2% annual chance (w/levee failure)	Moderate
Severe Weather: Heavy Rains and Storms	Limited	Flood: Localized Flooding	Limited
Severe Weather: High Winds and Tornado	Limited	Hazardous Materials Transportation	Moderate
Ag Hazard: Severe Weather/ Pests/Weeds	Limited	Landslide, Mudslide, and Debris Flow	Limited
Climate Change	Limited	Volcano	High
Dam Failure	Moderate	Wildfire (w/smoke and air quality)	High
Drought & Water Shortage (w/tree mortality)	Limited	–	–

Source: Plumas County Planning Team

Efforts to mitigate potential impacts to community lifelines are key to building resilience. These community lifelines connect to the sectors in the National Mitigation Framework and the Recovery Support Functions under the National Disaster Recovery Framework; the same agencies and departments that support these sectors also often support community lifelines and the recovery mission.

Specific information on these community lifelines in the Plumas County Planning Area and how they may be affected by a hazard event or disaster are discussed in more detail in each hazard section below as well as in each jurisdictional annex to this Base Plan.

Natural, Historical, and Cultural Resources

Assessing the vulnerability of the Plumas County Planning Area to disaster also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.

- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Natural resources are important to include in cost/benefit analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural resource assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as reducing the force of and storing floodwaters.

The Plumas County 2035 General Plan Conservation Open Space Element noted that Plumas County is located in an area of varying topography and slopes, with elevations ranging from approximately 1,800 feet in the Feather River Canyon to 8,300 feet near the summit of Mount Ingalls. With a majority of land associated with agricultural activities, forestry, or other managed resource uses, approximately 94% of the total County area, the primary land use in Plumas County is considered an open space use. Additionally, many of these lands are managed for a combination of resource values, including but not limited to recreation, mining, timber production, and cultural and historic resources.

Plumas County is comprised of a range of habitat types many of which influence the water quality and quantity of the Feather River Watershed. These habitats, or vegetation communities, provide food, shelter, movement corridors, and breeding opportunities for a variety of wildlife species, many unique to the Feather River Watershed and the larger Sierra Mountain region. Conifer (including Mixed Conifer) habitat types comprise approximately 72% of land coverage in the County and are habitats commonly found at higher elevations. Plants characteristic of this habitat includes a variety of pines and firs. As one gets farther away from the higher elevation Sierra regions of the County, the pines and firs give way to sagebrush, annual grasslands, and the freshwater emergent wetland habitat types more common at lower elevations.

Plumas County and the larger Feather River Watershed area contain a variety of aquatic habitats. Within the watershed, two types of fisheries are found: cold water river/stream species and warm water lake/ reservoir species. Historically, the watershed was habitat to Chinook salmon and steelhead. Special-status species are plants or animals that are legally protected under the State and/or federal Endangered Species Acts (ESAs) or other regulations, and species that are considered by the scientific community to be sufficiently rare to qualify for such listing. The California Department of Fish and Wildlife has documented habitat for over 90 different species of special concern in the County. These include several amphibians, such as the red-legged frog, bald eagles, osprey, several mammals, and plant/wildlife species associated with wetland habitats.

Special Status Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the Planning Area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

The California Natural Diversity Database, a program that inventories the status and locations of rare plants and animals in California, was queried to create an inventory of special status species in Plumas County. A summary list of these species is found below in Table 4-15. Appendix E lists the name, federal status, state status, California Department of Fish and Wildlife status, and the California Rare Plant rank of species in Plumas County.

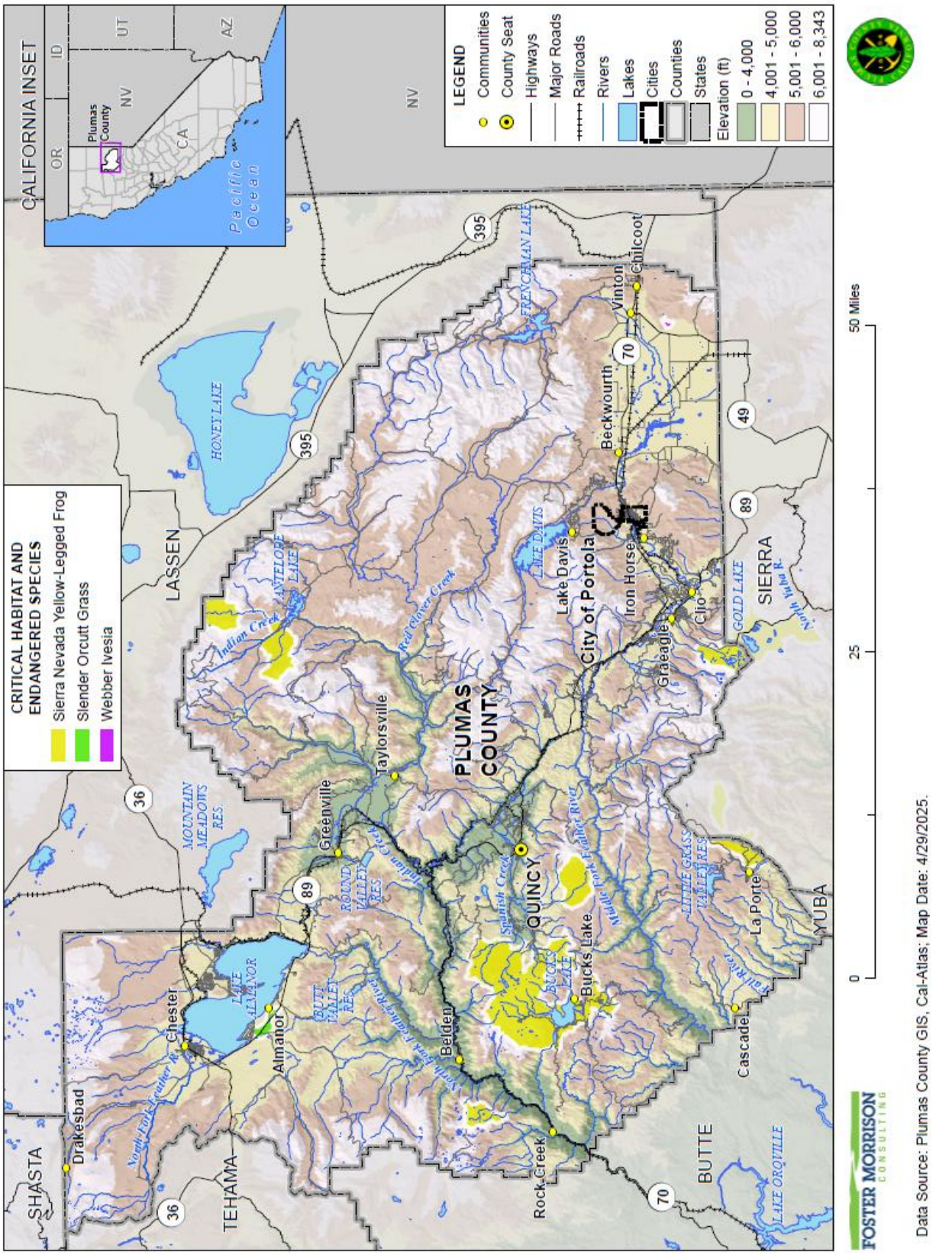
Table 4-15 Plumas County Planning Area – Summary of Special Status Species

Type	Number
Animals - Amphibians	2
Animals - Birds	47
Animals - Fish	7
Animals - Insects	6
Animals - Mammals	26
Animals – Mollusks	11
Animals – Reptiles	2
Community – Aquatic	3
Community – Terrestrial	1
Plant – Bryophytes	2
Plants – Vascular	171

Source: California Natural Diversity Database. Retrieved January 2025.

Additionally, Plumas County has mapped critical habitat and endangered species in the County. This is shown on Figure 4-15.

Figure 4-15 Plumas County Critical Habitat and Endangered Species



Wetlands

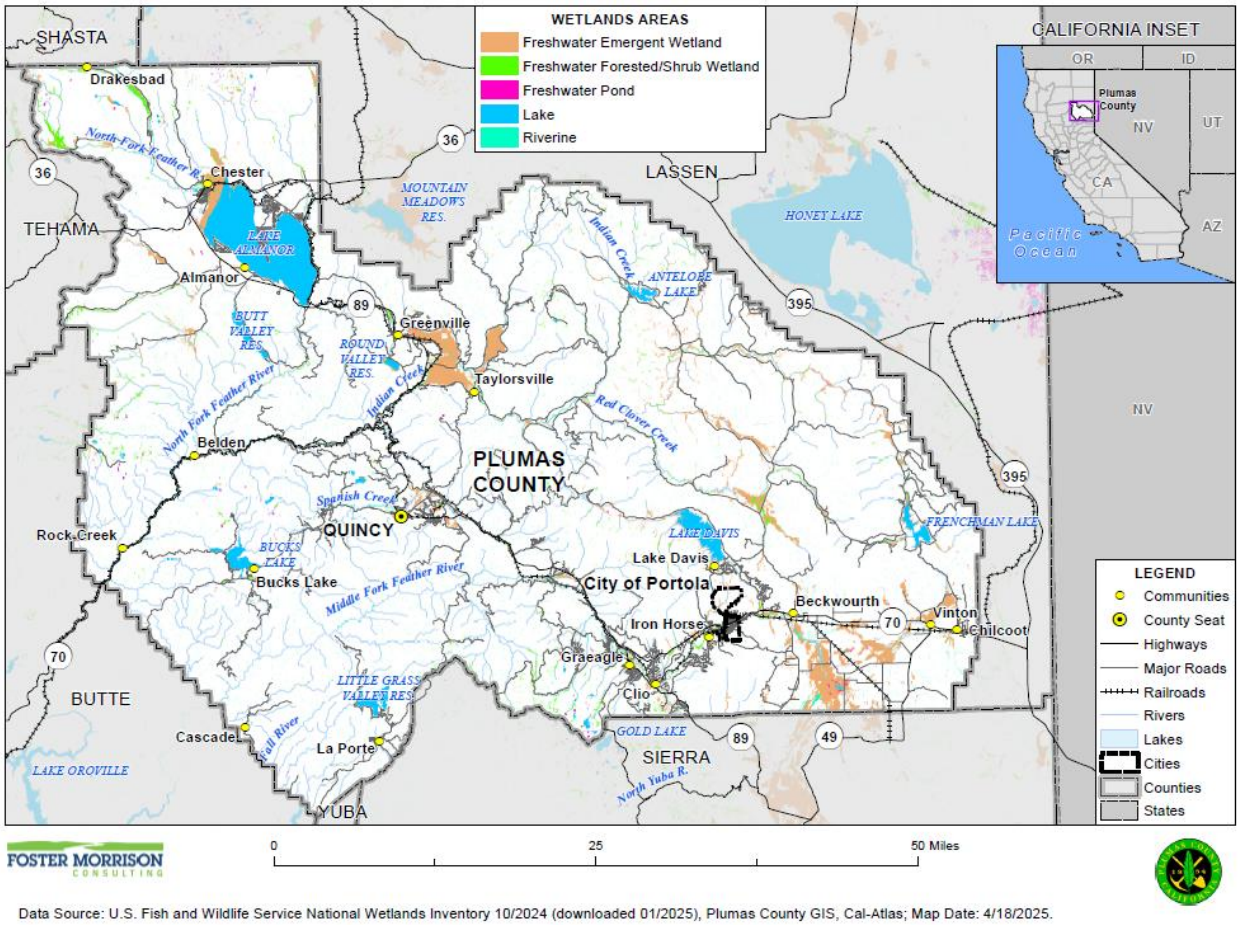
Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Fresh emergent wetland habitats occur in Plumas County on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed. In some areas organic soils (peat) may constitute the primary growth medium. Climatic conditions are highly variable and range from the extreme summer heat to winter temperatures well below freezing.

The US Fish and Wildlife Service has maps of wetlands in the United States. Those wetlands that fall in Plumas County are shown on Figure 4-16. They are detailed in Table 4-16 and are shown separated by jurisdiction. More information on the locations of wetlands in Portola can be found in its respective annex to this LHMP Update.

Figure 4-16 Plumas County Planning Area – Wetlands Locations



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Table 4-16 Plumas County Planning Area – Wetlands

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
City of Portola		
Freshwater Emergent Wetland	54	126.35
Freshwater Forested/Shrub Wetland	9	9.67
Freshwater Pond	1	0.18
Lake	0	0.0
Riverine	56	30.91
Non-Wetland*	1,643	3,324.21
City of Portola Total	**1,763**	**3,491.32**
Unincorporated Plumas County		
Freshwater Emergent Wetland	7,077	43,290.38
Freshwater Forested/Shrub Wetland	7,571	11,795.93
Freshwater Pond	769	874.03

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Lake	373	36,595.95
Riverine	18,236	14,995.44
Non-Wetland*	24,195	1,561,082.10
Unincorporated Plumas County Total	**58,221**	**1,668,633.84**
Grand Total	**59,984**	**1,672,125.16**

Source: USFWS October 2024 National Wetlands Inventory

* This category is all other "blank/no data" areas

Wetlands Natural and Beneficial Functions

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the Plumas County Planning Area.

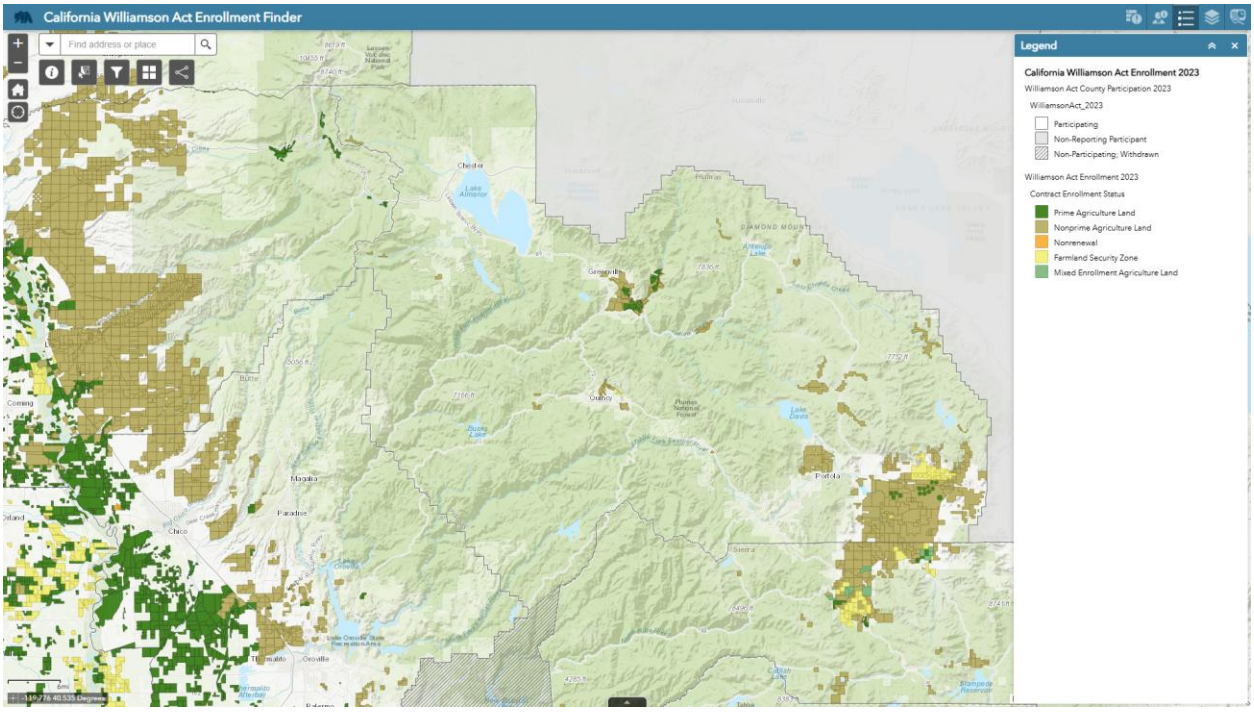
Farmlands

Williamson Act

The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years, and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. This affects the County's

overall values for assessed taxable lands. The County has designated areas as agricultural preserves within which the County will enter into contracts for the preservation of the land in agriculture. Locations from the most recent map (dated 2023) can be seen on Figure 4-17 for Plumas County.

Figure 4-17 Plumas County – Williamson Act Lands



Source: California Department of Conservation. Retrieved 04/22/2025.

State Inventory of Important Farmland

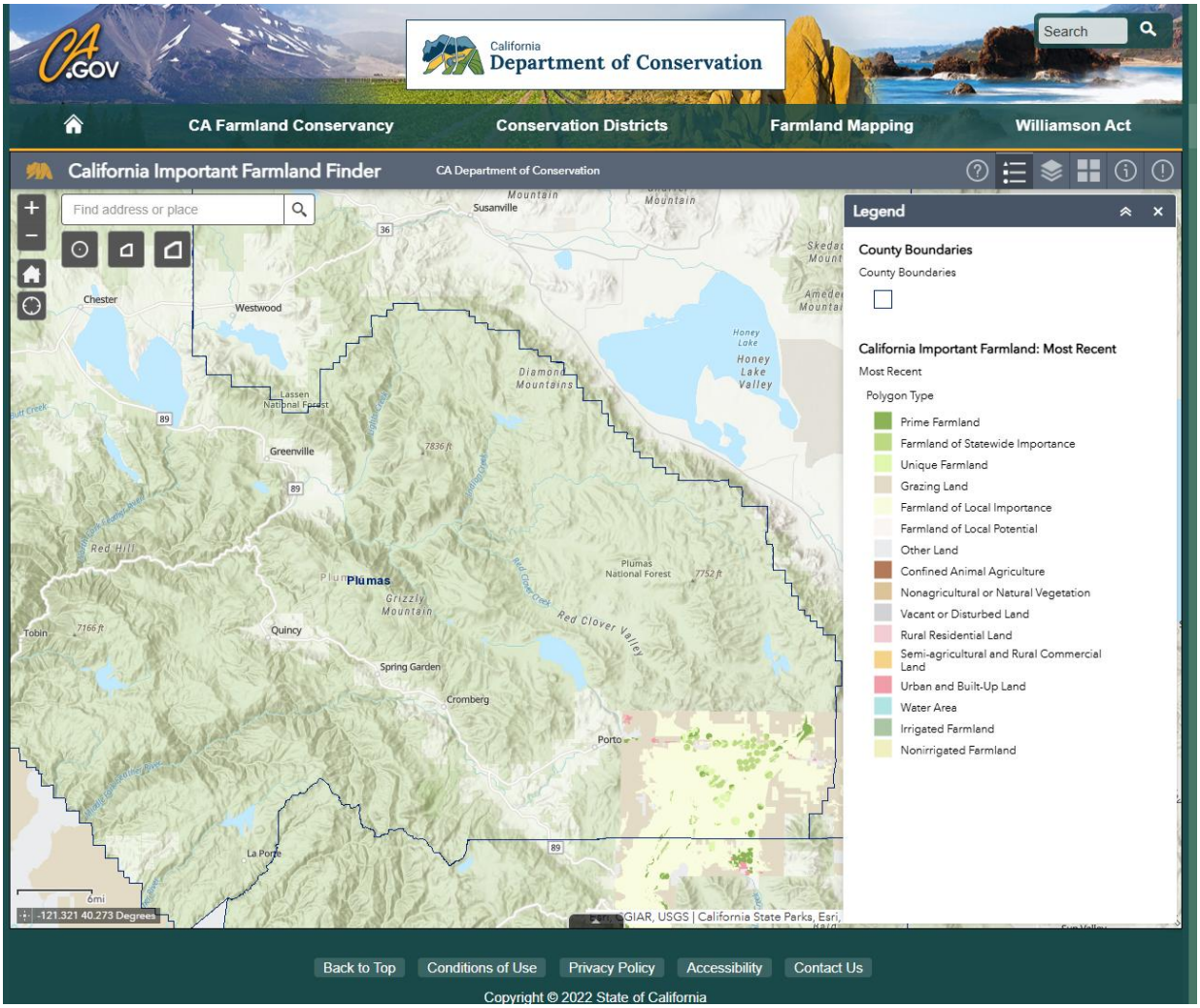
The Farmland Mapping and Monitoring Program was established in 1984 to document the location, quality, and quantity of agricultural lands and conversion of those lands over time. The program provides impartial analysis of agricultural land use changes throughout California. For inventory purposes, several categories were developed to describe the qualities of land in terms of its suitability for agricultural production. The State Department of Conservation utilizes the following classification system:

- The Prime Farmland category describes farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- Farmland of Statewide Importance is farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- Unique Farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

- Farmland of Local Importance is either currently producing crops or has the capability of production. This farmland category is determined by each county's board of supervisors and a local advisory committee.

The 2022 maps are the most recent versions. These lands are shown in Figure 4-18. The map does not show the full extent of the County; however, no important farmlands fall in the western and northwestern portions of the County.

Figure 4-18 Plumas County – Map of Important Farmlands 2022



Source: State of California Department of Conservation. Retrieved 04/22/2025.

Cultural and Historical Resources

Plumas County has a large stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's

irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements.

- The **National Register of Historic Places** is the nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.
- The **California Register of Historical Resources** program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance and identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act. The Register is the authoritative guide to the state's significant historical and archeological resources.
- **California Historical Landmarks** are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Landmarks #770 and above are automatically listed in the California Register of Historical Resources.
- **California Points of Historical Interest** are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register.

Historical resources included in the programs above are identified in Table 4-17.

Table 4-17 Plumas County Planning Area – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	California Register	Point of Interest	Date Listed	City/ Community
Beckwourth Pass (336)		X			8/8/1939	Chilcoot
Buck's Lake (197)		X			6/20/1935	Quincy
Ch'ichu'yam-Bam (N2213)	X				9/25/2003	Crescent Mills
Chinese American Cemetery, Plumas County Memorial Park (P770)				X	5/11/1992	Quincy
Drakesbad Guest Ranch (N2216)	X				10/22/2003	Chester
Elizabethtown (231)		X			6/20/1935	Quincy
James P. Beckwourth Ranch & Trading Post (P183)				X	9/24/1970	Beckwourth
Jamison City, Eureka Mills, Johnstown, and The Famous Eureka Mine (196)		X			6/20/1935	Blairsden

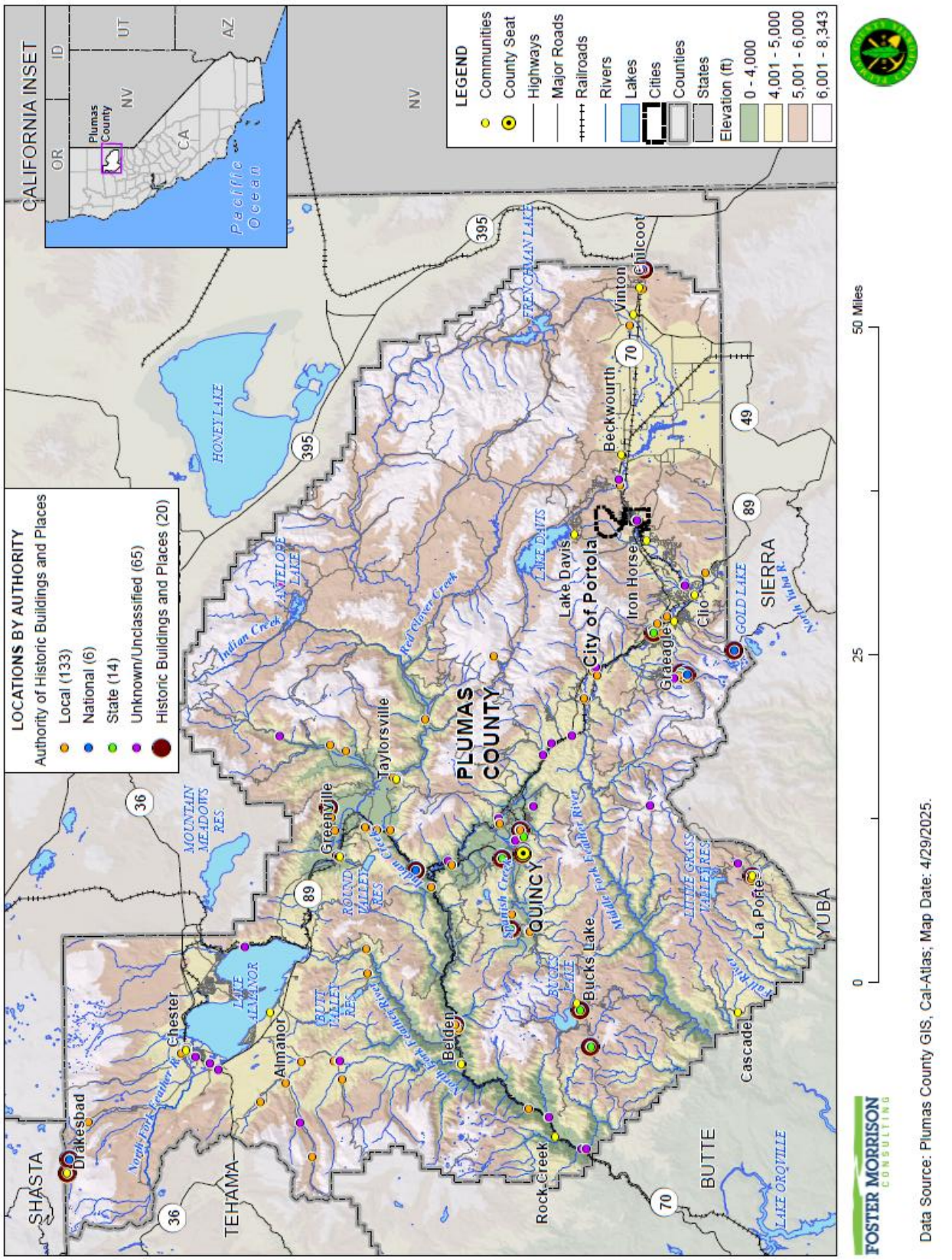
Resource Name (Plaque Number)	National Register	State Landmark	California Register	Point of Interest	Date Listed	City/ Community
Lakes Basin Petroglyphs (N85)	X				5/6/1971	Gold Lake
Marysville-Carson City Trail (P620)				X	8/16/1983	Plumas National Forest
Peter Lassen Marker (Site Of Lassen Trading Post) (184)		X			6/20/1935	Greenville
Pioneer Grave (Grizzly Creek) (212)		X			6/20/1935	Quincy
Pioneer Schoolhouse (625)		X			1/13/1958	Quincy
Pioneer Ski Area of America, Johnsville (723)		X			1/18/1960	Blairsden
Plumas-Eureka Mill, Jamison Mines District (N249)	X				7/16/1973	Blairsden
Rabbit Creek Hotel Monument (213)		X			6/20/1935	La Porte
Rich Bar (337)		X			8/8/1939	Quincy
Site of American Ranch And Hotel (479)		X			11/9/1950	Quincy
Site Of Plumas House (480)		X			11/9/1950	Quincy
Spanish Ranch and Meadow Valley (481)		X			11/9/1950	Quincy
Taylorsville Schoolhouse (P742)				X	5/8/1991	Taylorsville
Town Of Taylorsville (P318)				X	9/12/1973	Taylorsville
Warner Valley Ranger Station (N579)	X				4/3/1978	Chester

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

In addition to this, the County has its own inventory of historic buildings and places. These are shown on Figure 4-19, Table 4-17, and detailed in Appendix F.

Figure 4-19 Plumas County – Historic Buildings and Places



Economic Assets and Community Activities of Value

Assessing the vulnerability of the Plumas County Planning Area to natural hazards and disasters also involves inventorying the economic assets and community activities of value to the Plumas County Planning Area.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the County, this includes Pacific Crest Trail; Plumas Corporation; Sierra Pacific Industries; Collins Pines; Plumas County; City of Portola; High Sierra Music Festival; 4th of July activities throughout Plumas County; Fair; Mountain Biking events; Christmas activities; Land Trust; Recreation; Feather River College; PG&E; and Plumas Sierra Rural Electric Cooperative.

Plumas National Forest; Plumas Unified School District; Hospitals; Central Plumas Recreation District; Almanor Recreation District; Tourism;

More information on economic assets for the incorporated jurisdictions in the County can be found in the respective jurisdictional annexes to this Base Plan.

Community Activities of Value

Inventorying economic assets in the Plumas County Planning Area and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities provide economic benefits to the Planning Area. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism

In the County, this includes High Sierra Music Festival; 4th of July activities throughout Plumas County; Fair; Mountain Biking events; Christmas activities; and recreation events.

More information on community activities of value can be found in the respective jurisdictional annexes to this Base Plan.

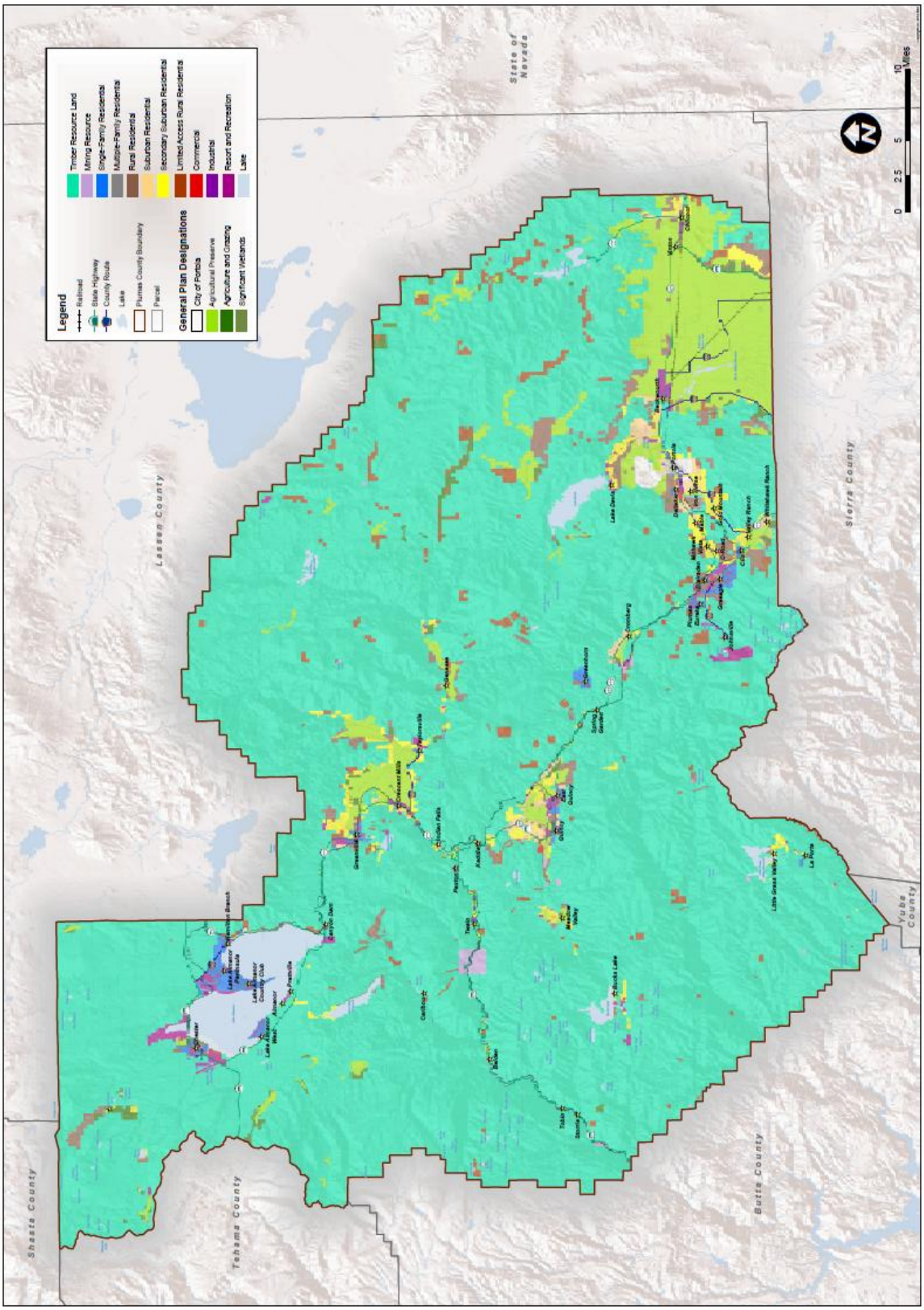
4.2.2. Growth and Development Trends

As part of the planning process, trends in growth and development, both current and future, were examined, both as a whole and in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This discussion focuses on unincorporated Plumas County.

Land Use

The future use of land in the County is fundamental to attaining the vision of a balanced, self-sustaining community. A land use pattern which balances growth between rural and urban areas, as well as providing a balance between housing, employment, natural resources, and services in the County is a key element in maintaining the quality of life and unique character of the County. Descriptions of allowed uses for each classification are detailed in the Plumas County General Plan Land Use Element. Figure 4-20 is sourced from this section.

Figure 4-20 Plumas County General Plan Land Use



Source: Plumas County 2016 General Plan Land Use Element

Population Projections

As indicated in the previous section, Plumas County had been steadily growing from 1940 to 2020. Since then, the County has begun to lose population. Long term forecasts by the California Department of Finance project population in Plumas County continuing through 2070. Table 4-18 shows the population projections for the County Planning Area as a whole through 2070. As shown, populations are expected to shrink over time.

Table 4-18 Population Projections for the Plumas County Planning Area (incorporated and unincorporated), 2025-2070

	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Plumas County	18,478	17,630	17,009	16,281	15,468	14,670	13,917	13,285	12,815	12,405

Source: California Department of Finance, P-2 Report

Development since 2020 Plan

The Plumas County Planning Department sought to track total building permits issued since 2020 for unincorporated Plumas County. A summary of this development is shown in Table 4-19. Development by known flood and fire hazard areas is shown in Table 4-20. All development in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas, were completed in accordance with the current and applicable development codes and standards in place at the time. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the County to identified priority hazards.

Table 4-19 Unincorporated Plumas County Development 2020–2024 Summary

Property Use	2020	2021	2022	2023	2024
Residential					
Commercial					
Industrial					
Other					
Total					

Source: Plumas County Planning Department

Table 4-20 Unincorporated Plumas County Development in Hazard Areas since 2020

Property Use	Moderate or Higher Fire Hazard Severity Zones	1% Annual Chance Flood	Landslide Potential Areas	Other
Residential	291	25	0	0
Commercial	6	0	0	0
Industrial	0	0	0	0

Property Use	Moderate or Higher Fire Hazard Severity Zones	1% Annual Chance Flood	Landslide Potential Areas	Other
Other	7	2	0	0
Total	**304**	**27**	**0**	**0**

Source: Plumas County Planning Department, August 2025

Summary by Year

- Moderate or Higher Fire Hazard Severity Zones
  - ✓ 2020 – 37
  - ✓ 2021 – 60
  - ✓ 2022 – 66
  - ✓ 2023 – 81
  - ✓ 2024 – 60
- 1% Annual Chance Flood (Special Flood Hazard Area – 100-year floodplain)
  - ✓ 2020 – 4
  - ✓ 2021 – 8
  - ✓ 2022 – 2
  - ✓ 2023 – 8
  - ✓ 2024 –5

In addition, it was noted that Plumas District Hospital Skilled Nursing Facility is currently being built. Seneca Healthcare District is building a new hospital. Plumas Crisis Intervention Resource Center added a housing center. Riley's Jerky was built after the Dixie Fire destroyed their previous shop.

Future Development Areas

It is important to review future development plans for the County. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazard events and disasters.

Plumas County has multiple areas that are expected to see or may see development over the next 5 years. These are listed below. Some of these have a narrative that follows the bulleted list. These are used as the basis for the GIS analysis below.

- CHP Station – This is a State/commercial facility. No narrative was available for this development area.
- Greenville Cy Hall Memorial Museum – This is a commercial museum property. No narrative was available for this development area.
- Greenville Rancheria Medical and Dental Clinic and Pharmacy – This is a medical/commercial facility. A narrative about this facility follows this bulleted list.
- Plumas Charter School – No narrative was available for this development area.
- Plumas County Search and Rescue – No narrative was available for this development area.

- Plumas District Hospital Skilled Nursing Facility – This is a medical/commercial facility. A narrative about this facility follows this bulleted list.
- Seneca Hospital – This is a medical/commercial facility. A narrative about this facility follows this bulleted list.
- Way Station – No narrative was available for this development area.
- Indian Valley Public Safety Center (Plumas County Sheriff Substation, Indian Valley Community Services District Fire Station, and Plumas District Hospital Ambulance) – This is an emergency services/commercial facility. A narrative about this facility follows this bulleted list.
- Meadow Edge Mobile Home Park – This is a residential single-family development. No narrative was available for this development area.
- North Star Navigation Center – Phase 2 – This is a residential multi-family development. A narrative about this facility follows this bulleted list.

In addition, though not mapped in the GIS analysis below, the County noted the following areas that may see development.

- 2024-2029 Housing Element Update Draft RHNA Vacant And Underutilized Sites List – multiple sites. A narrative about these follows this bulleted list.

Greenville Rancheria Medical Campus

On November 13, 2024, the Plumas County Zoning Administrator approved a special use permit amendment for the Greenville Rancheria of Maidu Indians of California to reestablish their Medical Campus in the Town of Greenville after the 2021 Dixie Fire destroyed the structure. The building involves the construction of a two-story, 16,200-square-foot outpatient medical, dental, pharmacy, and behavioral health facility and a 59-space parking lot on the parcels located at 408 and 410 Main Street, Greenville (APNs 110-062-007, 110-062-028, 110-062-029). As included in the construction document set, the proposed facility will have a reception and lobby area, waiting rooms, medical and dental exam and treatment rooms, behavioral health facilities, a pharmacy, administration and human resources offices, training and conference room space, a shipping and receiving area, employee break room, patient and staff restrooms, and several other supplemental rooms. The project will be able to serve up to a maximum of 25 patients a day with hours of operation Monday through Friday, 8:00 AM to 5:00 PM.

Plumas District Hospital Skilled Nursing Facility

On December 21, 2021, the Plumas County Zoning Administrator approved a special use permit for the construction of a new Plumas District Hospital skilled nursing facility in the Town of Quincy, located across the street from the existing hospital campus on Bucks Lake Road. The 22,507 square foot facility advanced construction activities in 2024 and is expected to be completed in summer 2025, consisting of two one-story buildings joined by a pedestrian bridge, and when fully operational, will host 36 beds with 24-hour nursing care and bring 79 livable wage jobs to Plumas County. Other functions include pharmaceutical service; dietary service space; activity programming space; common areas including lobby and reception, spa and salon, consult/family room, and restrooms; administrative offices; housekeeping; storage; employee dressing rooms; lockers; staff lounge; and parking.

Seneca Healthcare District Hospital Replacement

On June 13, 2023, the Plumas County Board of Supervisors approved Resolution 2023-8812 and Ordinance No. 2023-1149 approving a Geneal Plan Amendment and Zone Change, including adopting a California Environmental Quality Act (CEQA) compliant Mitigated Negative Declaration (No. 685) for the Seneca Healthcare District Hospital property at 199 Reynolds Road, in the Town of Chester. The Seneca Healthcare District broke ground in 2024 and completed the underground infrastructure for the construction of a 45,000 square foot state-of-the-art healthcare hospital due to aging hospital facilities and the requirement of Sente Bill 1953 which mandated seismic safety standards for hospitals. The new hospital will typically have a staff of approximately 48 employees on site at peak hours and accommodate the District's acute-care replacement hospital and an expanded skilled nursing facility, in addition to other amenities, as follows:

- 10-bed acute care, 2 of those with isolation capabilities
- 3-bed private emergency room and Trauma/procedure room
- 26-bed skilled nursing facility
- Imaging to include x-ray, CT scanner, ultrasound, and mobile MRI via trailer
- Operating room, procedure room, and 3-bed patient recovery
- Pharmaceutical services
- Laboratory services
- Dietary services – kitchen and dining
- Ambulatory surgery
- Physical therapy
- Occupational therapy
- Maintenance, materials management, laundry services

All spaces are sized to allow for improved workflow, updated and improved infrastructure, updated technology and medical equipment, and ADA accessibility per current code requirements. Additionally, the hospital will include a 3,000 square foot support services building and the approved plans allow for the construction of 10,000 square feet of housing for District employees and their families with up to ten 1,000 square foot residential units. To fund the construction, the District pursued U.S. Department of Agriculture (USDA) funding as well as a public bond measure (Measure B), which passed in the November 8, 2022, election, and philanthropic offerings by the community. Construction will continue into 2025, through 2026, with an anticipated timeframe to open of early 2027.

Indian Valley Public Safety Center

On April 13, 2023, Indian Valley Community Services District (IVCSD), applicant, submitted a special use permit application (Exhibit 1) to allow a public service facility use to construct the Indian Valley Public Safety Center facility (approximately 9,890-square-foot multi-use structure) for emergency services, including the Indian Valley Community Services District Fire Department Station, Plumas County Sheriff's Substation, and Plumas District Hospital ambulance with sleeping quarters, in addition to other associated accessory structures on a 5.0-acre parcel zoned Periphery Commercial ("C-2") located at 19646 Highway 89, Greenville, CA, APN 110-330-007-000 (Exhibit 2).

As shown on the site plan (Exhibit 3) dated February 20, 2025, the proposed facility would include a 4,560-square-foot drive-through truck bay, 5,070-square-foot main building, 260-square-foot shop, 700-square-foot covered patio, 840-square-foot carport, and a 112-square-foot covered entry.

The existing fire house metal structure, with bays, shown on the site plan was placed on the property as a temporary fire house as a result of the destruction of the IVCSD fire house due to the 2021 Dixie Fire. The existing fire house would be kept on site for the storage of equipment.

The proposed 3,600-square-foot biomass building shown on the site plan may be relocated to another location in Greenville, but is shown to be analyzed, as it could possibly remain located on the subject parcel.

The Plumas District Hospital ambulance services would have personnel using the building twenty-four (24) hours per day, seven days per week, Monday through Sunday, and dependent on calls, the IVCSD Fire Department personnel may be using the building twenty-four (24) hours per day, seven days per week, Monday through Sunday. Other IVCSD staff would utilize the office space as a satellite office, with no public visits, to the primary public IVCSD office at 127 Crescent Street, Greenville. The Plumas County Sheriff's Substation would be used intermittently seven days per week, Monday through Sunday.

The maximum number of staff on site at any given time would be as follows:

- Eight (8) IVCSD Staff
- Two (2) Sheriff Deputies
- Three (3) Staff for Plumas District Hospital Ambulatory Services

Additionally, there are IVCSD Fire Department trainings held every Tuesday at a different fire station location throughout the District, which is a total of four (4) stations – Greenville, Taylorsville, North Arm Indian Valley, and Genesee. Therefore, on occasion, there would be a maximum of thirty (30) volunteer firefighters on site. For an intermittent total maximum number of staff on site of forty-three (43).

North Star Navigation Center – Phase 2

Plumas Crisis Intervention and Resource Center (PCIRC), Plumas County's homelessness and CE provider, broke ground in 2022 and completed construction of Phase 1 in 2024 on the County's first emergency and transitional housing Navigation Center under the state's Low Barrier housing model pursuant to Government Code Sec. 65660 – 65668 (AB 101, Weiner, 2019). The parcel is 1 acre and is zoned "M-R" Multiple Family Residential. The NorthStar Navigation Center is an appropriate site for a year-round emergency shelter as the parcel has utility services, including water, sewer, and power. Furthermore, the site is located in Quincy in proximity to retail services, public transportation, medical facilities, and employment opportunities. A Low Barrier Navigation Center pursuant to Government Code Sec. 65660 – 65668 (AB 101, Weiner, 2019) means a Housing First approach, low-barrier, service-enriched shelter focused on moving people into permanent housing that provides temporary living facilities while case managers connect individuals experiencing homelessness to income, public benefits, health services, shelter, and housing. "Low Barrier" means best practices to reduce barriers to entry, and may include, but is not limited to: the presence of partners if it is not a population-specific site, such as for survivors of domestic violence or sexual assault, women, or youth; pets; the storage of possessions; and privacy, such as partitions around beds in a dormitory setting or in larger rooms containing more than two beds, or private

rooms. The North Star Navigation Center provides immediate emergency shelter and transitional housing services to the homeless, chronically homeless, transitioning offenders, the Housing and Disability Advocacy Program (HDAP) for seniors and/or disabled, and former foster youth in Plumas. The main building (Phase 1) includes a 27-bed capacity emergency shelter with congregate beds and non-congregate bedrooms for families, associated congregate and non-congregate bathrooms, day use room areas, a kitchen and dining room, administrative offices for staff, and storage. More specifically, there are 12 beds in the bunkroom (7 male and 5 female) and three family rooms with a total 15 bed capacity. Ohana Village (Phase 2) will offer transitional housing that includes 26 detached cabins ranging in size from studio units (16 beds, one of which is accessible), 1 bedroom-units (16 beds, one of which is accessible), and 2 bedroom-units (8 beds, one of which is accessible). The 1- and 2-bedroom units will include half baths, while the studio units utilize a common building with congregate bathrooms that also have shower facilities for all Ohana Village units. A second common building will include Ohana Village resident dining and there is also a maintenance building and outdoor play area. Supportive service staffing includes a Navigation Center Manager, Housing Navigator, Behavioral Health Counselor, Alcohol and Drug Counselor, HDAP Disability Advocate, and Grief Recovery Specialist with the primary purpose to bring all activities in-house and on-site. Educational opportunities and trainings will be provided to North Star Navigation Center residents including money management, life skills, and workforce development skills. Expected outcomes include:

- Increasing access to emergency and transitional housing.
- Delivery of a comprehensive array of supportive services.
- Reducing the number of days of homelessness.
- Increasing access to permanent housing and housing stability.
- Developing a 'systems change' in how Plumas County addresses homelessness for its most vulnerable residents.

Sites from RHNA

The County provided the Initial Review Draft of the 2024-2029 Housing Element. It included the following tables (Table 4-21 through Table 4-24) where development may occur to accommodate Very Low Income and Low Income housing. Any of these sites could be used for future development.

Table 4-21 Vacant High-Density Sites to Accommodate the Very Low Income RHNA[1]

Identified in Prior 5th/6th Planning Cycle	APN/Address	Community/ ZIP Code	Approx. Acreage	General Plan Land Use Designation	Zoning	Community Services District (CSD)	Electricity	FEMA Flood Zone	Site Constraints	Min Density (10 du/acre)	Max Density (21.8 du/acre)	Realistic Capacity
Yes	116-172-010 1967 Claremont Way	East Quincy/95971	0.98	Multiple-Family Residential	M-R	American Valley CSD Water/Sewer	PG&E	Shaded Zone X	None	9	21	12
Yes	116-320-034 1506 Peppard Flat Rd.	East Quincy/95971	Gross 7.47 Net 2.70	Multiple-Family Residential	M-R	American Valley CSD Water/Sewer	PG&E	Unshaded Zone X	Topography/ Forested	27	58	32
									Total	**36**	**79**	**44**

Source: Plumas County Planning Department, August 2025.

[1] The 32-unit realistic capacity of 1506 Peppard Flat Rd. as a vacant high-density site to accommodate a portion of the very low income RHNA assumes accommodating the acutely low- and extremely low-income RHNA of 10 units.

Table 4-22 Underutilized High-Density Sites to Accommodate the Very Low Income RHNA

Identified in Prior 5th/6th Planning Cycle	APN/Address	Community/ ZIP Code	Approx. Acreage	General Plan Land Use Designation	Zoning	Community Services District (CSD)	Electricity	FEMA Flood Zone	Site Constraints	Min Density (10 du/acre)	Max Density (21.8 du/acre)	Realistic Capacity
No	116-112-008 7 Fairground Rd.	East Quincy/95971	1.28	Multiple-Family Residential	M-R	American Valley CSD Water/Sewer	PG&E	Unshaded Zone X	One (1) Dwelling Unit	12	27	16
No	116-172-012 56 Mill Creek Rd.	East Quincy/95971	1.16	Multiple-Family Residential	M-R	American Valley CSD Water/Sewer	PG&E	Unshaded Zone X	One (1) Dwelling Unit	11	25	24
									Total	23	52	40

Source: Plumas County Planning Department, August 2025.

Table 4-23 Vacant High-Density Sites to Accommodate the Low Income RHNA

Identified in Prior 5th/6th Planning Cycle	APN/Address	Community/ ZIP Code	Approx. Acreage	General Plan Land Use Designation	Zoning	Community Services District (CSD)	Electricity	FEMA Flood Zone	Site Constraints	Min Density (10 du/acre)	Max Density (21.8 du/acre)	Realistic Capacity
Yes	115-080-022 105 Louisiana Ave.	Quincy/95971	Gross 3.64 Net 1.96	Multiple-Family Residential	M-R	American Valley CSD Water/Sewer	PG&E	Unshaded Zone X	Soils/Geotechnical	19	42	40
No	110-171-022 168 Hot Springs Rd.	Greenville/95947	0.79	Multiple-Family Residential	M-R	Indian Valley CSD Water/Sewer	PG&E	Unshaded Zone X	None	7	17	12
									Total	26	59	52

Source: Plumas County Planning Department, August 2025.

Table 4-24 Underutilized High-Density Sites to Accommodate the Low Income RHNA

Identified in Prior 5th/6th Planning Cycle	APN/Address	Community/ ZIP Code	Approx. Acreage	General Plan Land Use Designation	Zoning	Community Services District (CSD)t	Electricity	FEMA Flood Zone	Site Constraints	Min Density (10 du/acre)	Max Density (21.8 du/acre)	Realistic Capacity
No	110-171-023 184 Hot Springs Rd.	Greenville/95947	Gross 3.50 Net 2.60	Multiple-Family Residential	M-R	Indian Valley CSD Water/Sewer	PG&E	Unshaded Zone X	Existing Plumas District Hospital Building with Medical Clinic/Road & Parking Easement	26	56	24
									Total	26	56	24

Source: Plumas County Planning Department, August 2025.

GIS Analysis

Plumas County provided 13 future development areas which were used as the basis for the inventory of future development for unincorporated Plumas County. These were mapped in GIS. Figure 4-21 show the locations of the future development areas. Table 4-25 shows the details of the future development areas by acreage and parcel count.

Figure 4-21 Unincorporated Plumas County – Future Development Areas

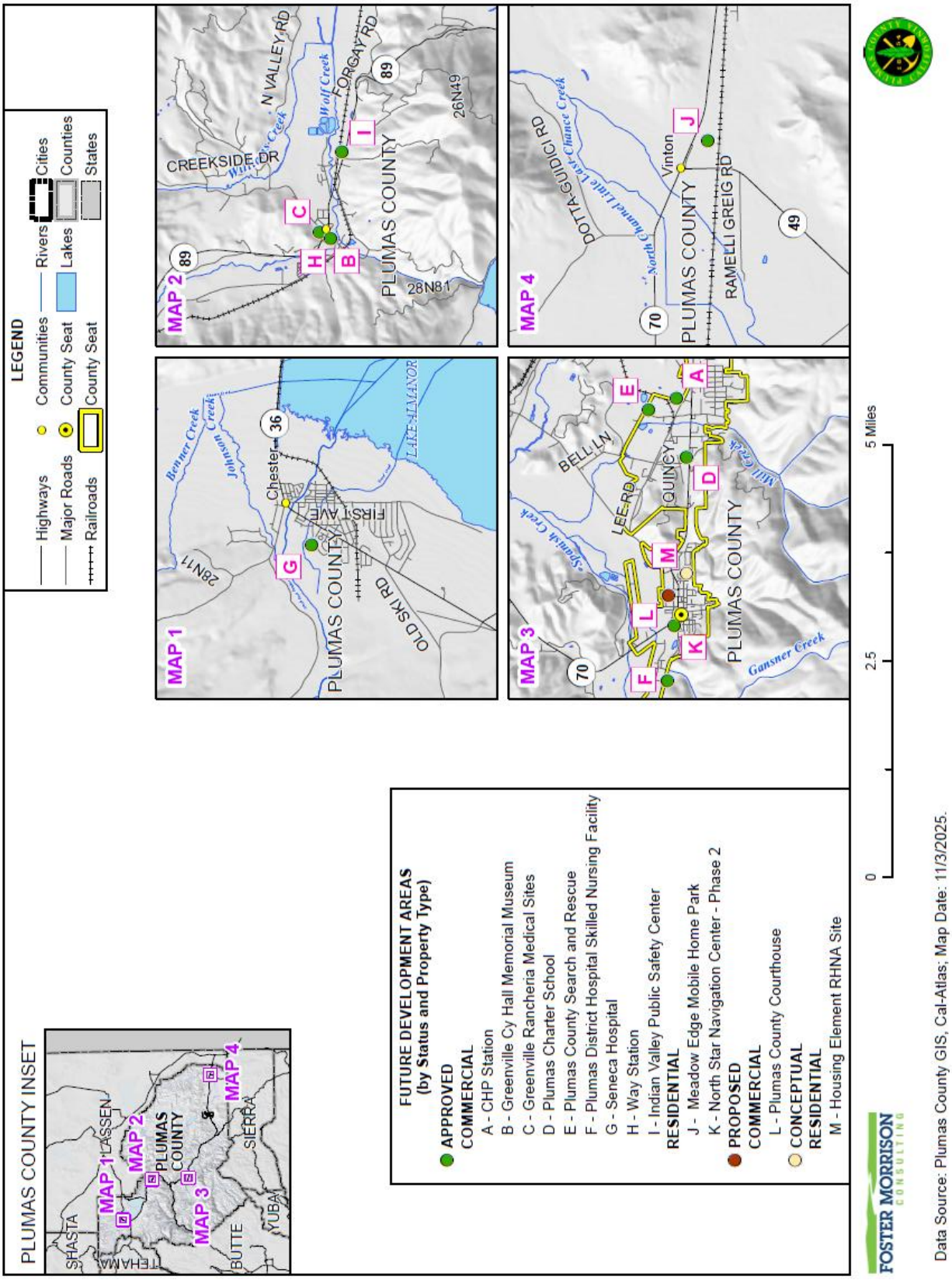


Table 4-25 Unincorporated Plumas County – Future Development Areas by Parcels and Acres

Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Approved							
Commercial	A - CHP Station	1	0	1	5.00	0.00	5.00
	B - Greenville Cy Hall Memorial Museum	1	0	1	0.11	0.00	0.11
	C - Greenville Rancheria Medical, Dental Clinic, and Pharmacy	1	0	1	1.58	0.00	1.58
	D - Plumas Charter School	1	0	1	0.89	0.00	0.89
	E - Plumas County Search and Rescue	1	1	0	4.50	4.50	0.00
	F - Plumas District Hospital Skilled Nursing Facility	1	0	1	4.12	0.00	4.12
	G - Seneca Hospital	1	0	1	11.80	0.00	11.80
	H - Way Station	1	0	1	0.28	0.00	0.28
	I - Indian Valley Public Safety Center	1	0	1	5.00	0.00	5.00
	Commercial Total	**9**	**1**	**8**	**33.28**	**4.50**	**28.78**
Residential	J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
	K - North Star Navigation Center - Phase 2	1	1	0	1.00	1.00	0.00
	Residential Total	**2**	**2**	**0**	**43.74**	**43.74**	**0.00**

Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Approved Total		**11**	**3**	**8**	**77.02**	**48.24**	**28.78**
Proposed							
Commercial	L - Plumas County Courthouse	1	1	0	2.86	2.86	0.00
	Commercial Total	**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
Proposed Total		**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
Conceptual							
Residential	M - Housing Element RHNA Site	1	1	0	3.64	3.64	0.00
	Residential Total	**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Conceptual Total		**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Grand Total		**13**	**5**	**8**	**83.52**	**54.74**	**28.78**

Source: Plumas County GIS

4.3 Hazard Profiles and Vulnerability Assessment

44 CFR Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
44 CFR §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
44 CFR §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
44 CFR §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.
44 CFR §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.
44 CFR §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The hazards identified in Section 4.1 Hazard Identification, are profiled individually in this section. The Hazard Profiles set the stage for the Vulnerability Assessment, where the vulnerability is quantified, as data allows, for each of the identified hazards.

Hazard Profiles Methodology

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the Plumas County Planning Area and unincorporated Plumas County. Where known, this includes information on the hazard extent, location, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical incidents, including impacts where known. Hazard research, historical incident worksheets and other input from the Hazard Mitigation Planning Committee were used to capture information on past occurrences.
- **Likelihood of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of experiencing a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
  - ✓ **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year.
  - ✓ **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.

- ✓ **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
- ✓ **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

➢ **Climate Change**—This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

Vulnerability Assessment Methodology

With the Plumas County Planning Area's hazards identified and profiled, a vulnerability assessment was conducted to describe the vulnerability and impact that each hazard would have on the Plumas County Planning Area and specific to each jurisdiction. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to identified hazards and estimate potential losses. This section focuses on the vulnerabilities of the Plumas County Planning Area as a whole and specific to unincorporated Plumas County. The vulnerability assessment is done in the following format:

➢ **General Vulnerability Discussion** – An assessment of the vulnerability of the Plumas County Planning Area to each hazard is provided in addition to the estimate of the risk of future occurrence. This is followed by a general discussion of the hazard and its vulnerability on the Plumas County Planning Area and unincorporated Plumas County. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into one of the following classifications:
- ✓ **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- ✓ **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- ✓ **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- ✓ **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- ✓ **Extremely High**—Very widespread with catastrophic impact.

➢ **Local Concerns** – This includes information on how the unincorporated Plumas County is uniquely affected by or vulnerable to each hazard. Information contained in this section also supports the resulting mitigation strategy for the unincorporated County. Local concerns sections specific to each of the other participating jurisdictions are included in their jurisdictional annexes to this plan.

➢ **Assets at Risk** – A discussion of the assets at risk follows. This includes sections on: People and Populations, as well as Structures (including Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources). These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped.
- ✓ **FEMA NRI Hazard Vulnerability** – For each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating.

- **Impacts** – A discussion on hazard impacts is included. Impacts describe how each hazard can affect the County and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions will influence or affect the hazard over time is included here and considers factors related to climate change, changes in population patterns, and changes in land use and development. This section also discusses future development plans relative to each hazard as well as mitigating measures that should be considered in the development process. Future conditions and future development is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Existing Built Environment and Assets at Risk

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of assets subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical facilities, historic structures, and valued natural resources. Together, this information conveys the impact, or vulnerability, of the Plumas County Planning Area and unincorporated Plumas County to that hazard.

The vulnerability assessment identified six hazards in the Plumas County Planning Area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These six hazards are:

- Dam Failure
- Earthquake
- Flood: 1%/0.2% (w/levee failure)
- Hazardous Materials Transportation
- Landslide, Mudslides, and Debris Flows
- Wildfire (w/smoke and air quality)

These hazards were analyzed using GIS, Plumas County data, and hazard data.

The vulnerability and potential impacts from the nine priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analysis are discussed in more general terms. These include:

- Agricultural Hazards (severe weather/pests/weeds)
- Climate Change
- Drought and Water Shortage (w/tree mortality)
- Flood: Localized/Stormwater
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Winds and Tornadoes
- Volcano

Power Outages/Failure: A Common Vulnerability of all Hazards

An additional impact or vulnerability common to most all hazards is power outage or power failure. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. Electric power disruptions can be generally grouped into two categories: intentional and unintentional.

Intentional Disruptions

There are four types of intentional disruptions:

- **Planned**: Some disruptions are intentional and can be scheduled based maintenance or upgrading needs.
- **Unscheduled**: Some intentional disruptions must be done "on the spot." in response to an emergency.
- **Demand-Side Management**: Some customers (i.e., on the demand side) have entered into an agreement with their utility provider to curtail their demand for electricity during periods of peak system loads.
- **Load Shedding**: When the power system is under extreme stress due to heavy demand and/or failure of critical components, it is sometimes necessary to intentionally interrupt the service to selected customers to prevent the entire system from collapsing, resulting in rolling blackouts.

The California Independent System Operator (CAISO) is tasked with managing the power distribution grid that supplies most of California, except in areas served by municipal utilities. CAISO is thus the entity that coordinates statewide flow of electrical supply. CAISO uses a series of stage alerts to the media based on system conditions. The alerts are:

- Stage 1 – reserve margin falls below 7 percent
- Stage 2 – reserve margin falls below 5 percent
- Stage 3 – reserve margin falls below 1.5 percent

Rotating blackouts become a possibility when Stage 3 is reached. Rotating outages and/or blackouts such as those experienced in 2000/2001 and 2006 can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption. Key California events include the following:

On January 17, 2001, CAISO declared a Stage 3 Emergency and notified the then Governor's Office of Emergency Services that PG&E was dropping firm load of 500 megawatts (MW) in Northern California leading to rolling blackouts. Cal OES, in turn, issued an Electrical Emergency Message to all Emergency Services Agencies to prepare for rolling blackouts. This scenario was repeated the following day, January 18, 2001, and again on March 19, 2001.

A July 2006 heat storm event affected the entire state as well as most of the West, producing record energy demand levels in California. The State was able to avoid rotating outages due to a combination of favorable

factors that included no major transmission outages, lower than typical generator outages, significant customer response to pleas for energy conservation, high imports from the Pacific Northwest despite unusually high loads, outstanding cooperation among western control area operators, and prompt response to fires that potentially threatened major interties. However, the event brought to light the vulnerability of the electric distribution system, as over 3,500 distribution transformers failed, leaving over two million customers without power at various times over the ten-day event, many for several hours and a small minority for up to three days.

In 2020, the state battled both extreme heat and wildfires. As a result of extreme heat, the CAISO declared a Stage 3 emergency. PG&E initiated rotating outages in August at the request of California's grid operator. The outages, which impacted 220,000 customers, occurred during periods of high heat. These rolling blackouts lasted less than a week.

Unintentional Disruptions

Unintentional or unplanned disruptions are outages that come with essentially no advance notice. This type of disruption can be the most problematic. The following are categories of unplanned disruptions:

- Accident by the utility, utility contractor, or others
- Malfunction or equipment failure
- Equipment overload (utility company or customer)
- Reduced capability (equipment that cannot operate within its design criteria)
- Tree contact other than from storms
- Vandalism or intentional damage
- Weather, including lightning, wind, earthquake, flood, and broken tree limbs taking down power lines
- Wildfire that damages transmission lines

Public Safety Power Shutoff

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), coordinated to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a Public Safety Power Shutoff (PSPS).

PSPS are another tool that PG&E uses to help eliminate and minimize ignitions caused by objects coming in contact with electrical circuits and causing fires. Severe weather, such as high winds, low humidity, and dry vegetation are some of the key elements to trigger a PSPS event in high fire threat areas (Tier 2 & Tier 3). By proactively shutting off power in areas that are very prone and susceptible to catastrophic wildfires, PG&E can help minimize the chance of a fire caused by electrical infrastructure. PG&E doesn't take lightly the shutting off power to residents, business, and critical customers and has a strict protocol for these actions.

Public Safety Power Shutoff for Plumas-Sierra Rural Electric Cooperative (PSREC)

PSREC may be affected by PSPS events. PSREC provides power to areas in Plumas County. During the summer, PG&E will de-energize electric lines that pass through high fire-threat areas. NV Energy has a similar program, though they call their outages Public Safety Outage Management (PSOM). These shutoffs will affect both distribution and transmission lines. The goal is to reduce the risk of fire during high-fire risk times such as high winds, low humidity levels and red flag warnings declared by the National Weather Service.

Although PSREC does not buy power from PG&E, PSREC's main transmission feed is from PG&E through the Feather River Canyon, where this feed transports power to PSREC members. Since PSREC relies on this transmission feed, these public safety power shutoffs will impact members. PSREC will strive to keep the impact of these shutoffs as minimal as possible to members.

A backup feed that comes to members from NV Energy is able to help support PSREC's system. However, this back-up isn't always available and could be de-energized for an NV Energy PSOM at the same time as a PG&E PSPS. When available during peak hours, it may not be enough, so rolling blackouts may need to be implemented. PSREC asks members to conserve when they are on a backup feed to prevent disruptions to service for all members.

It is likely that, in the event of PSPS and PSOM events, electric power will be out for one to a few days. Because these events will be triggered by PG&E and NV Energy's assessment of weather conditions and fire risk, PSREC cannot reliably predict the timing or duration. Residents or businesses who can't be without power should consider a professionally installed generator that meets local code requirements.

Public Safety Power Shutoff Criteria for PG&E

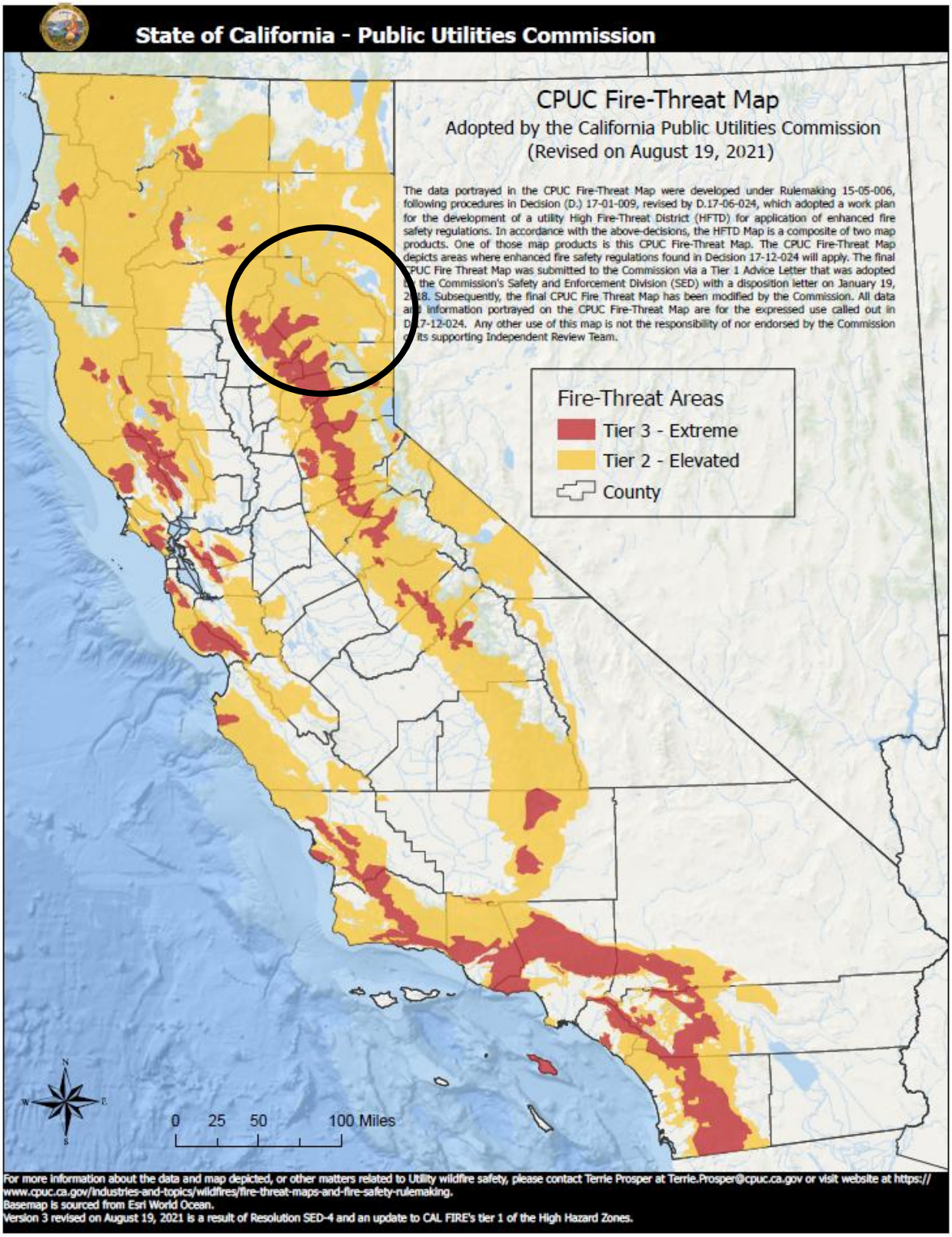
The Wildfire Safety Operations Center (WSOC) monitors fire danger conditions across PG&E's service area, including PSPS conditions. These factors include:

- A Red Flag Warning declared by the National Weather Service
- Low humidity levels generally 20% and below
- Forecasted sustained winds generally above 25 mph and wind gusts in excess of approximately 45 mph, depending on location and site-specific conditions such as temperature, terrain and local climate
- Condition of dry fuel on the ground and live vegetation (moisture content)
- On-the-ground, real time observations from PG&E's WSOC and field observations from PG&E crews

The most likely electric lines to be considered for shutting off for safety will be those that pass through areas that have been designated by the CPUC as at elevated (Tier 2) or extreme (Tier 3) risk for wildfire (seen on Figure 4-22). This includes both distribution and transmission lines. The specific area and number of affected customers will depend on forecasted weather conditions, and which circuits PG&E needs to turn off for public safety. Although a customer may not live or work in a high fire-threat area, their power may also be shut off if their community relies upon a line that passes through an area experiencing extreme fire danger conditions. This means that any customer who receives electric service from PG&E should be prepared for a possible PSPS. PSPS events, while preventative in nature, can cause a variety of issues related to the lack of power to those impacted by the PSPS. For the Plumas County Planning Area, a

significant concern is the impact to their communication systems as well as on other critical infrastructure and services. PSPS events also cause concerns for certain vulnerable populations. As seen on Figure 4-22, Plumas County has areas inside the Tier 2 and Tier 3 areas, as well as areas outside of them.

Figure 4-22 State of California Tier 2 and 3 Areas



PG&E noted that extreme weather threats can change quickly. When possible, PG&E will provide customers with advance notice prior to turning off the power, as well as updates until power is restored. Timing of notifications (when possible) are:

- Approximately 48 hours before power is turned off
- Approximately 24 hours before power is turned off
- Just before power is turned off
- During the public safety outage
- Once power has been restored

Power outages that affect Plumas County residents do happen, though these outages are becoming less frequent and are not sustained as long as past years. This is due to PG&E's hardening and undergrounding projects along with its enhanced vegetation management practices. During these outages, PG&E provides contacts and tools to assist the residents and officials with current outage information for planning purposes. PG&E works with county officials to assist and help mitigate outages affecting the residents of Plumas County.

When a PSPS is forecasted, PG&E will notify County Emergency Management Agencies so they may monitor and make any plans they see needed. Customers affected will also get notified so they may also take steps to plan and make arrangements they deem necessary for the event. PG&E will support the customers with Community Resource Centers (CRC) near the affected areas of the PSPS and offer other programs to qualified customers. PG&E will also work with the public safety agencies in the area to help mitigate any other issues related to the PSPS event. PG&E offers many tools to help assist the agencies in monitoring and planning for these events. The County noted that there have been events in the past where wildfires have not occurred, but wildfire conditions were high. During these times of high winds, high temps, and high wildfire risk, a PSPS occurred in the County. These are also discussed in the City of Portola's respective annex to this Base Plan.

October 9–November 1, 2019: The 2019 California power shutoffs, described as massive PSPS events, included Plumas County among approximately 30 counties affected by PG&E, Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E). Multiple events occurred during this period, but the exact number specific to Plumas County is not isolated in the source.

Figure 4-23 Plumas County – 2019 PSPS Events

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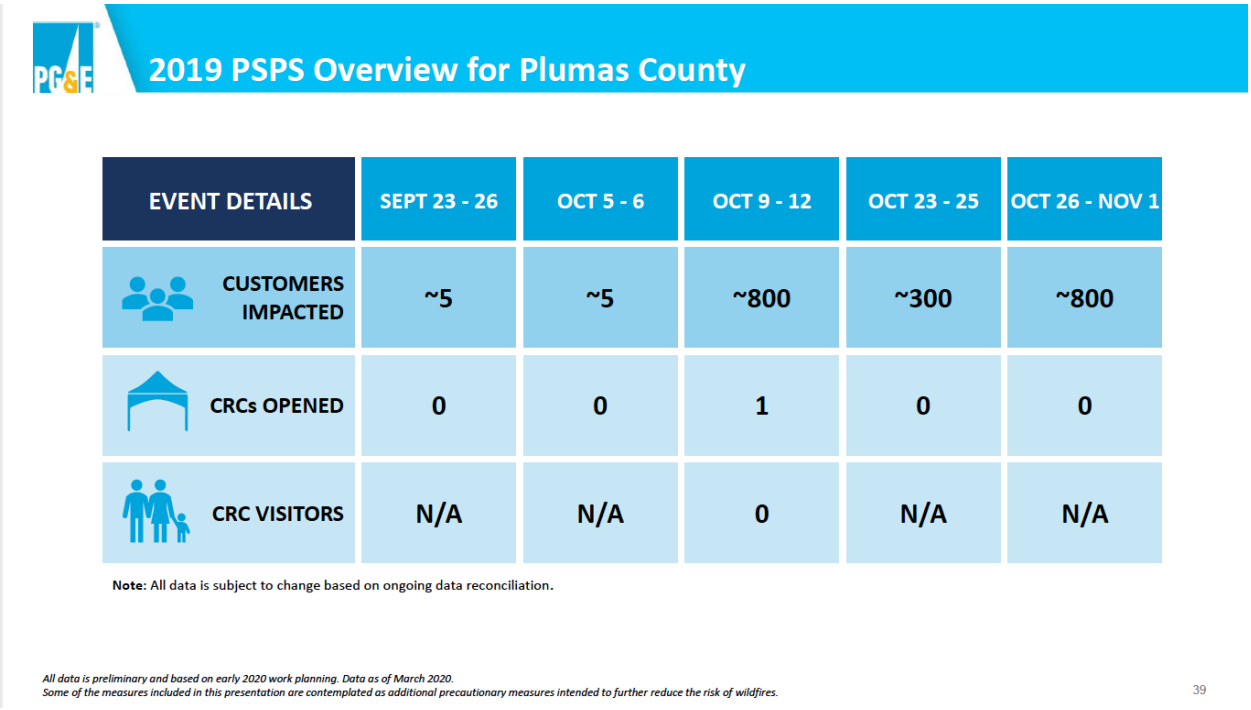

2019 PSPS Overview for Plumas County

EVENT DETAILS	SEPT 23 - 26	OCT 5 - 6	OCT 9 - 12	OCT 23 - 25	OCT 26 - NOV 1
CUSTOMERS IMPACTED	~5	~5	~800	~300	~800
CRCs OPENED	0	0	1	0	0
CRC VISITORS	N/A	N/A	0	N/A	N/A

Note: All data is subject to change based on ongoing data reconciliation.

All data is preliminary and based on early 2020 work planning. Data as of March 2020.
Some of the measures included in this presentation are contemplated as additional precautionary measures intended to further reduce the risk of wildfires.

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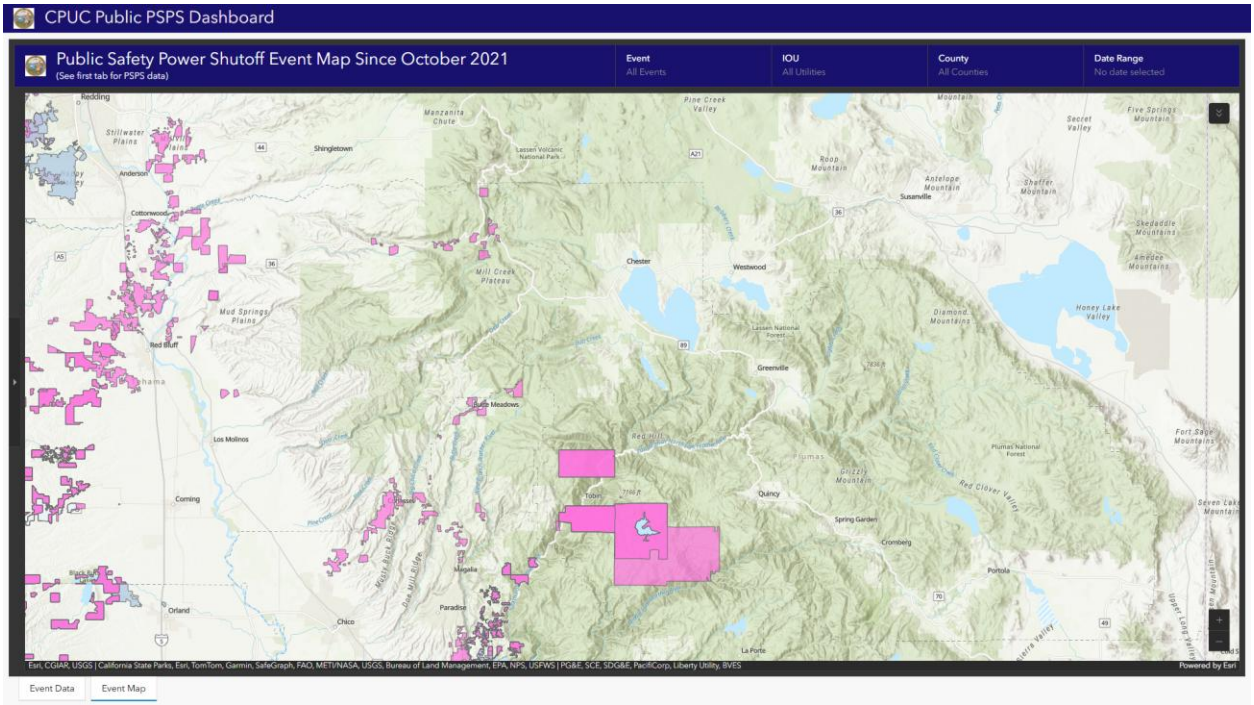
It should be noted that "customers" in PG&E vernacular refer to both households or business addresses.

October 2020: A PSPS event impacted 1,855 customers in Plumas County, as part of a broader event affecting 41,000 customers across multiple counties.

In October of 2021, the California Public Utilities Commission began a mapping application to show areas affected by PSPS. These are shown on Figure 4-24, and each event is discussed below.

Figure 4-24 Plumas County Planning Area – PSPS Events since October 2021



Source: California Public Utility Commission PSPS Dashboard. Retrieved 4/22/2024.

October 11, 2021: A PSPS event was reported, with potential impacts in Plumas County, specifically in the Bucks Lake area and a portion of the Feather River Canyon. The source does not confirm the exact number of customers affected but notes 25,000 customers across 20 counties were impacted.

August 2021: A potential PSPS event was expected to affect 778 customers in Plumas County, as part of a broader event impacting 39,000 customers across 16 counties.

February 22, 2024 – Seneca Health noted a PG&E Power Failure - Hospital on Emergency Generator power. The CT machine was out of service due to power outage. Stroke and trauma patients had to be diverted. Power out at 1550 and Restored at 1700.

March 29, 2024 – at 11:23 PM Liberty Utilities had a power outage. The outage lasted for 2 days. Plumas County OES opened a warming shelter on March 30th.

April 6, 2024 – Seneca Health noted a PG&E Power Outage from 0009 – 0330. The Hospital was on emergency power and CT was disrupted due to outage.

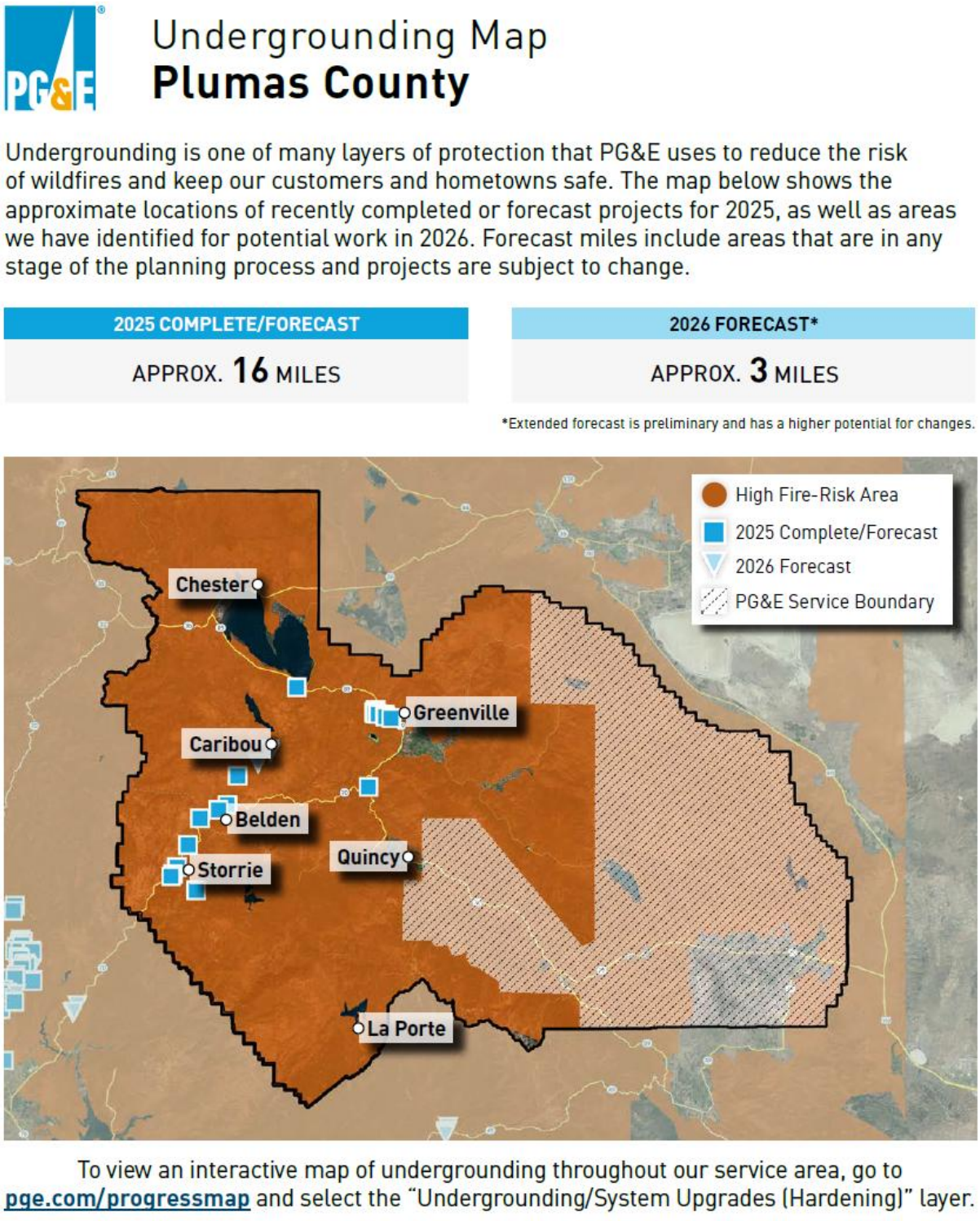
April 29, 2024 – At 11:23 PM Liberty Utilities' customers lost power. They supply power to a portion of Portola and Sierra Valley. Liberty Utilities receives its power from Nevada Energy. Nevada Energy lost power. Unknown what broke.

October 17–20, 2024: A PSPS event affected 658 customers in Plumas County, with specific areas like Little Grass Valley Reservoir, Bucks Lake, Haskins, and Feather River Canyon noted.

November 5, 2024: A PSPS watch was issued for Plumas County, with potential outages in areas east of Highway 70, including Storrie, as part of a 12-county event affecting 15,000 customers. It's unclear if this watch resulted in an actual shutoff.

PG&E has started to underground more power lines to reduce wildfire risks. The most recent map for Plumas County showing this progress is included in Figure 4-25.

Figure 4-25 Plumas County – PG&E Undergrounding



Source: PG&E – January 2025.

It was also noted that PG&E is working to enhance its power network with Enhanced Powerline Safety Settings (EPSS) capable lines. EPSS are advanced safety settings. They allow PG&E powerlines to automatically turn off power within one-tenth of a second. This can happen when there is a hazard, like a tree branch falling into a powerline, which can cause a fire. These settings are in high fire-risk and surrounding areas. These have not yet been installed in and near the Plumas County area, as PG&E focuses on other very high fire hazard areas in its service territory first. It is thought these EPSS capable lines will eventually come to the Plumas County Planning Area.

Climate Change and Power Outages/Failures (Energy Shortage)

Changing climate is expected to bring more frequent and intense natural disasters. Key climate parameters are starting to move outside of historically observed variability at a rate that makes historical data a poor predictor of future climate. For example, the warmest years on record in California occurred in 2014, 2015, 2016, and 2019. 2022 - 2025 were remarkably hot years as well. In addition, the 2016-2017 year broke the record as the wettest ever recorded in the northern Sierra Nevada Mountains. Recent years, including the 2023 storms, have also seen heavy precipitation, further compounded by atmospheric river events.

Changes in temperatures, precipitation patterns, extreme events, and sea level rise have the potential to decrease the efficiency of thermal power plants and substations, decrease the capacity of transmission lines, render hydropower less reliable, spur an increase in electricity demand, and put energy infrastructure at risk of flooding.

With climate warming, higher costs from increased demand for cooling in the summer are expected to outweigh the decreases in heating costs in the cooler seasons. Hotter temperatures in California will mean more energy (typically measured in "cooling-degree days") needed to cool homes and businesses both during heat waves and on a daily basis, during the daytime peak of the diurnal temperature cycle. During future heat waves, historically cooler coastal cities (e.g., San Francisco and Los Angeles) are projected to experience greater relative increases in temperature, such that areas that never before relied on air conditioning will experience new cooling demands.

Secondary impacts of energy shortages are most often felt by vulnerable populations. For example, those who rely on electric power for life-saving medical equipment, such as respirators, are extremely vulnerable to power outages. Also, during periods of extreme heat emergencies, the elderly and the very young are more vulnerable to the loss of cooling systems requiring power sources.

Additional impacts from power disruption can also affect remote areas. This can affect evacuation messaging and coordination difficulties, and a reduction in firefighting capabilities due to lack of water access in more remote areas (especially for those on wells).

Hazard Profiles and Vulnerability Assessment by Hazard

The following sections provide the hazard profile and vulnerability assessments for each of the hazards identified in Section 4.1 Hazard Identification. ***The severe weather hazards are discussed first to paint the picture of the Plumas County's Planning Area's climate and hazard environment which often lead to other hazards such as flood and wildfire. The remainder of the hazards follow alphabetically.***

Data Sources

In general, information provided by the County, participating jurisdictions, and the HMPC is integrated into this section with information from other data sources. The data sources listed below formed the basis for this Hazard Profiles portion of the plan. Where data and information from these studies, plans, reports, and other data sources were used, the source is referenced as appropriate throughout this risk assessment.

- ADD MORE
- 2014 California Natural Resources Report
- 2017 California Adaptation Planning Guide
- 2020 US Census Bureau Average Household Size
- 2021 California Climate Adaptation Study
- 2023 State of California Hazard Mitigation Plan
- American Society of Civil Engineers
- Bureau of Land Management
- Cal Adapt – Extended Drought Scenarios
- CAL FIRE
- CAL FIRE (FHSZ SRA 2024, FHSZ FRA 2007)
- CAL FIRE (LRA 2025)
- Cal-Adapt
- Cal-Adapt – Number of Extreme Heat Days by Year
- Cal-Adapt – Precipitation: Decadal Averages Map
- Cal-Adapt – Temperature: Decadal Averages Map
- Cal-Adapt 2017/2023
- Cal-Adapt Climate Projections
- California Climate Adaptation Strategy
- California Department of Conservation's Farmland Mapping and Monitoring Program
- California Department of Public Health
- California Department of Water Resources
- California Department of Water Resources 2012-2016 California Drought: Historical Perspective
- California Department of Water Resources Best Available Maps
- California Department of Water Resources Division of Safety of Dams
- California Division of Mines and Geology
- California Geological Survey
- California Invasive Plant Council
- California Natural Resource Agency
- California Office of Emergency Services
- California Public Utilities Commission
- California's Adaptation Planning Guide: Understanding Regional Characteristics
- Center for Western Weather and Water Extremes
- Climate Change and Health Profile Report – Plumas County
- Design-Magnitude Avalanche Mapping and Mitigation Analyses
- DSOD/Cal OES/NID Dam Status 1/25
- Federal Emergency Management Agency – DFIRM 1/20/2016
- Federal Emergency Management Agency – Disaster Declaration Database
- Federal Emergency Management Agency – National Flood Hazard Layer

- Federal Emergency Management Agency – Wind Zones in the United States
- Federal Emergency Management Agency: Building Performance Assessment: Oklahoma and Kansas Tornadoes
- Fire and Resource Assessment Program
- Geology Open File Report 84-52 (1994)
- Hazus-MH 6.1
- Intergovernmental Panel on Climate Change
- Multi-Hazard Identification and Risk Assessment, FEMA 1997
- National Aeronautics and Space Administration
- National Avalanche Center
- National Center for Atmospheric Research
- National Climate Assessment
- National Climatic Data Center Storm Events Database.
- National Drought Mitigation Center
- National Earthquake Information Center
- National Flood Insurance Program
- National Integrated Drought Information System
- National Inventory of Dams
- National Oceanic and Atmospheric Administration
- National Oceanic and Atmospheric Administration Storm Prediction Center
- National Oceanic and Atmospheric Administration's National Climatic Data Center
- National Park Service
- National Performance of Dams Program
- National Weather Service
- National Weather Service HeatRisk
- National Weather Service XMAC site
- Public Policy Institute of California
- Sierra Avalanche Center
- Smoke Impacts CA: 2020 Lessons – 2021 Actions
- State of California Department of Conservation Farmland Mapping and Monitoring Program
- Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011)
- University of California, Berkeley's Department of Environmental Science, Policy, and Management
- US Army Corps of Engineers
- US Department of Agriculture
- US Department of Agriculture – Farm Service Agency Secretarial Disasters Declarations
- US Drought Monitor
- US Farm Service Agency
- US Fish and Wildlife Service
- US Forest Service
- US Geological Survey Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977
- US Geological Survey Emergency Assessment of Post-Fire Debris Flow Hazards
- US Geological Survey National Earthquake Information Center
- US Geological Survey Open File Report 2015-3009
- Vaisala National Lightning Detection Network
- Western Regional Climate Center

4.3.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs throughout the Plumas County Planning Area as temperature extremes, localized storms that bring heavy rain and strong winds, and other extreme weather events. The National Oceanic and Atmospheric Administration's (NOAA's) National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 785 severe weather events that occurred in Plumas County between January 1, 1950, and July 31, 2024. Table 4-26 summarizes these events.

*Table 4-26 NCDC Severe Weather Events for Plumas County 1950-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Astronomical Low Tide	2	1	0	0	0	$0	$0
Blizzard	3	0	0	0	0	$0	$0
Cold/Wind Chill	3	0	0	0	0	$0	$0
Debris Flows	21	0	0	0	0	$2,000	$0
Dense Fog	9	0	0	0	0	$1,000	$0
Dense Smoke	1	0	0	0	0	$0	$0
Drought	2	0	0	0	0	$50,000	$0
Excessive Heat	5	0	0	0	0	$0	$0
Flash Flood	3	0	0	0	0	$0	$0
Flood	12	0	0	1	0	$3,140,000	$0
Freezing Fog	1	0	0	0	0	$0	$0
Hail	10	0	0	0	0	$100	$5,000
Heat	2	0	0	0	0	$0	$0
Heavy Rain	60	0	0	0	0	$1,000	$0
Heavy Snow	330	1	0	0	0	$220,000	$0
High Wind	88	0	0	1	0	$2,245,500	$0
Ice Storm	1	0	0	0	0	$0	$0
Lightning	1	0	0	0	0	$0	$0
Strong Wind	4	0	0	0	0	$63,300	$0
Thunderstorm Wind	2	0	0	0	0	$675,000	$0
Wildfire	14	1	0	3	0	$22,775,000	$0
Winter Storm	150	0	0	0	0	$150,000	$0
Winter Weather	61	0	0	0	0	$0	$0
Total	**785**	**3**	**0**	**5**	**0**	**$29,322,900**	**$0**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Plumas County

The NCDC table above summarizes severe weather events that occurred in Plumas County. Only a few of the events actually resulted in federal and state disaster declarations. It is further interesting to note that different data sources capture different events during the same time period, and often display different information specific to the same events. While the HMPC recognizes these inconsistencies, they see the value this data provides in depicting the County's "big picture" hazard environment.

As previously mentioned, most all of Plumas County's federal and state disaster declarations have been a result of severe weather. For this Plan Update, severe weather is discussed in the following subsections:

- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes

4.3.2. Severe Weather: Extreme Cold, Freeze, and Snow (w/Avalanche)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area and unincorporated Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

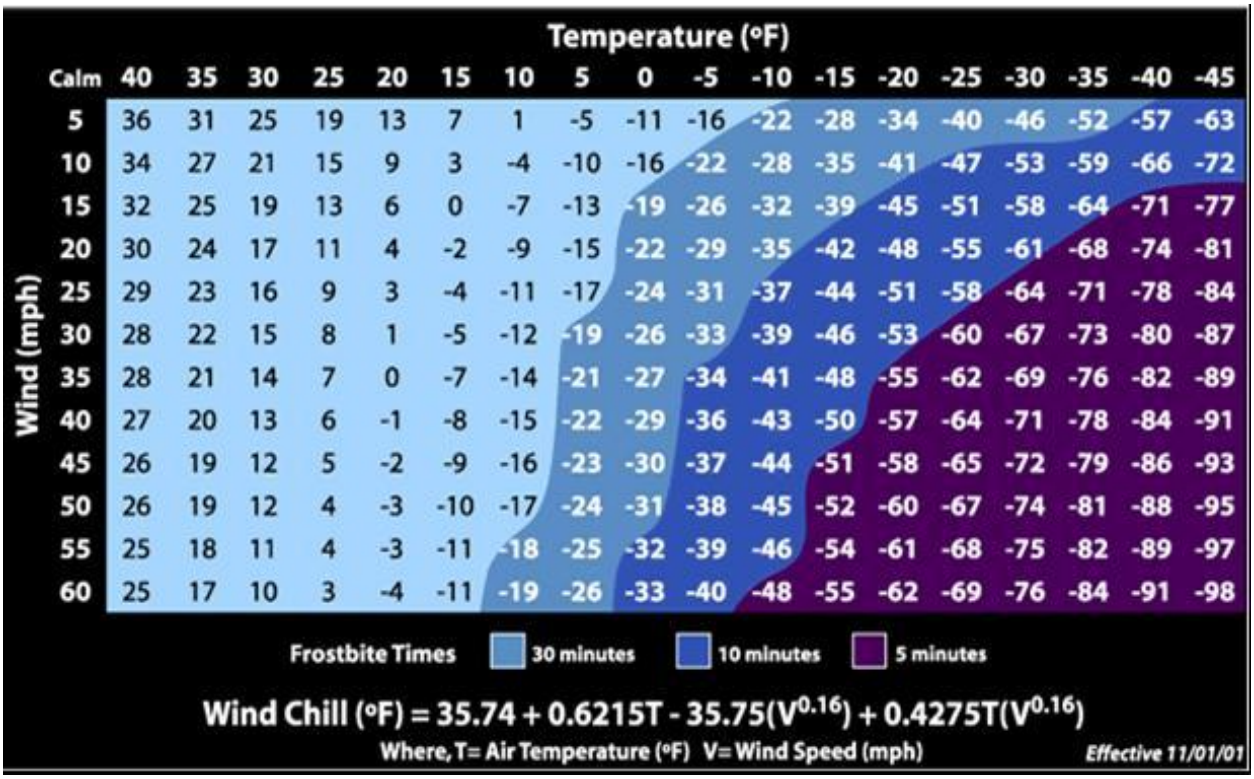
Separate hazard descriptions and locations and extents are shown below for cold and freeze, as well as for snow and avalanche.

Extreme Cold and Freeze

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm (and snow event) or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry. The effects of freezing temperatures on agriculture in Plumas County are discussed further in Section 4.3.6 Agricultural Hazards.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-26), which is reproduced below. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-26 Wind Chill Temperature Chart



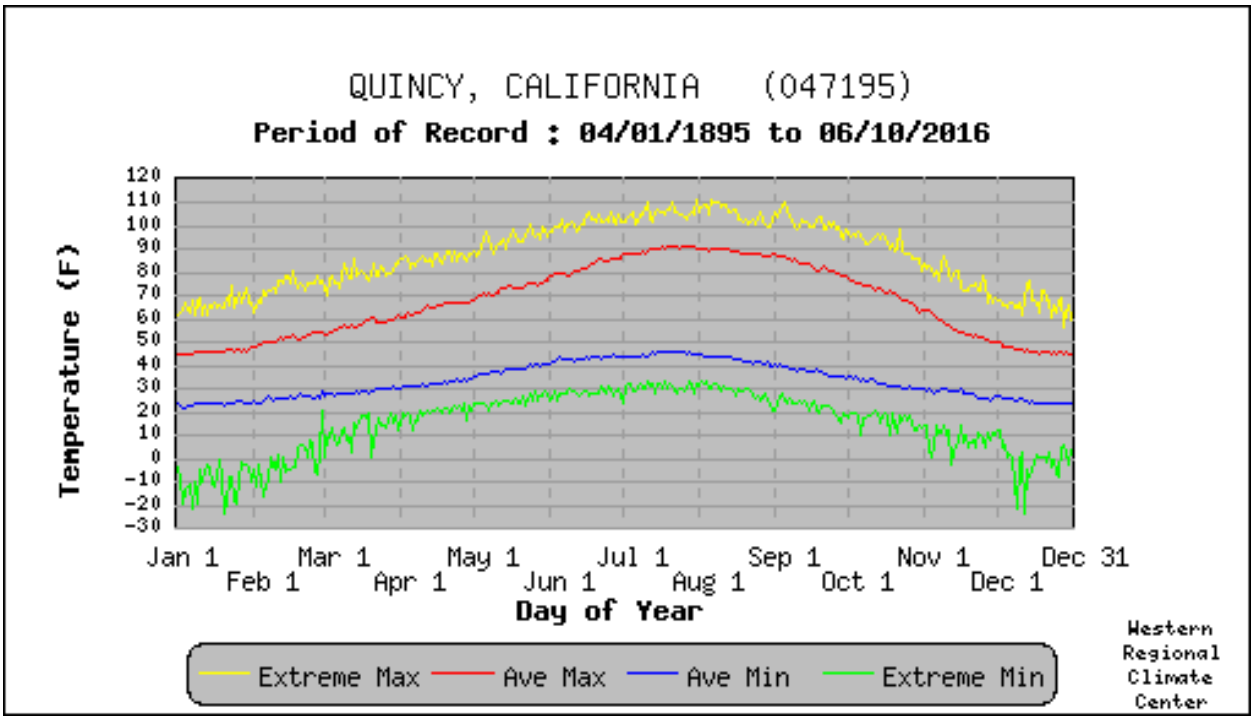
Source: National Weather Service

It should be noted that the WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for extreme cold and freeze for the County is summarized below.

Plumas County—WRCC Quincy Station Weather Station, Period of Record 1895 to 2016

According to the WRCC, in Plumas County monthly average minimum temperatures from November through April range from the low-20s to upper-40s. The lowest recorded daily extreme was -28°F on January 8, 1937. In a typical year, minimum temperatures fall below 32°F on 166.9 days with 1.5 days falling below 0°F. Table 4-27 shows the record low temperatures by month for western Plumas County. Average daily temperatures for Plumas County are shown in Figure 4-27.

Figure 4-27 Plumas County— Quincy Station (WRCC) Daily Temperature Averages and Extremes



Source: Western Regional Climate Center

Table 4-27 Plumas County – Quincy Station (WRCC) Record Low Temperatures 1895 to 2016

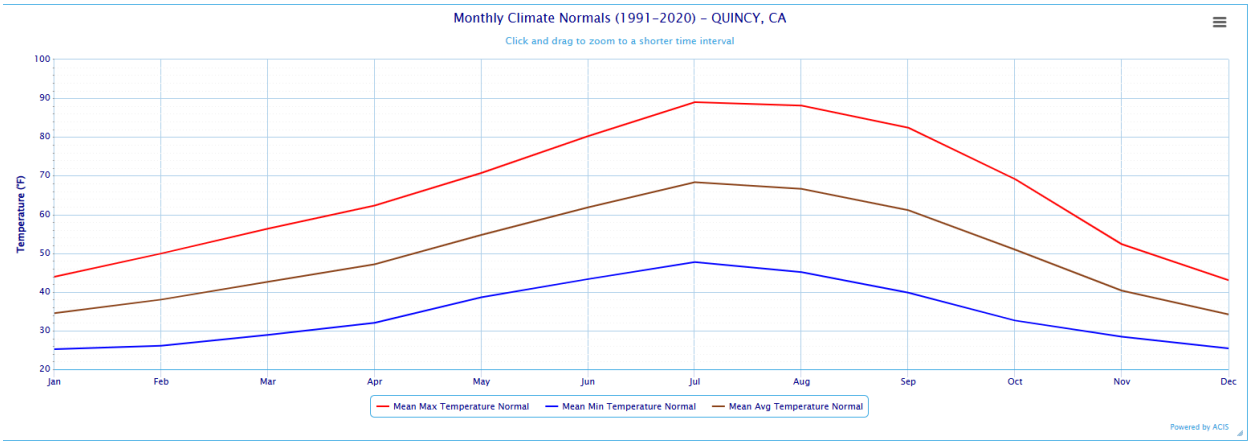
Month	Record Low	Date	Month	Record Low	Date
January	-28°	1/8/1937	July	23°	7/1/1912
February	-19°	2/13/1949	August	20°	8/31/1910
March	0°	3/20/1952	September	15°	9/28/1972
April	12°	4/6/1982	October	6°	10/27/1917
May	20°	5/7/1984	November	-3°	11/12/1985
June	25°	6/4/1950	December	-24°	12/12/1972

Source: Western Regional Climate Center

Plumas County—NWS Quincy Station Weather Station, Period of Record 1895 to 2025

According to the NWS, monthly average minimum temperatures in the coldest months (December through February) range from the mid to upper-20s. The lowest recorded daily extreme was -24°F on December 12, 1972. Figure 4-28 shows the average daily low temperatures and extremes for the County. Table 4-28 shows the record low temperatures for the County.

Figure 4-28 Plumas County – Quincy Station (NWS) Daily Temperature Averages and Extremes, 1991-2020



Month	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)	Mean Avg Temperature Normal (°F)
January	43.9	25.2	34.5
February	49.9	26.1	38.0
March	56.3	28.9	42.6
April	62.3	32.0	47.1
May	70.7	38.6	54.7
June	80.2	43.3	61.8
July	89.0	47.7	68.3
August	88.1	45.1	66.6
September	82.4	39.8	61.1
October	69.1	32.6	50.9
November	52.3	28.4	40.3
December	43.0	25.4	34.2
Annual	65.6	34.4	50.0

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-28 Plumas County – Quincy Station (NWS) Record Low Temperatures 1895 to 2025

Temperature	Date
-24.0°	12/12/1972
-24.0°	1/20/1937
-22.0°	12/9/1972
-22.0°	1/7/1937
-20.0°	1/21/1937
-20.0°	1/9/1937
-19.0°	1/3/1950
-19.0°	1/25/1949
-18.0°	1/24/1949
-16.0°	2/5/1989

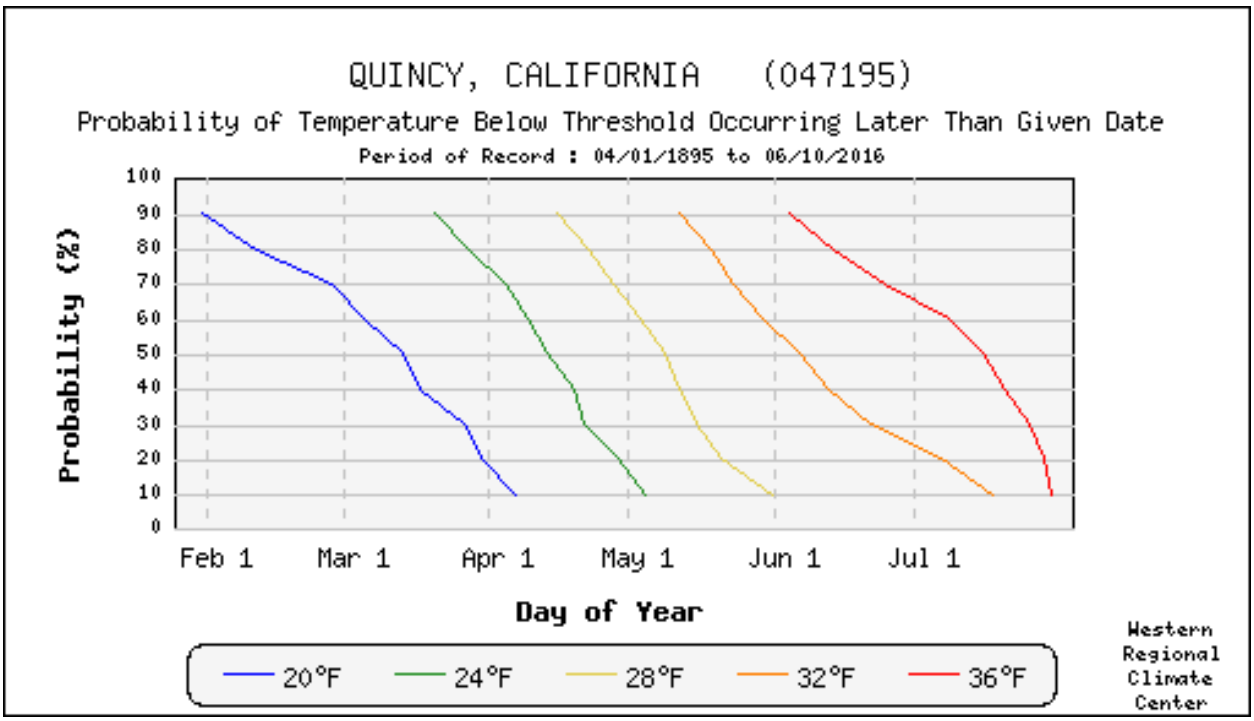
Source: National Weather Service XMAC site. Retrieved 3/12/2025

Location and Extent of Extreme Cold and Freeze

Extreme cold and freeze events occur on a regional basis. Extreme cold can occur in any location of the County. All portions of the County are at risk to extreme cold, with the upper elevations at greater risk. Extreme cold can affect agricultural products in the County. Freeze damages reduce the values of

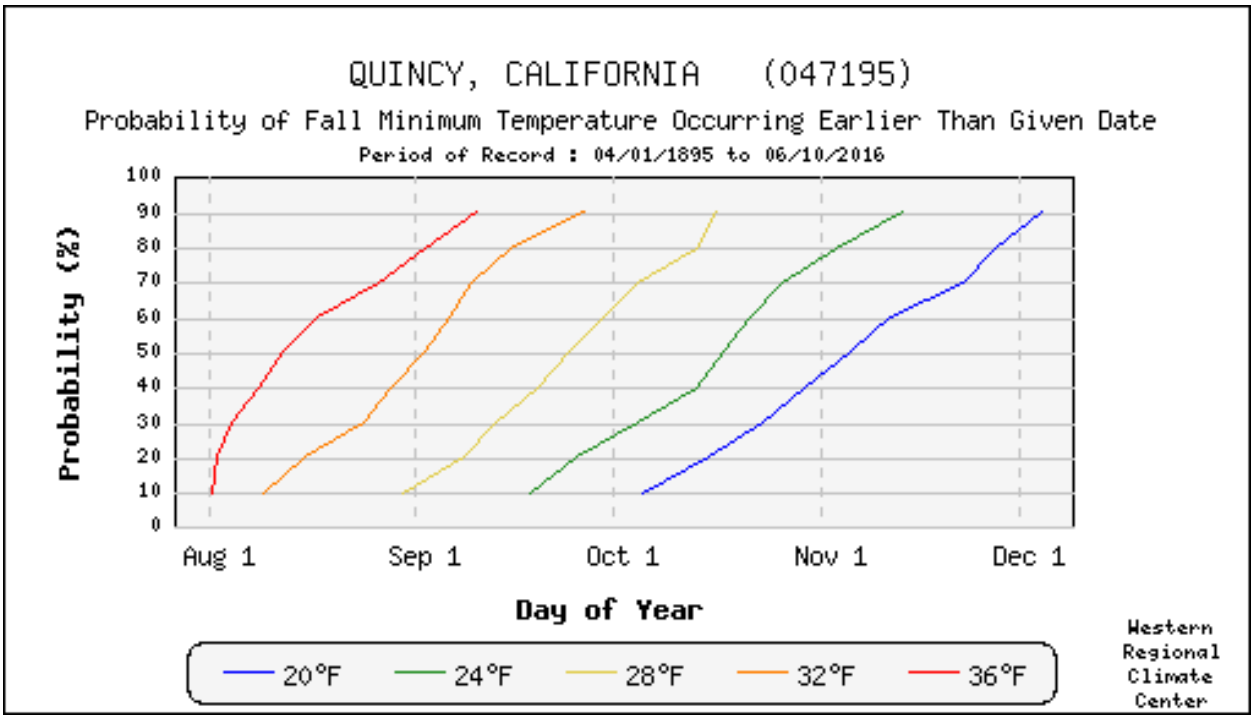
agricultural crops (discussed further in Section 4.3.6). While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data from the County from the WRCC indicates that there are 166.9 days that fall below 32°F. Freeze has a slow onset and can generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Figure 4-29 and Figure 4-30 show the probabilities in the County of freeze for both spring and fall. ***Note***: there are no National Weather Service XMAC freeze probabilities, so only the WRCC is captured below.

Figure 4-29 Plumas County – Spring Freeze Probabilities



Source: Western Regional Climate Center

Figure 4-30 Plumas County – Fall Freeze Probabilities



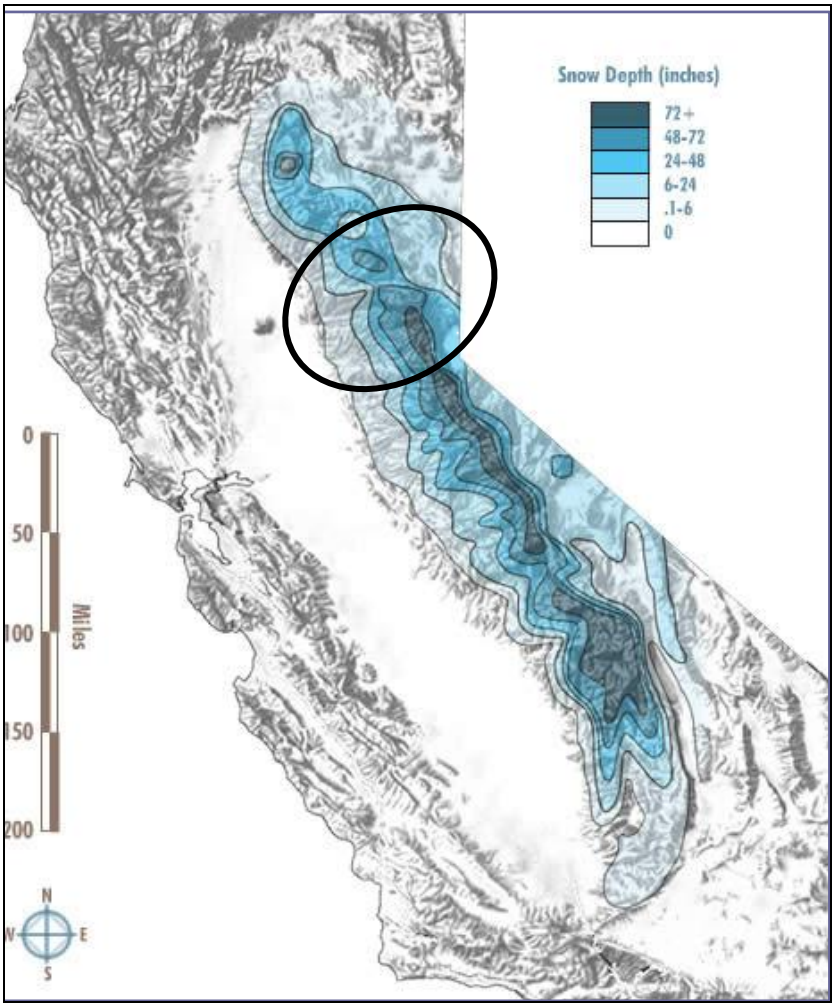
Source: Western Regional Climate Center

Snow and Avalanche

Plumas County is located in the Sierra Nevada region of the State of California. Severe weather affects all areas of Plumas County but differs significantly by region. Throughout areas of the County there are significant variations in the average temperature and amount of precipitation received due to topography.

Snowfall in the Sierras increases with elevation. The lower foothills rarely receive any measurable snow. Middle elevations receive a mix of snow and rain during the winter. Above about 6,000 ft., the majority of precipitation falls as snow. It is not unusual, in some locations, to have ten feet of snow on the ground for extended periods. Figure 4-31 shows the average maximum measured snow depth in the Sierra Nevada for the month of March (the month of greatest average snow depths).

Figure 4-31 Average Maximum Snow Depths of Sierra Nevada Mountains in March



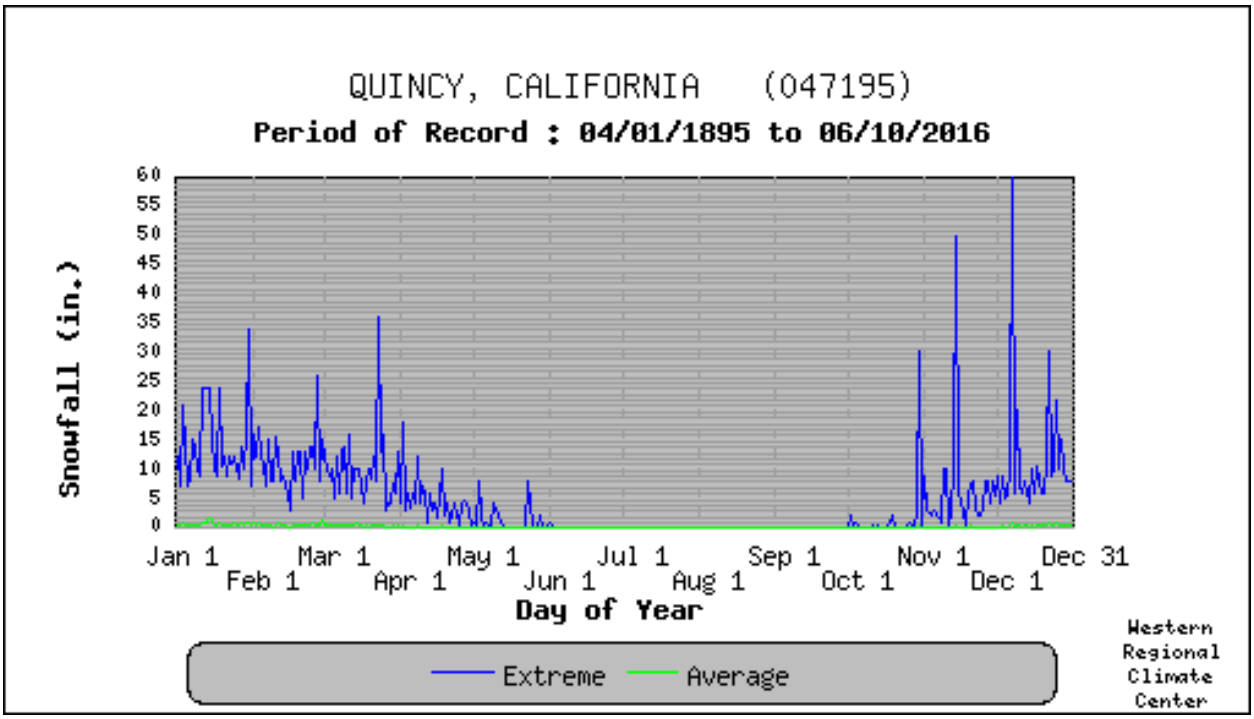
Source: http://www.sierranevadaphotos.com. This image is no longer available publicly. It was retrieved for the 2020 Plumas County LHMP Update.

It should be noted that the WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for snowfall for the County is summarized below.

Plumas County—WRCC Quincy Station Weather Station, Period of Record 1895 to 2016

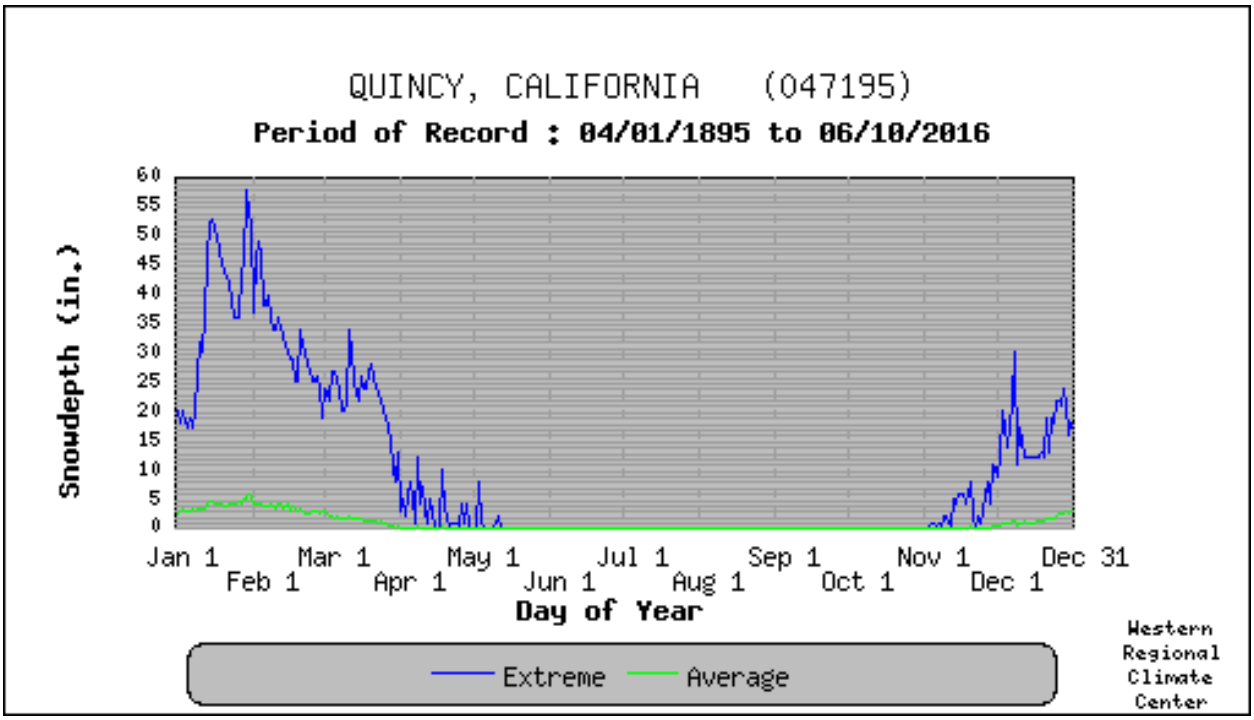
According to the WRCC, average snowfall of the County is 55.1 inches, as shown in Figure 4-32. The highest annual snowfall fell in 1952, when 167.2 inches fell. Highest monthly snowfall accumulation came in January of 1916, when 133.0 inches fell. Average snow depths in January through March can be significant. This can be seen in Figure 4-33.

Figure 4-32 Plumas County—Snowfall Averages and Extremes



Source: Western Regional Climate Center

Figure 4-33 Plumas County—Snow Depth Averages and Extremes



Source: Western Regional Climate Center

Plumas County—NWS Quincy Station Weather Station, Period of Record 1895 to 2025

Table 4-29 shows historical data of the highest daily snowfall on March 23, 1907, when 36.0 inches fell. The maximum snow depth came on January 29th of 1916, with a depth of 58.0 inches. This can be seen in Table 4-30. Monthly average snowfall (from 1991 to 2020) is shown on Figure 4-34. ***Note***: While the overall period of record for this NWS station is 1895 to 2025, not all data is recorded for those dates. Snowfall is covered from November of 1895 to April 2025. Snow depth is covered from November of 1900 to April of 2025.

Table 4-29 Plumas County –Quincy Station (NWS) Highest Daily Snowfall 1895 to 2025

Snowfall in Inches	Date
36.0	3/23/1907
34.0	1/30/1968
30.0	10/30/1909
30.0	12/22/1908
26.0	2/27/1955
24.0	1/18/1955
24.0	1/12/1952
24.0	1/13/1911
24.0	1/11/1911
24.0	1/14/1910

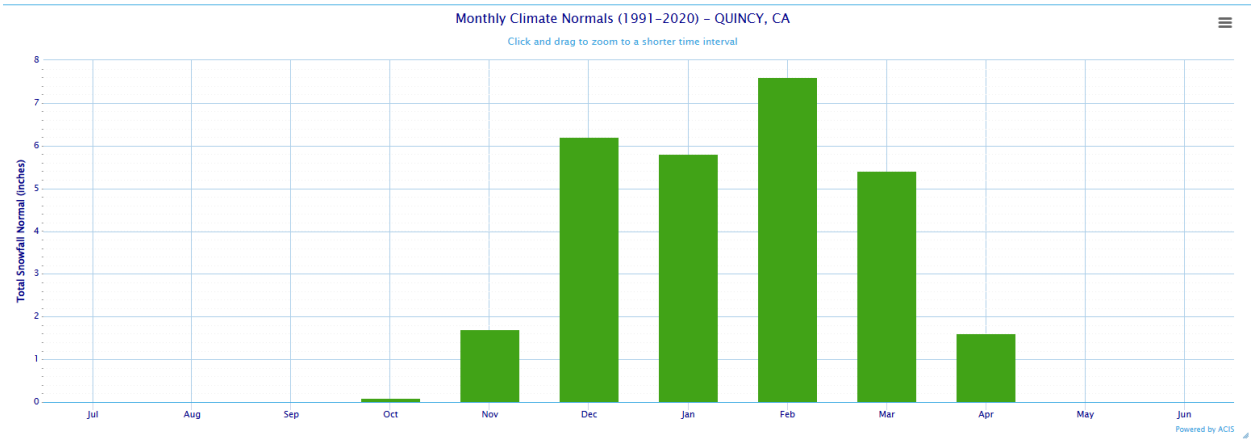
Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-30 Plumas County – Quincy Station (NWS) Maximum Snow Depth 1895 to 2025

Snow Depth in Inches	Date
58.0	1/29/1916
54.0	1/30/1916
53.0	1/15/1952
52.0	1/14/1952
52.0	1/31/1916
51.0	1/16/1952
50.0	1/17/1952
49.0	2/3/1937
48.0	1/18/1916
48.0	1/17/1916

Source: National Weather Service XMAC site. Retrieved 3/12/2025

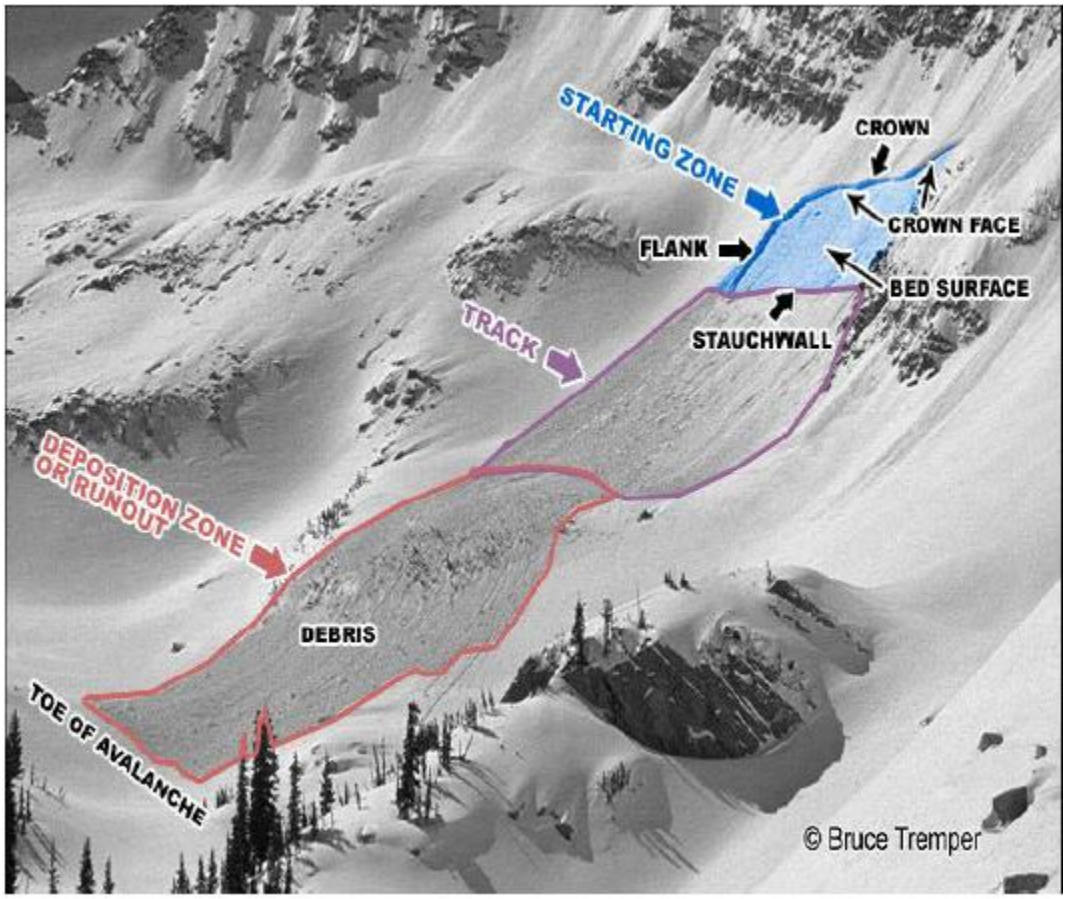
Figure 4-34 Plumas County –Quincy Station (NWS) Average Daily Snowfall 1991 to 2020



Source: National Weather Service XMAC site. Retrieved 3/12/2025

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited. This can be seen in Figure 4-35.

Figure 4-35 Avalanche Zones



Source: Sierra Avalanche Center

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent of Snow and Avalanche

Snowfall can affect almost all areas of the County. Depending on the elevation of any given area, severe snowstorms are some of the most common extreme weather events that occur in Plumas County. Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting and dangerous wind chills. There is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of snowfall other than snow depths. Heavy snow has a slow to moderate onset and can generally be predicted in advance for the County. Snow events can last for hours or for days, and snow can stay on the ground for weeks to months at a time.

Avalanche affects only certain areas of the County. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement to create an avalanching episode. Avalanche

hazards exist in many of the steeply sloped areas of Plumas County, where combinations of the above criteria occur. The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually. The HMPC noted that Genesee (and approximately 20 homes) are in an area affected by avalanche.

Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This can be found in Table 4-31.

Table 4-31 North American Public Avalanche Danger Scale

Danger Level	Travel Advice	Likelihood of Avalanche	Avalanche Size or Distribution.
5 – Extreme	Avoid all avalanche terrain	Natural and human-triggered avalanches certain	Large to very large avalanches in many areas
4 – High	Very dangerous avalanche conditions. Travel in avalanche terrain not recommended	Natural avalanches likely; human-triggered avalanches very likely	Large avalanches in many areas; or very large avalanches in specific areas
3 – Considerable	Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision making essential	Natural avalanches possible; human-triggered avalanches likely	Small avalanches in many areas; or large avalanches in specific areas; or very large avalanches in isolated areas
2 – Moderate	Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern	Natural avalanches unlikely; human-triggered avalanches possible	Small avalanches in specific areas; or large avalanches in isolated areas
1 – Low	Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features	Natural and human-triggered avalanches unlikely	Small avalanches in isolated areas or extreme terrain

Source: National Avalanche Center

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for extreme cold and freeze. There were no disasters from snow or from avalanche. Table 4-32 shows the dates of the disaster declarations. More information on USDA disaster declarations (2016, twice in 2022, 2023) from cold and freeze can be found in Table 4-51 in the Past Occurrences in Section 4.3.6.

Table 4-32 Plumas County – Federal and State Disaster Declarations for Freeze 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	2007	0	–

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 549 extreme cold, freeze, and snow incidents for Plumas County since 1993. Information for these events is shown in Table 4-33. The NCDC has no recorded events of avalanche.

*Table 4-33 NCDC Cold and Freeze Events for Plumas County 1950-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	3	0	0	0	0	$0	$0
Cold/Wind Chill	3	0	0	0	0	$0	$0
Freezing Fog	1	0	0	0	0	$0	$0
Heavy Snow	330	1	0	0	0	$220,000	$0
Ice Storm	1	0	0	0	0	$0	$0
Winter Storm	150	0	0	0	0	$150,000	$0
Winter Weather	61	0	0	0	0	$0	$0
Total	**549**	**1**	**0**	**0**	**0**	**$370,000**	**$ 0**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Plumas County

Hazard Mitigation Planning Committee Events

The HMPC noted past events. These are separated for cold and freeze, snow, and avalanche.

Cold and Freeze Events

These section separates events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

The County noted the following notable events since the 2019 and 2020 LHMPs:

- 2022
  - ✓ On the 1st-2nd of January, temperatures dropped down to 6º and 7º.
  - ✓ On September 14th, Plumas County had its first frost of the year.
  - ✓ On the 20th of November, temperatures dropped to 15º.
- 2023
  - ✓ In January, temperatures dropped to 11º-15º on the 21st, 30th, and 31st.
  - ✓ In February, Temperatures reached 15º on the 16th and the 22nd.

- ✓ A cold event on June 21 caused temperatures to drop to 37º and frost was seen.

- 2024
  - ✓ A cold event on June 18 caused temperatures to decrease to 33º causing a freeze event.

Events before 2019

Many events occurred, but not specific events causing damages could be recalled.

Snow Events

These section separates events since the 2019/2020 LHMPs and those before 2019.

Events since 2019

- **2020** – Jan 14-16. 12.75' of snow. Mar 16. 21.75' of snow
- **2021** – In the month of December 6.75" of snow fell on the 16th. Following this, the 25- 29 received 35" (or almost 3 ft.) of snow
- **2022** – On November 9th, 5" of snow fell in Plumas County.
- **February of 2023** – between the days of the 23rd and 28th, 40.75" of snow fell, causing blizzard conditions on the 28th.
- **March of 2023** – Snow occurred in the County as part of an atmospheric river storm event. A strong winter storm impacted Plumas County from February 26 through March 4, 2024. Rain, strong winds and multiple feet of snow occurred with this storm. Blizzard conditions were widespread with a total snow accumulation of 1 to 10 feet. Snow levels dropped as low as 1,500 feet over the weekend, with a significant accumulation. Visibility on roads was poor. Downed trees and power outages occurred throughout Plumas County. Outages ranged from less than an hour to 96 hours. Portola was impacted the most with over 4 feet of snow and power outages for 4 days. Liberty Utilities supplies power to a portion of Portola and Sierra Valley. Liberty Utilities receives its power from Nevada Energy. The damage was down a steep hill with no easy access. Nevada Energy did not keep linemen on 24/7 during this event. Once Nevada restored their power, Liberty linemen were on top of getting the power restored. A Damage Tracking document provided by the County indicated that several parties did have major damage to their residences where the weight of the snow cracked their walls, there was ice dam destruction to roofs, and minor flooding in basements. All parties affected advised the County that they are still able to live in the structures. This caused flooding in areas of the County. This is discussed in the Past Occurrences of Section 4.3.11.
- **2024** – In March, after multiple inches of rain had already fallen, 13.75" fell on the 3rd and 7.25" fell the next day, totaling to 21" of snowfall. In May, late snowfall impacted the county with 2.25" falling.

Events before 2019

HMPC also noted the following events:

- Extreme snow events have included up to 60 inches of snow in Quincy and 45 inches of snow in Chester in one month. Two notable snow seasons occurred in **1951-1952**, and **1992-1993**. During these years the Chester area received a total of 362 inches of snow in **1951-52** and 295 inches in **1992-93**.

Figure 4-36 Community of Chester 1951-1952 Snow Event

Source: Plumas County

Figure 4-37 1993 Storm Damage of Store in Quincy

Source: KCRA News Report

Figure 4-38 Community of Chester 2001 Snow Event

Source: Plumas County

- On **June 12 to 14 of 1981**, there were freezes each day in Quincy. A member of the HMPC from Viera Ranch noted that the freeze killed their garden.
- Between **March 28 and April 7 of 1982**, there was high snowfall in the Quincy area. A member of the HMPC from Viera Ranch noted that power was out by March 31, with roads and schools closed in the area.
- The winter of **1989** featured many cold weather incidents and heavy snows. A member of the HMPC from Viera Ranch noted that from January 1 to 3, 46 inches of snow fell. Lows in Quincy from February 5 to February 8 were -8°F, -15°F, -14°F, and -18°F, respectively.
- The winter of **1990** also featured many cold weather incidents and heavy snows. A member of the HMPC from Viera Ranch noted that from February 15 to 18 46 inches of snow fell. Lows in Quincy from December 21 and 22 were -5°F and -8°F, respectively.
- On **June 15, 1992**, a late freeze hit. It killed gardens and crops in the area.
- A member of the HMPC from Viera Ranch noted from **December 28 of 1992 to January 9 of 1993** over six feet of snow fell in Quincy.
- A member of the HMPC from Viera Ranch noted on **February 20 and 21 of 1994**, 23 inches of snow fell near Quincy. June 20-24 of that yar also saw lows around 32°F.
- A member of the HMPC from Viera Ranch noted the from **January 4-6 of 1995**, 13 inches of snow fell. Between the 7th and the 15th, 27.85 inches of rain fell as well. This caused flooding in Quincy. Snow fell again in March, and on the 22nd and 23rd, 41 inches of snow fell, cancelling schools and knocking out power. June 16th of 1995 of that year also saw 2.5 inches of snow!
- A member of the HMPC from Viera Ranch noted 19 inches of snow fell between **April 5th and 8th of 1999**.

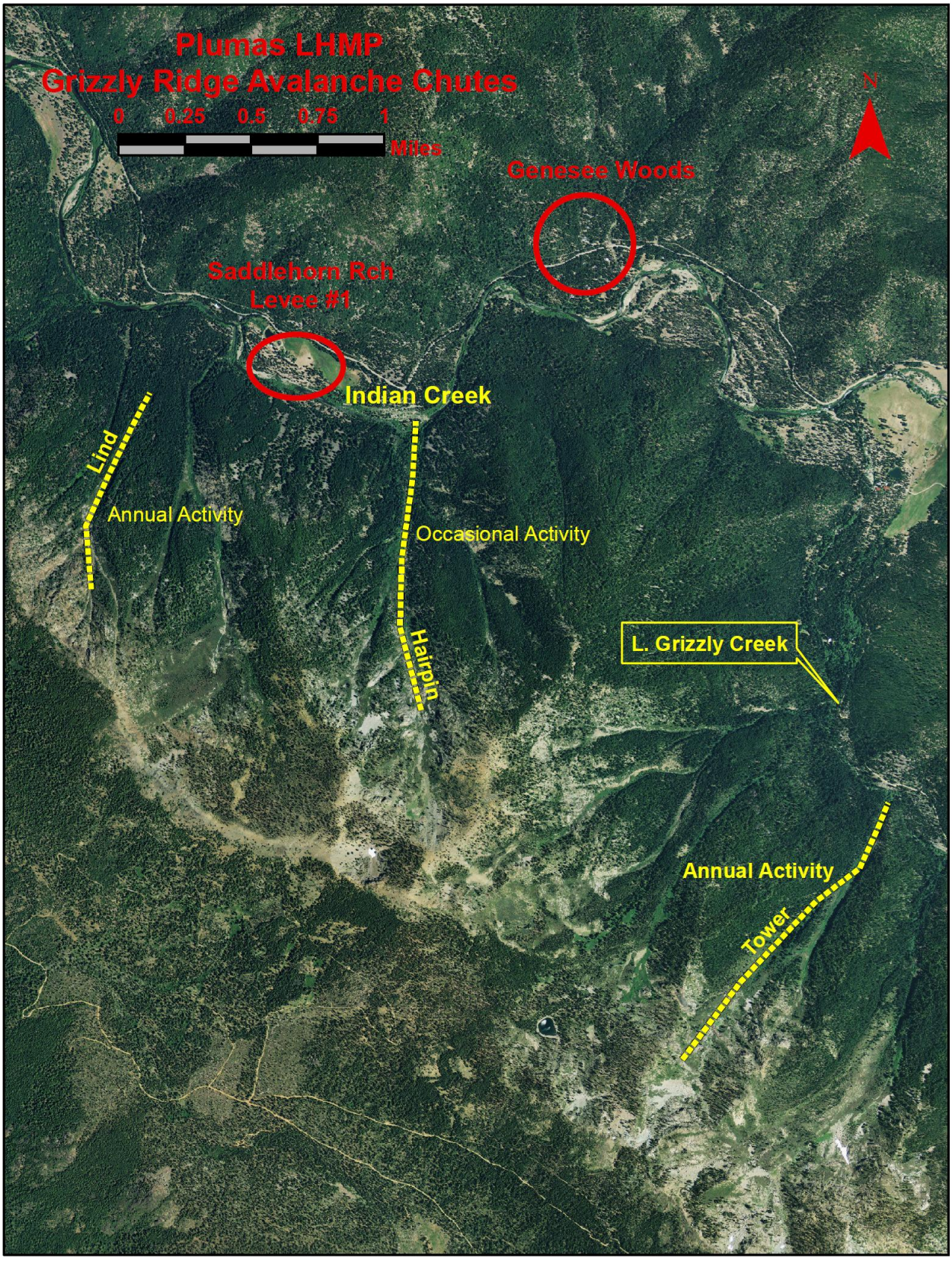
- A low of 8°F was seen on **February 15th of 2001**.
- A member of the HMPC from Viera Ranch noted heavy snows between January 7th and 11th of 2005. Power was out in the Quincy area on January 11th. Events of frost were noted between **June 3rd and 6th of 2005**.
- June **7th of 2007** saw frost, with damages to gardens and crops in the area reported.
- Frost was noted on **June 18th, 2014**.

Avalanche Events

Historically, avalanches occur within the steeply sloped portion of the County between the months of January and March, following snowstorms. Past occurrences of avalanche in the County include:

- The HMPC noted that near Grizzly Ridge in Genessee, avalanches occur with regularity. These have blocked Indian Creek and Little Grizzly Creek and/or Grizzly Creek. There are 4 homes in the area that have their ingress and egress routes blocked. There are numerous avalanche chutes on the northeast and north faces of Grizzly Ridge in the Genesee Valley area. These can be seen in Figure 4-39. The Tower & Lind chutes are active annually, with multiple small to moderate falls per year. The Tower does deliver stream-blocking falls to Little Grizzly Creek (observed by a member of the HMPC in **1983 and 1993**). The Lind chute, while very active, does not extend to Indian Creek. The Hairpin chute reportedly blocked Indian Creek in **1952 and 1963** (as reported by members of the HMPC). It last sent snow to Indian Creek in **1995**, without blocking the creek. The less active chutes are becoming more overgrown with vegetation with overall reductions in last 30 years in snowfall/avalanches to keep clear.

Figure 4-39 Plumas County – Grizzly Ridge Avalanche Chutes



- An avalanche occurred in the winter of **2012** near Sloat. No injuries or deaths were reported. Timber stock in the avalanche area was damaged, though no damage estimates were available.
- CalTrans had an avalanche in **2023** on SR70 in the Feather River Canyon within the Butte County section of the highway, but the risk factors are similar to Plumas County along that portion of SR70.

Likelihood of Future Occurrence

Highly Likely—Extreme cold, freeze, snow, and avalanche are likely to continue to occur annually in the Plumas County Planning Area, especially in the eastern portion of the County. In a typical year, minimum temperatures fall below 32°F on 166.9 days in Plumas County. Snow falls in the County every year. Avalanches occur every year (though many go unreported as they occur in undeveloped areas). This equates to a likelihood of future occurrences being considered highly likely.

It is likely that climate change will decrease the chance of future occurrence as well as future impacts. More information on climate change and extreme cold, freeze, snow, and avalanche can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Extreme Cold, Freeze, Snow, and Avalanche

According to the 2021 California Climate Adaptation Study (CAS) as well as the 2024 Draft CAS, freezing spells are likely to become less frequent in California as climate temperatures increase. If emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off. Snow and avalanche are expected to decline due to reduced snow and snowpack.

Vulnerability Assessment

Vulnerability—Medium

Extreme cold, freeze, snow, and avalanche events happen in the Plumas County Planning Area each year. It can impact key assets in the Planning Area. The whole of the Planning Area has some measure of vulnerability to extreme cold, freeze, snow, and avalanche.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerabilities to this hazard.

The varying elevations in the County, in part, determine the extent to which a given area is affected by freeze and cold. The agricultural industry is especially vulnerable to extreme temperatures. Freezing temperatures can cause significant loss to crops. Historically, extreme cold and freeze have caused losses to agricultural crops and have resulted in several USDA disaster declarations including the ones noted above in the Past Occurrences section.

The Plumas County Planning Area does experience snowfall on a seasonal basis, and portions of the County receive an abundance of snow, mostly between the months of November through March. Winter snowstorms in the County, including strong winds and blizzard conditions, can result in localized power and phone outages and closures of streets, highways, schools, businesses, and nonessential government operations. During periods of heavy snow there is also an increase in the number and severity of traffic accidents. People can become isolated in their homes and vehicles and are unable to receive essential services. During times of isolation, individuals and communities become isolated and must depend upon themselves in early stages of an emergency. Snow removal costs can impact budgets significantly. Heavy snowfall during winter can lead to flooding or landslides during the spring if the area snowpack melts too quickly and can also create numerous challenges for emergency responders.

Heavy snow events occur on an annual basis in the higher elevations of the County. Snow removal is an ongoing issue in the upcountry areas of the County. Snow removal is constant during the snowiest months, within the County and other agencies providing snow removal on public roads. Individuals and road associations are a primary snow removal resource for all the private roads. Impacts to the County as a result of winter snowstorms include damage to infrastructure, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also, of concern as described below is the impact to populations with additional needs such as the elderly, low-income individuals, and those requiring the use of medical equipment should the power go out. Delays in emergency response services can be of significant concern during large storm events. Further, there are economic impacts associated with areas prone to heavy snow.

There have been many extreme snow events that have occurred in Plumas County, most notably in the high elevation regions such as Chester and La Porte. However, lower elevation areas such as Quincy are also susceptible to extreme snow events. Seneca Road, the first part of the road, has been impacted by avalanches during heavy snow (this is County Road 306).

The HMPC noted that Genesee (and approximately 20 homes) are in an area affected by avalanche.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from extreme cold, freeze, snow, and avalanche include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

All populations within the Plumas County Planning Area are vulnerable to extreme cold, freeze, and snow, but this hazard generally affects people spending large amounts of time outside to a greater extent. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Snow can cause transportation issues for people, including vulnerable populations. Vulnerable populations to cold, freeze, and snow include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Populations in the County are much less vulnerable to avalanche.

Structures

Structures in the Plumas County Planning Area have some measure of risk from extreme cold and freeze. Buildings in the upper elevations of the County can be affected directly by freeze; pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm and snow events. Structures can also be damage by excessive snow loads (as seen above in Past Occurrences). Structures in the Plumas County Planning Area have some measure of risk from avalanche. Buildings in the upper elevations of the County can be affected directly by avalanche events. However, most of these events occur away from structures in the Plumas County Planning Area.

Critical Facilities and Infrastructure

Winter storms typically involve snow and ice, occasionally accompanied by high winds, cold temperatures, and avalanche, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the County. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by freeze and extreme cold and winter weather events. Damage to pipes that feed buildings can be damaged during periods of extreme cold. Other equipment may also be affected. Infrastructure such as roads, highways, and bridges can become slippery, causing accidents and road closures. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by avalanche events. Infrastructure such as roads, highways, and bridges can be blocked during these events.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold, freeze, snow, or avalanche event, natural resources in the Plumas County Planning Area may be affected. During periods of freeze and heavy snow, trees in the Planning Area may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures.

FEMA NRI Hazard Vulnerability Assessment

FEMA's NRI provides additional data on Plumas County's vulnerability to Extreme Cold, Freeze, and Snow (with avalanche). The NRI contains data and analysis for 18 separate natural hazards. The NRI hazards related to Plumas County's Extreme Cold, Freeze, and Snow (with Avalanche) hazards are: avalanche, cold wave, ice storm, and winter weather. As shown in Table 4-34, while avalanches, cold waves, and ice storms are expected to cause no expected annual losses and are given no historic loss ratio, winter weather could cause a total of $29,230 in expected annual losses, with a rating of very low. Winter weather has a relatively low rating for social vulnerability and a relatively high community resilience, with a risk index score of 35.8 out of 100. According to the NRI, there have been 297 events on record between the years 2005-2021, with an average of 16.5 events per year.

Table 4-34 Plumas County Planning Area – Avalanche, Cold Wave, Ice Storm, and Winter Weather Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Avalanche	–	$0	$0	–
Cold Wave	0	$0	$0	No rating
Ice Storm	–	$0	$0	–
Winter Weather	35.8	$29,230	$237,469,807,133	Very low

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Severe Weather: Extreme Cold, Freeze, Snow, and Avalanche

Extreme cold, freeze, and snow can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the Plumas County Planning Area. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions.

When extreme cold is coupled with high winds and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the Planning Area include can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

The most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur independently of other types of hazards, although it is possible for avalanches to be triggered by severe weather and earthquakes. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for Plumas County include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, snow, and avalanche and their associated impacts to the County.
- The population of Plumas County is expected to slowly shrink as time progresses. Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Changes in populations patterns should also be considered. Especially vulnerable individuals to this hazard include older adults, children, outdoor workers, those below the poverty line and the unhoused. Planning for population changes will help to decrease the County's overall vulnerability. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of population growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future freeze, extreme cold, and heavy snow conditions. In addition, structures should be built away from avalanche

prone areas. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development built to code should be able to withstand extreme cold, freeze, and heavy snow. Future development should be built away from avalanche zones. Current building codes provide such provisions for new construction. Older buildings and infrastructure should be evaluated to ensure that extreme cold and freeze will not cause negative impacts. Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements such as building codes are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more resilient community.

4.3.3. Severe Weather: Extreme Heat

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. Recently in California, records were set across the state during a July 2024 heat event. 2024 was considered the hottest on record. Extreme heat can also affect the agricultural industry. Extreme heat as it affects agriculture in Plumas County is discussed further in the agricultural hazards discussion in Section 4.3.6.

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds a level at which the body can remove it, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise, and heat-related illness may develop. Elderly persons, small children, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to extreme heat.

Location and Extent

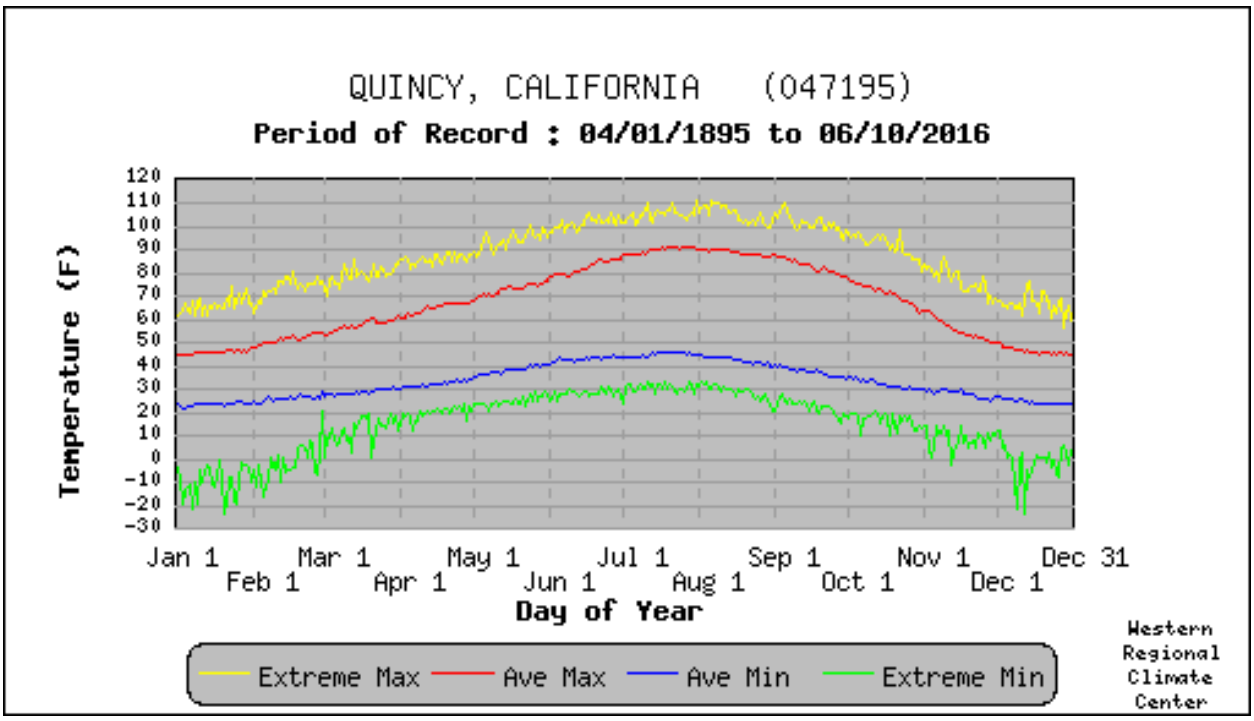
Extreme heat events occur on a regional basis. Extreme heat can occur in any location of the County. All portions of the County are at risk to extreme heat. Extreme heat occurs throughout the Planning Area primarily during the summer months. The WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from

the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for the County is summarized below.

Plumas County — WRCC Quincy Station, Period of Record 1896 to 2016

According to the WRCC, in Plumas County, monthly average maximum temperatures in the warmest months (May through October) range from the low-70s to the upper-80s. The highest recorded daily extreme was 110°F on both August 9, 1981, and September 5, 1988. In a typical year, maximum temperatures exceed 90°F on 45.3 days. Figure 4-40 shows the average daily high temperatures and extremes for the County. Table 4-35 shows the record high temperatures for the County.

Figure 4-40 Plumas County – Quincy Station (WRCC) Daily Temperature Averages and Extremes 1943 to 2016



Source: Western Regional Climate Center. Retrieved 3/19/2025

Table 4-35 Plumas County – Quincy Station (WRCC) Record High Temperatures 1943 to 2016

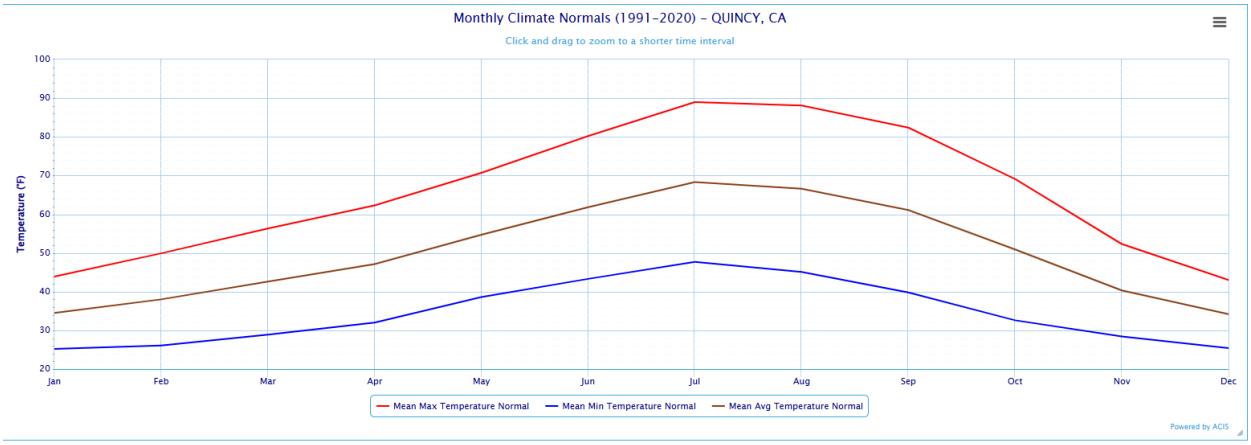
Month	Record High	Date	Month	Record High	Date
January	74°	1/23/1918	July	109°	7/21/1994
February	80°	2/17/1920	August	110°	8/09/1981
March	85°	3/13/1910	September	110°	9/05/1988
April	89°	4/21/2006	October	98°	10/22/1988
May	100°	5/24/1992	November	86°	11/09/1990
June	105°	6/17/1895	December	76°	12/14/1921

Source: Western Regional Climate Center

Plumas County—NWS Quincy Station, Period of Record 1895 to 2025

According to the NWS, monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the low 90s. The highest recorded daily extreme was 111°F on August 6, 1994, and July 31, 1994. Figure 4-41 shows the average daily high temperatures and extremes for the County. Table 4-28 shows the record low temperatures for the County.

Figure 4-41 Plumas County – Quincy Station (NWS) Daily Temperature Averages and Extremes, 1991-2020



Month	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)	Mean Avg Temperature Normal (°F)
January	43.9	25.2	34.5
February	49.9	26.1	38.0
March	56.3	28.9	42.6
April	62.3	32.0	47.1
May	70.7	38.6	54.7
June	80.2	43.3	61.8
July	89.0	47.7	68.3
August	88.1	45.1	66.6
September	82.4	39.8	61.1
October	69.1	32.6	50.9
November	52.3	28.4	40.3
December	43.0	25.4	34.2
Annual	65.6	34.4	50.0

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-36 Plumas County – Quincy Station (NWS) Record High Temperatures 1895 to 2025

Temperature	Date
111.0°	8/6/1994
111.0°	7/31/1994
110.0°	8/7/1990
110.0°	9/5/1988
109.0°	8/9/1981
109.0°	7/11/2002
109.0°	7/21/1994
109.0°	8/8/1981
108.0°	8/3/1993
108.0°	8/12/1992

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. While heat waves are obviously less dramatic, they are potentially deadlier. According to the 2018/2023 California State Hazard Mitigation Plan, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Table 4-37.

Table 4-37 National Weather Service HeatRisk Categories

Category	Level	Meaning
Green	0	No Elevated Risk
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight

Source: National Weather Service

The NWS office in Sacramento or Reno can issue the following heat-related advisory as conditions warrant.

- **Heat Advisories** are issued during events where the HeatRisk is on the Orange/Red threshold (Orange will not always trigger an advisory)
- **Excessive Heat Watches/Warnings** are issued during events where the HeatRisk is in the Red/Magenta output

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disasters related to extreme heat, as shown in Table 4-4. There have been no USDA disaster declarations for extreme heat.

NCDC Events

The NCDC data shows 7 extreme heat incidents for Plumas County since 1993. Information for these events are shown in Table 4-38.

*Table 4-38 NCDC Extreme Heat Events in Plumas County 1993 to 7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Excessive Heat	5	0	0	0	0	$0	$0
Heat	2	0	0	0	0	$0	$0
Total	**7**	**0**	**0**	**0**	**0**	**$ 0**	**$ 0**

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

Hazard Mitigation Planning Committee Events

These section separates events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

A member of the HMPC from Viera Ranch searched through records kept by the Ranch, and found the following extreme heat events:

- **2020 –** In the month of June, from the 22nd to the 29th, high temperatures reached 101º to 104º. June 29 saw 101ºF. In the month of July, from the 15th to the 17th, temperatures reached 102º to 103ºF. In August 9th and 10th, temperatures reached 102º to 103ºF.
- **June 2021** – In the second half of the month of June, temperatures reached as high as 103º-108º, the highest being on the 28th.
- **July 6-9, 2021** – Seneca Health noted excessive heat during these days caused in influx of additional patients. Temperatures reached 103º-106ºF.
- **August 29th of 2021** saw temperatures reached up to 101º F.
- **September 9th and 10th of 2021** saw temperatures reached 101º- 102º F.
- **2022** - In January, temperatures reached odd heights, up to 60º-61º on the 13th, 28th, and 30th. In July, between the 27th and 30th, temperatures reached up to 101º-105ºF. In early September, the 5th-8th, temperatures reached up to 101º-105ºF.
- **2023** – In July, throughout various days between the 2nd and 22nd, temperatures reached 101º-106ºF. In August, the heat trend continued from the 12th to the 16th, with temperatures reaching 103º-105ºF. Seneca Health noted excessive heat during these days caused an influx of additional patients.
- **2024** - In July, from the 5th to the 20th, temperatures ranged from 101º-105º.

Events before 2019

A member of the HMPC from Viera Ranch searched through records kept by the Ranch, and found the following extreme heat events:

- **1999** – From July 6th to 10th, high temperatures ranged from 100°F to 103°F. On October 9th, daytime highs were at 92°F.
- **2002** – Multiple days saw very high temperatures. This includes July 9th – 104°F; July 10th – 108°F; July 11th – High 109°F; 8/14/2002 – 105°F; 8/15/2002 – 104°F; 8/16/2002 – 101°F.
- **2003** – Multiple days saw very high temperatures. This includes June 28th – 102°F, July 14th to 23rd – 100°F to 108°F, and July 28th to 30th – 102°F to 105°F.

- **2006** – Multiple days saw very high temperatures. This includes June 20th to 24th – 101°F to 103°F, and July 17th to 25th – 100°F plus highs.
- **2007** – Multiple days saw very high temperatures. This includes July 4th to 6th – 101°F to 101°F.
- **2015** – Multiple days saw very high temperatures. This includes June 24th to 27th – 105°F to 108°F, and June 30th to July 2nd – 101°F to 105°F.
- **2016** – Multiple days saw very high temperatures. This includes July 14th – 102°F, July 23rd to 30th – 101°F to 108°F, and August 13th to 21st – 102°F to 107°F.
- **2017 –** Multiple days saw very high temperatures. This includes June 19th to 23rd – 101°F to 106°F, and July 30th to August 2nd – 102°F to 110°F.
- **2018 –** Multiple days saw very high temperatures. This includes July 18th – 101°F, July 19th – 103°F, July 25th – 102°F, July 26th – 104°F, and August 7th to 10th – High 10°F each day.

Likelihood of Future Occurrence

Highly Likely—Temperature extremes are likely to continue to occur annually in the Plumas County Planning Area. Temperatures at or above 90°F are common most summer days in the western portion of the County.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and extreme heat can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Extreme Heat

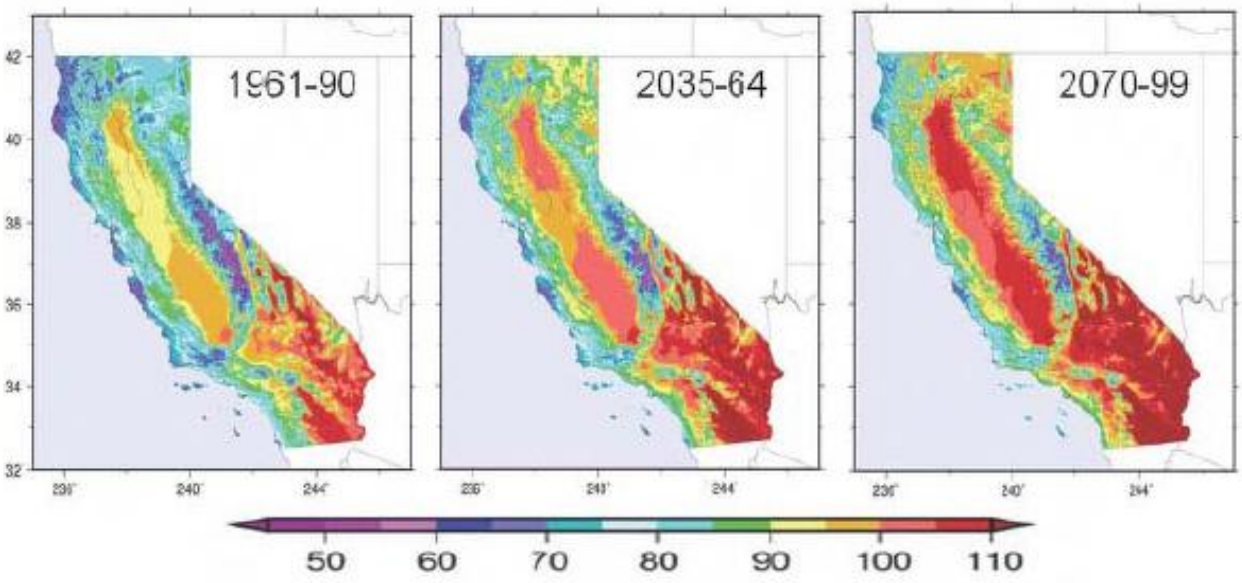
Climate change and its effect on extreme heat in the County has been discussed by three sources:

- California Climate Adaptation Strategy (CAS) – 2021
- Climate Change and Health Profile Report –Plumas County
- Cal-Adapt

Climate Adaptation Strategy

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-42.

Figure 4-42 California Historical and Projected Temperature Increases – 1961 to 2099



Source: Dan Cayan; California Climate Adaptation Strategy

As temperatures increase, California and Plumas County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS report (as well as the 2024 Draft CAS) and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in illnesses and deaths related to extreme heat in Plumas County.

Climate Change and Health Profile Report – Plumas County

The Climate Change and Health Profile Report (CCHPR) noted for Plumas County that increased temperatures manifested as heat waves and sustained high heat days directly harm human health through heat-related illnesses (mild heat stress to fatal heat stroke) and the exacerbation of pre-existing conditions in the medically fragile, chronically ill, and vulnerable. Increased heat also intensifies the photochemical reactions that produce smog and ground level ozone and fine particulates (PM2.5), which contribute to and exacerbate respiratory disease in children and adults. Increased heat and carbon dioxide enhance the growth of plants that produce pollen, which are associated with allergies. Increased temperatures also add to the heat load of buildings in urban areas and exacerbate existing urban heat islands adding to the risk of high ambient temperatures.

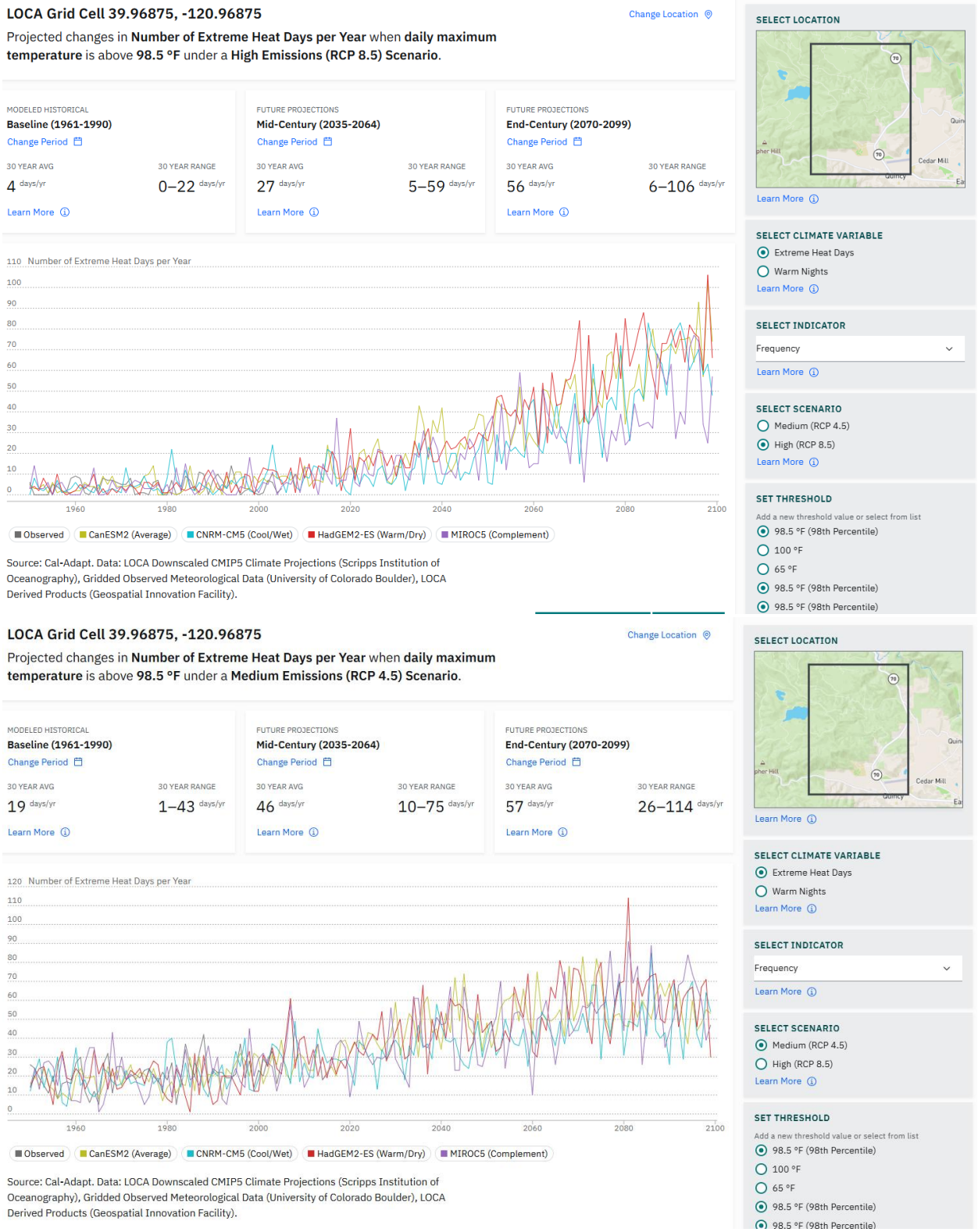
Cal-Adapt

Cal Adapt also noted that overall temperatures are expected to rise substantially throughout this century. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (Representative Concentration Pathways (RCP) 8.5) are approximately twice as high as those projected in the lower emissions scenario (RCP 4.5).

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. Future temperature estimates from Cal-Adapt for the Plumas County Planning are shown in Figure 4-43. It shows the following:

- The upper chart shows the number of days in a year when daily maximum temperature is above the extreme heat threshold of 98.5°F. Data is shown for Plumas County under the RCP 8.5 scenario in which emissions continue to rise through 2050 and maintain that trend into 2100.
- The lower chart shows the number of days in a year when daily maximum temperature is above the extreme heat threshold of 98.5 °F. Data is shown for Plumas County under the RCP 4.5 scenario in which emissions show continued rise throughout 2050 with continued increasing patterns into 2100.

Figure 4-43 Plumas County – Future Temperature Estimates in Low and High Emission Scenarios



Source: Cal-Adapt – Number of Extreme Heat Days by Year. Retrieved 2/10/2025.

Vulnerability Assessment

Vulnerability—Medium

Extreme heat happens in Plumas County each year. Extreme heat may overload demands for electricity to run air conditioners and other utilities in homes and businesses during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. Extreme heat may also be a secondary effect of droughts or may cause drought-like conditions in a temporary setting. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Extreme heat, when combined with wind, can also lead to PSPS events in the County. Extreme heat also contributes to poor air quality during extended events.

Vulnerable populations are at the greatest risk to the effects of extreme heat. The Public Health Alliance has developed a composite index to identify cumulative health disadvantages in California. Factors such as those bulleted above were combined to show what areas are at greater risk to hazards like extreme heat.

The whole of the Planning Area has some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerabilities to this hazard.

The County noted that extreme heat can cause crop damages. These can be substantial if extreme heat occurs during periods of plant susceptibility to heat. Extreme heat contributes to PSPS and wildfire issues in the County. Heat domes have settled over the County in the past, which has caused the County to open cooling centers. The County is also worried about the effects on vulnerable populations. It was also noted that extreme heat contributes to unhealthy air quality.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for both the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

All populations within the Plumas County Planning Area are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. In the Plumas County Planning Area, extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Park areas and natural resource assets in the Plumas County Planning Area may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of Plumas County that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

FEMA NRI Hazard Vulnerability Assessment

FEMA's NRI provides additional data on Plumas County's vulnerability to Extreme Heat. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Plumas County's

Extreme Heat is a heat wave. As shown in Table 4-39, heatwaves could cause a total of $8,162 in expected annual losses, with a historic loss rating of very low. Heat wave has a relatively low rating for social vulnerability and relatively high community resilience, with a risk index score of 23.8 out of 100. According to the NRI, there have been 11 events on record between the years 2005-2021, with an average of 0.7 events per year.

Table 4-39 Plumas County Planning Area – Heat Wave Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Heat Wave	23.8	$8,162	$237,469,807,133	Very low

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Severe Weather: Extreme Heat

The County experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. Health issues are the primary concern with this hazard with vulnerable populations at greater risk, although economic impacts can also be an issue. Air quality can also be an issue during extreme heat.

During these times, drought conditions may worsen, and the Planning Area may see an increase in dry fuels contributing to wildfires. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Also power outage and PSPS events may occur during these times as well. Drought is discussed further in Section 4.3.9 and wildfire in Section 4.3.15.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the County.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to decrease for Plumas County and, as such, the vulnerability to this hazard may decrease. However, certain growing vulnerable populations such as the senior citizens population continues to rise within the communities of the County. Along with this, low income and the unhoused population are at risk to extreme heat which can put strain on emergency services and shelters. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future extreme heat conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development in the County will take extreme heat into account. Backup generators are currently in use at many County facilities, and additional generators and backup power sources are being sought for other locations. One way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that combines individual strategies into an integrated approach. Components of such a plan might include forecasting and monitoring, education and awareness, and heat wave preparedness and response.

In addition to a comprehensive heat response plan, local officials can help areas adapt to extreme heat in the short-term by improving the resilience of infrastructure. Transportation planners can protect or modify roads, bridges, and other structures—for example, by using materials that are more resilient and heat tolerant—to help these systems withstand higher temperatures and reduce service disruptions. They can also implement energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves and help avoid power outages.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements such as building codes are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more disaster resilient community.

4.3.4. Severe Weather: Heavy Rains and Storm

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Storms in the Plumas County Planning Area occur throughout the Planning Area and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Plumas County area falls mainly in the fall, winter, and spring months.

Cloudburst storms can be expected in the spring, summer, and fall. Cloudburst storms, sometimes lasting as long as 6 hours in the study areas, are high intensity storms that can produce floods characterized by high peak flows, short-duration flood flows, and small runoff volume. In small drainage basins such as Portola Tributary, cloudbursts can produce peak flows substantially larger than those of general rainstorms.

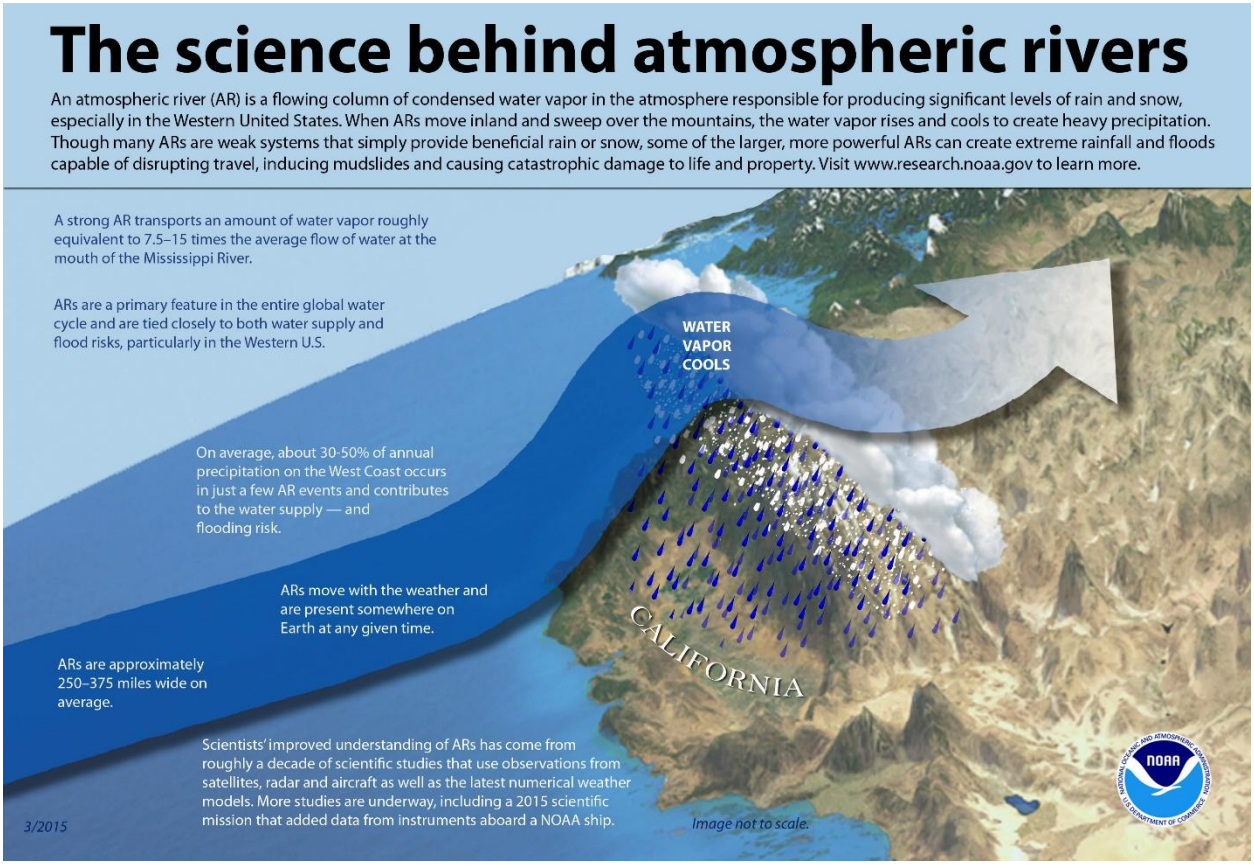
Separate hazard descriptions and locations and extents are shown below for heavy rains and storms, hail, and lightning.

Heavy Rain and Storms

The NWS reports that storms and thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

The County and the rest of California can also be affected by a phenomenon known as an atmospheric river. According to the NOAA, atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow. This can be seen in Figure 4-44.

Figure 4-44 Atmospheric Rivers



Source: NOAA

Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.

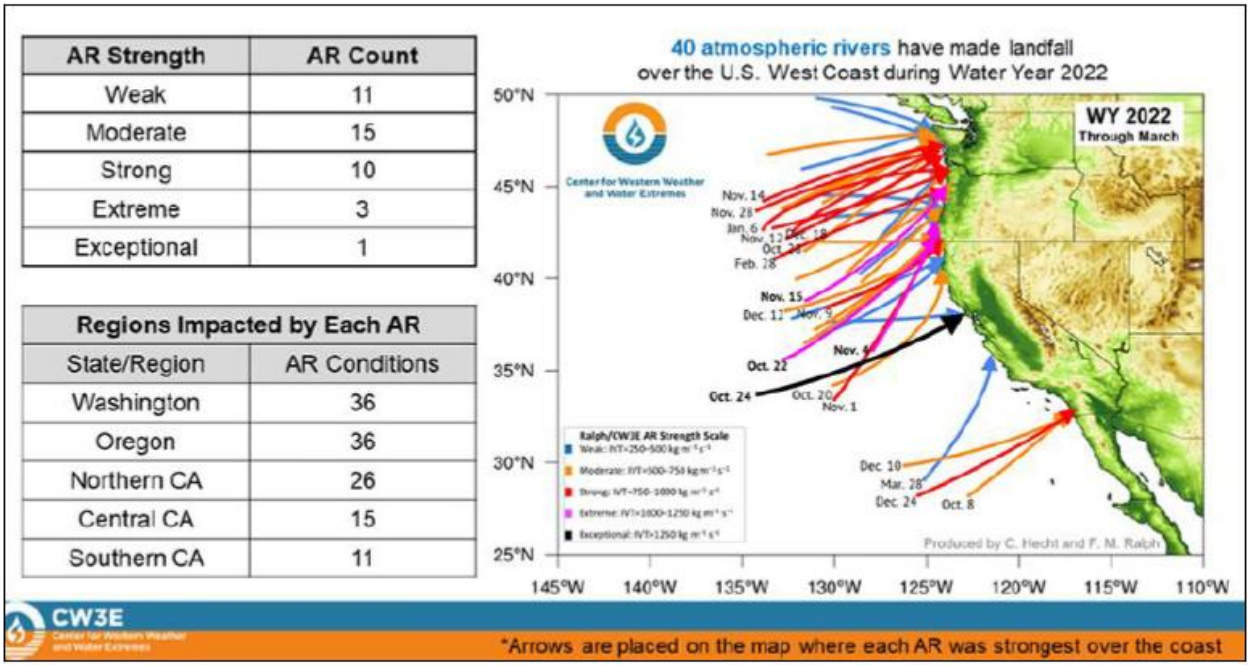
Not all atmospheric rivers cause damage; most are weak systems that often provide beneficial rain or snow that is crucial to the water supply. Atmospheric rivers are a key feature in the global water cycle and are closely tied to both water supply and flood risks — particularly in the western United States.

While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from Dec. 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by Dec. 22, the first full day of winter. Another example of this happened in 2022. Multiple atmospheric river storms occurred in the County and the rest of California. This can be seen in Figure 4-45. This also happened in the 2023 as well as in 2024, which can be seen in Figure 4-46 and Figure 4-47, respectively.

Figure 4-45 2022 Atmospheric River Events

AR Strength	AR Count
Weak	11
Moderate	15
Strong	10
Extreme	3
Exceptional	1

Regions Impacted by Each AR	
State/Region	AR Conditions
Washington	36
Oregon	36
Northern CA	26
Central CA	15
Southern CA	11

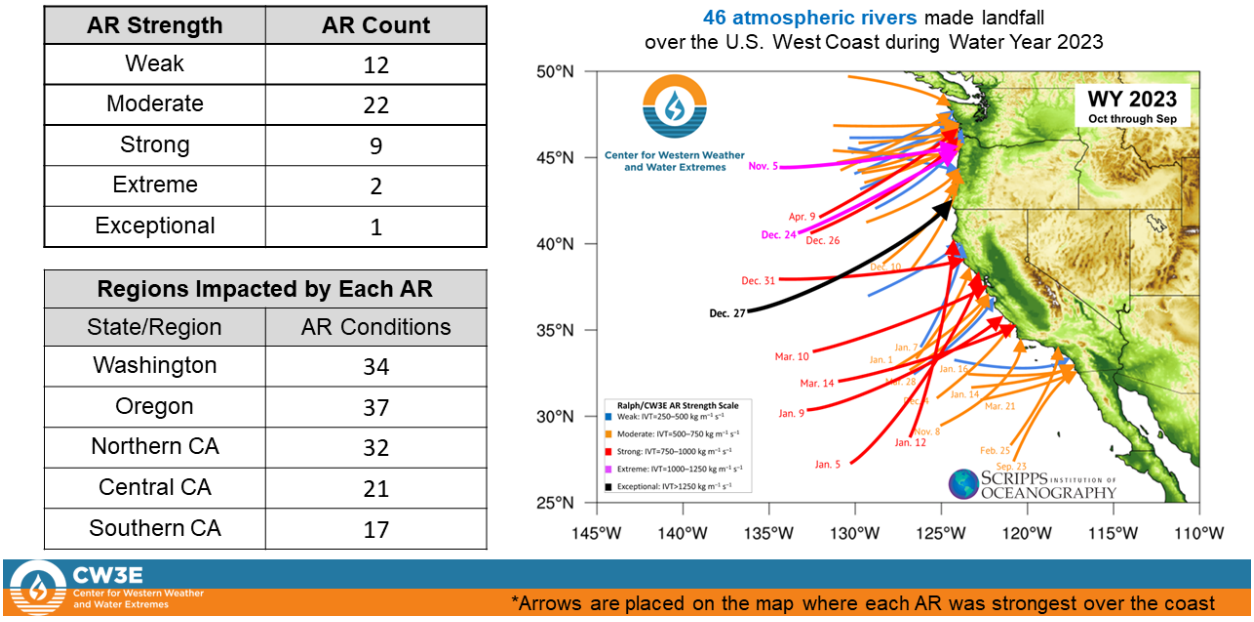


Source: Center for Western Weather and Water Extremes. Retrieved 12/18/2024.

Figure 4-46 2023 Atmospheric River Events

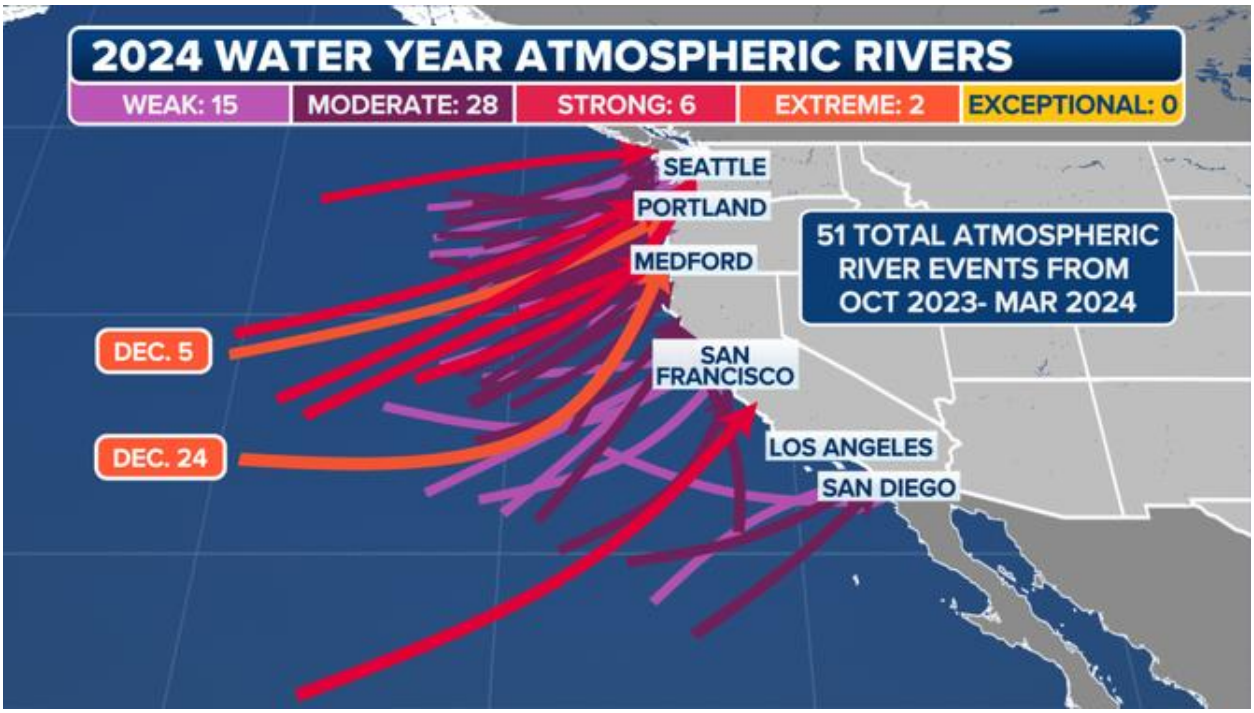
AR Strength	AR Count
Weak	12
Moderate	22
Strong	9
Extreme	2
Exceptional	1

Regions Impacted by Each AR	
State/Region	AR Conditions
Washington	34
Oregon	37
Northern CA	32
Central CA	21
Southern CA	17



Source: Center for Western Weather and Water Extremes. Retrieved 12/18/2024.

Figure 4-47 2024 Atmospheric Rivers



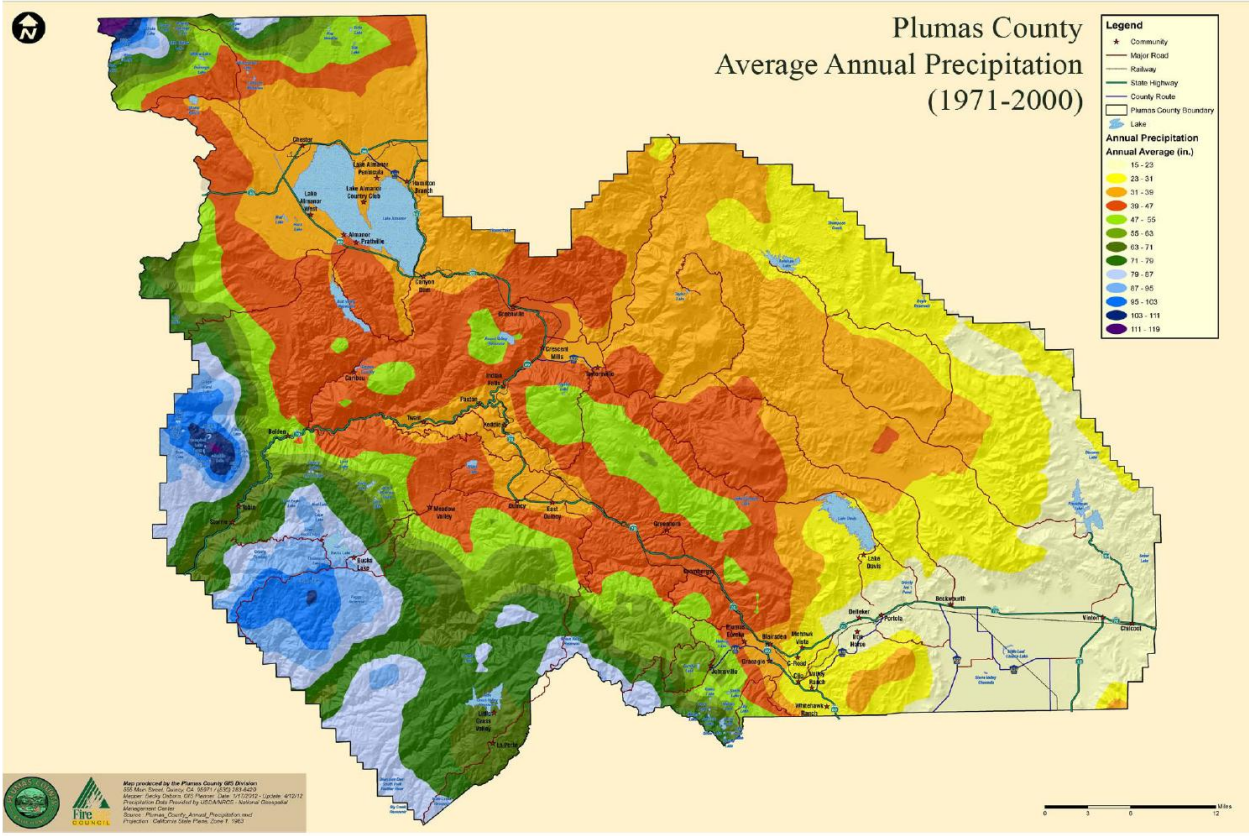
Source: Foxweather.com. Retrieved 12/18/2024.

Short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

Location and Extent of Heavy Rains and Storms

Heavy rains in Plumas County vary by season and location. Plumas County is located in the Northern portion of the Sierra Nevada region and has significant topographic variation, which causes it to experience a more severe and geographically variable winter climate (discussed in more detail in Section 4.3.2). The highest precipitation amounts are seen in the Western portion of the county where there is an orographic lift that forces air from low elevations to a higher elevation, quickly cooling down the air and raising the relative humidity to 100%. Under the right conditions orographic lifts create rain shadows where high amounts of precipitation are found on the crests of mountain ranges, but as the air descends to the leeward side of the mountain it warms and dries. In Plumas County the leeward side of the mountains represents the Eastern portion of the county where precipitation typically averages around two inches in the wettest months of the year. Areas west of the mountains, however, experience much higher precipitation levels. For example, Bucks Creek averages nearly 12 inches per month in December and January as shown on Figure 4-48. Most of these rains occur during the winter months, as discussed below.

Figure 4-48 Plumas County Average Annual Precipitation



Source: Plumas County GIS

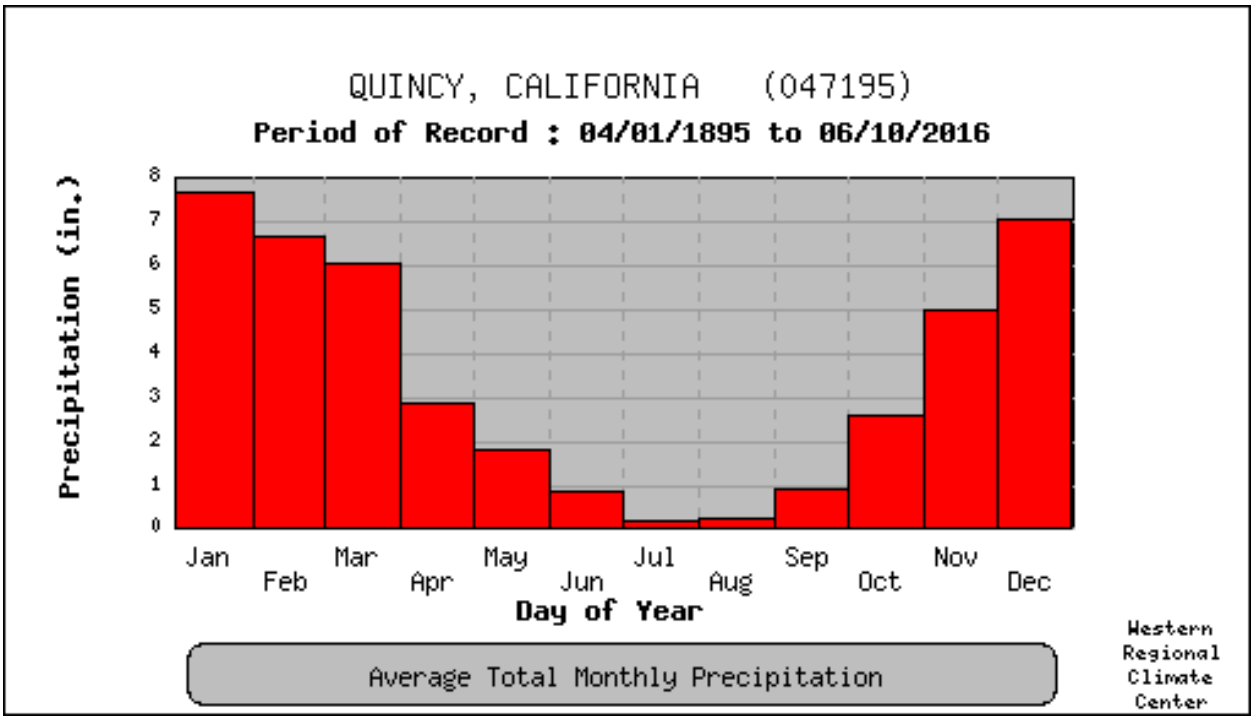
There is no scale by which heavy rains are measured – usually it is measured in terms of rainfall amounts. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. This can cause localized flooding, which is discussed in more detail in Section 4.3.12.

The WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for the County is summarized below.

Plumas County—WRCC Quincy Station Weather Station, Period of Record 1895 to 2016

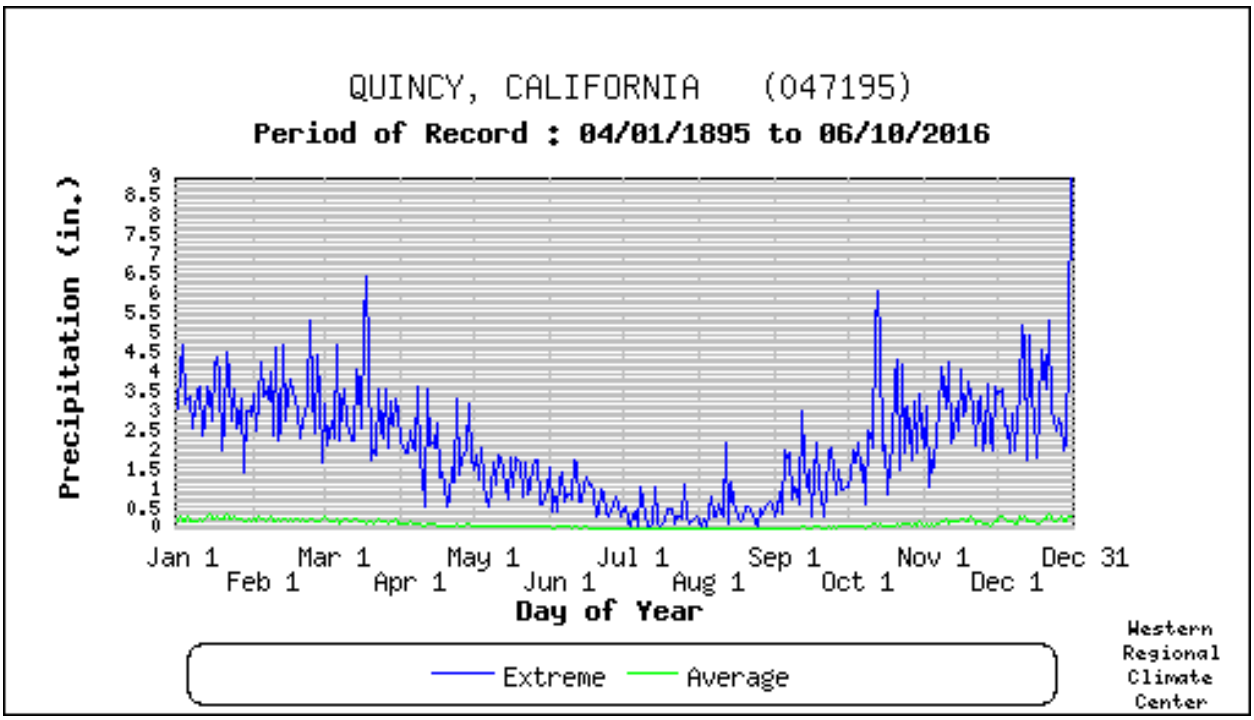
According to the WRCC, average annual precipitation in Plumas County is 40.15 inches per year. The highest recorded annual precipitation is 68.87 inches in 1909; the highest recorded precipitation for a 24-hour period is 6.50 inches on March 18, 1907. The lowest recorded annual precipitation was 22.15 inches in 1949. Average monthly precipitation for Plumas County is shown in Figure 4-49. Daily average and extreme precipitations are shown in Figure 4-50.

Figure 4-49 Plumas County—WRCC Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 4/12/2025.

Figure 4-50 Plumas County—WRCC Daily Average and Extreme Precipitation

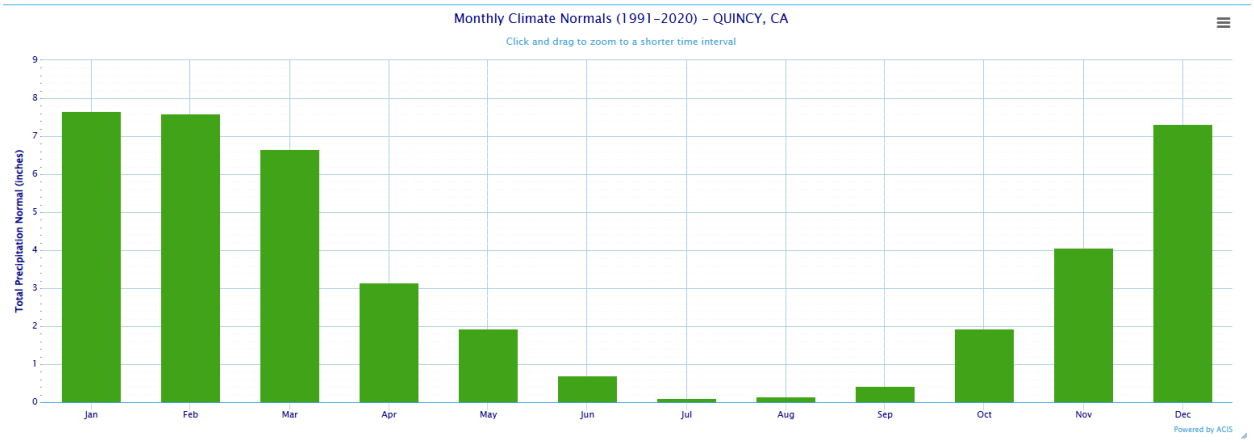


Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 4/12/2025.

Plumas County—NWS Quincy Station Weather Station, Period of Record 1895 to 2016

According to the NWS, average annual precipitation in Plumas County is 41.7 inches per year. Average monthly precipitation for Plumas County is shown in Figure 4-51. The highest recorded precipitation for a 24-hour period is 9.0 inches on December 31, 2004. One day extreme precipitations are shown on Table 4-40.

Figure 4-51 Plumas County— Quincy Station (NWS) Monthly Average Total Precipitation 1991 to 2020



Source: National Weather Service XMAC site. Retrieved 4/12/2025.

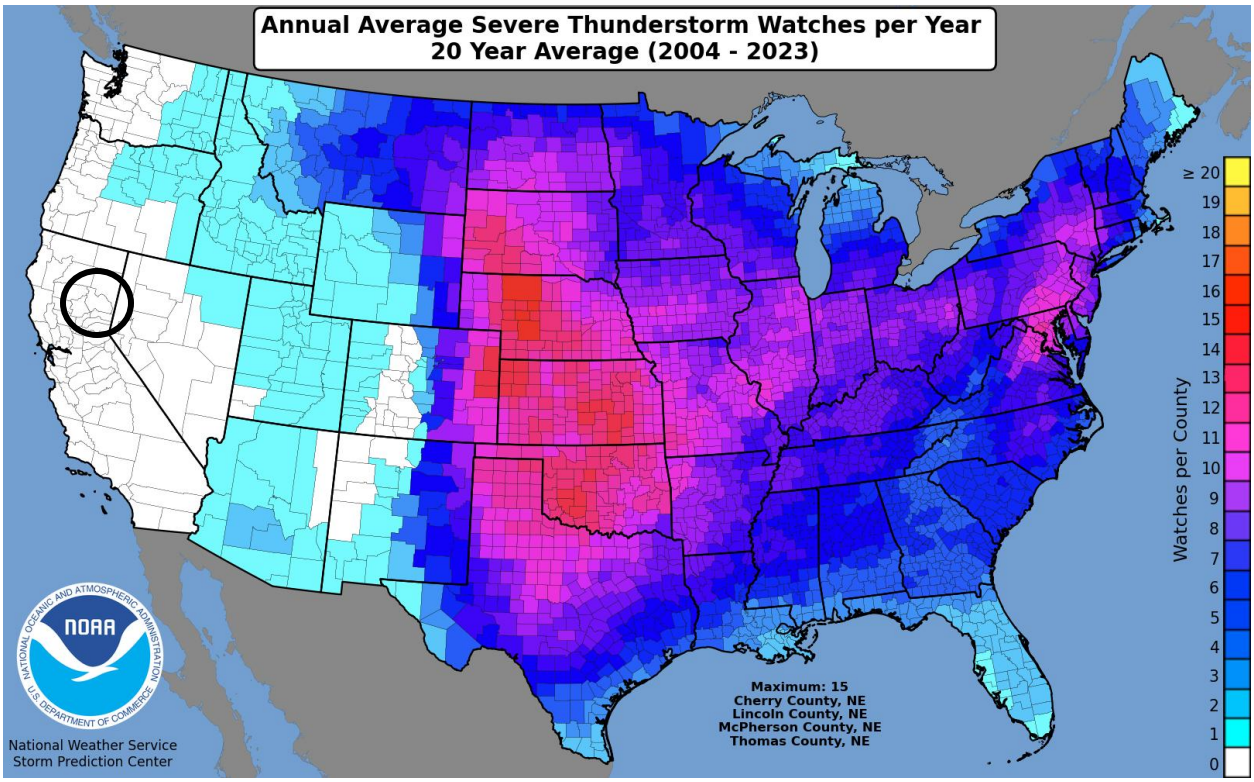
Table 4-40 Plumas County – Quincy Station (NWS) 24 Hour Rainfall Extremes from 1895 to 2025

Rainfall in Inches	Date
9.00	12/31/2004
6.71	10/25/2021
6.50	3/18/1907
6.10	10/13/1962
5.33	12/22/1964
5.32	2/24/1904
5.30	3/17/1907
5.25	12/11/1937
5.17	12/11/1937
5.05	11/23/2024

Source: National Weather Service XMAC site. Retrieved 4/12/2025.

The NOAA Storm Prediction Center tracks thunderstorm watches on a county basis. Figure 4-52 shows thunderstorm watches in Plumas County and the United States for a 20-year period between 2004 and 2023.

Figure 4-52 Plumas County – Average Thunderstorm Watches per Year (2004 to 2023)



Source: NOAA Storm Prediction Center. Retrieved 3/5/2025.

Hail

Hail can occur throughout the Planning Area during storm events, though it is rare in the County. Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the Plumas County Planning Area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-41 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-41 Hailstone Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter

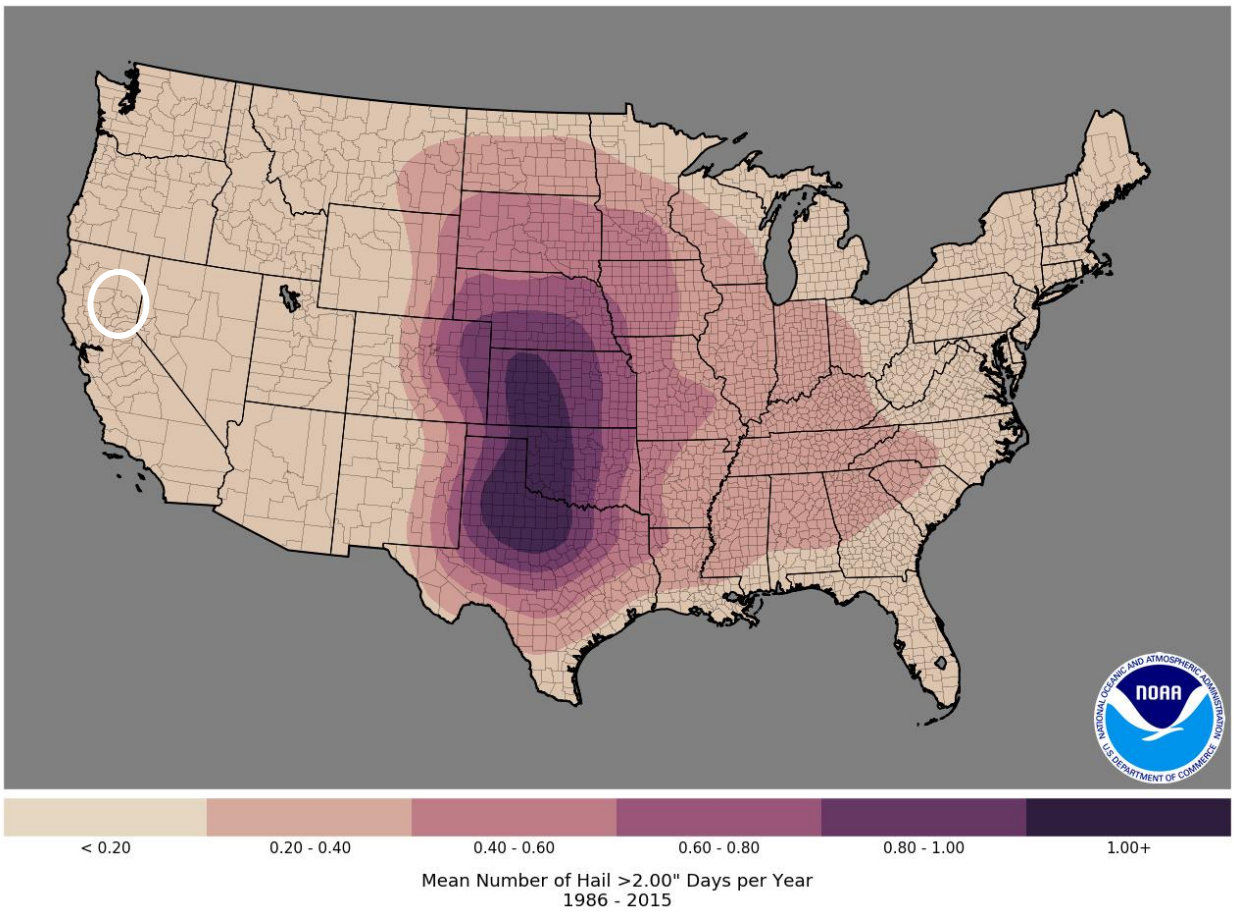
Average Diameter	Corresponding Household Object
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

Location and Extent of Hail

Hail events can occur in any location of the County. All portions of the County are at risk to hail. Hail tends to be rare in California. There is no scale in which to measure hail, other than hail stone size as detailed above. The speed of onset of hail can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms that can cause hail in California is often short, ranging from minutes to hours. Hail events last shorter than the duration of the total thunderstorm. The National Weather Service tracks hail events. Figure 4-53 shows the average days each year where hail of greater than 1" in diameter occurred during a 20-year period from 1986 to 2015 (the most recent data available).

Figure 4-53 Plumas County – Average Hail Days per Year (1986 to 2015)



Source: National Weather Service. Retrieved 4/23/2025.

Lightning

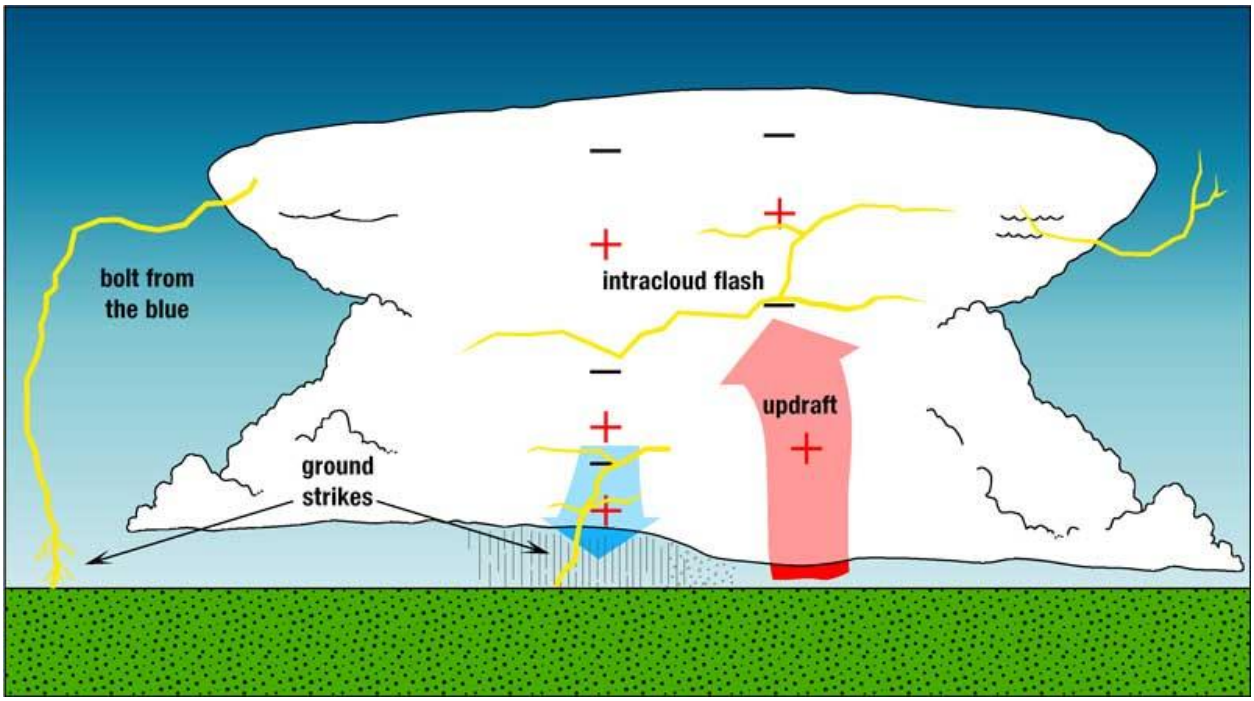
Lightning can occur throughout the County during storm events. Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or damage may be indirect when the current passes through or near an object, which generally results in less damage.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually, it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage

of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-54). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-54 Cloud to Ground Lightning



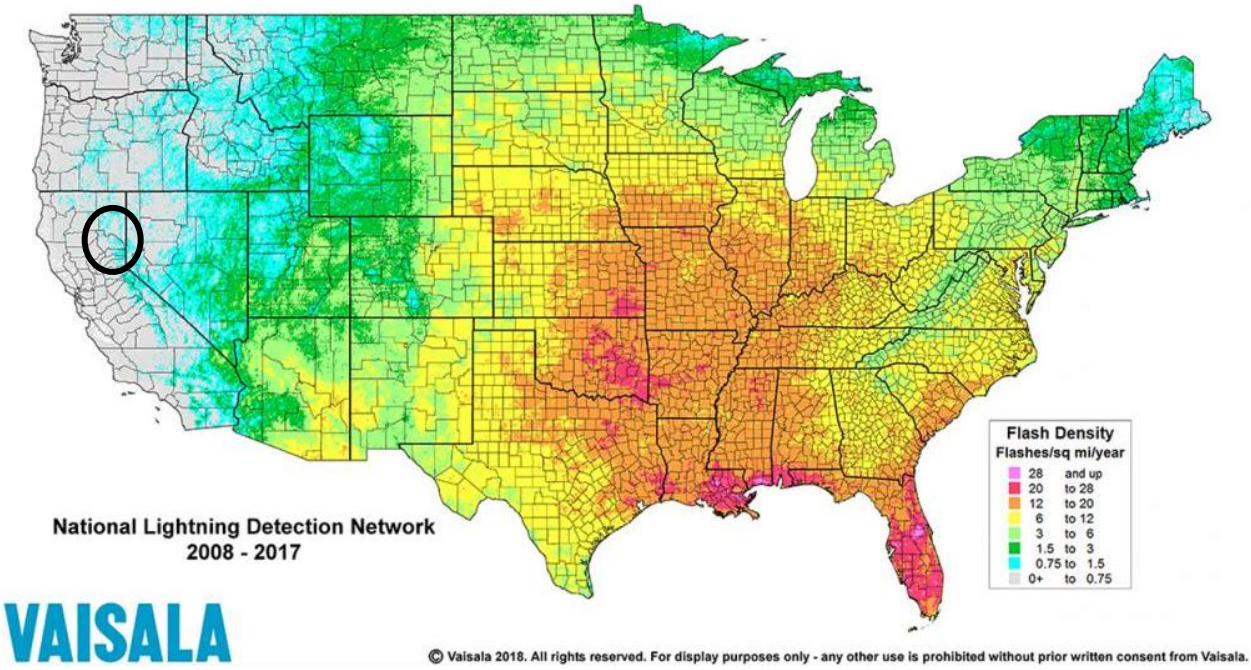
Source: National Weather Service

Location and Extent of Lightning

Lightning events can occur in any location of the County and are often associated with thunderstorms. All portions of the County are at risk to lightning. Lightning tends to be infrequent in the County, as discussed in the extent section below.

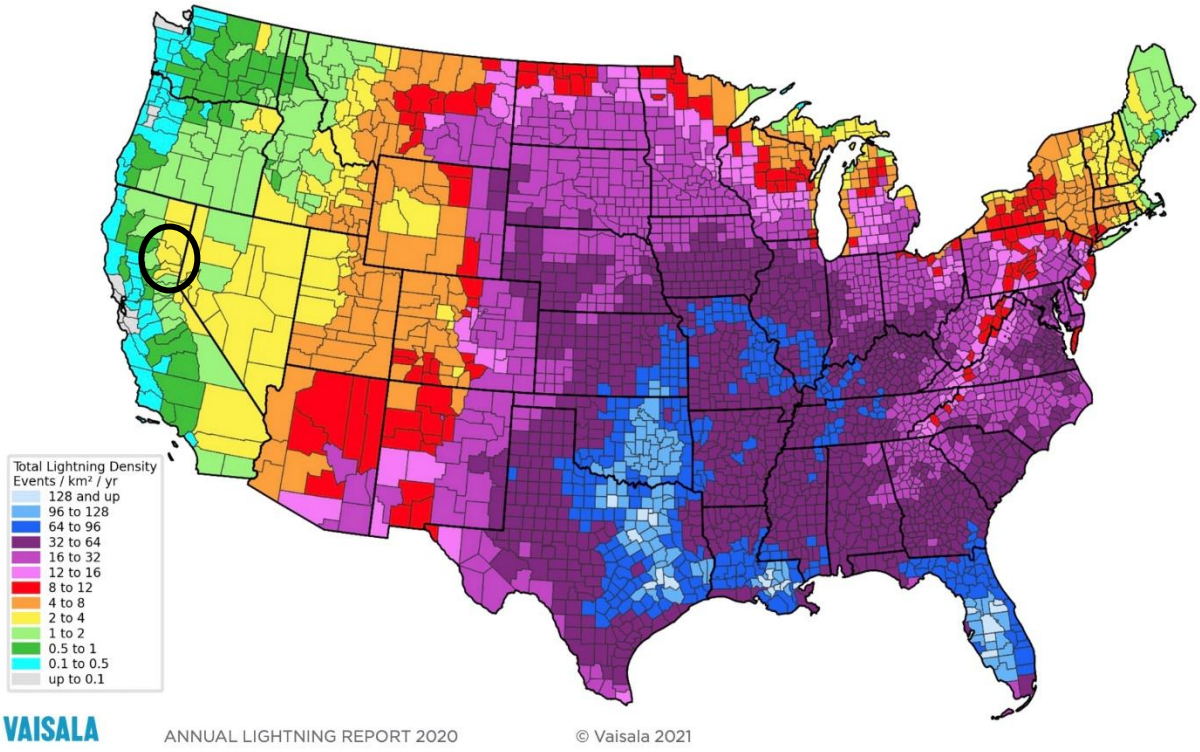
Lightning in the County can occur during thunderstorms. The speed of onset of thunderstorms that can cause lightning can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. Thunderstorms and lightning are rare in the County. Lightning can also occur in the County outside of a thunderstorm event. Vaisala maintains the National Lightning Detection Network. It tracks cloud to ground lightning incidences in the United States. Figure 4-55 shows lightning incidences in the County and the rest of the United States from 2008 to 2017 (the most recent long term tracking map available). Figure 4-56 shows a more recent lightning density by county map.

Figure 4-55 Plumas County – Lightning Incidence Map 2008 to 2017



Source: Vaisala National Lightning Detection Network. Retrieved 4/23/2025.

Figure 4-56 Plumas County – Average US Total Lightning Density per County 2015-2019



Source: Vaisala National Lightning Detection Network. Retrieved 4/23/2025.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. Heavy rains and storms have caused flooding in the County. Events where flooding and heavy rains and storms resulted in a state or federal disaster declaration are shown in Table 4-42. More information on USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) can be found in Table 4-51 in the Past Occurrences in Section 4.3.6.

Table 4-42 Plumas County – Disaster Declarations from Heavy Rain and Storms 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: FEMA, Cal OES

*indicates heavy rains and storms may have also caused landslide issues

NCDC Events

The NCDC data recorded 132 hail and heavy rain weather incidents for Plumas County since 1950. Winter weather events tend to be more rain in the lower elevations of the County, while snow can fall in the upper elevations. No incidents of lightning were found in the NCDC database for the County. A summary of these events is shown in Table 4-43.

*Table 4-43 NCDC Severe Weather Events in Plumas County 1950-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	10	0	0	0	0	$100	$5,000
Heavy Rain	60	0	0	0	0	$1,000	$0
Lightning	1	0	0	0	0	$0	$0
Winter Weather	61	0	0	0	0	$0	$0
Total	**132**	**0**	**0**	**0**	**0**	**$1,100**	**$5,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Plumas County

Hazard Mitigation Planning Committee Events

These section separates events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

HMPC also noted the following events:

- **2019** – 2.65 inches of rain fell in the Quincy area on January 7th. Between the 15th and 17th of January, another 8.05 inches of rain fell. February 13th and 14th saw another 5.47 inches of rain fall. February 25th to 27th, 9.5 more inches or fain fell. March 26th saw 3.52 inches of rain.
- On **September 5, 2019,** quarter size hail was reported near Vinton. No injuries or deaths were reported. Property damage occurred, but damage estimates were unavailable.
- **2020** – In the month of May on the 16th and 17th, 1.40" of rain was recorded for both days, totaling at 2.80". On July 26. 1/2" hail was reported. On Aug 16 a lightning storm was reported. In the month of November on the 17-18, 2.25" first day and 2.62" the next. Dec 26. 1.30" of rain fell.
- **2021** – Dec 13. 4.03" of rain fell.
- **2022** – In April, inches worth of rain fell on the 16th, 19th, and 21st. Over an inch fell each day, resulting in a total of 4.59". In December, two larger rain periods occurred. In the beginning of the month, a total of 5.03" fell. At the end of the month, an atmospheric river caused another 3.81" to fall.
- **2023** – In January, 15.92" fell between the 1st and the 15th. During the event period starting February 21st, 2023, through July 10th, 2023, the State of California experienced a series of atmospheric river events that brought heavy rains and high winds. The heavy rains saturated the ground, caused severe flooding throughout the State of California. An atmospheric river caused 2.5" of rain to fall on the County; only a few days after 86" of snow had fallen in the region. Plugged culverts caused damage to road surface, base and subbase. On November 18, 1.85" of rain fell. On December 19, 2.32" of rain fell.
- **2024** – In February, 1.90" of rain fell on the 5th. More rain fell on the 19th-20th, dropping a total of 4.57". In March, an atmospheric river along with high winds impacted the County on the first two days. This rain event dropped a total of 4.53". In May, alongside snowfall, 2.86" of rain fell on the County. In December, an atmospheric river during the 21st-23rd dropped a total of 13.92" of rain.
- **2025** – In August, lightning caused multiple fires to occur in Plumas National Forest. 29 fires were started by lightning. Fortunately, heavy rains followed the lightning event which kept the fires to a small burn area (the largest being 2.75 acres).

Events before 2019

In **1977** and **1981** there were lightning events that caused damages in the County.

A member of the HMPC from Viera Ranch searched through records kept by the ranch, and found the following heavy rain and storm events:

- **November 6, 1994** – 4.2 inches of rain fell in the Quincy area.
- **December 2, 1994** – 3.5 inches of rain fell in the Quincy area.
- **From January 7th to 15th of 1995**, 27.85 inches of rain fell in the Quincy area. This came after 3 inches of snow had fallen the previous two days.
- **April 26, 1995,** saw 4.1 inches of rain fall in the Quincy area.
- **January 16th to 23rd 1999** – 7.85 inches of rain fell in the Quincy area. From February 6th to the 9th, another 10.3 inches of rain fell in the Quincy area.
- In early **2000**, large amounts of rain fell. Between January 10th and 24th, 14.9 inches of rain fell in the Quincy area. From February 11th to 27th, another 13.7 inches fell.

- **July 10, 2001** – Portola had 2 inches of rain in 30 minutes. 4" of 1" diameter hail fell. Flash flooding occurred.
- **December 2002** - 49.3 inches of rain and 21.5 inches of snow fell in the Quincy area.
- **2003** – 5.7 inches rain fell in Quincy on March 14th and 15th. Marble size hail was seen on June 23rd. 1.25 inches of rain fell in 3 hours on August 22nd. 3.25 inches and 3.4 inches fell on the 6th and 10th of December, respectively.
- **June 8, 2004** – A thunderstorm with pea sized hail occurred in the Quincy area.
- **2006** - 5.8 inches rain fell on the 27th and 28th of February, and 5.33 inches fell on the 3rd and 4th of April.
- **2007** – between February 8th and 12th, 7.4 inches of rain fell.
- **2015** – 3.4 inches of rain fell in the Quincy area between February 5th and 7th. Trees were blown down, and power outages were reported.
- **2016** – Heavy rains fell in the Quincy area in both January and March. January saw 18.44 inches of rain, while March saw 18.24 inches of rain.
- **2017** – From January 7th to 22nd, 13.03 inches of rain fell in the Quincy area. Between February 1st and 11th, another 18.71 inches fell. April 7th says 3.72 inches of rain fall. 0.5-inch hail was reported on May 29th.
- **2018** – Between the 8th and 9th of January, 3.75 inches of rain fell.

The HMPC also noted some events of heavy rain and storm that caused agricultural impacts. Those are discussed in the Past Occurrences in Section 4.3.6. The HMPC also noted that Plumas County experience localized heavy rains yearly. Additionally, the County noted many of these past events are discussed in the Section 4.3.11 Flood: 1%/0.2% Annual Chance and Section 4.3.12 Flood: Localized Stormwater Flooding.

Likelihood of Future Occurrence

Highly Likely – Based on NCDC data and HMPC input, 131 heavy rain and storm incidents over a 75-year period (1950-2024) equates to a severe storm event every year. Severe weather is a well-documented seasonal occurrence that will continue to occur often in the Plumas County Planning Area.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and heavy rains and storms can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Heavy Rains and Storms

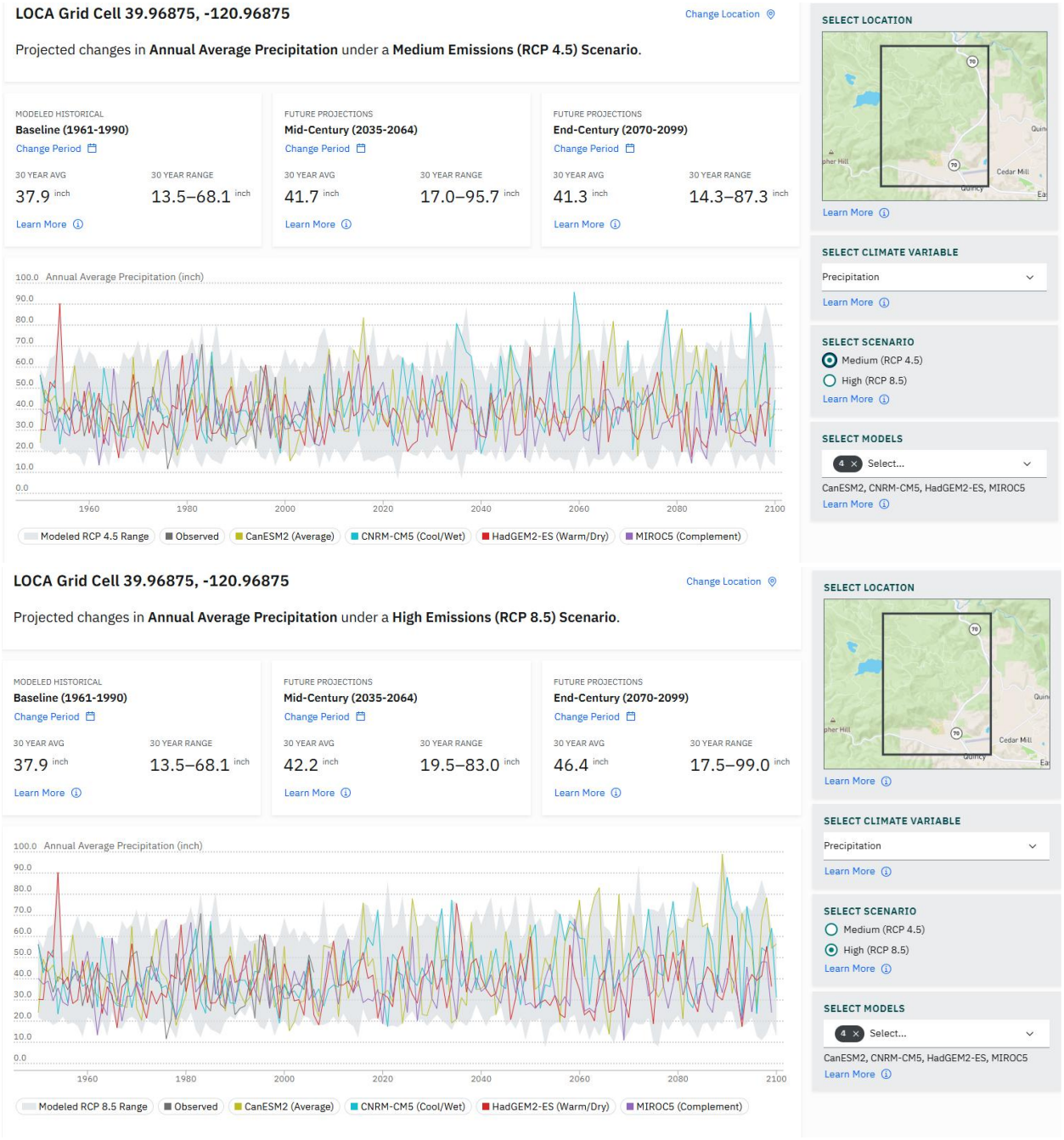
According to the 2021 CAS (and 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in the County. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate models projects slightly wetter winters, and another projects slightly drier winters with a 10 to 20 percent decrease in total

annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized. Future precipitation estimates for the County are shown in Figure 4-57.

- The upper chart shows annual averages of observed and projected Precipitation values for the selected area on map under the RCP 4.5 scenario. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.
- The lower chart shows annual averages of observed and projected Precipitation values for the selected area on map under the RCP 8.5 scenario. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.

Figure 4-57 Plumas County– Future Precipitation Estimates: High and Low Emission Scenarios



Source: Cal-Adapt – Precipitation: Decadal Averages Map. Retrieved 2/10/2025.

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data, heavy rains and storms, including hail and lightning, are an annual occurrence in the Plumas County Planning Area. Heavy rains can cause both localized flooding and

flooding in the floodplains. Atmospheric river storms, which have been more frequent in recent years, are of great concern as they can dump large amounts of water in single storms, or in back-to-back storms.

The whole of the Planning Area has some measure of vulnerability to heavy rains and storms, including hail and lightning. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerabilities to this hazard.

One of the primary concerns of the County to heavy rains and storms is the resulting flooding that occurs during extreme storm events. These include large flood events as detailed in the Flood: 1%/0.2% annual chance flood hazard section and the localized flooding that occurs following these storms. Localized flood problem areas in the unincorporated County are shown in Section 4.3.12. Downed trees, power outages, and agricultural impacts are also concerns.

With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue.

Lightning in the County is also a concern due to the number of fires that are started by lightning strikes. Wildfire is discussed in more detail in Section 4.3.15.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure and community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

All populations in the Plumas County Planning Area have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those who live in floodplains (discussed in further detail in the Flood: 1%/0.2% Annual Chance in Section 4.3.11) and those who live in and near localized flooding areas floodplains (discussed in further detail in the Flood: Localized Stormwater Flooding in Section 4.3.12).

Structures

Structures in the Plumas County Planning Area have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Lightning can damage buildings. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure

Heavy rain and storms can affect critical facilities and infrastructure, and community lifelines during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure can impact operations. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the Planning Area. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged, and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme storm and flood events.

FEMA NRI Hazard Vulnerability Assessment

FEMA's NRI provides additional data on Plumas County's vulnerability to Heavy Rains and Storms. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Plumas County's Heavy Rains and Storms are: hail and lightning. As shown in Table 4-44, hail could cause a total of $4,198 in expected annual losses, with a historic loss rating of relatively low. Lightning could cause a total of $77,248 in expected annual losses with a historic loss ratio rating of very high. Hail and lighting have a relatively low rating for social vulnerability and a relatively high community resilience, with a risk index score of 6.1 out of 100 for hail and 45.8 out of 100 for lightning. According to the NRI, there have been 5 hail events between the years 1986-2021 with an average of 0.1 events per year and 73 lightning events on record between the years 1991-2012, with an average of 3.3 events per year.

Table 4-44 Plumas County Planning Area – Hail and Lightning Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Hail	6.1	$4,198	$237,469,962,102	Relatively low
Lightning	45.8	$77,248	$237,458,956,144	Very high

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Heavy Rains and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion, downed trees, damaged utility structures and infrastructure; power outages; road damage and blockages; and lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landslides occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods, landslides, and erosion that have had the greatest impact on the Planning Area. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this Plan (Section 4.3.11 Flood: 100/500-year, Section 4.3.12 Flood: Localized Stormwater – specifically in the localized flood areas shown on the tables in the Local Concerns section, Section 4.3.8 Dam Failure, and Section 4.3.13 Landslide.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in

population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the County to flooding.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to decrease slowly for Plumas County; however, the vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as the unhoused, outdoor workers, and others could experience disproportional effects from this hazard. and should be addressed as the County continues to grow. Thus, changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the County. Building codes in the County ensure that new development is built to current building standards, which should reduce the risk to future development in the County from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, changes in land use and development will not likely increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help make for a more resilient community.

4.3.5. Severe Weather: High Winds and Tornadoes

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent;

past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

High Winds

High winds, often accompanying severe storms and thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms.

Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snowstorms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

A special type of wind event can occur in the County. Microbursts have occurred in the County. According to the National Weather Service, a microburst is a downdraft (sinking air) in a thunderstorm that is less than 2.5 miles in scale. Some microbursts can pose a threat to life and property, but all microbursts pose a significant threat to aviation. Although microbursts are not as widely recognized as tornadoes, they can cause comparable, and in some cases, worse damage than some tornadoes produce. In fact, wind speeds as high as 150 mph are possible in extreme microburst cases.

Another type of wind in the County is a foehn wind. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the County indicate they occurred during foehn winds. This is discussed in greater detail in the wildfire profile in Section 4.3.15.

Location and Extent

The entire Planning Area is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort wind force scale. Figure 4-58 shows the Beaufort wind scale.

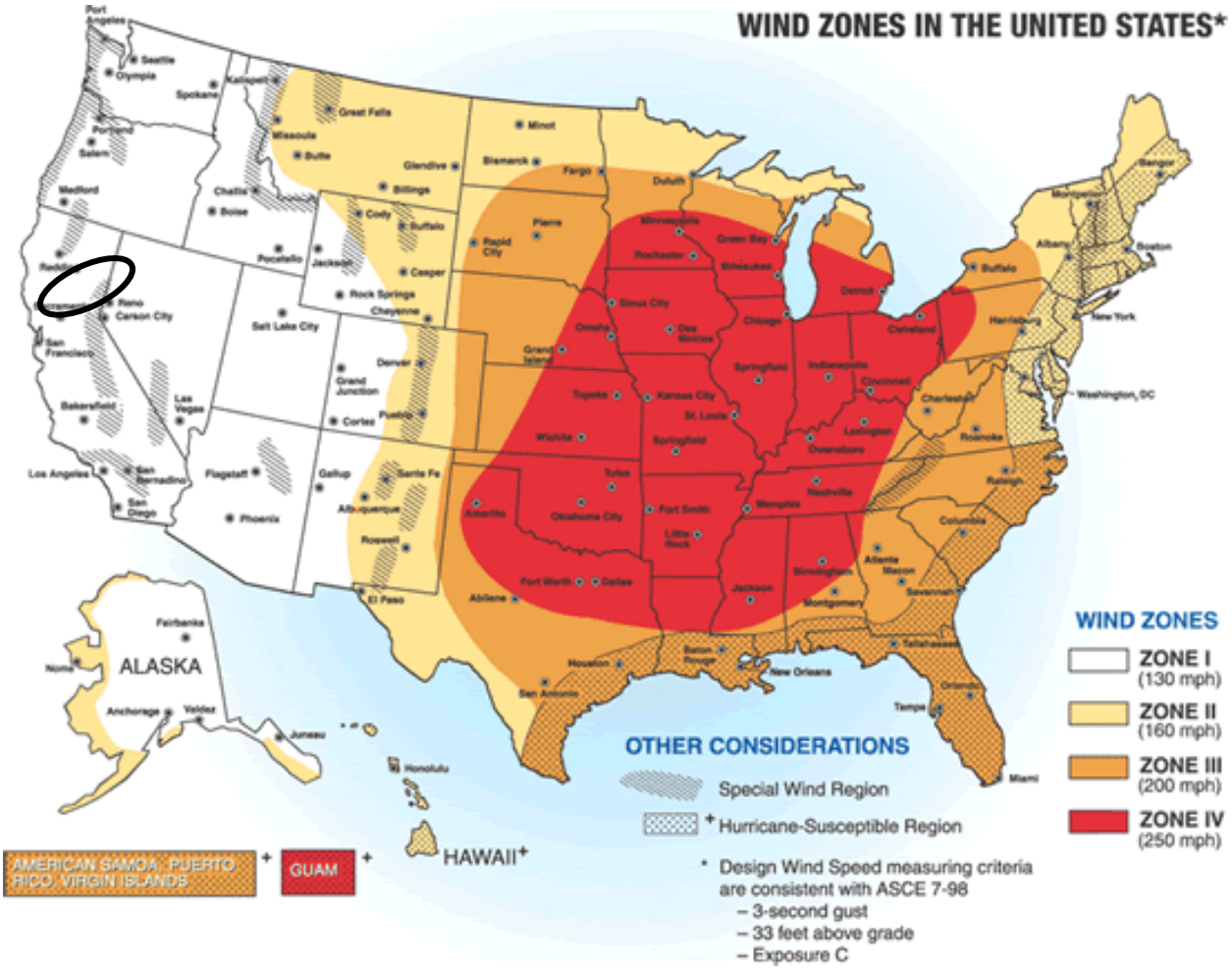
Figure 4-58 Beaufort Wind Scale

Beaufort Number	Wind Speed (miles/hour)	Wind Speed (km/hour)	Wind Speed (knots)	Description	Wind Effects on Land
0	< 1	< 1	< 1	Calm	Calm. Smoke rises vertically.
1	1-3	1-5	1-3	Light Air	Wind motion visible in smoke.
2	4-7	6-11	4-6	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	12-19	7-12	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	13-18	20-28	11-16	Moderate Breeze	Dust and loose paper are raised. Small branches begin to move.
5	19-24	29-38	17-21	Fresh Breeze	Small trees begin to sway.
6	25-31	39-49	22-27	Strong Breeze	Large branches are in motion. Whistling is heard in overhead wires. Umbrella use is difficult.
7	32-38	50-61	28-33	Near Gale	Whole trees in motion. Some difficulty experienced walking into the wind.
8	39-46	62-74	34-40	Gale	Twigs and small branches break from trees. Cars veer on road.
9	47-54	75-88	41-47	Strong Gale	Larger branches break from trees. Light structural damage.
10	55-63	89-102	48-55	Storm	Trees broken and uprooted. Considerable structural damage.
11	64-72	103-117	56-63	Violent Storm	Widespread damage to structures and vegetation.
12	> 73	> 117	> 64	Hurricane	Considerable and widespread damage to structures and vegetation. Violence.

Source: National Weather Service

Figure 4-59 depicts wind zones for the United States. The map denotes that Plumas County falls into Zone I, which is characterized by high winds of up to 130 mph. Portions of the County are also located in a special wind hazard region, which is a result of foehn winds (as discussed above).

Figure 4-59 Wind Zones in the United States

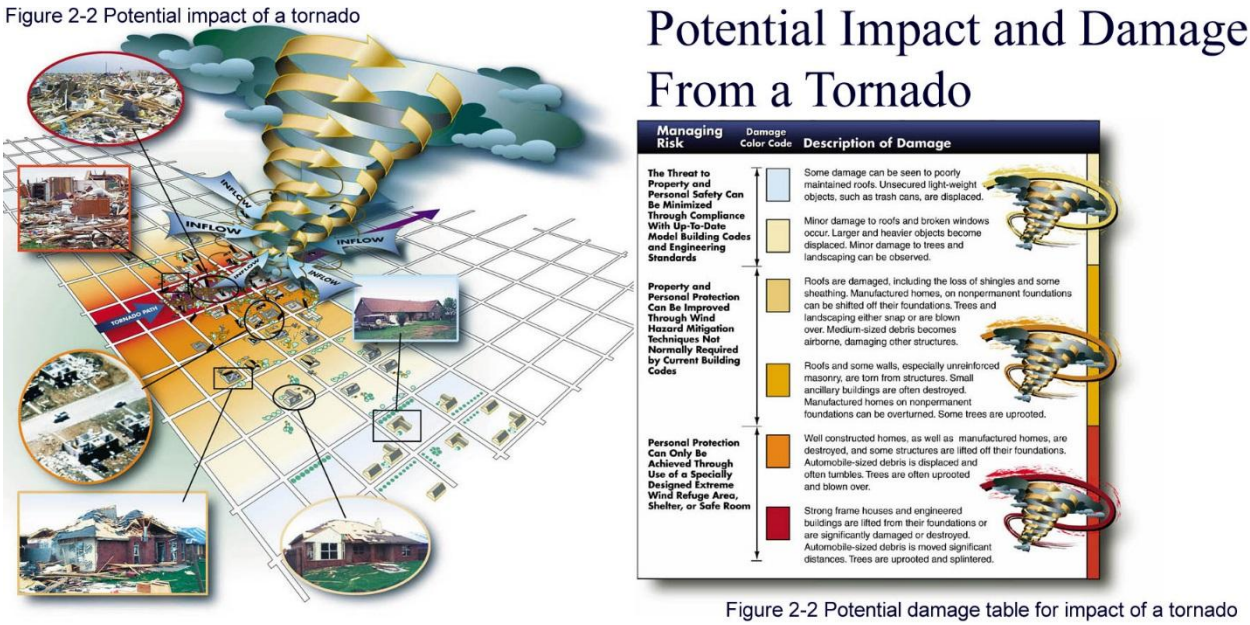


Source: FEMA

Tornadoes

Tornadoes and funnel clouds can also occur during these types of severe storms. Tornadoes are another severe weather hazard that, though rare, can affect lower elevations within the Plumas County Planning Area, but most often in the lower elevation, and primarily occur during the storm season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential across a path only 300 yards wide or less as 300-mile-wide hurricanes. Figure 4-60 illustrates the potential impact and damage from a tornado.

Figure 4-60 Potential Impact and Damage from a Tornado



Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

Location and Extent

Tornadoes, while rare, can occur lower elevation locations in the County, but most often occur in the lower elevations.

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. Table 4-45 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-46 shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 4-45 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/f-scale.html

Table 4-46 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

It is difficult to predict a tornado or the conditions that preclude a tornado far in advance. Tornadoes can strike quickly with very little warning. In California it is rare for tornadoes to exceed EF3 magnitude. Most tornadoes that touch down are not long lived and cause limited damages.

Past Occurrences

Disaster Declaration History

There have been no past federal or state disaster declarations due to high winds or tornadoes, according to Table 4-4. There was one USDA Secretarial Disaster Declaration for high winds from 2016, which can be found in Table 4-51 in Section 4.3.6 below.

NCDC Events

The NCDC data recorded 94 high wind and no tornado incidents for Plumas County since 1950. A summary of these events is shown in Table 4-47.

Table 4-47 NCDC High Wind and Tornado Events in Plumas County 1950-7/31/2024

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
High Wind	88	0	0	1	0	$2,245,500	$0
Strong Wind	4	0	0	0	0	$63,300	$0

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Thunderstorm Wind	2	0	0	0	0	$675,000	$0
Total	**94**	**0**	**0**	**1**	**0**	**$2,983,800**	**$ 0**

Source: NCDC

Hazard Mitigation Planning Committee Events

These section separates events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

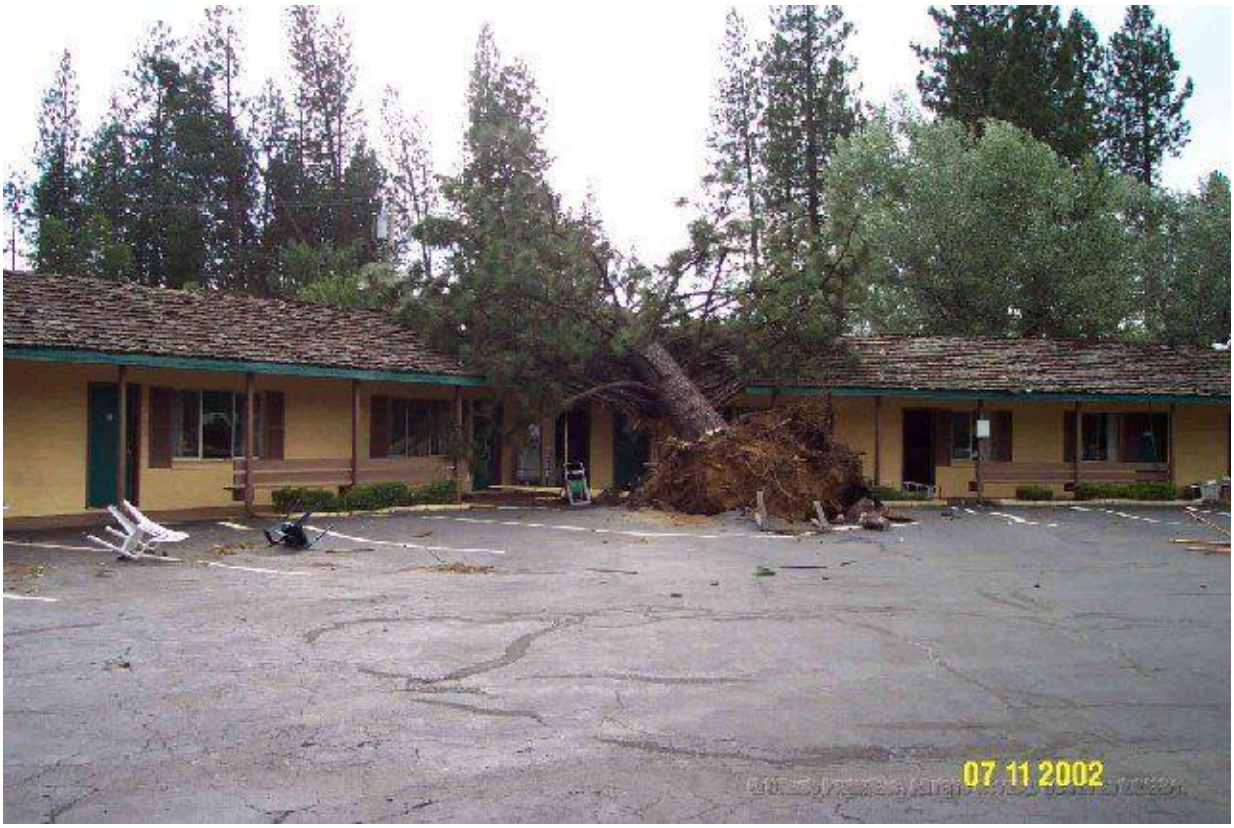
WHAT HAS OCCURRED SINCE 2020? DATES? DAMAGES? PICTURES?

Events before 2019

HMPC also noted the following events:

In **2002**, a microburst occurred in Plumas County. This caused large amounts of damage throughout the County. In all, 122 buildings were damaged. 32 had minor damage, 40 had moderate damage, and 50 had severe damage. Damages to a motel from this event can be seen in Figure 4-61. Total initial damage estimates in the County exceeded $3 million.

Figure 4-61 Damage to Motel from Tree Felled during Microburst in 2002



Source: Plumas County

December 10, 1995 – A member of the HMPC from Viera Ranch noted gale force winds. The Ranch lost parts of the well house roof. Other damages were reported in Quincy.

July 11, 2002 – After a day with 109°F highs, a microburst occurred in Quincy. Damage estimates were unavailable. No injuries or deaths were reported.

February 5th to 7th, 2015 – Heavy rains were accompanied by high winds. Gusts over 45 mph were recorded. Many trees were blown down, and power lines were downed.

July 3, 2015 – The Lake Almanor area was hit with high winds. Wind which toppled trees seemed to cause the biggest losses (in terms of cost). Figure 4-62 shows a house suffering the most damage located on the Lake Almanor peninsula. Based only on observations, this looks to be significant damage and could total $250,000 by itself. Two other houses were damaged on the west shore, but these were much less significant perhaps totaling $75,000. Three vehicles were damaged including a Sheriff Deputy patrol car. Total replacement cost could be another $100,000. Many residents suffered mud and debris problems in yards and driveways, but these were not always reported and not easy to tally for damage estimates. A few of the larger incidents may total $100,000, bringing the total for the event just over $500,000.

Figure 4-62 Plumas County – 2015 Wind Event Damage

January 7th and 8th, 2017 – Heavy rains and winds caused issues in the County. 6.12 inches of rain fell and were accompanied by high winds. This knocked out power in areas of the County.

Likelihood of Future Occurrence

Highly Likely/Unlikely– Based on NCDC data and HMPC input, 94 wind and tornado incidents over a 74-year period (1950-2024) equates to a severe wind event every year. High winds are a well-documented seasonal occurrence that will continue to occur annually in the Plumas County Planning Area. Tornadoes tend to be rare in the County and warrant a likelihood of future occurrence rating of unlikely.

Climate change may increase the chance of future occurrence as well as future impacts. More information on climate change and high winds and tornadoes can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and High Winds

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm wind events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds.

Vulnerability Assessment

Vulnerability—Medium

The Plumas County Planning Area is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern.

The whole of the Planning Area has some measure of vulnerability to high winds and tornadoes. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. The sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The County noted that while there has been some scattered record keeping describing the impacts of windstorms, there is little information to indicate that straight-line winds are little more than a nuisance. For example, while winds can blow weeds that can create an additional expense for farmers, they often cause little long-term damage and there is little justification for allocating resources to combat them. Trees may be downed in the County. As detailed in the wildfire discussion, one of the most significant concerns in the County is the effect of high winds in fueling wildfires. Even before a wildfire starts, high winds can cause PG&E to put PSPS events into effect.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from high winds and tornadoes include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

All populations are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include the unsheltered, residents who live in mobile homes, residents who live in older buildings not built to withstand high winds and that may not have areas to shelter, such as below ground floors, and those working or caught outdoors during a wind or tornado event.

Structures

All structures in the Plumas County Planning Area have some measure of risk from high wind and tornadoes. Though most structures are built to withstand winds, high wind speeds can still cause damages in the Planning Area. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, power lines in the Planning Area can be damaged causing power outages and falling trees can cause damage to nearby structures by falling trees caused by wind. A tornado could also damage power lines. High winds are also a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in California.

Critical Facilities and Infrastructure

Though most critical facilities are built to withstand winds, high wind speeds can still cause damage in the Plumas County Planning Area. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. Winds can cause PSPS events and lead to out-of-control wildfires, which can damage critical facilities and impact their abilities to perform their critical roles in the community.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased levee and streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can cause streambank erosion and impact marsh lands, wetlands, and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

FEMA NRI Hazard Vulnerability Assessment

The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Plumas County's High Winds and Tornadoes are: strong winds and tornadoes. As shown in Table 4-48, strong winds could cause a total of $15,164 in expected annual losses, with a historic loss rating of relatively moderate. Tornadoes could cause a total of $38,006 in expected annual losses with a historic loss ratio rating of very low. Strong winds and tornadoes have a relatively low rating for social vulnerability and a relatively high community resilience, with a risk index score of 5.4 out of 100 for strong winds and 8 out of 100 for tornadoes. According to the NRI, there have been 3 strong wind events between the years 1986-2021 with an average of 0.1 events per year and 0 tornado events on record between the years 1950-2021, with an average of 0.1 events per year.

Table 4-48 Plumas County Planning Area – Strong Wind and Tornado Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Strong Wind	5.4	$15,164	$237,469,962,102	Relatively moderate
Tornado	8	$38,006	$237,469,962,102	Very low

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Severe Weather: High Wind and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires.

Tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the County. Climate change is not likely to affect future tornado conditions.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population in Plumas County is expected to shrink over time. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth (or decline) and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Building codes in the County ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the County from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more resilient community. Utilities at risk to high winds should be undergrounded as new facilities are improved or added. Whether high winds and tornadoes will occur, where, when, and of what intensity are all factors that evolve over the days and hours before they form and after they do. Improved weather forecasts coupled with new information technologies, including social media, have resulted in an increasingly large volume of risk information that is available to people when tornadoes and high winds threaten.

4.3.6. Agricultural Hazards: Severe Weather/ Pests/ Weeds

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

In Plumas County, forest and agriculture lands are a fundamental component of the rural character, historic use, and way of life. Agriculture plays a significant role in the income and history of the County as well as in the current landscape. Agriculture provides not only local food production, agricultural lands make up open space and scenic vistas that are an intrinsic part of the Plumas County environment.

Agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

In addition to severe weather, pests and weeds, including invasive species, can affect the agricultural industry in the County. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. This hazard also addresses the issues related to pests, weeds, and invasive species including those that pose a significant threat to the agricultural industry and are therefore a concern in the Plumas County Planning Area. This hazard does not address pests and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

According to the 2023 Plumas County Crop Report (the most recent available), many commodities are grown in Plumas County. The top three commodities for the County in 2023 were cattle; field crops; and timber products. According to the 2023 Crop Report, Plumas County's 2023 estimated commodity production value is $38,262,907. Timber harvest dropped in 2023. This decrease represents the end of the

Dixie Fire salvage and the resulting loss of harvestable timber in the County. A summation of crop production values, sourced from the Plumas County Agricultural Commissioner's Annual Crop Reports, from 2020-2023 for Plumas County is shown in Table 4-49.

Table 4-49 Plumas County – Value of Agricultural Production 2020-2023

Crop	2020	2021	2022	2023
Apiary	$26,305	$20,734	$54,000	$113,066
Fruit and Vegetable	$285,000	$161,557	$311,359	$311,807
Field Crops	$5,473,000	$4,234,300	$7,676,000	$3,493,359
Livestock Productions	$10,595,000	$13,001,000	$25,572,000	$14,201,134
Livestock & Poultry Products	$36,222	$43,419	$87,110	$29,653
Timber	$16,666,000	$21,790,520	$24,067,294	$14,804,401
Rangeland	$3,300,000	$3,300,000	$3,154,000	$3,291,828
Pastureland	$1,896,000	$1,896,000	$1,902,560	$2,017,659
Organic Crops	$55,358	$70,301	$82,937	$89,560
Total	**$38,332,885**	**$44,517,831**	**$62,907,260**	**$38,262,907**

Source: Plumas County Agricultural Commissioner Reports. Retrieved 4/25/2025.

Natural Disasters and Severe Weather

According to the US Department of Agriculture (USDA), every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include: contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature.

Animal Pests

California is home to a large diversity of wildlife. Human-wildlife conflict can occur when humans and wild animals interact in an unwanted or unsafe way. In California, habitat loss and a changing climate have increased the frequency and type of wildlife incidents reported to the California Department of Fish and Wildlife. It has become more common for people to observe, encounter, and interact with wildlife while recreating outdoors or living in a wildland-urban interface as wild animals search for food and water. (California Department of Fish and Wildlife 2025). The HMPC noted that invasive species in animal groups like wild pigs are causing extensive damage to both residential areas and also agricultural areas. However, feral hog herds are not prevalent in Plumas County at this time.

Insect Pests

Plumas County is threatened by a number of insects that, under the right circumstances, can cause severe economic and environmental harm to the agricultural industry. Insects of concern to plants and crops include the Spongy Moth, Japanese Beetle, and European Pine Shoot Moth. Pest detection is a proactive program that seeks to identify exotic, invasive insects. These pests have wide host ranges and are difficult and costly to manage once established. Early detection is essential for quick and efficient eradication. Public participation is critical to the success of this program, since staff relies on the goodwill of property owners who allow traps to be placed on their properties. The Plumas County Department of Agriculture traps and monitors all these agricultural pests. Bark Beetles and Clear Wing Grasshoppers can also cause great destruction of crops within Plumas County

Weeds (both invasive and native)

Noxious weeds, defined as any plant that is or is liable to be troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, are also of concern. Noxious weeds within the Planning Area include those listed on Table 4-50.

Table 4-50 Plumas County Weeds of Concern

Species of Concern					
Barb Goatgrass	Jointed Goatgrass	Medusahead	Yellow Starthistle	Scotch thistle	Musk Thistle
Scotch Broom	French Broom	Tree of Heaven	Perennial pepperweed	Spotted knapweed	Diffuse Knapweed
Rush Skeletonweed	Musk thistle	Himalayan blackberry	Leafy Spurge	Dalmatian Toad Flax	Puncture vine
Euphorbia	Stinkwort	Saltcedar	Hounds Tongue	Spanish Broom	Dyer's Woad

Source: California Invasive Plant Council

The Plumas County Department of Agriculture uses mechanical and chemical control measures to contain all of these agricultural pests.

Location and Extent

Agricultural hazards occur throughout the County where lands are used for farming and grazing. The County has large swaths of agricultural lands in the non-federally owned areas of the County. These are shown in the Land Use Map for the County on Figure 4-20 above. Areas not as greatly affected by severe weather, insects, and pests are the City of Portola as well as the communities of Chester and Quincy in Plumas County, as well as the upper elevations of the County which all contain fewer agricultural acres. However, while the communities may not be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: insects, weeds, severe weather, as well as downturns in commodity prices. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought

can have a long onset and long duration. Insects and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Wildlife and human interactions can take place anywhere in the County. The extent of these interactions ranges from peaceful viewing at a distance, but can also include deadly encounters for pets, livestock, and people.

Past Occurrences

Disaster Declaration History

The agricultural lands of Plumas County have historically been affected by weather related events such as extreme heat, freeze, heavy rain, and drought. The severe weather events can have devastating effects leading to losses in yield and affecting quality. The US Farm Services Agency provided information on disaster declarations from 2012 through 2024. These are shown in Table 4-51.

Table 4-51 Plumas County – USDA Disaster Declarations 2012 to 2024

Year Declared/Disaster Type	Designation Number	Primary or Contiguous	Begin Date
2012			
Drought-FAST TRACK	S3248	Contiguous	5/31/2012
Drought-FAST TRACK	S3268	Primary	7/12/2012
2013			
Drought – FAST TRACK	S3491	Contiguous	1/1/2013
2014			
Drought – FAST TRACK	S3637	Primary	1/14/2014
2015			
Drought – FAST TRACK	S3784	Primary	1/1/2015
2016			
Drought – FAST TRACK	S3952	Primary	1/1/2016
Excessive rain, high winds, cold temperatures, and hail	S4170	Contiguous	3/1/2016
2017			
–	–	–	–
2018			
Drought – FAST TRACK	S4349	Contiguous	2/28/2018
2019			
–	–	–	–
2020			
Drought – FAST TRACK	S4675	Primary	4/14/2020
Drought – FAST TRACK	S4691	Primary	4/21/2020

Year Declared/Disaster Type	Designation Number	Primary or Contiguous	Begin Date
Drought – FAST TRACK	S4697	Contiguous	4/21/2020
2021			
Drought – FAST TRACK	S4916	Primary	10/1/2020
2022			
Drought – FAST TRACK	S5146	Primary	4/8/2022
Freeze	S5229	Contiguous	7/1/2022
Freeze	S5332	Contiguous	4/12/2022
2023			
Drought – FAST TRACK	S5371	Primary	10/1/2022
Freeze	S5556	Contiguous	2/16/2023
2024			
–	–	–	–

Source: US Farm Service Agency

NCDC Events

The NCDC does not track agriculture events.

Hazard Mitigation Planning Committee Events

These sections separate events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

The County noted the following recent events:

2022 – The HMPC noted that agriculture events occur yearly, though with varying levels of damages to a variety of crops. The 2021 Plumas County Crop Report noted that 2021 saw multiple issues that affected the agricultural industry in the County. Drought has had large impacts in the County.

> ***Due to the severity of the drought Plumas County was experiencing single digit relative humidity (RH) during the summer of 2021. This resulted in a lack of forage for livestock as well as a decrease in hay production. The lack of livestock feed had a ripple effect in that most of the ranchers had to reduce their herds to match the available forage.***
>
> ***On July 13, 2021, Plumas County dealt with another devastating blow, the Dixie Fire started to burn and continued to burn until October consuming half of the range land in as well as half of the timberland in Plumas County. It takes three years for the rangeland to recover and 70 years for timber to grow back. In 2021 and 2022 there was a spike in timber harvest receipts as there is a two-year window in which to harvest trees after a fire.***

The following statistics show how the County was affected:

- Timber production rose to $24,002,774 in 2022, due to the Dixie fire timber harvest, and then fell to $14, 804, 401 in 2023 and will continue to decline before stabilizing.
- Total hay tonnage decreased from 24,000 tons in 2022 to 14,000 tons in 2023 due to lack of surface water and grasshoppers.
- In 2021 some agricultural wells ran dry resulting in the loss of high dollar hay acreage that was turned into pasture for grazing.

Summer of 2023 – Grasshoppers are no longer experiencing winter kill due to the warming climate and are decimating pastureland and some hay fields. As the grasshopper population increases so does the blister beetle which feeds on grasshopper eggs. The blister beetle is highly toxic to livestock as well as causing blisters on people. Blister Beetle also affects the marketability of hay.

Events before 2019

Multiple events occurred before 2019. These are captured in other past occurrences in the rest of the hazard sections.

Likelihood of Future Occurrence

Highly Likely—As long as severe weather events, insects, pests, and weeds continue to be an ongoing concern to the Plumas County Planning Area, the potential for agricultural losses remains.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and agricultural hazards can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Agricultural Hazards

According to the 2021 CAS (as well as the 2024 Draft CAS), addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

The 2023 California State Hazard Mitigation Plan noted that California farmers contend with a wide range of crop-damaging invasive pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. It also noted that change in climate can directly impact crop growth through new temperature patterns and northward shifts of pests and disease. Additionally, longer growing seasons may enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Finally, the 2023 State Plan noted that temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the life cycles of many insects, suggesting that pest

problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed.

Vulnerability Assessment

Vulnerability—High

According to historical hazard data, severe weather affecting agriculture and agricultural pests and weeds are an annual occurrence in the Plumas County Planning Area. If left unchecked, insects, pests, and weeds, including invasive species can threaten native species, biodiversity, ecosystem services, recreation, water resources, agricultural and forest production, cultural resources, economies and property values, public safety, and infrastructure.

The whole of the Planning Area has some measure of vulnerability to agricultural hazards. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions and Districts can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

USDA Concerns

According to the USDA, every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. Specific impacts by hazard are listed below:

- Drought's most severe effects on agriculture include water quality and quantity issues. Other impacts include decreased crop yields, impact to feed and forage, altered plant populations and tree mortality.
- Earthquakes, though rare in Plumas County, can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on agricultural production and the environment. These impacts could include loss of harvest or livestock and destruction of irrigation systems and other agricultural infrastructure.

- Extreme cold may result in loss of livestock, increased deicing, downed power lines, and increased use of generators. Deicing can impact agriculture by damaging local ecosystems and contaminating water bodies. Downed power lines cause people to run generators more often, which can release harmful air pollutants.
- Hot weather and extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock.
- Wildfires can spread quickly and devastate thousands of acres of land, which may include agricultural lands. This devastation could lead to large losses in crops, forestry, livestock, and agricultural infrastructure.
- Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.
- The County sees lots of alfalfa loss during heavy storm/rain and flood events. The alfalfa sits in these temporary "lakes" and rots. Additionally, ranchers can't get the cattle in these areas when wet/flooded.
- Landslides and debris flow occur in all 50 states and commonly occur in connection with other major natural disasters such as earthquakes, volcanoes, wildfires, and floods. Some of the threats from landslides and debris flow include rapidly moving water and debris that can cause trauma; broken electrical, water, gas, and sewage lines; and disrupted roadways and railways. This can lead to agricultural impacts including contamination of water, change in vegetation, and harvest and livestock losses.

The Plumas County Agricultural Commissioner noted that of the above, the County is most concerned with drought, freeze, and insect infestations.

Climate Change and Ag Hazards

A recent report from the Intergovernmental Panel on Climate Change shows that the climate crisis has already affected or resulted in the loss of ecosystems, and global warming will likely reach or exceed 1.5°C in the near-term. Agricultural experts warn that these changes are already threatening crop productivity worldwide. Extreme heat has a significant impact on crops, particularly affecting hay crops, rangeland, and livestock gains. Unusually hot temperatures cause smaller harvests and rising food prices, a phenomenon known as "heatflation". This is also true with timber and other high value Plumas County crops.

Wildlife Interactions

Wildlife and human interactions can take place anywhere in the County. The extent of these interactions ranges from peaceful viewing at a distance, but can also include deadly encounters for pets, livestock, and people. Wildlife and human interaction can present the following hazards in Plumas County:

Wildlife – Vehicle Collisions

Vehicle collisions with wildlife are an ongoing concern across Plumas County. Large animals such as deer, pronghorn, bears, mountain lions, and wolves cross rural roads, often at dawn and dusk. Vehicle drivers on narrow winding roads may encounter wildlife with little to no time to avoid an accident.

Wolf Attacks

Plumas County issued an emergency declaration on April 15, 2025, for the devastating economic toll wolves are having on ranchers in the county. Wolves have shown a lack of fear towards humans, attacking livestock near homes where both adults and children are present. Incidents in 2025 have shown that the wolves killed cattle without feeding on them, suggesting reasons beyond hunger. This behavior poses an imminent danger to local livestock producers and the families living and working on affected properties. Between January and June 6, 2025, the California Department of Fish and Wildlife reported 42 confirmed or probable wolf depredations. Ranchers and homeowners are not allowed to shoot at or around the wolves because of their protected status under the California Endangered Species Act. Deterrent measures such as electric fencing, turbo fladry, and full-time riders in the herds have not proven to be feasible or cost-effective.

Bear Conflict

According to the Plumas County Sheriff's Office bears are a weekly nuisance in the spring, summer, and fall, but they are usually not a public safety issue. Some bears have been known to break into homes, sheds and barns and cause much destruction in the process. Visitors and residents can mitigate the hazard by properly storing food and trash so as not to attract bears. Electric fencing is also a recommended mitigation measure. Bears also cause agricultural losses through livestock depredation and apiary destruction.

Mountain Lions

Mountain Lions are now frequently observed in rural communities. Most often they will prey on dogs and cats that are outside at night. Livestock depredation is also a known occurrence. Night penning can be a mitigation measure to prevent attacks. A Mountain Lion interacting directly with humans is considered a public safety concern.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from agricultural hazards include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

Agricultural hazards (severe weather, pests and weeds, both native invasive species) have a minimal effect on people and populations in Plumas County, including vulnerable populations. However, damage to crops

from invasive and nuisance species can cause significant increases in food prices and food insecurity among low-income communities.

Structures

Structures in Plumas County may be indirectly affected by agricultural hazards. The effects of severe weather on structures are included in the discussions on severe weather above. This section focuses then on native and invasive species, pests, and weeds. Some species can impact vegetation and can result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly causing foundation issues for nearby structures. If species cause trees and other vegetation to die, there is an increased risk of damage to roadways, powerlines, and buildings, and increased risk to wildfire. Some invasive plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other nuisance plant species have been known to clog culverts and streams, increasing flooding risk.

Critical Facilities and Infrastructure

Critical facilities and infrastructure in Plumas County may be affected by agricultural hazards, though these effects are expected to be limited. The effects of severe weather on critical facilities are included in the discussions on severe weather above. This section focuses then on native and invasive species and insects, pests, and weeds. The 2023 State of California Hazard Mitigation Plan noted that water treatment plants could be impacted by invasive and nuisance species. Water that becomes polluted due to increased sedimentation and erosion will require additional treatment. If the system becomes clogged with these pollutants or with invasive aquatic species, the ability of water treatment plants to operate may become impaired. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

Natural, Historic, and Cultural Resources

Natural resources can be affected by agricultural hazards. The effects of severe weather on these resources are included in the discussions on severe weather above. This section focuses then on invasive species and pests. Negative impacts of pests and weeds to natural resources include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat.

Historic and cultural resources have a more limited risk from agricultural hazards.

FEMA NRI Hazard Vulnerability Assessment

Agricultural hazards are not an NRI hazard; therefore, no data is presented.

Impacts from Agricultural Hazards

According to the California Invasive Plants Council. California annually suffers over $3 billion in agricultural losses due to these invasive species. The magnitude of this problem cannot be understated, as both the United States and California Departments of Agriculture are mandated to protect against the invasion of exotic pests and diseases.

The consequences of agricultural disasters to the Planning Area include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products). When these hazards cause a mass die-off of livestock, other issues occur that include the disposal of animals, depopulation of affected herds, decontamination, and resource problems. Those disasters related to severe weather may also require the evacuation and sheltering of animal populations. Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community and the entire Plumas County Planning Area.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future conditions that may impact the agricultural industry in Plumas County.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Plumas County is expected to decrease. Population changes are unlikely to affect the vulnerability of the County to this hazard unless the population growth significantly increases, displacing agricultural uses. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Limited growth is occurring in the County, which should result in limited changes to land uses that would affect the agricultural industry. As the County continues to add new development, land uses may change resulting in a reduction in agricultural uses. However, for the next five years covered by this LHMP Update, changes

in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development in the County is not likely to have an impact on agricultural hazards in Plumas County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing. In addition, the HMPC did note that with additional development in the County, there may be additional competition for water resources thus possibly impacting the agricultural industry.

4.3.7. Climate Change

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Climate change is the distinct change in measures of weather patterns over a long period of time, ranging from decades to millions of years. More specifically, it may be a change in average weather conditions such as temperature, rainfall, snow, ocean and atmospheric circulation, or in the distribution of weather around the average. While the Earth's climate has cycled over its 4.5-billion-year age, these natural cycles have taken place gradually over millennia, and the Holocene, the most recent epoch in which human civilization developed, has been characterized by a highly stable climate – until recently.

This LHMP Update is concerned with human-induced climate change that has been rapidly warming the Earth at rates unprecedented in the last 1,000 years. Since industrialization began in the 19th century, the burning of fossil fuels (coal, oil, and natural gas) at escalating quantities has released vast amounts of carbon dioxide and other greenhouse gases responsible for trapping heat in the atmosphere, increasing the average temperature of the Earth.

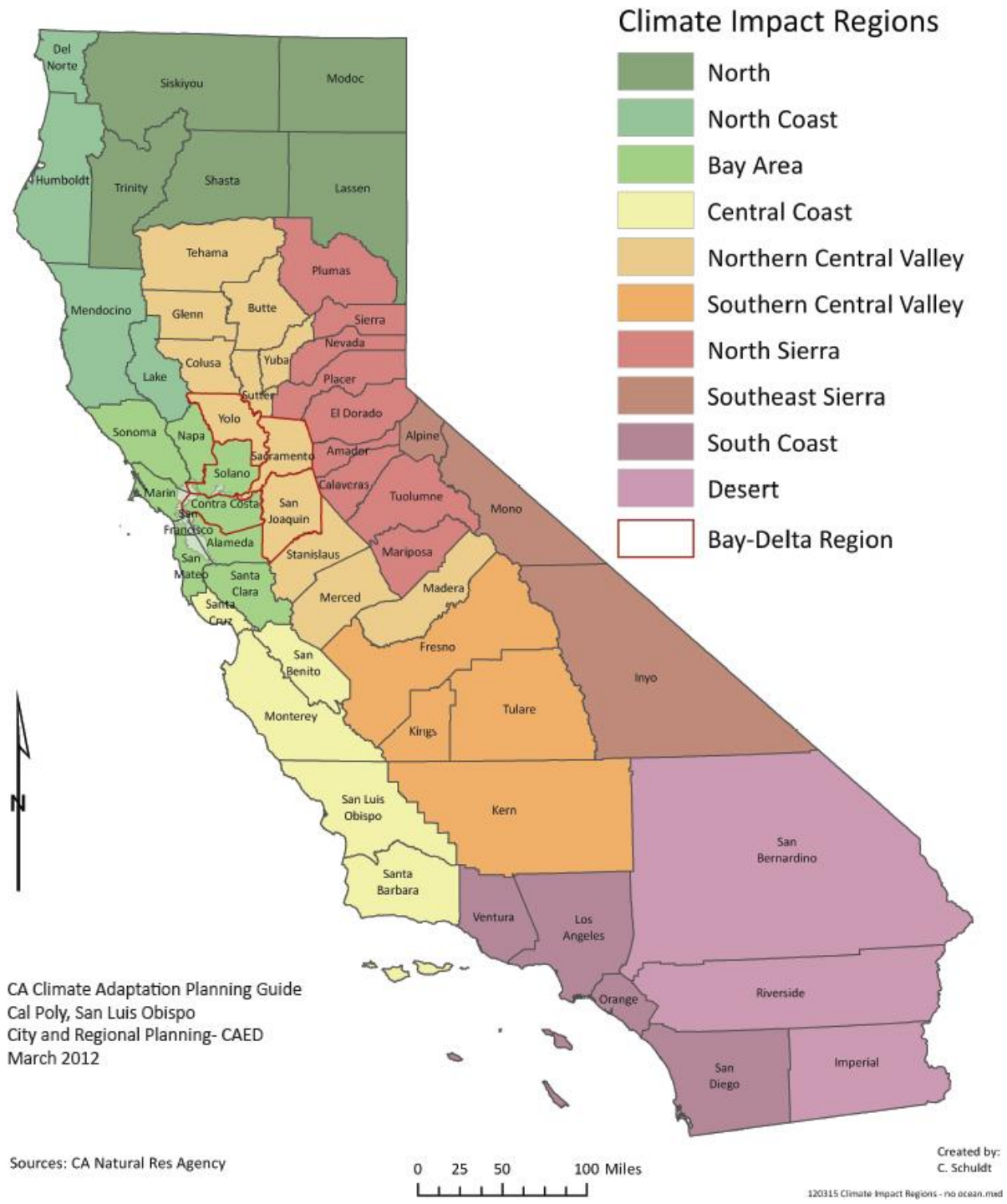
In Plumas County, the HMPC noted that each year it seems to get a bit warmer. California's Adaptation Planning Guide (APG): Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Plumas County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. Table 4-52 provides a summary of Cal-Adapt Climate Projections for the North Sierra Valley Region.

Table 4-52 North Sierra Region and Plumas County – Cal-Adapt Climate Projections

Effect	Ranges
Temperature Change, 1990-2100	January increase in average temperatures: 2.5 °F to 4°F by 2050 and 6°F to 7°F by 2100. The largest changes are observed in the southern part of the region. July increase in average temperatures: 4 °F to 5°F by 2050 and 10°F by the end of the century, with the greatest change in the northern part of the region. (Modeled average temperatures; high emissions scenario)
Precipitation	Precipitation decline is projected throughout the region. The amount of decrease varies from 3 to 5 inches by 2050 and 6 inches to more than 10 inches by 2100, with the larger rainfall reductions projected for the southern portions of the region. (Community Climate System Model Version 3 (CCSM3) climate model; high carbon emissions scenario)
Heat wave	Heat waves are defined as five consecutive days over 83 °F to 97°F depending on location. By 2050, the number of heat waves per year is expected to increase by two. A dramatic increase in annual heat waves is expected by 2100, eight to 10 more per year.
Snowpack	Snowpack levels are projected to decline dramatically in many portions of the region. In southern portions of the region, a decline of nearly 15 inches in snowpack levels - a more than 60 percent drop - is projected by 2090. (CCSM3 climate model; high carbon emissions scenario)
Wildfire	Wildfire risk is projected to increase in a range of 1.1 to 10.5 times throughout the region, with the highest risks expected in the northern and southern parts of the region. (Geophysical Fluid Dynamics Laboratory (GFDL) climate model; high carbon emissions scenario)

Source: Cal-Adapt 2017/2023.

Figure 4-63 Plumas County – Climate Impact Regions



Source: Cal-Adapt 2017/2023

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the County. There is no scale to measure the extent of climate change. Climate change exacerbates other hazard, such as drought, extreme

heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters, as shown in Table 4-4.

NCDC Events

The NCDC does not track climate change events.

Hazard Mitigation Planning Committee Events

While the HMPC noted that climate change is of concern, no specific climate change incidents could be recalled. HMPC members noted that the strength of storms does seem to be increasing, and the temperatures seem to be getting hotter. The HMPC also noted that snow levels seem to be higher (or larger) each year, and the recent atmospheric river winter rains were more intense. In addition, the Plumas County Air Quality District noted that within the last five years, Plumas County has experienced extreme droughts that have affected the health of the forest. The lack of rain lead to the Bark Beetle infestation, causing thousands upon thousands of trees to die. This has led to large areas of Plumas County to be declared high fire hazard zones as well. The combined effects of the drought, decline in the health of the forest, temperature changes, and wildfires in and around neighboring counties, much contributed to climate change, have also steered our way to poor air quality.

Likelihood of Future Occurrence

Highly Likely – Climate change is virtually certain to continue without immediate and effective global action. According to NASA, 2024 was one of the hottest years on record. Without significant global action to reduce greenhouse gas emissions, the United Nations Intergovernmental Panel on Climate Change (IPCC) concludes in its Sixth Assessment Synthesis Report (2022) that average global temperatures are likely to exceed 1.5°C by the end of the 21st century, with consequences for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges.

Climate Scenarios

The United Nations IPCC developed several greenhouse gas (GHG) emissions scenarios based on differing sets of assumptions about future economic growth, population growth, fossil fuel use, and other factors. The emissions scenarios range from "business-as-usual" (i.e., minimal change in the current emissions trends) to more progressive (i.e., international leaders implement aggressive emissions reductions policies). Each of these scenarios leads to a corresponding GHG concentration, which is then used in climate models to examine how the climate may react to varying levels of GHGs. Climate researchers use many global climate models to assess the potential changes in climate due to increased GHGs.

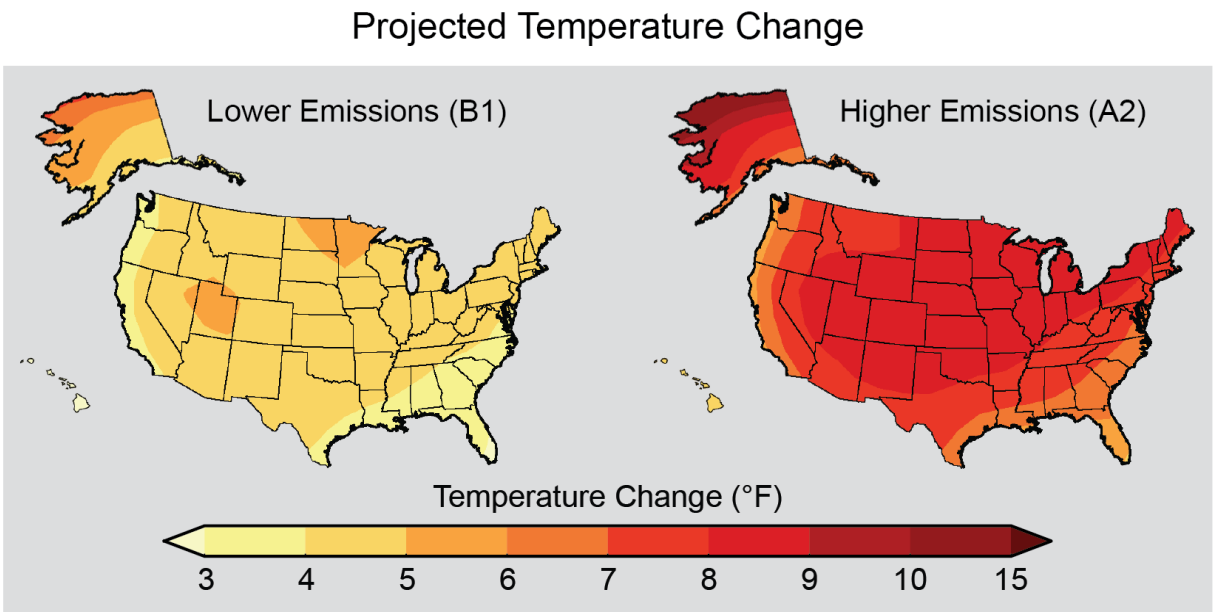
Key Uncertainties Associated with Climate Projections

- Climate projections and impacts, like other types of research about future conditions, are characterized by uncertainty. Climate projection uncertainties include but are not limited to:
  - ✓ Levels of future greenhouse gas concentrations and other radiatively important gases and aerosols,
  - ✓ Sensitivity of the climate system to greenhouse gas concentrations and other radiatively important gases and aerosols,
  - ✓ Inherent climate variability, and
  - ✓ Changes in local physical processes (such as afternoon sea breezes) that are not captured by global climate models.

Even though precise quantitative climate projections at the local scale are characterized by uncertainties, the information provided can help identify the potential risks associated with climate variability/climate change and support long term mitigation and adaptation planning.

Maps show projected change in average surface air temperature in the later part of this century (2071-2099) relative to the later part of the last century (1970-1999) under a scenario that assumes substantial reductions in heat trapping gases and a higher emissions scenario that assumes continued increases in global emissions. These are shown in Figure 4-64.

Figure 4-64 Projected Temperature Change – Lower and Higher Emissions Scenario



Source: National Climate Assessment

According to the California Natural Resource Agency (CNRA), climate change is already affecting California and is projected to continue to do so well into the foreseeable future. Current and projected changes include increased temperatures, sea level rise, a reduced winter snowpack altered precipitation patterns, and more frequent storm events. Over the long term, reducing greenhouse gases can help make these changes less severe, but the changes cannot be avoided entirely. Unavoidable climate impacts can

result in a variety of secondary consequences including detrimental impacts on human health and safety, economic continuity, ecosystem integrity and provision of basic services.

The CNRA's 2021 CAS (as well as the 2024 Draft CAS) delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, and drought:

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Plumas County and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes may increase the probability of floods and levee and dam failures, along with creating issues related to saltwater intrusion.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

Vulnerability to Climate Change

Vulnerability—High

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

The whole of the County is at some measure of vulnerability to climate change. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating

jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Anthropogenic and other greenhouse gasses will continue to cause more extreme climate change conditions unless steps are taken to minimize greenhouse gases and carbon footprints. The County's roadways, infrastructure in flood zones, disadvantaged communities, agriculture sector and sensitives species habitat are among the most vulnerable to climate change impacts.

Climate change threatens the food security and economic viability of agriculture in Plumas County. Drought, flood, and severe weather are all poised to intensify as climate change continues to impact California. Agricultural practices need updating to become resilient and can be part of the solution to climate change in our region.

CAL FIRE noted that wildfires pose several significant public health concerns. Here are some of the chief local concerns:

- Respiratory Issues: Wildfire smoke contains fine particulate matter (PM2.5) that can penetrate deep into the lungs and even enter the bloodstream, exacerbating conditions like asthma, bronchitis, and chronic obstructive pulmonary disease (COPD).
- Cardiovascular Problems: Exposure to wildfire smoke can increase the risk of heart attacks, arrhythmias, and other cardiovascular issues.
- Vulnerable Populations: Certain groups, such as children, the unhoused, the elderly, pregnant women, and those with pre-existing health conditions, are more susceptible to the health impacts of wildfire smoke.
- Mental Health: The stress and trauma from experiencing wildfires and displacement can lead to mental health issues like anxiety, depression, and post-traumatic stress disorder (PTSD).
- Long-term Health Effects: Prolonged exposure to wildfire smoke can have lasting health impacts, including increased rates of respiratory infections and other chronic conditions.
- Emergency Room Visits and Hospitalizations: Increased air pollution from wildfires can lead to a rise in emergency room visits and hospitalizations for respiratory and cardiovascular issues which could overcome our small rural hospital's ability to care for patients.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical infrastructure and vulnerable uses (with community lifelines); natural, historic, and cultural resources; and economic assets

and community activities of value. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning) or transportation, people who are socially isolated and other socially vulnerable or underserved populations (as shown in Special Populations discussion in Section 4.2). Acclimatization to heat may help reduce risks from heat waves in the healthy general population but may not be sufficient to protect those with underlying issues and lack of resources.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the County are expected to undergo improvements and adapt over time to a new climate normal.

Critical Infrastructure and Vulnerable Uses

As with structures, critical and vulnerable facilities in areas of increased wildfire, flood areas, or in other hazard areas exacerbated by climate change, would be at increased risk. Climate change is expected to increase the general vulnerability of critical and vulnerable facilities to natural hazards. Due to the slow onset of climate change, critical and vulnerable facilities and community lifelines in the County are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, and open space areas of the County supports rich biodiversity, including many special-status species. These are all at risk from the effects of climate change. In addition, if heat changes wildfire patterns, all areas (on land) of the County are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, if climate change exacerbates the drought hazard, areas of wetlands in the County may dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

FEMA NRI Hazard Vulnerability Assessment

Climate change is not an NRI hazard; therefore, no data is presented.

Impacts from Climate Change

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Plumas County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Secondary impacts include changes in precipitation patterns, the global water cycle, melting glaciers and ice caps, and rising sea levels. According to the IPCC, climate change will "increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems" if unchecked.

Through changes to oceanic and atmospheric circulation cycles and increasing heat, climate change affects weather systems around the world. Climate change increases the likelihood and exacerbates the severity of extreme weather – more frequent or intense storms, floods, droughts, and heat waves. The 2023 State of California Hazard Mitigation Plan noted that there are direct and secondary impacts:

- Direct Impacts
  - ✓ Increase in average temperature
  - ✓ Changes in annual precipitation
- Secondary Impacts
  - ✓ Increased frequency, intensity, and duration of extreme heat days and heat waves/events
  - ✓ Increased flooding
  - ✓ Increased wildfire
  - ✓ Loss of snowpack and decreased water supplies

Consequences for human society include loss of life and injury, damaged infrastructure, long-term health effects, loss of agricultural crops, disrupted transport and freight, and more. Climate change is not a discrete event but a long-term hazard, the effects of which communities are already experiencing.

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7 °F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.

- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.
- Sea level rise is expected to continue to increase beach, cliff, and bluff erosion.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- As climate change continues to accelerate over time, climate related impacts to the County will continue to increase.
- Climate change can influence population growth in the County over time. While the County is expected to decrease, the County could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. So, while changes in population and population patterns are not expected to increase the impacts associated with this hazard, climate change may instead influence future population growth in the County.
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events due to the changing climate should be taken into account while considering land use planning for the County. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more disaster resilient community.

4.3.8. Dam Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following causes:

- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

The CA DWR Division of Safety of Dams (DSOD) has jurisdiction over impoundments that meet certain capacity and height criteria. Embankments that are less than six feet high and impoundments that can store less than 15 acre-feet are non-jurisdictional. Additionally, dams that are less than 25 feet high can impound up to 50 acre-feet without being jurisdictional. FEMA and CA DWR DSOD assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in four categories that identify the potential hazard to life and property:

- **Extremely High Hazard** – Expected to cause considerable loss of human life or would result in an inundation area with a population of 1,000 or more.
- **High Hazard** – Expected to cause loss of at least one human life.
- **Significant Hazard** – No probable loss of human life but can cause economic loss, environmental damage, impacts to critical facilities, or other significant impacts.
- **Low Hazard** – No probable loss of human life and low economic and environmental losses. Losses are expected to be principally limited to the owner's property.

Location and Extent

According to data provided by Plumas County, CA DWR DSOD, there are 22 dams in Plumas County that were constructed for flood control, storage, treatment impoundments, electrical generation, and recreational purposes. One dam outside the County (Indian Ole in Lassen County – a high hazard dam) could also affect areas inside the County. Of the 23 dams that could affect the County, 1 is rated as Extremely High Hazard, 16 are rated as High Hazard, 4 are rated as Significant Hazard, and 2 are rated as Low Hazard. Table 4-53 gives information on each of the dams in the County, and the dams outside the County that could affect areas in Plumas County.

AT THE MEETINGS IT WAS NOTED THAT THERE ARE LOCAL NAMES FOR SOME OF THE DAMS BELOW. WE WENT WITH DSOD NAME (AS WE HAD DONE LAST TIME). IS THERE A DESIRE TO RENAME ANY OF THESE?

Figure 4-65 Plumas County Dam Inventory (Including Dams from Outside the County)

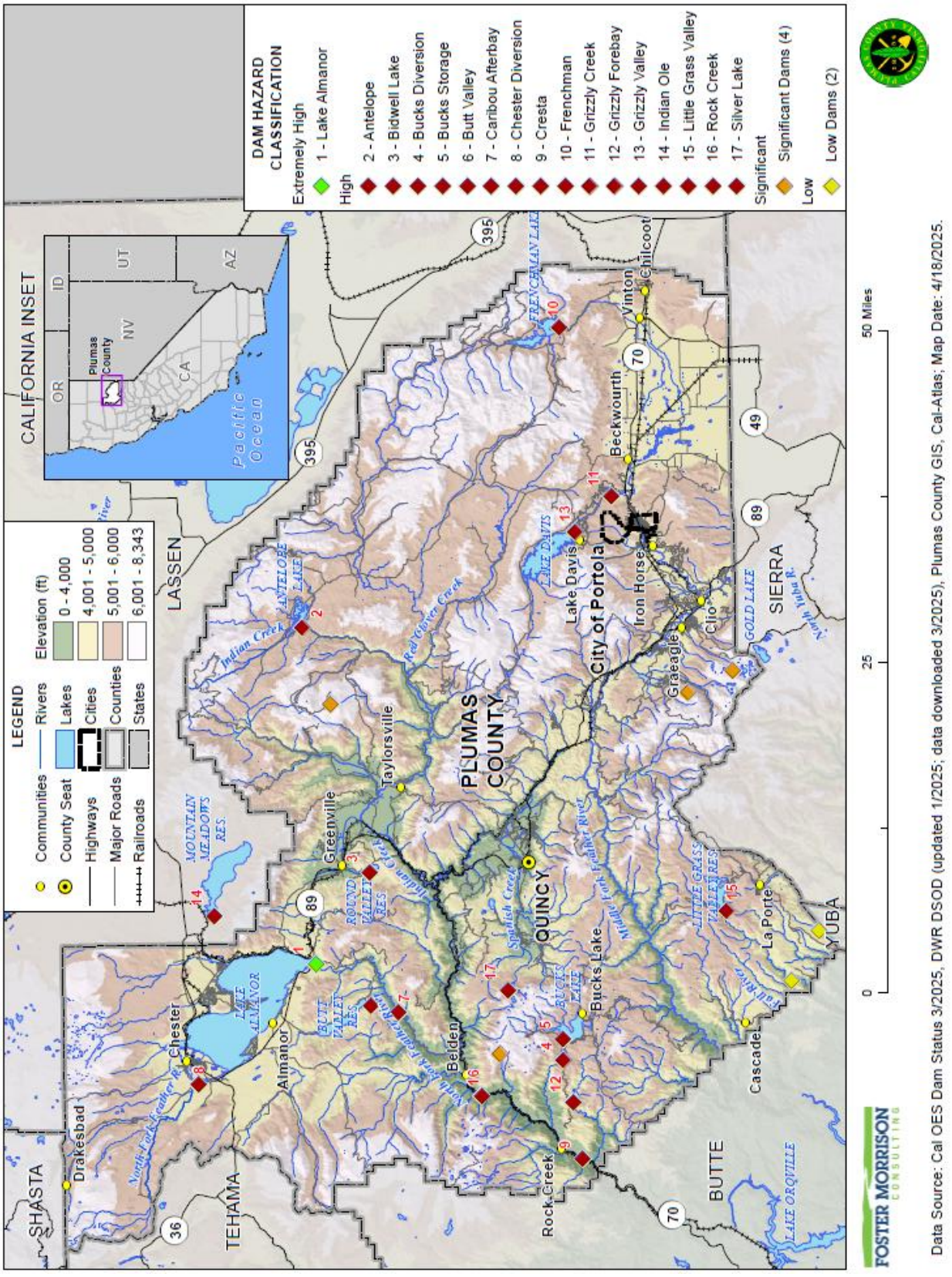


Table 4-53 Plumas County – Dam Inventory (both Inside and Outside the County)

Name	River/Stream	Hazard Classification	Owner	Dam Type	Capacity (acre-ft)	Structural Height (ft)	Year Built
Inside Plumas County							
Antelope	Indian Creek	High	CA DWR	Earth	22,566	113	1964
Bidwell Lake**	Canyon Creek	High	Indian Valley Community Services District	Earth and Rock	5,200	35	1865
Bucks Diversion	Brush Creek	High	PG&E	Earth	5,843	99	1928
Bucks Storage	Brush Creek	High	PG&E	Rockfill	103,000	122	1928
Butt Valley	Butt Creek	High	PG&E	Earth	49,800	106	1924
Caribou Afterbay	North Fork Feather River	High	PG&E	Earth and Rock	2,400	164	1959
Chester Diversion	North Fork Feather River	High	Central Valley Flood Protection Board	Earth	7	47	1975
Cresta	North Fork Feather River	High	PG&E	Gravity	4,400	103	1949
Eureka	Eureka Creek	Significant	California Dept. of Parks and Recreation	Earth	220	29	1866
Frenchman	Last Chance Creek	High	CA DWR	Earth	55,477	139	1961
Grizzly Creek	Big Grizzly Creek	High	Private	Gravity	140	39	1915
Grizzly Forebay	Grizzly Creek	High	PG&E	Arch	1,112	92	1928
Grizzly Valley	Big Grizzly Creek	High	CA DWR	Earth and Rock	83,000	115	1966
Lake Almanor	North Fork Feather River	Extremely High	PG&E	Earth	1,308,000	130	1927
Little Grass Valley	South Fork Feather River	High	South Feather Water and Power Agency	Rockfill	74,730	210	1961
Long Lake	Gray Eagle Creek	Significant	Graeagle Water Company	Rockfill	1,478	12	1938
Lower Three Lakes	Feather River	Significant	PG&E	Rockfill	525	32	1928

Name	River/Stream	Hazard Classification	Owner	Dam Type	Capacity (acre-ft)	Structural Height (ft)	Year Built
Rock Creek	North Fork Feather River	High	PG&E	Gravity	4,660	120	1950
Silver Lake	Silver Creek	High	Soper Wheeler Company	Earth and Rock	650	21	1906
Slate Creek Diversion	Slate Creek	Low	South Feather Water and Power Agency	Arch	643	72	1961
South Fork Diversion	South Fork Feather River	Low	South Feather Water and Power Agency	Earth	88	70	1961
Taylor Lake	Tributary of Indian Creek	Significant	Nature Conservancy	Earth	380	14	1929
Dams Outside the County							
Indian Ole (Lassen County)	Hamilton Creek	High	PG&E	Flashboard and Buttress	24,800	26	1924

Source: DSOD/Cal OES/NID Dam Status 1/25, National Performance of Dams Program

*One Acre Foot=326,000 gallons

**this dam is locally known as Round Valley

Once a list of dams was established, dam inundation layers were obtained from DSOD in GIS. Only extremely high and high hazard dams were analyzed for this LHMP due to the potential for these dams to cause loss of life in the Plumas County Planning Area should a dam failure occur. Dams with an inundation area in the Plumas County Planning Area are shown on Figure 4-66 for extremely high hazard dams, and Figure 4-67 for high hazard dams. All extremely high and high hazard dams had available inundation mapping. Due to the size of Plumas County, inset maps derived from Figure 4-67 were created to zoom in on areas of dam inundation. These are shown from Figure 4-68 through Figure 4-71. Geographic flood extents as shown on the dam inundation maps are detailed by dam in Table 4-54 for both extremely high and high hazard dams. As shown, only the unincorporated County has areas located in the extremely high hazard dam inundation areas. The high hazard dam inundation zones are located in the unincorporated County, as well as in Portola. Information on the City of Portola can be found in its annex to this Plan.

Figure 4-66 Plumas County Planning Area – Extremely High Hazard Dam Inundation Areas

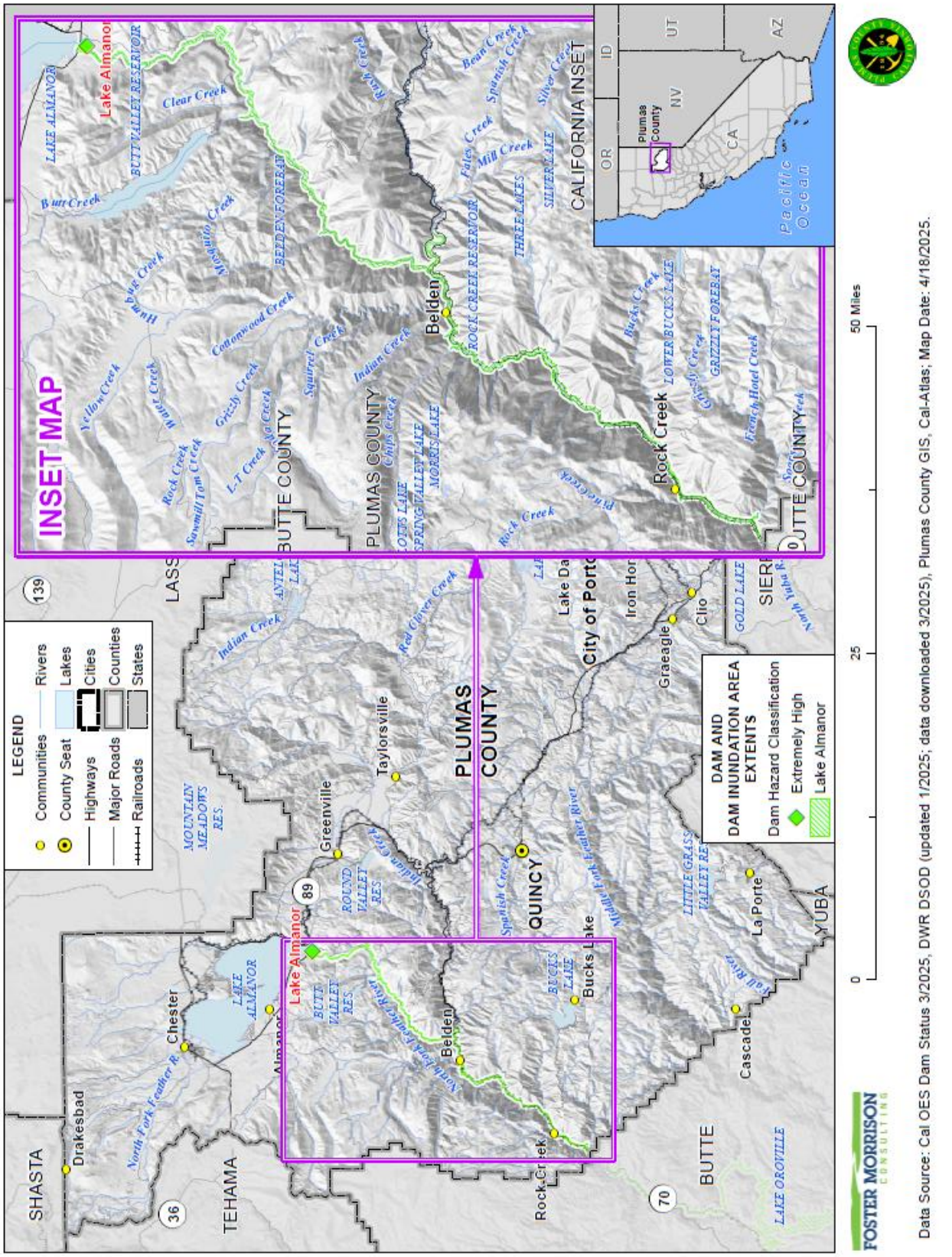


Figure 4-67 Plumas County Planning Area – High Hazard Dam Inundation Areas (Overview and Map Insets)

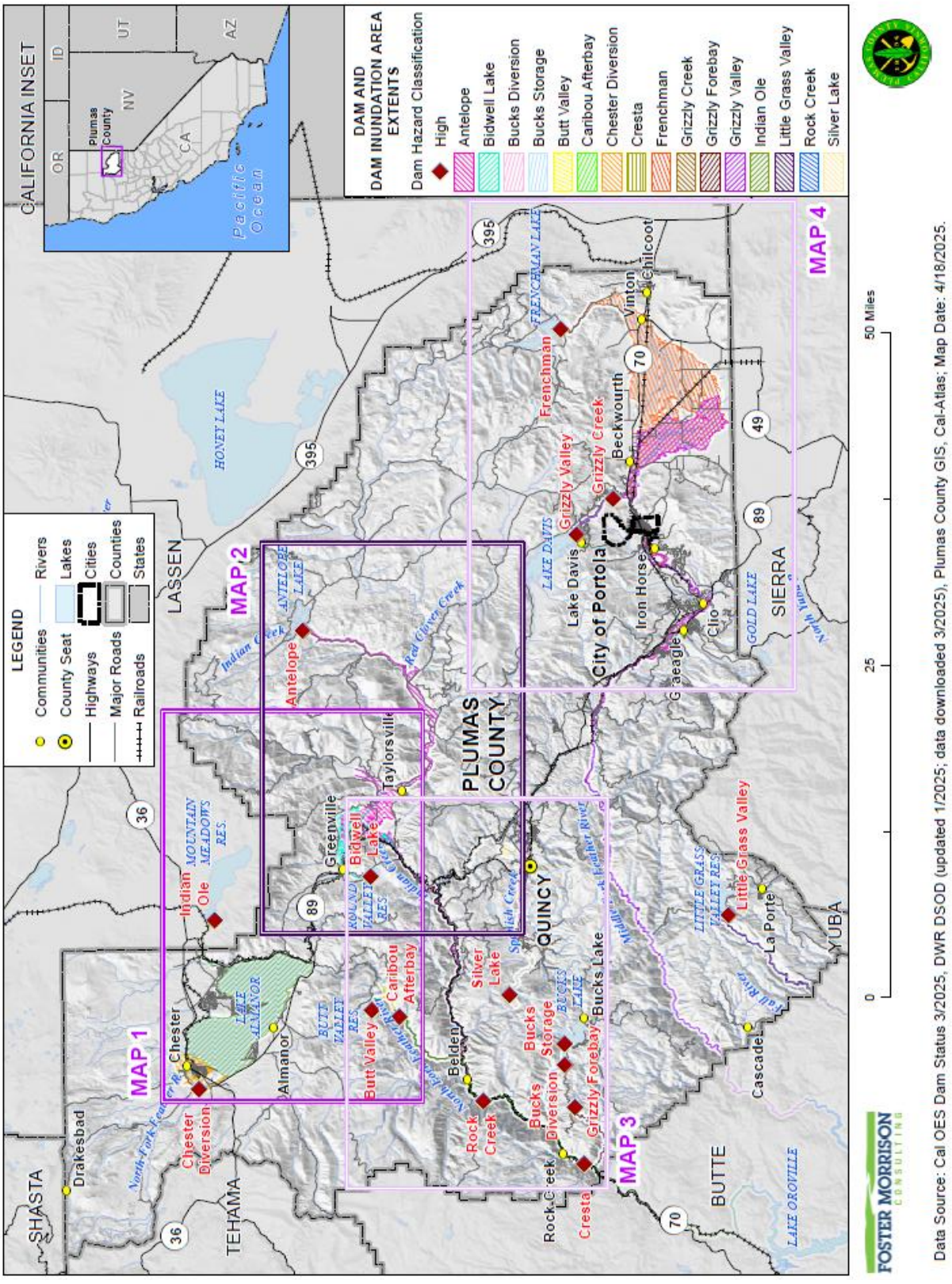


Figure 4-68 Plumas County Planning Area – High Hazard Dam Inundation Areas (Map Inset 1)

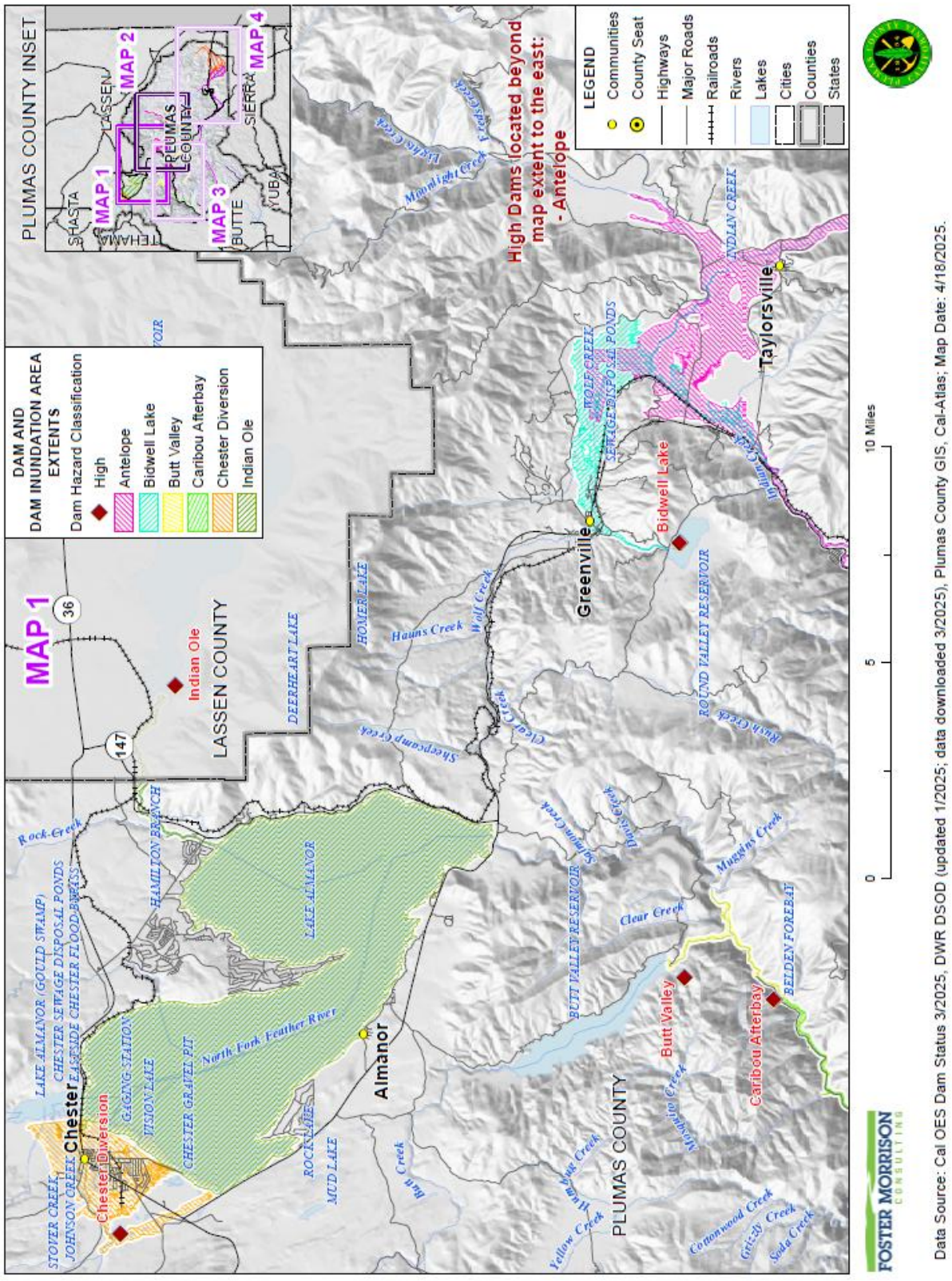


Figure 4-69 Plumas County Planning Area – High Hazard Dam Inundation Areas (Map Inset 2)

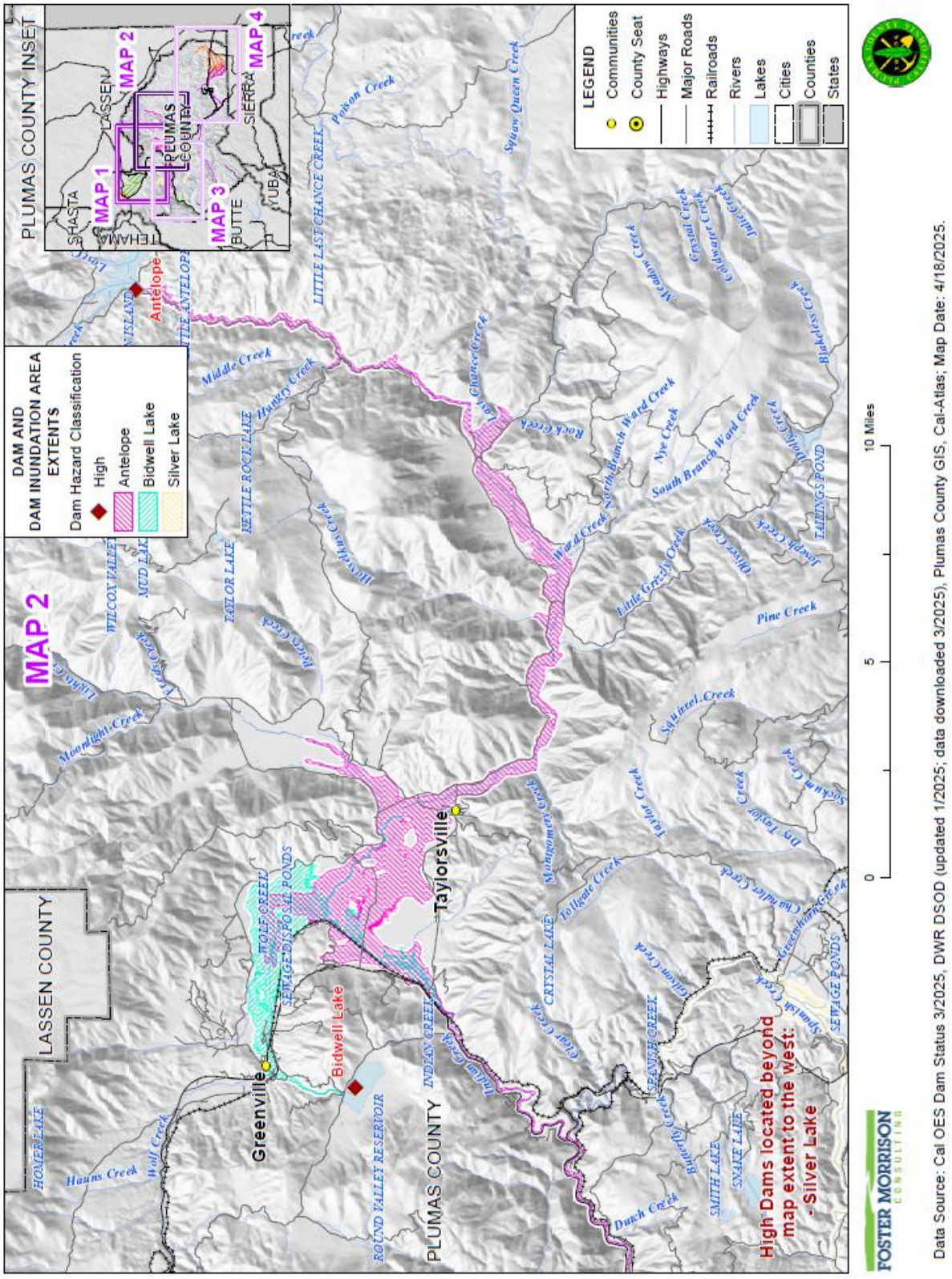


Figure 4-70 Plumas County Planning Area – High Hazard Dam Inundation Areas (Map Inset 3)

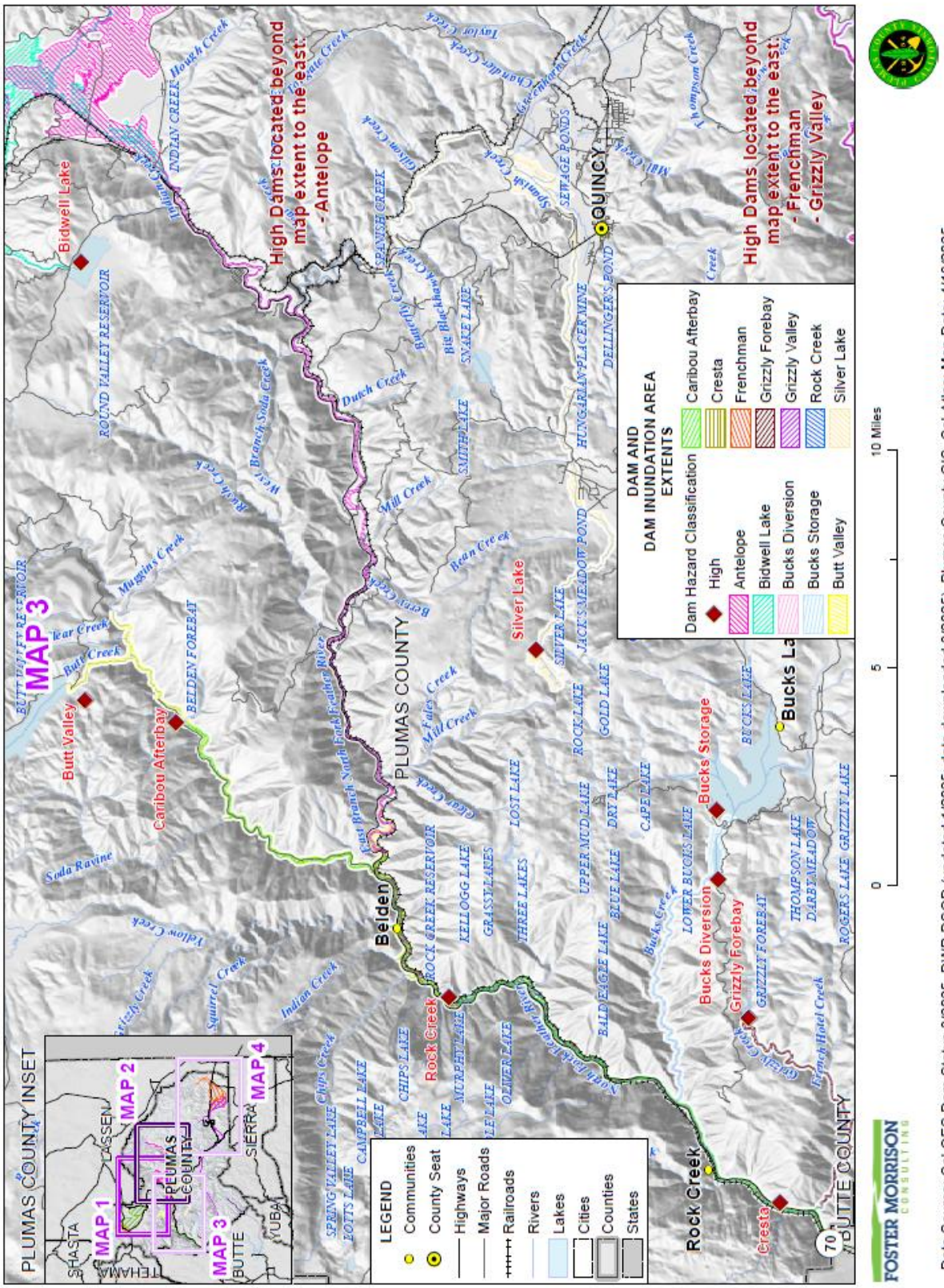


Figure 4-71 Plumas County Planning Area – High Hazard Dam Inundation Areas (Map Inset 4)

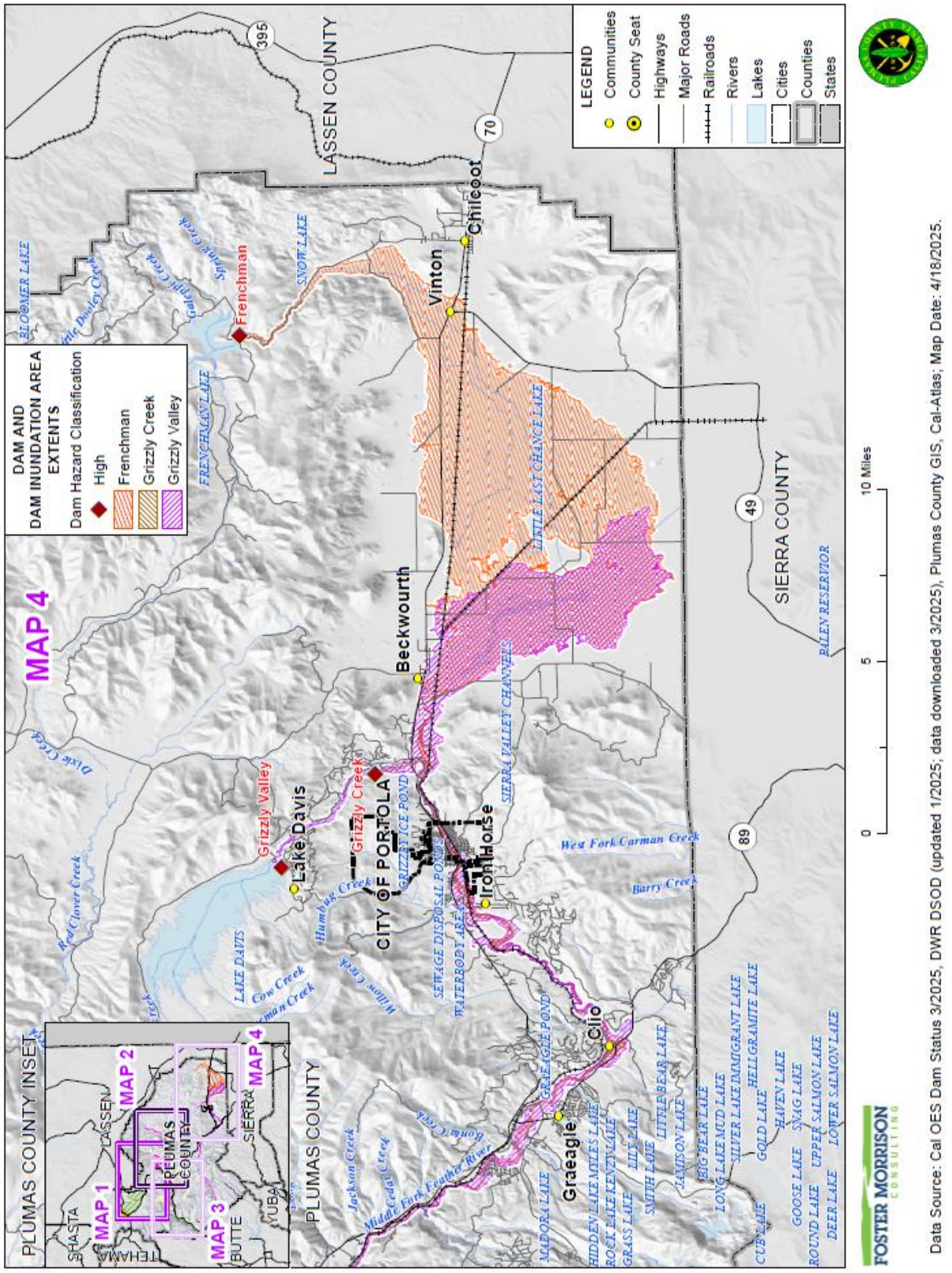


Table 4-54 Plumas County Planning Area–Geographical Dam Inundation Extents

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Extremely High Hazard Dams						
Unincorporated County						
Lake Almanor	2,355	0.14%	19	0.02%	2,337	0.15%
High Hazard Dams						
City of Portola						
Frenchman	78	2.2%	5	0.2%	73	5.8%
Grizzly Creek	61	1.7%	4	0.2%	57	4.5%
Grizzly Valley	234	6.7%	33	1.5%	202	16.1%
Unincorporated County						
Antelope	9,462	0.6%	2,607	2.9%	6,855	0.4%
Bidwell Lake*	2,660	0.2%	509	0.6%	2,151	0.1%
Bucks Diversion	622	0.04%	2	0.002%	621	0.04%
Bucks Storage	833	0.05%	2	0.002%	831	0.05%
Butt Valley	1,648	0.10%	10	0.01%	1,638	0.1%
Caribou Afterbay	983	0.06%	7	0.01%	976	0.06%
Chester Diversion	2,781	0.2%	654	0.7%	2,127	0.1%
Cresta	44	0.003%	0	0.0%	44	0.003%
Frenchman	34,051	2.0%	16,764	18.5%	17,287	1.1%
Grizzly Creek	609	0.04%	81	0.1%	528	0.03%
Grizzly Forebay	192	0.01%	0	0.0%	192	0.01%
Grizzly Valley	16,282	1.0%	3,052	3.4%	13,230	0.8%
Indian Ole	25,743	1.5%	5	0.01%	25,738	1.6%
Little Grass Valley	523	0.03%	0	0.0%	523	0.03%
Rock Creek	571	0.03%	1	0.001%	571	0.04%
Silver Lake	971	0.06%	299	0.3%	672	0.04%

Source: DSOD/Cal OES/NID Dam Status 01/25

*this dam is locally known as Round Valley

There is no scale with which to measure dam failure, only a scale to measure dam failure vulnerability based on size of dam and proximity to development. Dam failure may range from a small breach to a total failure. While a dam may fill slowly with runoff from winter storms, a dam break can have a very quick speed of onset. The duration of dam failure is not long – only as long as it takes to empty the reservoir of water the dam held back.

For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam event). The Plumas County Planning Area would be affected for as long as the flood waters from the dam failure takes to drain downstream.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations related to dam failure in Plumas County, as shown in Table 4-4.

NCDC Events

There have been no NCDC dam failure events in Plumas County.

National Performance of Dams Program Events

The National Performance of Dams Program at Stanford University tracks dam failures. A search of the National Performance of Dams Program database showed no past dam failure events in Plumas County.

Hazard Mitigation Planning Committee Events

No events of dam failure were noted to have occurred in Plumas County.

Likelihood of Future Occurrence

Unlikely—No dam failure events have occurred in the County. Further, based on historical data and input from the HMPC, it is unlikely that major dam failure event will occur in Plumas County. There is concern that many of the State's older dams, including those in Plumas County, could start experiencing problems associated with aging infrastructure and deferred maintenance issues.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and dam failure can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Dam Failure

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Plumas County.

Vulnerability Assessment

Vulnerability—Extremely High

Dam failure flooding can occur as the result of a partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. An earthquake event can also contribute to a

dam failure. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions. Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding.

The whole of the Planning Area has some measure of vulnerability to dam failure. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

WHAT SPECIFIC LOCAL CONCERNS DOES THE COUNTY HAVE? SPECIFIC VULNERABILITY CONCERNS? WHICH AREAS ARE MOST LIKELY AFFECTED? WHICH AREAS WILL MITIGATION EFFORTS FOCUS ON?

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk from Dam Failure

Assets at risk from dam failure include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

Methodology (Location, Parcels, and Structures)

In order to analyze people and populations, structures, and critical facilities at risk in dam inundation areas, GIS was used to quantify those values. The 2024 Plumas County Parcel/Assessor Data was provided by Plumas County and was used as the basis for the inventory of assessed values for both improved and unimproved parcels within the Plumas County Planning Area. The dam inundation areas, obtained from DSOD, were then overlaid on the parcel layer. For the purposes of this analysis, if the dam inundation layer intersected any portion of a parcel polygon, the entire parcel was considered to be in the dam inundation

area. The parcels were segregated and analyzed in this fashion for the entire Planning Area. This analysis was performed on extremely high and high hazard dam inundation areas only. No analyses for significant, low or unknown hazard classification dams analysis were performed.

This dam inundation analysis can be misleading since there are many large polygons throughout the County.

All extremely high and high classification dams in the County have mapped dam inundation areas. Those dams, their hazard classification, mapping status, and whether they inundate areas in Plumas County are shown on Table 4-55.

Table 4-55 Plumas County Planning Area – Dam Inundation Mapping Status and Availability

Dam Number	Source County	Cal OES Dam Inventory		DSOD Dam Inundation Data		Mapped	Plumas County Affected (analyzed)
		Dam Inventory	Previous Plan Classification	DSOD Data Available	DSOD Classification		
1	Plumas County	Lake Almanor	Extremely High	Lake Almanor	Extremely High	Yes	Yes
2	Plumas County	Antelope	High	Antelope	High	Yes	Yes
3	Plumas County	Bidwell Lake	High	Bidwell Lake	High	Yes	Yes
4	Plumas County	Bucks Diversion	High	Bucks Diversion	High	Yes	Yes
5	Plumas County	Bucks Storage	Extremely High	Bucks Storage	High	Yes	Yes
6	Plumas County	Butt Valley	High	Butt Valley	High	Yes	Yes
7	Plumas County	Caribou Afterbay	High	Caribou Afterbay	High	Yes	Yes
8	Plumas County	Chester Diversion	High	Chester Diversion	High	Yes	Yes
9	Plumas County	Cresta	High	Cresta	High	Yes	Yes
10	Plumas County	Frenchman	High	Frenchman	High	Yes	Yes
11	Plumas County	Grizzly Creek	High	Grizzly Creek	High	Yes	Yes
12	Plumas County	Grizzly Forebay	High	Grizzly Forebay	High	Yes	Yes
13	Plumas County	Grizzly Valley	High	Grizzly Valley	High	Yes	Yes
14	Lassen County	Indian Ole	High	Indian Ole	High	Yes	Yes
15	Plumas County	Little Grass Valley	High	Little Grass Valley	High	Yes	Yes

Dam Number	Source County	Cal OES Dam Inventory		DSOD Dam Inundation Data		Mapped	Plumas County Affected (analyzed)
		Dam Inventory	Previous Plan Classification	DSOD Data Available	DSOD Classification		
16	Plumas County	Rock Creek	High	Rock Creek	High	Yes	Yes
17	Plumas County	Silver Lake	High	Silver Lake	High	Yes	Yes
18	Plumas County	Eureka	Significant	Eureka	Significant	Yes	No
19	Plumas County	Long Lake	Significant	Long Lake	No DSOD Inundation/Class Available	No	No
20	Plumas County	Lower Three Lakes	Significant	Lower Three Lakes	Significant	Yes	No
21	Plumas County	Taylor Lake	Significant	Taylor Lake	No DSOD Inundation/Class Available	No	No
22	Plumas County	Slate Creek Diversion	Low	Slate Creek Diversion	No DSOD Inundation/Class Available	No	No
23	Plumas County	South Fork Diversion	Low	South Fork Diversion	No DSOD Inundation/Class Available	No	No

Source: Cal OES/DSOD

People and Populations

All people and populations located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Plumas County residents that live in these dam inundation areas are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the Plumas County Planning Area's residential populations located in these hazard areas, a separate analysis was performed to determine residential populations in the dam inundation areas. The DSOD dam inundation areas were overlayed on the parcel layer and linked to Assessor Data. Those residential parcel polygons that intersect the dam inundation areas were counted and multiplied by the Census Bureau average household factors for each jurisdiction. This is shown in Table 4-56.

Table 4-56 Plumas County Planning Area – Residential Population in Extremely High and High Hazard Dam Inundation Area by Jurisdiction

Dam Inundation Area	City of Portola		Unincorporated Plumas County	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Extremely High Hazard Dams				
Lake Almanor	0	0	8	19
High Hazard Dams				
Antelope	0	0	170	406
Bidwell Lake	0	0	45	108
Bucks Diversion	0	0	0	0
Bucks Storage	0	0	0	0
Butt Valley	0	0	3	7
Caribou Afterbay	0	0	2	5
Chester Diversion	0	0	1,023	2,445
Cresta	0	0	0	0
Eureka	0	0	0	0
Frenchman	13	30	108	258
Grizzly Creek	12	27	29	69
Grizzly Forebay	0	0	0	0
Grizzly Valley	82	188	396	946
Indian Ole (Lassen County)	0	0	143	342
Little Grass Valley	0	0	0	0
Rock Creek	0	0	0	0
Silver Lake	0	0	64	153

Source: Cal OES, DSOD, 2024 Plumas County Parcel/Assessor Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29); Unincorporated Plumas County (2.39).

Structures

Many structures in the Plumas County Planning Area have some measure of risk to dam failure. Dam failure flooding can affect the built environment of many locations in the Plumas County Planning Area. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to total inundation. Analysis by extremely high hazard dam and high hazard dam follows.

Extremely High Hazard Dam Analysis

Parcel counts, land, and improved values (i.e., those with a structure improvement on the parcel), personal property, estimated content replacement values, and total values that fall within each extremely high hazard dam inundation areas in the Planning Area are presented below by dam. For the extremely high hazard dam inundation areas, only the unincorporated County is affected. Breakdowns of parcel counts by property

use in each inundation are for the incorporated jurisdictions in the County are shown in their respective annexes to this LHMP Update. Analysis is presented in the following tables.

- Table 4-57 shows the summary counts and values of parcels in all extremely high hazard dam inundation areas in the Plumas County Planning Area. It should be noted that only the unincorporated County is affected by extremely high hazard dam inundations.
- Table 4-58 shows the count and value of parcels in the Lake Almanor Dam inundation area detailed by property use for the unincorporated County.

Table 4-57 Plumas County Planning Area – Summary Counts and Values of Parcels and Structures in Extremely High Hazard Dam Inundation Area by Dam

Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Lake Almanor	47	12	$1,493,588	$2,266,764	$62,488	$2,049,844	$5,872,684

Source: Cal OES/DSOD, 2024 Plumas County Parcel/Assessor Data

Table 4-58 Unincorporated Plumas County – Count and Value of Parcels and Structures in Extremely High Hazard Dam Inundation Area (Lake Almanor) by Property Use

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Lake Almanor							
Agricultural	2		$55,771	$0	$0	$0	$55,771
Commercial	4	3	$109,485	$1,736,350	$56,350	$1,736,350	$3,638,535
Federal Lands	9	0	$0	$0	$0	$0	$0
Government	2	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$3,716	$0	$0	$0	$3,716
Recreational	1	1	$122,330	$96,574	$638	$96,574	$316,116
Residential	22	8	$1,202,286	$433,840	$5,500	$216,920	$1,858,546
ROW/Utilities	6	0	$0	$0	$0	$0	$0
Unincorporated Plumas County Total	**47**	**12**	**$1,493,588**	**$2,266,764**	**$62,488**	**$2,049,844**	**$5,872,684**

Source: Cal OES/DSOD, 2024 Plumas County Parcel/Assessor Data

High Hazard Dam Analysis

Parcel counts, land, and improved values (i.e., those with a structure improvement on the parcel), personal property values, estimated content replacement values, and total values that fall within each high hazard

dam inundation areas in the Planning Area are presented below by dam. For the high hazard dam inundation areas, both the City of Portola (Frenchman, Grizzley Creek, Grizzly Valley) as well as the unincorporated County is affected. The results are presented in tables below by:

- Table 4-59 shows the shows the summary counts and values of parcels in all high hazard dam inundation areas. This table includes summaries for both the unincorporated County, as well as the City of Portola.
- Table 4-60 shows the count and value of parcels in each high hazard dam inundation area detailed by property use for the unincorporated County.

More information on dam inundations affecting the City of Portola is shown in their annex to this LHMP Update.

Table 4-59 Plumas County Planning Area – Summary Counts and Values of Parcels and Structures in High Hazard Dam Inundation Area by Dam

Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Antelope	445	203	$32,907,880	$41,089,602	$2,946,487	$24,732,037	$101,676,006
Bidwell Lake	276	63	$16,141,238	$12,518,086	$773,289	$9,227,265	$38,659,878
Bucks Diversion	7	1	$64,771	$44,198	$0	$44,198	$153,167
Bucks Storage	10	1	$64,771	$44,198	$0	$44,198	$153,167
Butt Valley	32	6	$588,715	$1,940,477	$56,350	$1,838,414	$4,423,956
Caribou Afterbay	23	5	$211,447	$1,874,126	$56,350	$1,805,238	$3,947,161
Chester Diversion	1,496	1,167	$73,477,181	$200,553,635	$25,417,370	$121,650,730	$421,098,916
Cresta	1	0	$0	$0	$0	$0	$0
Frenchman*	487	187	$47,205,467	$43,065,368	$2,913,406	$30,157,820	$123,342,061
Grizzly Creek*	188	59	$11,183,050	$14,622,880	$65,215	$10,508,935	$36,380,080
Grizzly Forebay	6	0	$59,280	$0	$0	$0	$59,280
Grizzly Valley*	1,207	667	$78,302,639	$136,953,183	$914,730	$90,820,304	$306,990,856
Indian Ole	193	143	$70,765,788	$74,205,539	$3,608	$37,102,770	$182,077,705
Little Grass Valley	7	0	$86,653	$0	$0	$0	$86,653
Rock Creek	8	1	$64,771	$44,198	$0	$44,198	$153,167
Silver Lake	122	64	$8,144,051	$10,846,489	$49,550	$5,859,745	$24,899,835

Source: Cal OES/DSOD, 2024 Plumas County Parcel/Assessor Data

* Affect the City of Portola and the unincorporated County

Table 4-60 Unincorporated Plumas County– Count and Value of Parcels and Structures in High Hazard Dam Inundation Area by Dam and Property Use

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Antelope							
Agricultural	76	21	$10,400,951	$3,369,109	$89,560	$3,369,109	$17,228,729
Commercial	10	8	$1,142,392	$3,834,150	$193,933	$3,834,150	$9,004,625
Federal Lands	16	0	$0	$0	$0	$0	$0
Government	17	0	$0	$0	$0	$0	$0
Industrial	7	2	$483,334	$446,826	$0	$670,239	$1,600,399
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	3	2	$82,464	$277,561	$40,139	$277,561	$677,725
Residential	280	170	$20,798,739	$33,161,956	$2,622,855	$16,580,978	$73,164,528
ROW/Utilities	35	0	$0	$0	$0	$0	$0
Total	**445**	**203**	**$32,907,880**	**$41,089,602**	**$2,946,487**	**$24,732,037**	**$101,676,006**
Bidwell Lake							
Agricultural	22	6	$4,673,292	$1,382,310	$20,260	$1,382,310	$7,458,172
Commercial	24	8	$1,658,161	$4,161,251	$662,673	$4,161,251	$10,643,336
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	11	0	$0	$0	$0	$0	$0
Industrial	8	2	$384,681	$57,661	$0	$86,492	$528,834
Institutional	1	0	$27,886	$0	$0	$0	$27,886
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	4	2	$99,018	$277,561	$40,139	$277,561	$694,279
Residential	175	45	$9,298,200	$6,639,303	$50,217	$3,319,652	$19,307,372
ROW/Utilities	28	0	$0	$0	$0	$0	$0
Total	**276**	**63**	**$16,141,238**	**$12,518,086**	**$773,289**	**$9,227,265**	**$38,659,878**
Bucks Diversion							
Agricultural	2	0	$55,771	$0	$0	$0	$55,771
Commercial	1	1	$9,000	$44,198	$0	$44,198	$97,396
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Residential	1	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Total	**7**	**1**	**$64,771**	**$44,198**	**$0**	**$44,198**	**$153,167**
Bucks Storage							
Agricultural	2	0	$55,771	$0	$0	$0	$55,771
Commercial	1	1	$9,000	$44,198	$0	$44,198	$97,396
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	1	0	$0	$0	$0	$0	$0
Residential	3	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Total	**10**	**1**	**$64,771**	**$44,198**	**$0**	**$44,198**	**$153,167**
Butt Valley							
Agricultural	2	0	$55,771	$0	$0	$0	$55,771
Commercial	4	3	$109,485	$1,736,350	$56,350	$1,736,350	$3,638,535
Federal Lands	9	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	10	3	$423,459	$204,127	$0	$102,064	$729,650
ROW/Utilities	6	0	$0	$0	$0	$0	$0
Total	**32**	**6**	**$588,715**	**$1,940,477**	**$56,350**	**$1,838,414**	**$4,423,956**
Caribou Afterbay							
Agricultural	2	0	$55,771	$0	$0	$0	$55,771
Commercial	4	3	$109,485	$1,736,350	$56,350	$1,736,350	$3,638,535
Federal Lands	6	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Recreational	0	0	$0	$0	$0	$0	$0
Residential	5	2	$46,191	$137,776	$0	$68,888	$252,855
ROW/Utilities	5	0	$0	$0	$0	$0	$0
Total	**23**	**5**	**$211,447**	**$1,874,126**	**$56,350**	**$1,805,238**	**$3,947,161**
Chester Diversion							
Agricultural	13	0	$297,165	$0	$0	$0	$297,165
Commercial	163	121	$17,051,266	$35,160,368	$24,614,834	$35,160,368	$111,986,836
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	33	0	$0	$0	$0	$0	$0
Industrial	19	13	$1,454,167	$2,954,682	$671	$4,432,023	$8,841,543
Institutional	16	9	$307,206	$1,412,790	$11,680	$1,412,790	$3,144,466
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	1	1	$53,060	$265,302	$0	$265,302	$583,664
Residential	1,187	1,023	$54,314,317	$160,760,493	$790,185	$80,380,247	$296,245,242
ROW/Utilities	60	0	$0	$0	$0	$0	$0
Total	**1,496**	**1,167**	**$73,477,181**	**$200,553,635**	**$25,417,370**	**$121,650,730**	**$421,098,916**
Cresta							
Agricultural	0	0	$0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Total	**1**	**0**	**$0**	**$0**	**$0**	**$0**	**$0**
Frenchman							
Agricultural	90	36	$17,901,349	$7,132,959	$2,470,258	$7,132,959	$34,637,525
Commercial	23	16	$2,097,396	$5,229,719	$46,465	$5,229,719	$12,603,299
Federal Lands	16	0	$0	$0	$0	$0	$0
Government	32	0	$0	$0	$0	$0	$0
Industrial	1	0	$83,626	$0	$0	$0	$83,626
Institutional	1	0	$0	$0	$0	$0	$0

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	7	5	$798,618	$1,727,948	$0	$1,727,948	$4,254,514
Residential	203	108	$23,913,007	$24,844,657	$380,018	$12,422,329	$61,560,011
ROW/Utilities	44	0	$0	$0	$0	$0	$0
Total	**418**	**165**	**$44,793,996**	**$38,935,283**	**$2,896,741**	**$26,512,955**	**$113,138,975**
Grizzly Creek							
Agricultural	2	0	$147,112	$0	$0	$0	$147,112
Commercial	15	9	$1,310,886	$2,433,410	$5,500	$2,433,410	$6,183,206
Federal Lands	4	0	$0	$0	$0	$0	$0
Government	13	0	$0	$0	$0	$0	$0
Industrial	1	0	$83,626	$0	$0	$0	$83,626
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	2	2	$138,946	$1,305,609	$0	$1,305,609	$2,750,164
Residential	68	29	$7,447,841	$7,371,019	$43,050	$3,685,510	$18,547,420
ROW/Utilities	19	0	$0	$0	$0	$0	$0
Total	**125**	**40**	**$9,128,411**	**$11,110,038**	**$48,550**	**$7,424,529**	**$27,711,528**
Grizzly Forebay							
Agricultural	2	0	$59,280	$0	$0	$0	$59,280
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Total	**6**	**0**	**$59,280**	$0	$0	$0	**$59,280**
Grizzly Valley							
Agricultural	43	11	$6,190,243	$1,837,037	$103,680	$1,837,037	$9,967,997
Commercial	64	45	$6,309,222	$15,256,180	$113,595	$15,256,180	$36,935,177
Federal Lands	16	0	$0	$0	$0	$0	$0
Government	53	0	$0	$0	$0	$0	$0
Industrial	24	17	$2,243,403	$2,399,030	$190	$3,598,545	$8,241,168

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Institutional	1	1	$9,399	$175,873	$0	$175,873	$361,145
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	53	34	$2,404,275	$5,183,330	$36,430	$5,183,330	$12,807,365
Residential	595	396	$52,209,444	$85,627,475	$253,480	$42,813,738	$180,904,137
ROW/Utilities	69	0	$0	$0	$0	$0	$0
Total	**919**	**504**	**$69,365,986**	**$110,478,925**	**$507,375**	**$68,864,703**	**$249,216,989**
Indian Ole							
Agricultural	5	0	$201,864	$0	$0	$0	$201,864
Commercial	4	0	$371,757	$0	$0	$0	$371,757
Federal Lands	5	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	3	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	159	143	$70,192,167	$74,205,539	$3,608	$37,102,770	$181,504,084
ROW/Utilities	16	0	$0	$0	$0	$0	$0
Total	**193**	**143**	**$70,765,788**	**$74,205,539**	**$3,608**	**$37,102,770**	**$182,077,705**
Little Grass Valley							
Agricultural	2	0	$82,644	$0	$0	$0	$82,644
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	4	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$4,009	$0	$0	$0	$4,009
Recreational	0	0	$0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Total	**7**	**0**	**$86,653**	**$0**	**$0**	**$0**	**$86,653**
Rock Creek							
Agricultural	2	0	$55,771	$0	$0	$0	$55,771
Commercial	1	1	$9,000	$44,198	$0	$44,198	$97,396
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	1	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Total	**8**	**1**	**$64,771**	**$44,198**	**$0**	**$44,198**	**$153,167**
Silver Lake							
Agricultural	10	4	$1,336,802	$856,234	$49,550	$856,234	$3,098,820
Commercial	3	1	$186,866	$16,767	$0	$16,767	$220,400
Federal Lands	8	0	$0	$0	$0	$0	$0
Government	4	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	90	59	$6,620,383	$9,973,488	$0	$4,986,744	$21,580,615
ROW/Utilities	7	0	$0	$0	$0	$0	$0
Total	**122**	**64**	**$8,144,051**	**$10,846,489**	**$49,550**	**$5,859,745**	**$24,899,835**

Source: Cal OES/DSOD, 2024 Plumas County Parcel/Assessor Data

Critical Facilities and Infrastructure

Dam failure presents a threat to critical facilities and infrastructure. For example, transportation routes, including bridges and highways, are vulnerable to dam inundation and have the potential to be unpassable and even destroyed, creating isolation and supply chain issues. Those critical facilities that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. The following GIS analysis identifies critical facilities and infrastructure at risk to dam inundation flooding, separated out by extremely high hazard and high hazard dams.

Extremely High Hazard Dam Inundation Analysis

Dam failure presents a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Plumas County Planning Area to determine critical facilities in extremely high hazard dam inundation areas. Using GIS, the DSOD extremely high hazard dam inundation areas were overlayed on the critical facility GIS layer. Figure 4-72 shows critical facilities, as well as the extremely high hazard dam inundation areas. Table 4-61 details critical facilities by extremely high hazard dam inundation areas by facility type and count for the Planning Area. Details of critical facility category, type, name and address by extremely

high hazard dam inundation areas are listed in Appendix G. As shown, 47 critical facilities fall in the extremely high hazard dam inundation area, all of which are located in the unincorporated County.

Figure 4-72 Plumas County Planning Area – Critical Facilities in Extremely High Hazard Dam Inundation Areas (Overview Map with Inset)

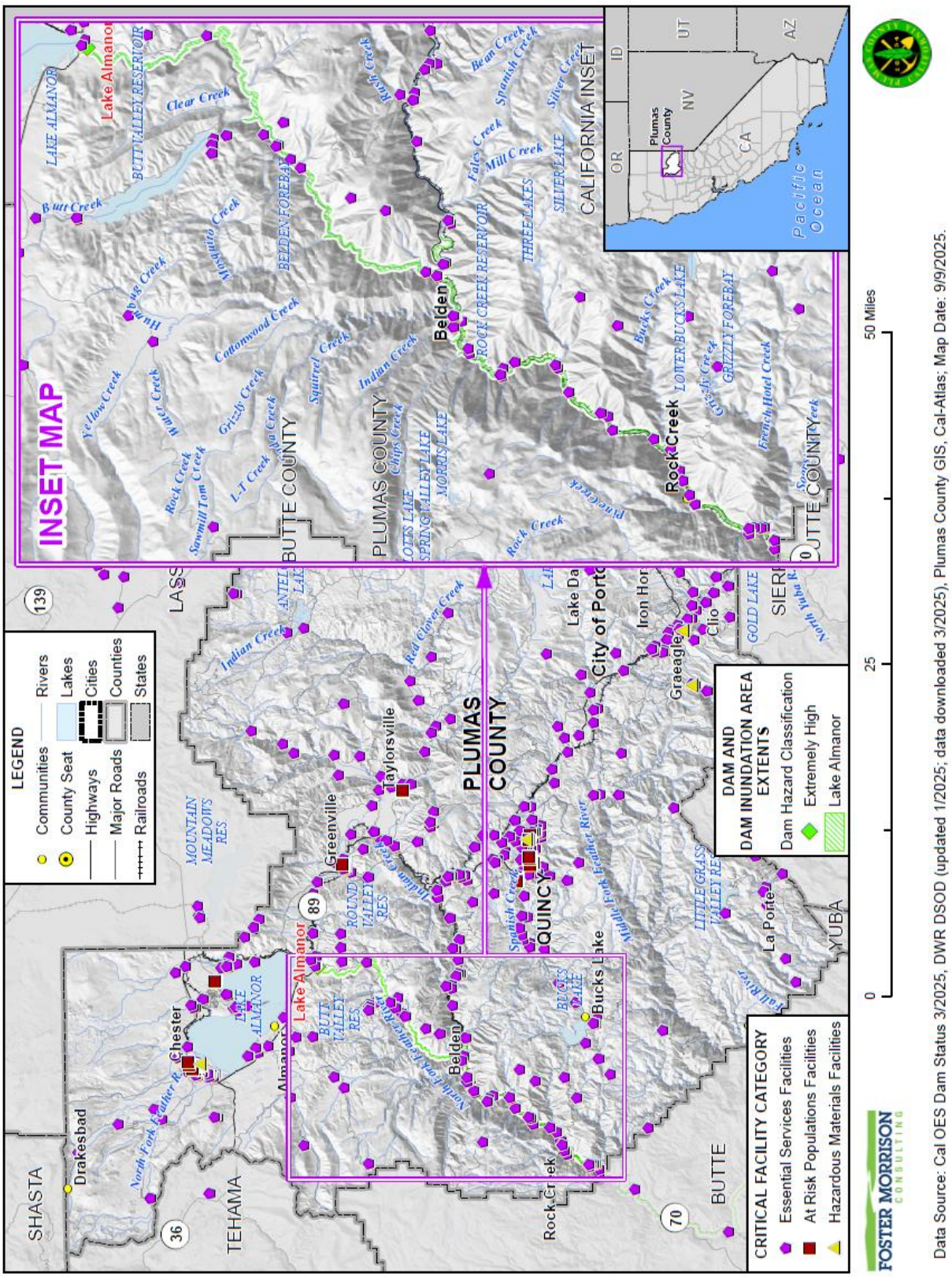


Table 4-61 Plumas County Planning Area – Critical Facilities in Extremely High Hazard Dam Inundation Zones by Jurisdiction and Critical Facility Category

Jurisdiction / Extremely High Hazard Dam Inundation Area	Critical Facility Category	Facility Count
Portola		
Outside of Extremely High Hazard Dam Inundation Area	Essential Services Facilities	16
	At Risk Populations Facilities	8
	Hazardous Materials Facilities	0
	Outside of Extremely High Hazard Dam Inundation Area Total	**24**
Portola Total		**24**
Unincorporated Plumas County		
Extremely High Hazard Dam Inundation Area	Essential Services Facilities	47
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Extremely High Hazard Dam Inundation Area Total	**47**
Outside of Extremely High Hazard Dam Inundation Area	Essential Services Facilities	782
	At Risk Populations Facilities	33
	Hazardous Materials Facilities	4
	Outside of Extremely High Hazard Dam Inundation Area Total	**819**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
Extremely High Hazard Dam Inundation Area	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Extremely High Hazard Dam Inundation Area Total	**2**
Outside of Extremely High Hazard Dam Inundation Area	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Extremely High Hazard Dam Inundation Area Total	**2**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
Outside of Extremely High Hazard Dam Inundation Area	Essential Services Facilities	34
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0

Jurisdiction / Extremely High Hazard Dam Inundation Area	Critical Facility Category	Facility Count
	Outside of Extremely High Hazard Dam Inundation Area Total	**34**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
Outside of Extremely High Hazard Dam Inundation Area	Essential Services Facilities	4
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Extremely High Hazard Dam Inundation Area Total	**4**
Unincorporated Sierra County Total		**4**
Unincorporated Tehama County		
Outside of Extremely High Hazard Dam Inundation Area	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Extremely High Hazard Dam Inundation Area Total	**2**
Unincorporated Tehama County Total		**2**
Grand Total		**934**

Source: Cal OES/DSOD; Plumas County GIS

High Hazard Dam Inundation Analysis

Dam failure presents a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Plumas County Planning Area to determine critical facilities in high hazard dam inundation areas. Using GIS, the DSOD high hazard dam inundation areas were overlayed on the critical facility GIS layer. Figure 4-73 shows critical facilities, as well as the high hazard dam inundation areas. Figure 4-74 through Figure 4-77 show the zoomed inset maps from Figure 4-73. Table 4-62 details critical facilities by high hazard dam inundation areas by facility type and count for the Planning Area. Details of critical facility category, type, name and address by high hazard dam inundation areas are listed in Appendix G. As shown, 8 critical facilities that fall in the high hazard dam inundation area are located in the City of Portola, 186 in the unincorporated County, and 3 in the surrounding counties.

Figure 4-73 Plumas County Planning Area – Critical Facilities in Extremely High Hazard Dam Inundation Areas (Overview Map)

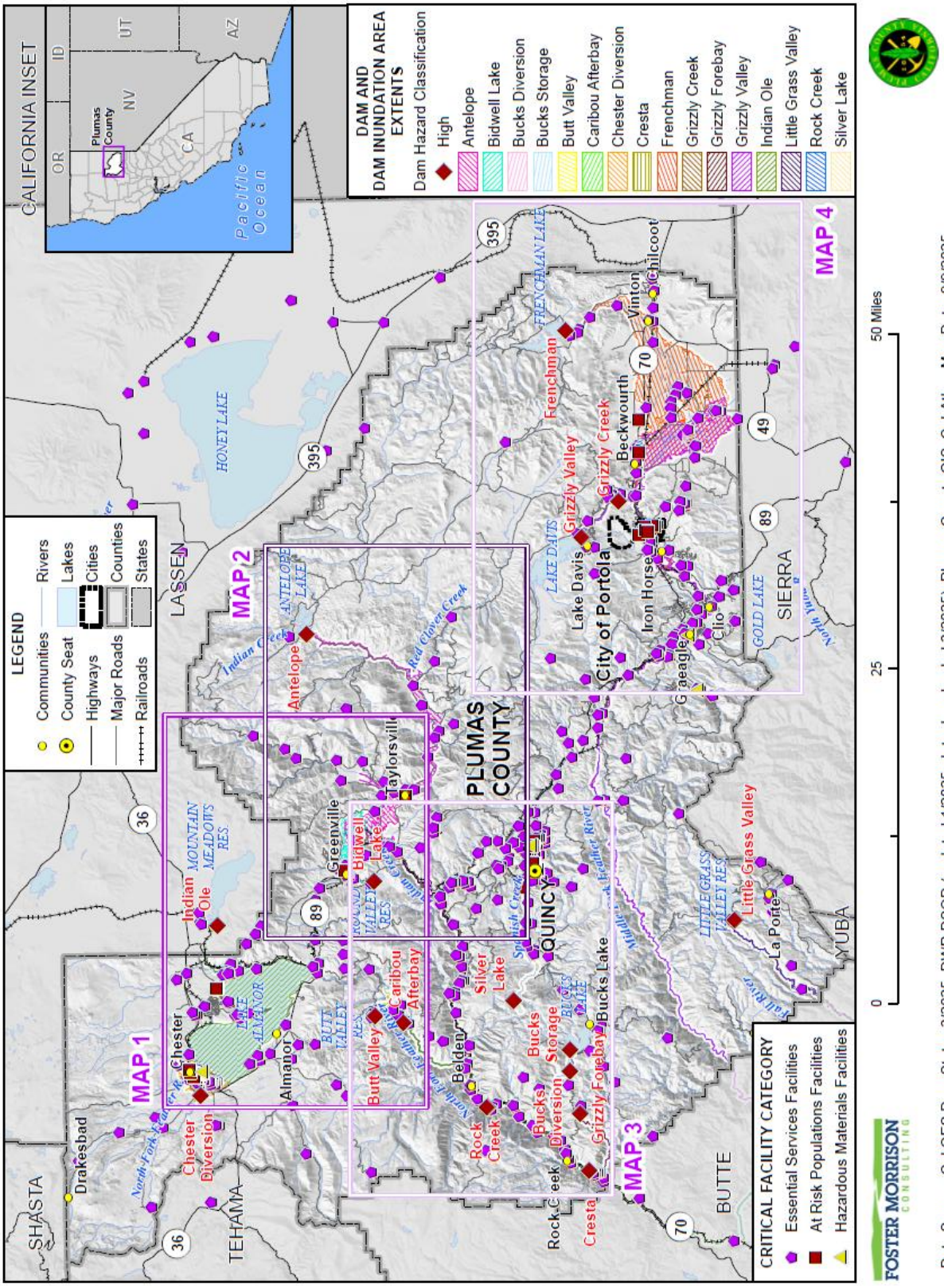


Figure 4-74 Plumas County Planning Area – Critical Facilities in High Hazard Dam Inundation Areas (Map Inset 1)

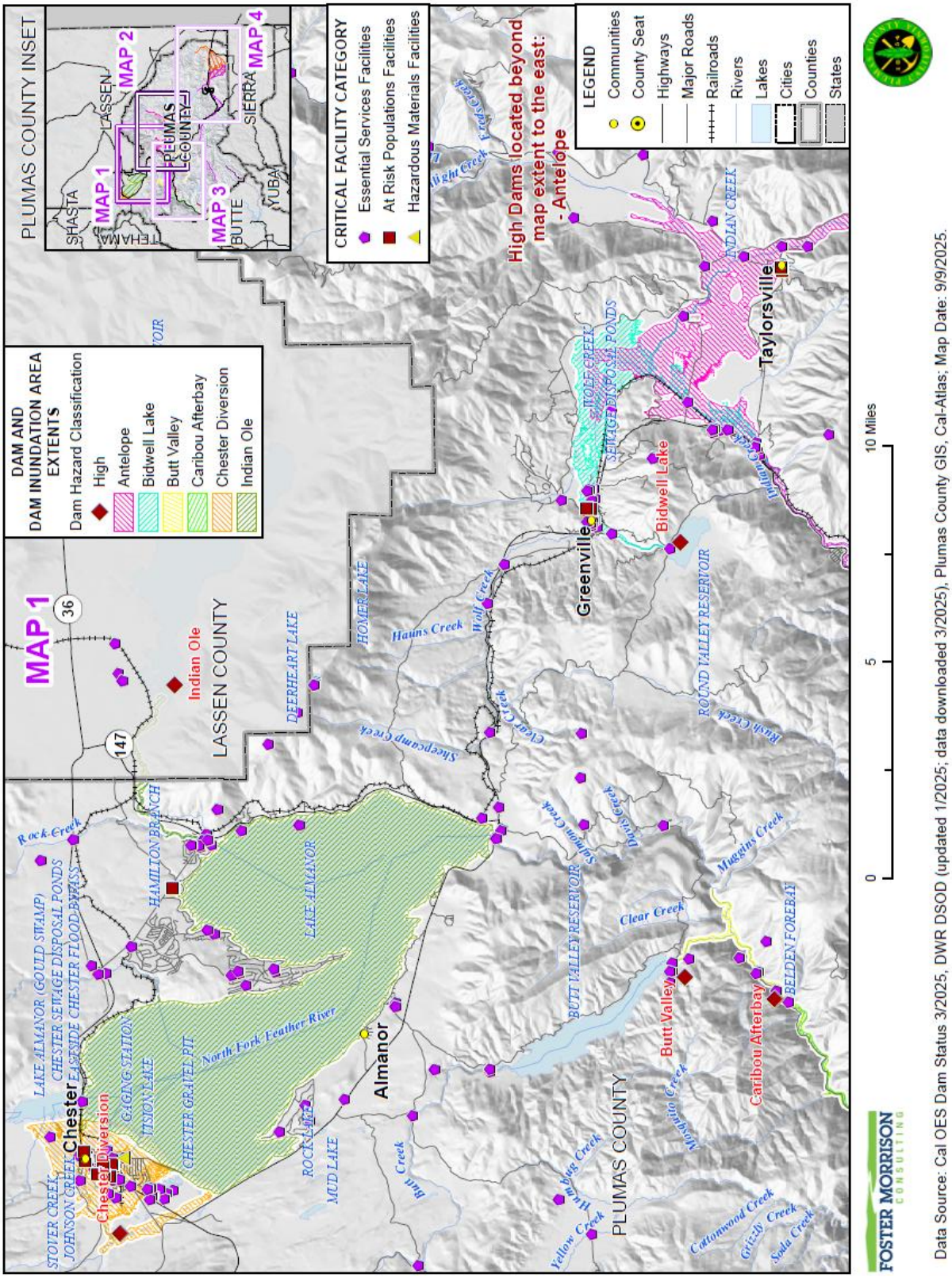


Figure 4-75 Plumas County Planning Area – Critical Facilities in High Hazard Dam Inundation Areas (Map Inset 2)

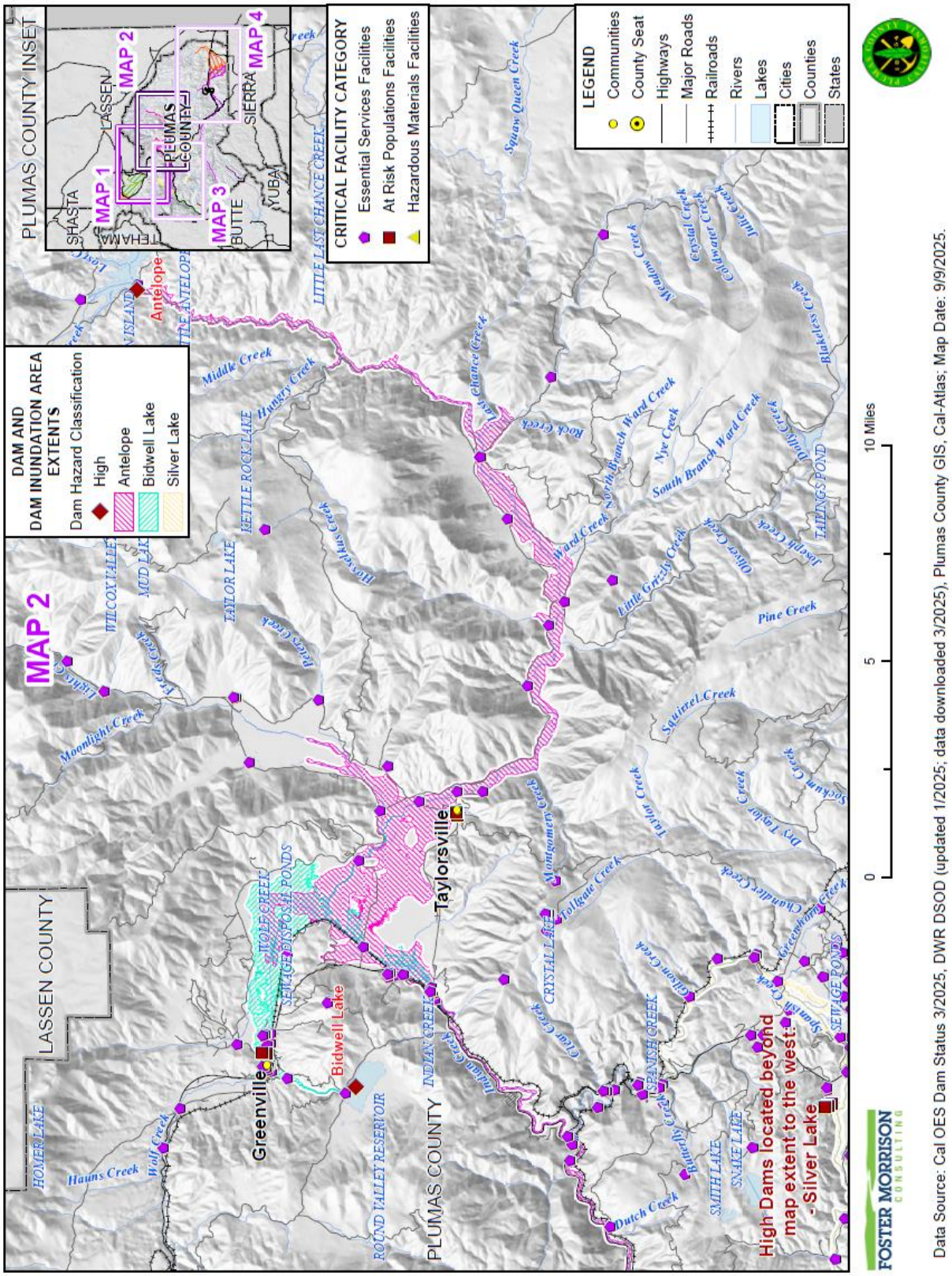


Figure 4-76 Plumas County Planning Area – Critical Facilities in High Hazard Dam Inundation Areas (Map Inset 3)

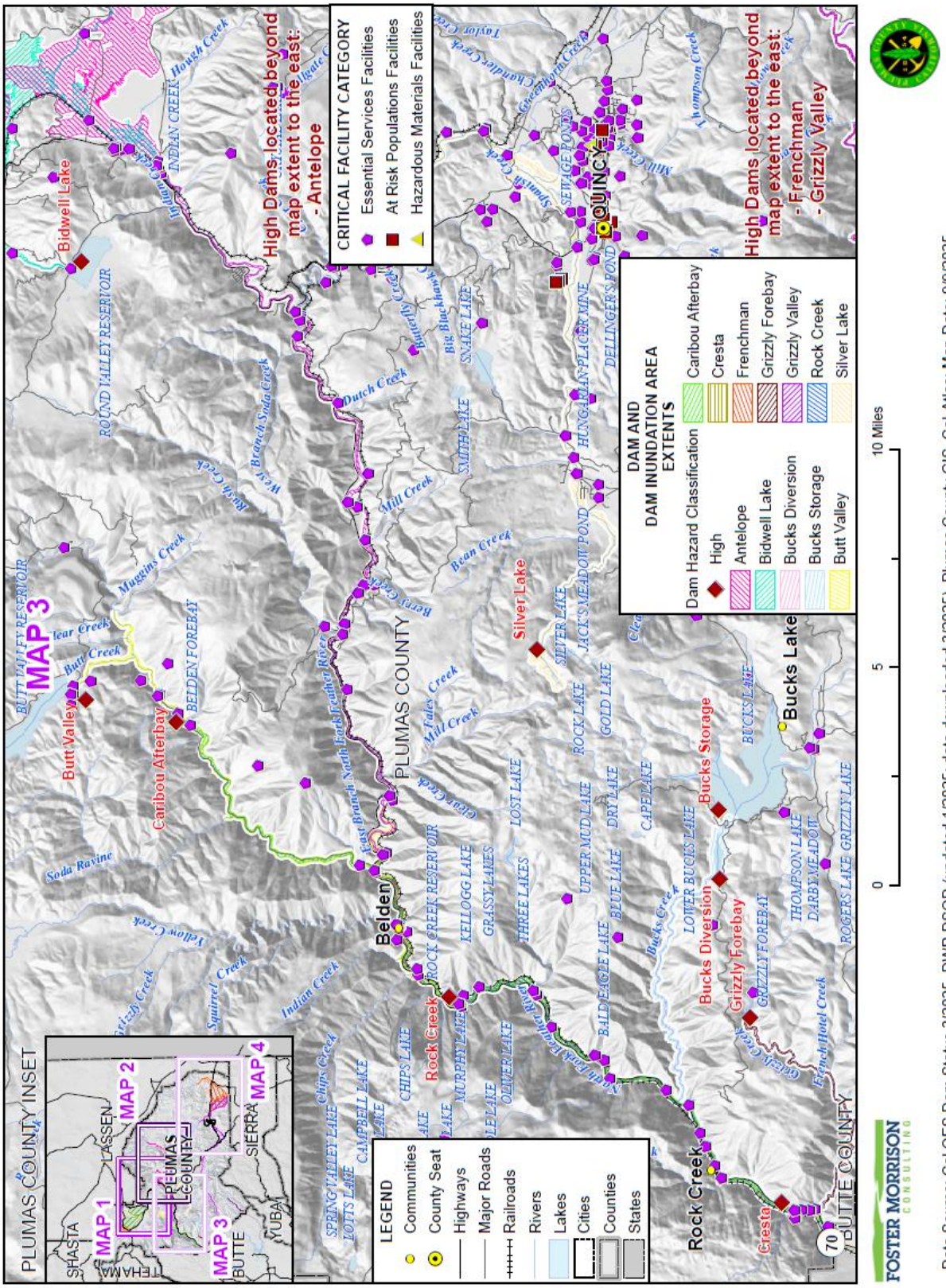


Figure 4-77 Plumas County Planning Area – Critical Facilities in High Hazard Dam Inundation Areas (Map Inset 4)

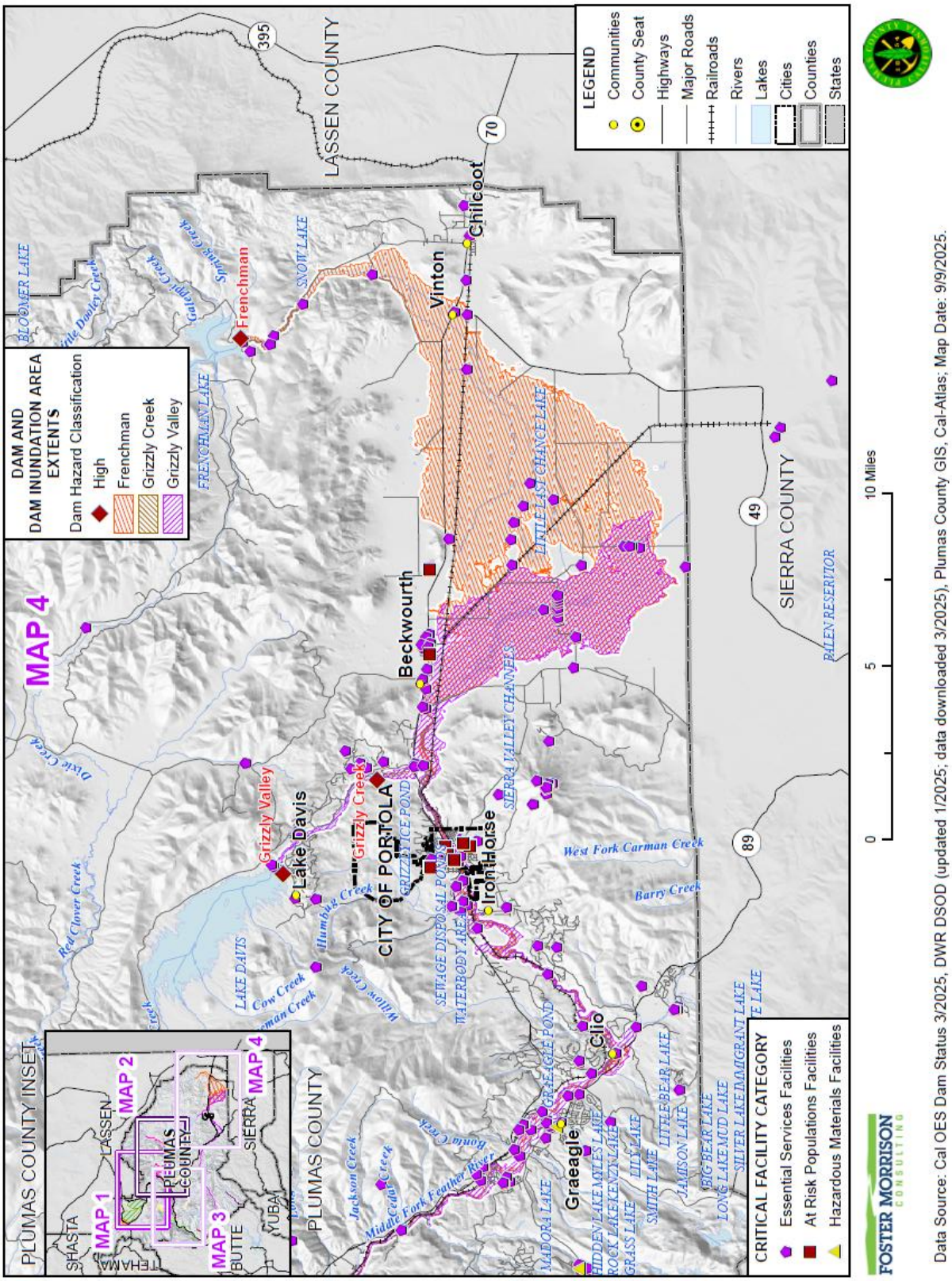


Table 4-62 Plumas County Planning Area – Critical Facilities in Extremely High Hazard Dam Inundation Zones by Jurisdiction and Critical Facility Category

Jurisdiction / High Hazard Dam Inundation Area	Critical Facility Category	Facility Count
Portola		
High Hazard Dam Inundation Area	Essential Services Facilities	7
	At Risk Populations Facilities	1
	Hazardous Materials Facilities	0
	High Hazard Dam Inundation Area Total	**8**
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	9
	At Risk Populations Facilities	7
	Hazardous Materials Facilities	0
	Outside of High Hazard Dam Inundation Area Total	**16**
Portola Total		**24**
Unincorporated Plumas County		
High Hazard Dam Inundation Area	Essential Services Facilities	172
	At Risk Populations Facilities	13
	Hazardous Materials Facilities	1
	High Hazard Dam Inundation Area Total	**186**
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	657
	At Risk Populations Facilities	20
	Hazardous Materials Facilities	3
	Outside of High Hazard Dam Inundation Area Total	**680**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
High Hazard Dam Inundation Area	Essential Services Facilities	3
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	High Hazard Dam Inundation Area Total	**3**
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of High Hazard Dam Inundation Area Total	**1**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	34

Jurisdiction / High Hazard Dam Inundation Area	Critical Facility Category	Facility Count
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of High Hazard Dam Inundation Area Total	**34**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	4
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of High Hazard Dam Inundation Area Total	**4**
Unincorporated Sierra County Total		**4**
Unincorporated Tehama County		
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of High Hazard Dam Inundation Area Total	**2**
Unincorporated Tehama County Total		**2**
Grand Total		**934**

Source: Cal OES/DSOD, Plumas County GIS

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the Plumas County Planning Area. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic structures and cultural resources may also be significantly affected and even destroyed. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme flood events.

FEMA NRI Hazard Vulnerability Assessment

Dam failure is not an NRI hazard; therefore, no data is presented.

Impacts from Dam Failure

Impacts to the Plumas County Planning Area from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the County to dam failure.
- Population in Plumas County is expected to slightly decrease. Vulnerable population groups could face disproportionate effects from a dam failure and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. However, County building codes are in effect to partially reduce this risk and should be updated as necessary to continue to address future dam failure conditions. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

GIS Analysis

Plumas County provided 13 future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Only high hazard dam inundation areas affect future development in the County. As such, no extremely high hazard or significant hazard dam mapping or analysis is presented. Figure 4-78 shows the locations of the future development areas overlayed on the high hazard dam inundation areas. 2 dams intersect the future development areas. Future development affected by the Chester Diversion Dam is detailed in Table 4-63, while future development affected by Frenchman Dam is detailed in Table 4-64.

Figure 4-78 Unincorporated Plumas County – Future Development Areas in High Hazard Dam Inundation Areas

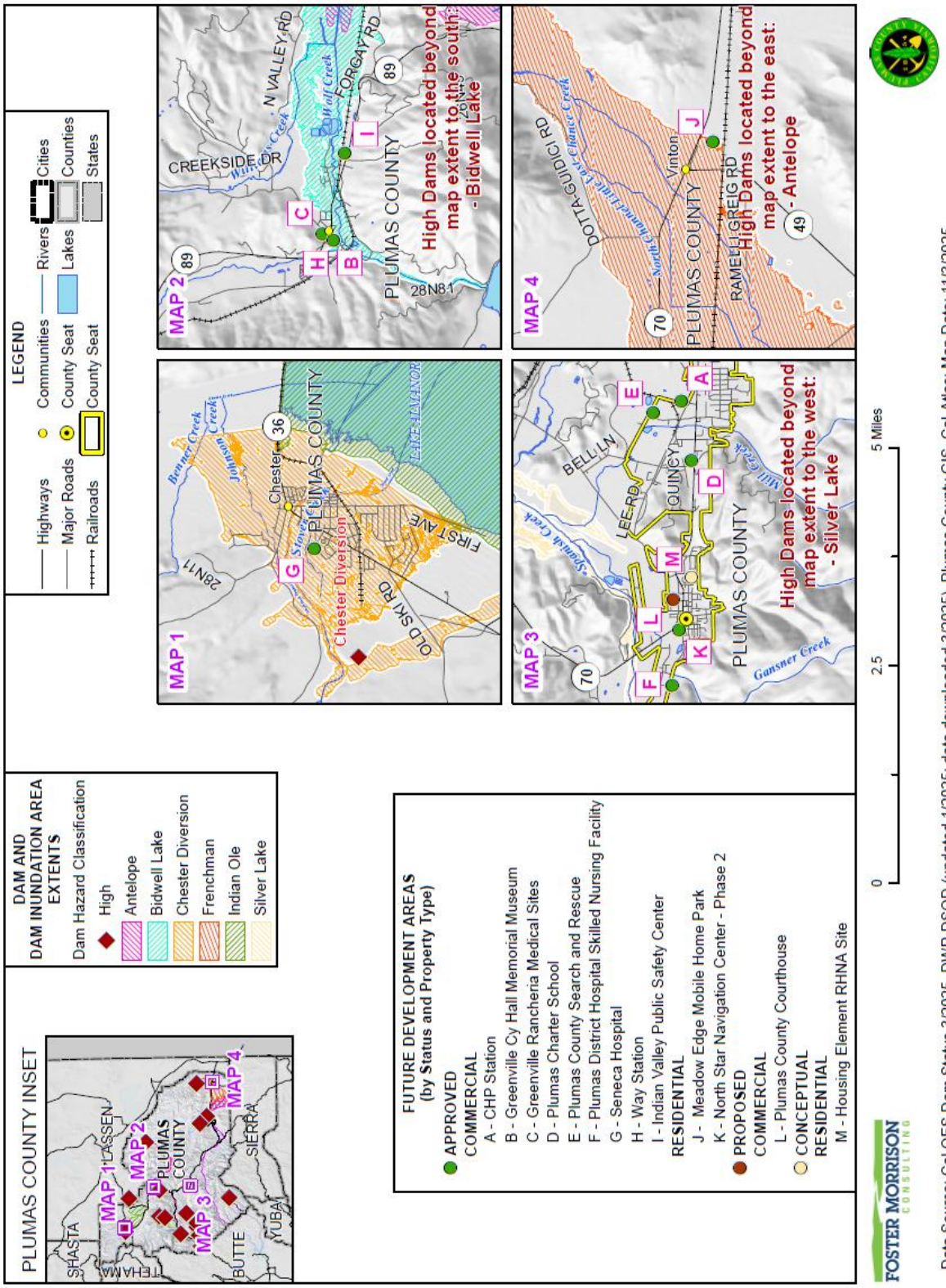


Table 4-63 Unincorporated Plumas County – Future Development Areas in Chester Diversion Dam Inundation Area by Parcels and Acres

Dam Hazard Inundation Areas / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Chester Diversion							
Approved							
Commercial	G - Seneca Hospital	1	0	1	11.80	0.00	11.80
Chester Diversion Total		**1**	**0**	**1**	**11.80**	**0.00**	**11.80**

Source: Cal OES, DSOD, Plumas County GIS

Table 4-64 Unincorporated Plumas County – Future Development Areas in Frenchman Dam Inundation Area by Parcels and Acres

Dam Hazard Inundation Areas / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Frenchman							
Approved							
Residential	J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
Frenchman Total		**1**	**1**	**0**	**42.74**	**42.74**	**0.00**

Source: Cal OES, DSOD, Plumas County GIS

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community. Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur.

4.3.9. Drought and Water Shortage (w/Tree Mortality)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

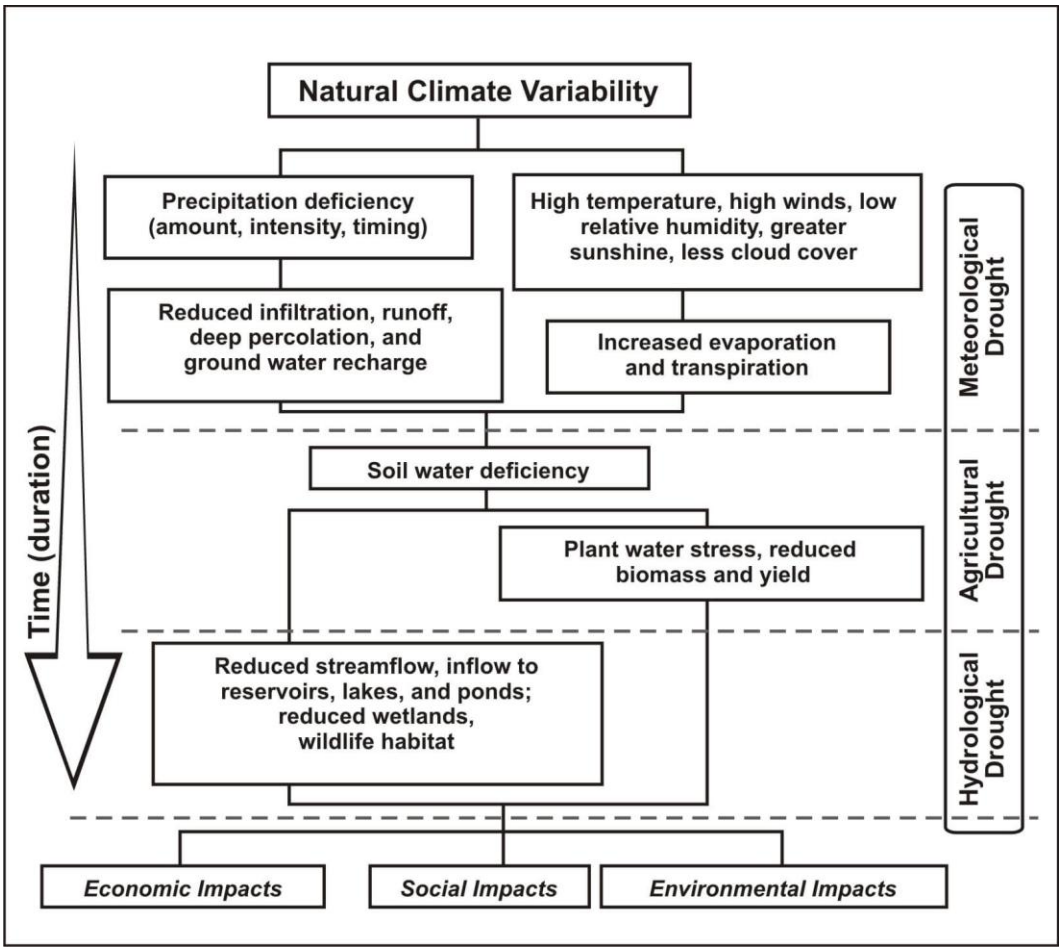
Drought

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving (see Figure 4-79) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological drought** is usually defined by a period of below average water supply.
- **Agricultural drought** occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological drought** is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic drought** occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

Figure 4-79 Causes and Impacts of Drought

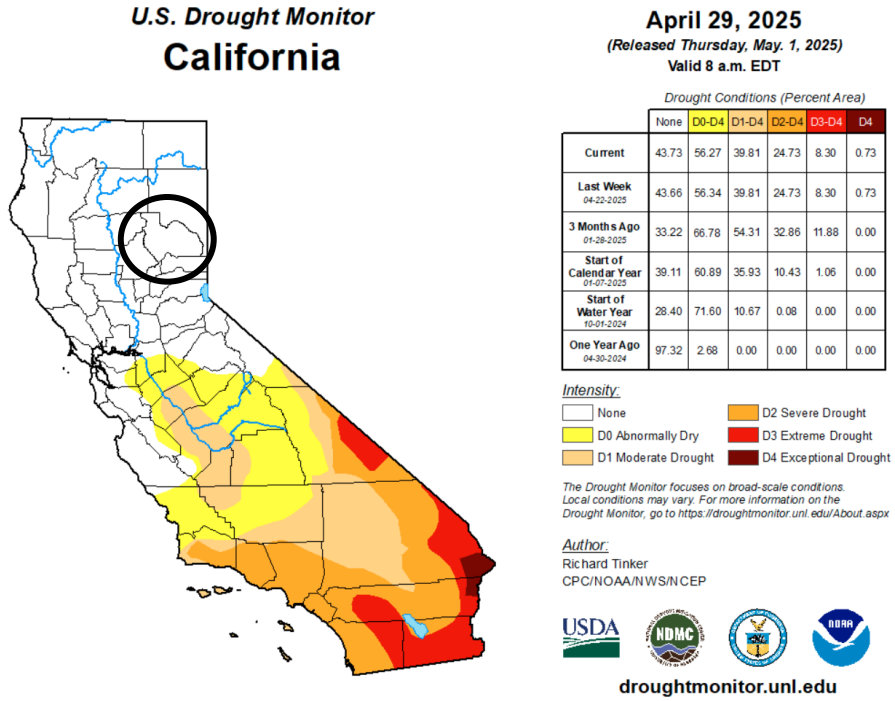


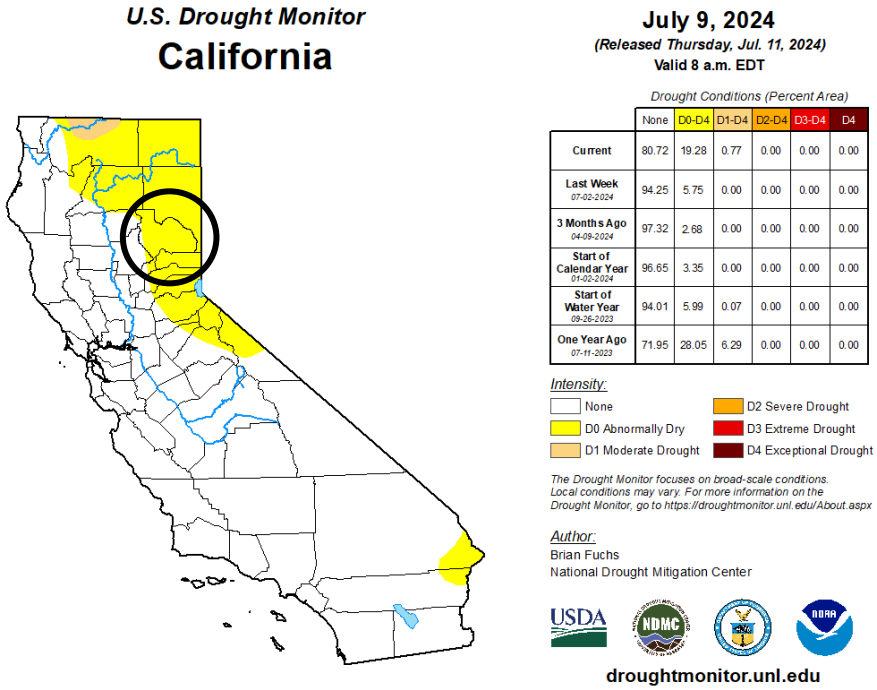
Source: National Drought Mitigation Center (NDMC)

Location and Extent of Drought

Drought is a regional phenomenon that affects the entire Plumas County Planning Area. Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the current (and 2024) drought conditions in California and the Plumas County Planning Area can be found in Figure 4-80. Snapshots from 2014 to 2023 are shown in Figure 4-81 and Figure 4-82. As seen in these figures and related data, the Planning Area has been in and out of drought over the past ten years since the last drought started in 2014.

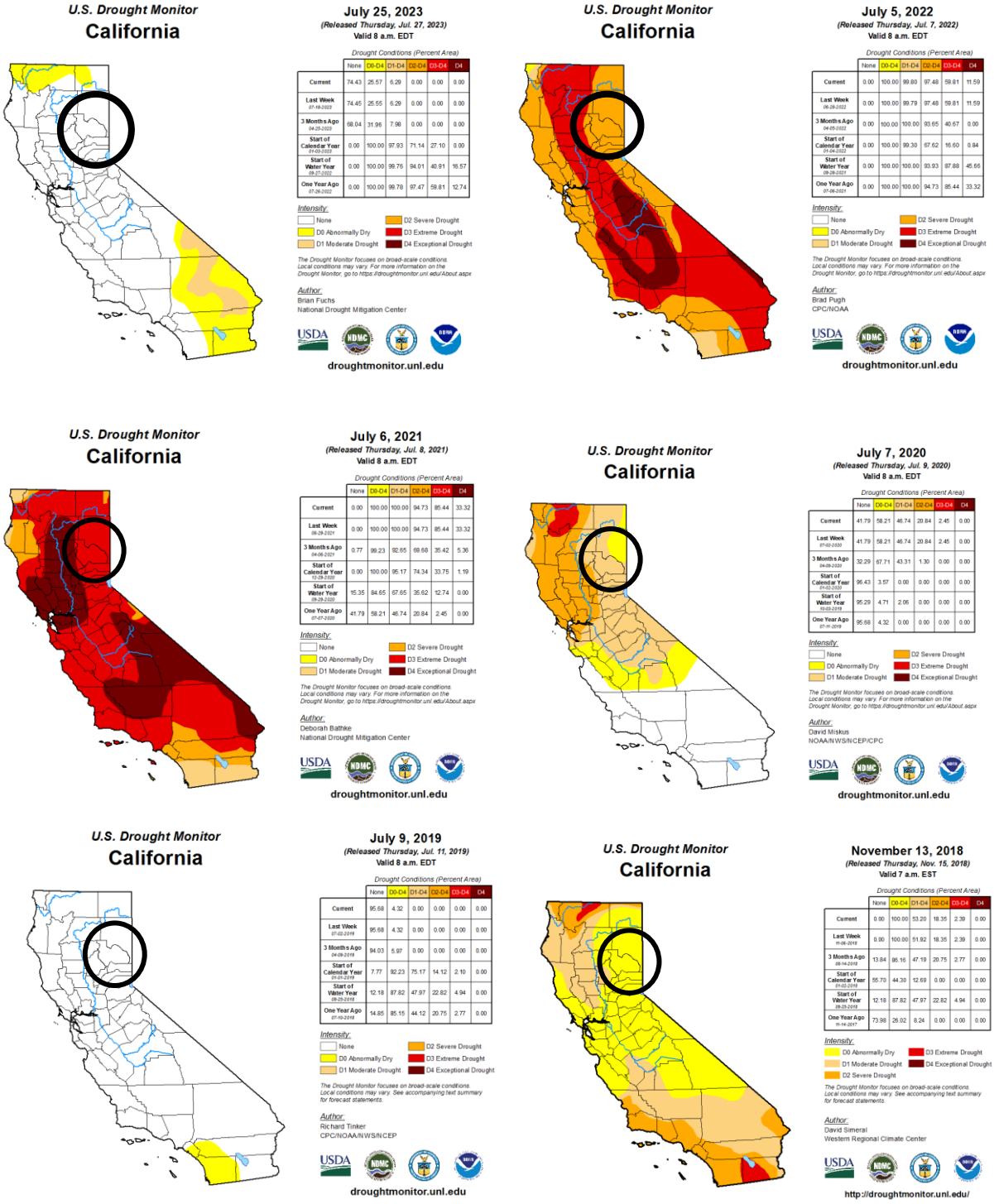
Figure 4-80 Plumas County Planning Area – Current (2025) and 2024 Drought Status





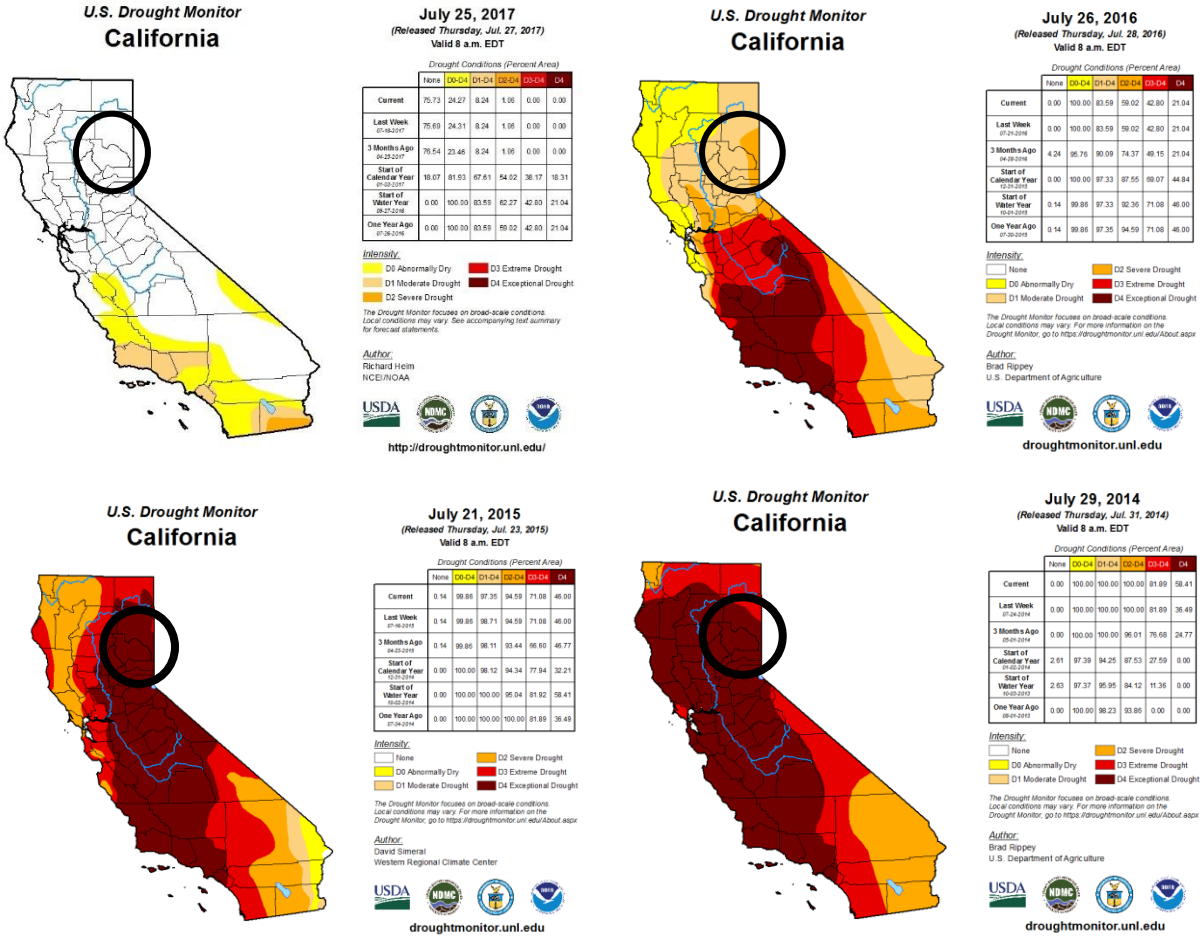
Source: US Drought Monitor

Figure 4-81 Previous Drought Status in Plumas County (2018-2023)



Source: US Drought Monitor

Figure 4-82 Previous Drought Status in Plumas County (2014-2017)



Source: US Drought Monitor

Cal DWR says the following about drought:

> ***One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.***

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between domestic uses, farming and federally protected fish habitats in California further contributes to this issue.

As shown on the previous figures, drought is tracked by the US Drought Monitor. The Drought Monitor includes a scale to measure drought intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Drought has a slow onset and long duration. Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer in Mediterranean climates, such as in California. This is particularly true in Northern California where drought impacts are delayed for most of the population by the wealth of stored surface and ground water. The drought complications normally appear more than a year after a drought begins. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. Drought has the potential to affect the entire Plumas County Planning Area.

Water Shortage

Northern Sacramento Valley counties, including Plumas County, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought. Water supply in the County is discussed in the below sections.

2035 Plumas County General Plan Water Resources Element

The 2035 Plumas County General Plan Water Resources Element noted that the amount of precipitation received throughout the watershed varies but greatly contributes to the significant amount of water available in the County and throughout the region. The Sierra Crest, centrally located within Plumas County, acts as a barrier to storm systems between the western and eastern portions of the County. The western side of the Sierra Nevada Mountains receives over 90 inches of precipitation annually while the area east of the Sierra Crest receives only 11 inches. Snowpack levels in the County's higher elevation areas serve as natural water reservoirs for surface water that becomes available as the snow melts and drains into the regional waterway system.

Plumas County Flood Control and Water Conservation District

The HMPC noted that the Plumas County Flood Control and Water Conservation District (PCFCWCD) is one of the 29 State Water Contractors within the State of California. The PCFCWCD has annual entitlements to 2,700-acre feet of water from the State Water project with 3 water customers. Water customers include City of Portola, Grizzly Ranch Golf Club and Grizzly Lake CSD. The project water is transported from Lake Davis by Grizzly Valley Pipeline to the Lake Davis Water Treatment plant and transported to City of Portola through the pipeline. Grizzly Ranch Golf Club has an intake pump on Grizzly Creek and pumps the water for irrigating the golf course. City of Portola currently purchases 946 acre-feet, Grizzly Golf Club 250 Acre-feet and Grizzly Lake CSD purchases 57 acre-feet. Grizzly Lake currently

does not use the entitlement but could in the future access the water by building a pipeline from the Lake Davis treatment plant. Grizzly Lake CSD currently pumps groundwater, and Portola utilizes a natural spring seasonally. Over 1,400 acre-feet annual entitlement is currently available for sale but not utilized due to lack of customers.

Upper Feather River Watershed

The Upper Feather River watershed covers a majority of the County (98%), which is about 72% of the watershed. The tributaries of the Upper Feather River watershed drain over 2 million acres of land in the Sierra Nevada Mountains, flowing southwest into Lake Oroville in neighboring Butte County. The Upper Feather River watershed is divided into four main branches with respective watersheds: the West Branch, the North Fork, the Middle Fork and the South Fork of the Feather River. The North Fork Feather River drainage area is the largest drainage area in the watershed covering approximately 1.4 million acres and contributing a yearly average flow of over 2.3 million acre-feet of water to Lake Oroville. The South Fork Feather River drainage is the smallest of the four drainage areas and contributes an average of over 189,000 acre-feet to Lake Oroville each year. The Upper Feather River watershed serves as an important supply of surface water resources. Water has been a valuable export from Plumas County since the State Water Project (SWP) located its main storage facility fed by the Feather River at Lake Oroville. This watershed supplies 3.2 million acre-feet per year for downstream urban, industrial and agricultural use as part of the State Water Project and delivers water to 29 agencies. The State Water Project also operates three reservoirs in Plumas County; Antelope Lake, Frenchman Lake and Lake Davis, which flow into Lake Oroville.

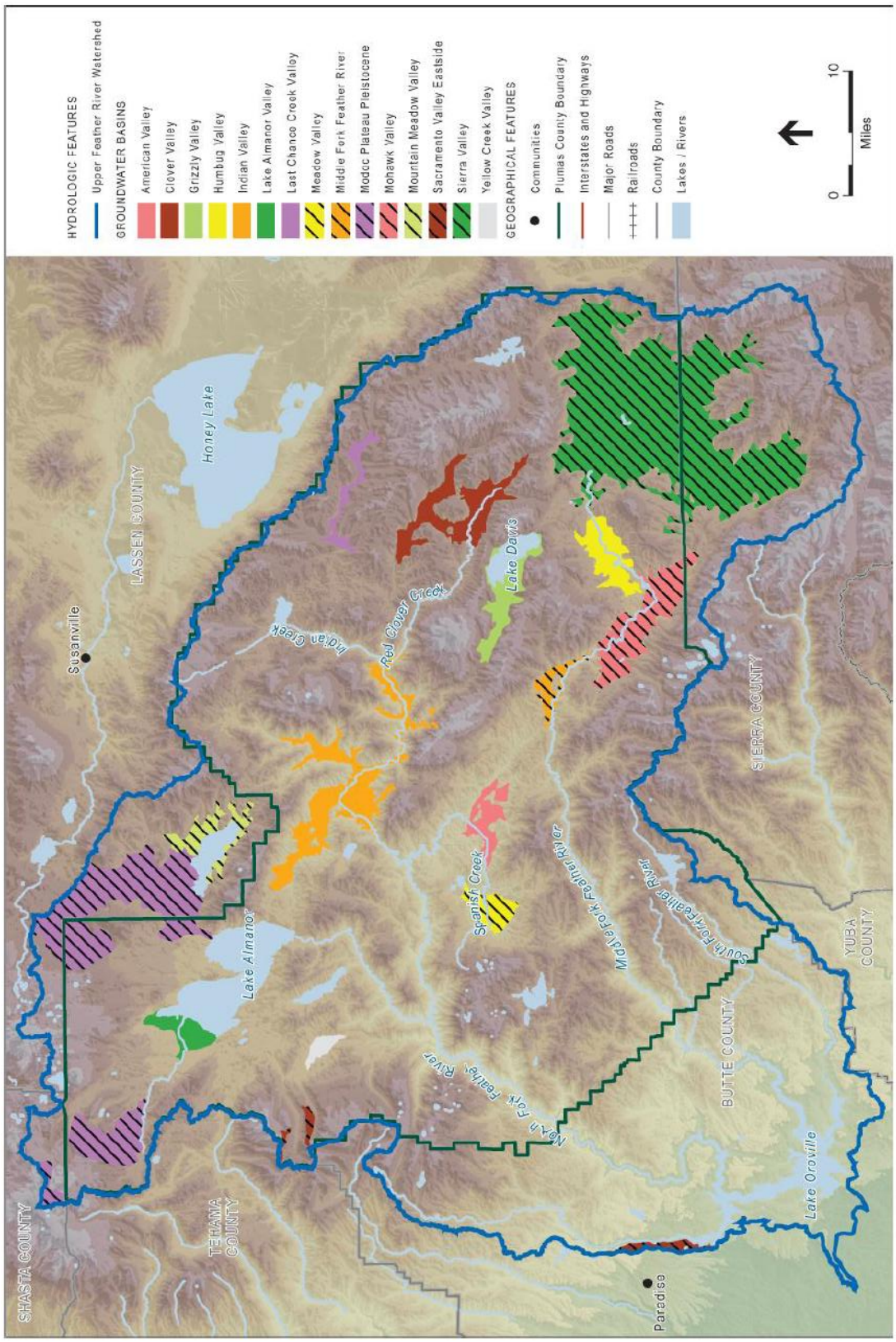
The main stems of the Upper Feather River watershed in addition to many of the tributaries exhibit some level of degradation, primarily due to human activities. The east side of the County experiences much more erosion than the west side, which greatly affects surface water quality. Timber harvesting, water diversion, irrigation practices, road and railroad construction, grazing and mining have all contributed to in-stream water quality issues, such as increased sediment transport, that impact aquatic life and riparian vegetation.

Plumas County Groundwater Basins

Plumas County contains fourteen groundwater basins, which are primarily located in the valleys on the east side of the Sierra Crest. These groundwater basins are also shown Figure 4-83. Sierra Valley is the largest groundwater basin, covering 125,250 acres, and underlies the Middle Fork of the Feather River. The smallest groundwater basin identified in the figure is Yellow Creek Valley Groundwater Basin covering 2,310 acres. Some of the County's groundwater basins have been depleted as a result of high extraction rates and slow recharge. For example, the Sierra Valley groundwater basin has experienced significant declines due to human activity and agricultural practices.

Groundwater quality is currently monitored in nine of the County's groundwater basins. Groundwater quality in the County varies by basin. Water quality in the Sierra Valley basin is primarily affected by geothermal activity which causes the groundwater to contain high concentrations of boron, fluoride, iron and sodium. Some wells within the Sierra Valley Sub-Basin also exhibit high levels of arsenic and manganese. Localized groundwater quality has been influenced in some areas by the use of septic systems.

Figure 4-83 Plumas County – Hydrologic Features



Source: Plumas County General Plan Water Resources Element

Plumas County Drought Plan (SB552)

We have some data in the folder. This is an in-process plan. This discusses all the small water suppliers. We are to get an updated version so we can pull from it. It will include state smalls, there is a good map, etc.

Location and Extent of Water Shortage

Since water shortage generally happens on a regional scale, the entirety of the Plumas County Planning Area is at risk. There is no established scientific scale to measure water shortage. The speed of onset of water shortage tends to be lengthy. The duration of water shortage can vary, depending on the severity of the drought that accompanies it and the status of the water sources going into the drought. The extent of the drought considers several factors, including the nature, source, and reliability of water. While drought conditions persist, the Planning Area has generally sufficient water supply from water supplies, which lessens the extent of water shortage impacts in the Planning Area.

Past Occurrences

Disaster Declaration History

There have been 1 state and 1 federal disaster declarations for Plumas County. These are shown on Table 4-65. More information on USDA disaster declarations from drought (13 events) can be found in Table 4-51 in the Past Occurrences in Section 4.3.6.

Table 4-65 Plumas County – Federal and State Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1997

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County. This is shown on Table 4-66.

*Table 4-66 NCDC Drought Events for Plumas County 1993-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Drought	2	0	0	0	0	$50,000	$0

Source: NCDC

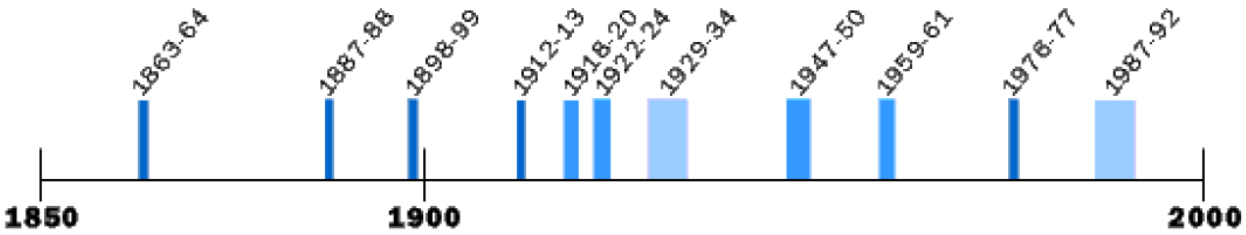
*Note: Losses reflect totals for all impacted areas, some of which fell outside of Plumas County

CA DWR Events (with Hazard Mitigation Planning Committee Input)

This section is not separated by events since the 2019/2020 LHMPs since much of it covers multiple year droughts.

Historically, California has experienced multiple severe droughts. According to the DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. Figure 4-84 depicts California's Multi-Year Historical Dry Periods, 1850-2000. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Figure 4-85 compares the 1929-34 drought to the 1976-77, 1987-92, 2007-09, and 2012-2016 droughts.

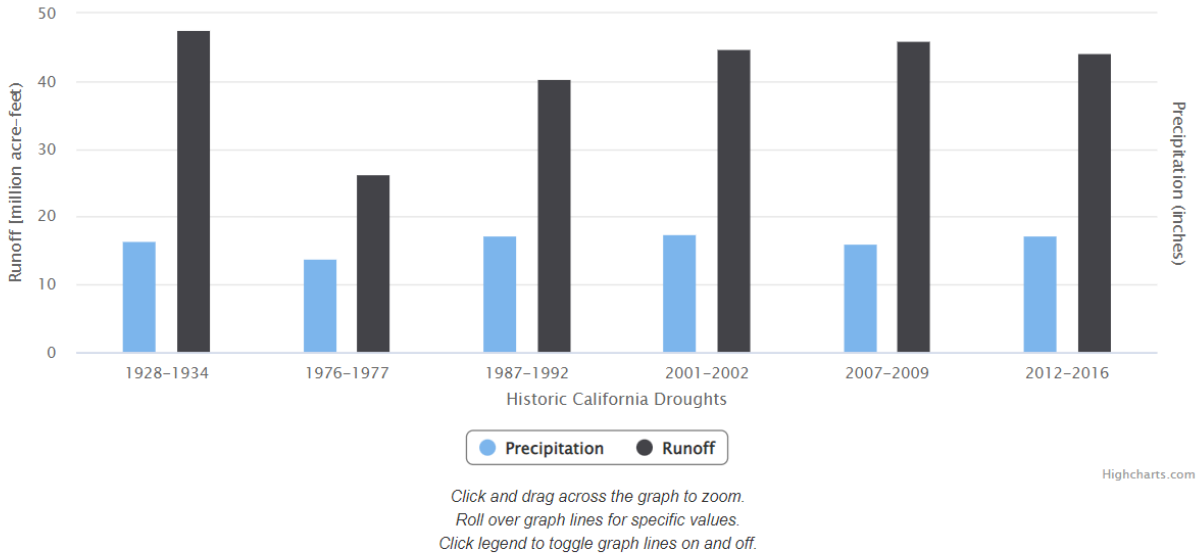
Figure 4-84 California's Multi-Year Historical Dry Periods, 1850-2000



Source: Cal DWR

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

Figure 4-85 Average Annual Runoff and Precipitation for Historic Droughts

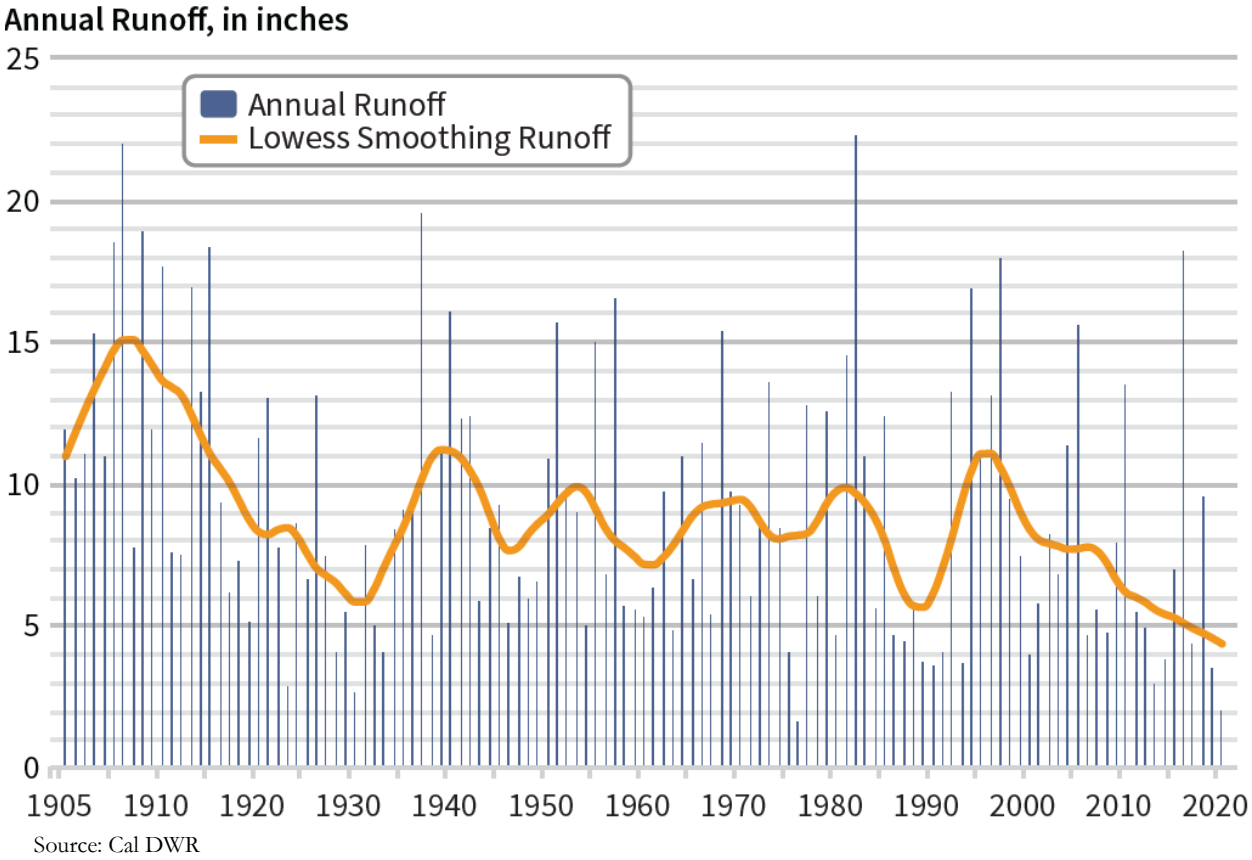


Runoff and precipitation conditions for California's six historical droughts. The most severe drought both in terms of precipitation and runoff was the drought of 1976-77. However, because it was just a two-year drought, the water supply impacts were not as severe as those associated with the longer duration droughts because shorter droughts can be partially mitigated by surface and groundwater storage.

Source: CA DWR – 2012-2016 California Drought: Historical Perspective (https://ca.water.usgs.gov/california-drought/california-drought-comparisons.html)

Figure 4-86 depicts runoff for the State from 1905 to 2021. This gives a historical context for the 2014-2021 drought to compare against past droughts.

Figure 4-86 Annual California Runoff –1905 to 2021



Source: Cal DWR

The 2018 and 2023 California State Hazard Mitigation Plan discussed the major droughts from 1900 to 2022. The discussion below appends to the tables and figures above.

The 1975-1977 Drought

From November 1975 through November 1977, California experienced one of its most severe droughts. Although people in many areas of the state are accustomed to very little precipitation during the growing season (April to October), they expect it in the winter. In 1976 and 1977, the winters brought only one-half and one-third of normal precipitation, respectively. Most surface storage reservoirs were substantially drained in 1976, leading to widespread water shortages when 1977 turned out to be even drier.

The 1987-1992 Drought

From 1987 to 1992, California again experienced a serious drought due to low precipitation and run-off levels. The hardest-hit region was the Central Coast, roughly from San Jose to Ventura. In 1988, 45 California counties experienced water shortages that adversely affected about 30 percent of the state's population, much of the dry-farmed agriculture, and over 40 percent of the irrigated agriculture. Fish and wildlife resources suffered, recreational use of lakes and rivers decreased, forestry losses and fires increased, and hydroelectric power production decreased. In February 1991, DWR and Cal OES surveyed drought conditions in all 58 California counties and found five main problems: extremely dry rangeland,

irrigated agriculture with severe surface water shortages and falling groundwater levels, widespread rural areas where individual and community supplies were going dry, urban area water rationing at 25 to 50 percent of normal usage, and environmental impacts.

Storage in major reservoirs had dropped to 54 percent of average, the lowest since 1977. The shortages led to stringent water rationing and severe cutbacks in agricultural production, including threats to survival of permanent crops such as trees and vines. Fish and wildlife resources were in critical shape as well. Not since the 1928-1934 drought had there been such a prolonged dry period. In response to those conditions, the Governor established the Drought Action Team. This team almost immediately created an emergency drought water bank to develop a supply for four critical needs: municipal and industrial uses, agricultural uses, protection of fish and wildlife, and carryover storage for 1992. The large-scale transfer program, which involved over 800,000 acre-feet of water, was implemented in less than 100 days with the help and commitment of the entire water community and established important links between state agencies, local water interests, and local governments for future programs.

The 2007-2009 Drought

Water years 2007-2009 were collectively the 15th driest three-year period for DWR's eight-station precipitation index, which is a rough indicator of potential water supply availability to the State Water Project (SWP) and Central Valley Project (CVP). Water year 2007 was the driest single year of that drought and fell within the top 20 percent of dry years based on computed statewide runoff. In June 2008, a state emergency proclamation was issued due to water shortage in selected Central Valley counties. In February 2009, for the first time in its history, the State of California proclaimed a statewide drought. The state placed unprecedented restrictions on CVP and SWP diversions from the Delta to protect listed fish species, a regulatory circumstance that exacerbated the impacts of the drought for water users.

The greatest impacts of the 2007–2009 drought were observed in the CVP service area on the west side of the San Joaquin Valley, where hydrologic conditions combined with reduced CVP exports resulted in substantially reduced water supplies (50 percent supplies in 2007, 40 percent in 2008, and 10 percent in 2009) for CVP south-of Delta agricultural contractors. Small communities on the west side highly dependent on agricultural employment were especially affected by land fallowing due to lack of irrigation supplies, as well as by factors associated with current economic recession. The coupling of the drought and economic recession necessitated emergency response actions related to social services, such as food banks and unemployment assistance.

The 2012-Current Drought (which is ongoing after a pause in 2017 and 2023)

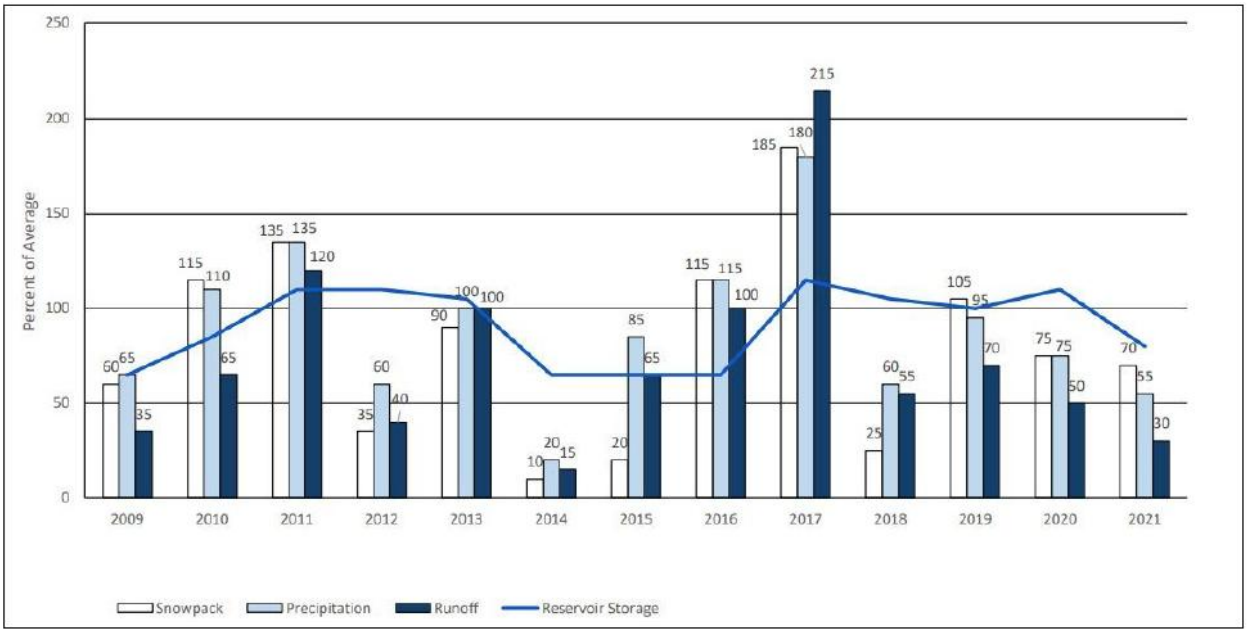
The statewide drought of 2012-2017, which is still ongoing, will be remembered as one of the most severe and costliest droughts of record in California. The drought that spanned water years 2012 through 2017 included the driest four-year statewide precipitation on record (2012-2015) and the smallest Sierra-Cascades snowpack on record (2015, with 5 percent of average). It was marked by extraordinary heat: 2014, 2015, and 2016 were California's first, second, and third warmest years in terms of statewide average temperatures. By the time the drought was declared officially over in April 2017, the state had expended $6.6 billion in drought response and mitigation programs and had been declared a federal disaster area. This coincides with many of the drought declarations from the USDA (discussed in more detail in Section

4.3.6 above). The HMPC reported that fire danger in 2013 and 2014 reached record levels as the drought produced dry, highly flammable fuel loads. The HMPC also noted that multiple tree mortality declarations were issued in 2020, 2021, 2023, and 2024 from the elevated risk to tree mortality from drought.

Water Shortage

Figure 4-87 illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 2009 and 2021. The chart illustrates the cyclical nature of weather patterns in California.

Figure 4-87 Water Supply Conditions, 2009 to 2021

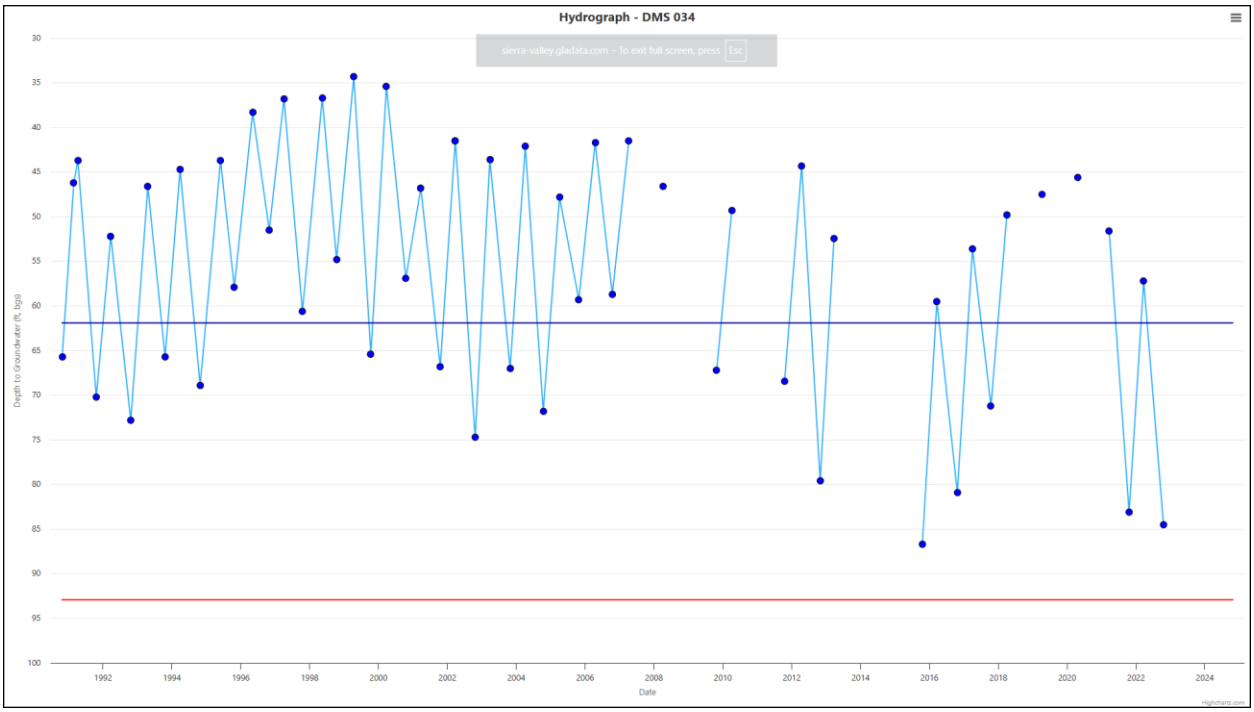


Source: 2023 State of California Hazard Mitigation Plan

Beginning in 2012, snowpack levels in California dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. Snowpack measurements have been kept in California since 1950 and nothing in the historic record comes close to 2015's severely depleted level. The previous record for the lowest snowpack level in California, 25 percent of normal, was set both in 1976-77 and 2013-2014. In "normal" years, the snowpack supplies about 30 percent of California's water needs, according to the California Department of Water Resources. Snowpack levels began to increase in 2016, and in 2017 snowpack increased to the largest in 22 years, according to the State Department of Water Resources. In late 2017 and early 2018, drought conditions began to return to California but have been dampened by periods of above average rainfall in the first part of 2019. Snowpack stayed low until the winters of 2021/2022 and 2022/2023 when atmospheric rivers caused heavy rains and snows in the area. Snowpack has been relatively normal since then.

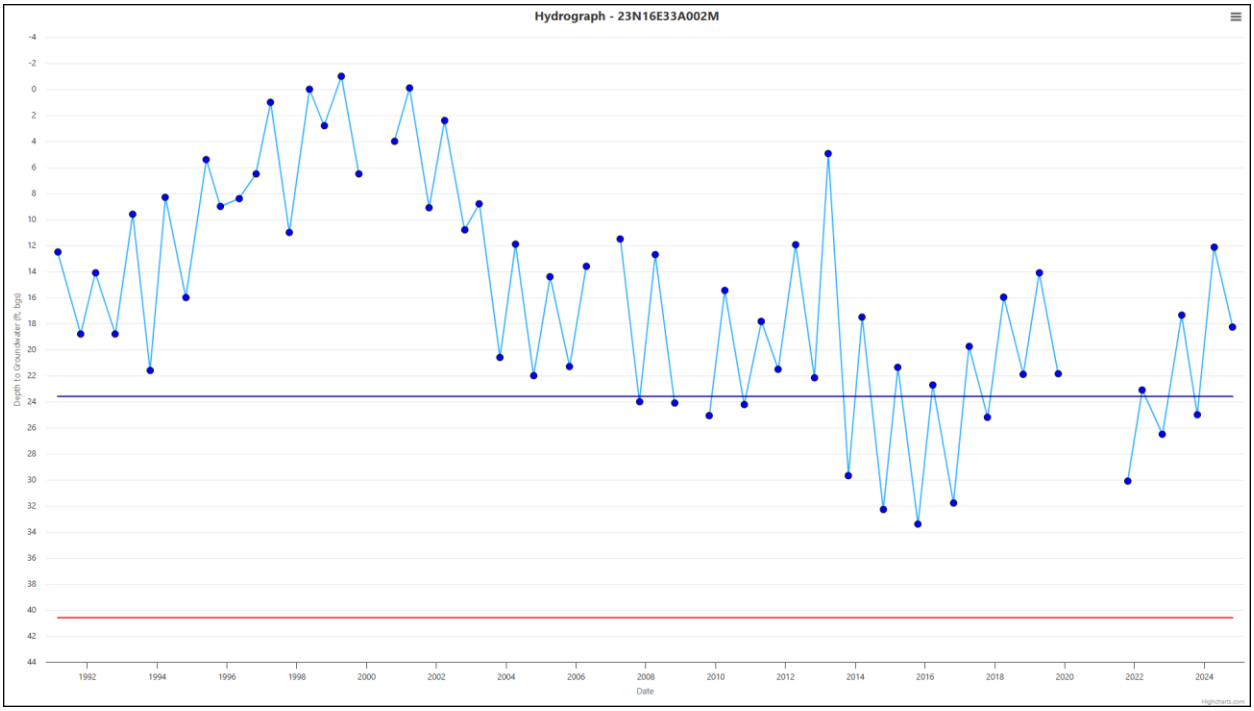
The Sierra Valley Groundwater District provided graphs of District water levels from 1980 to 2016. These can be seen on Figure 4-88, Figure 4-89, and Figure 4-90.

Figure 4-88 Plumas County – Loyalton Water Levels 1980-2016



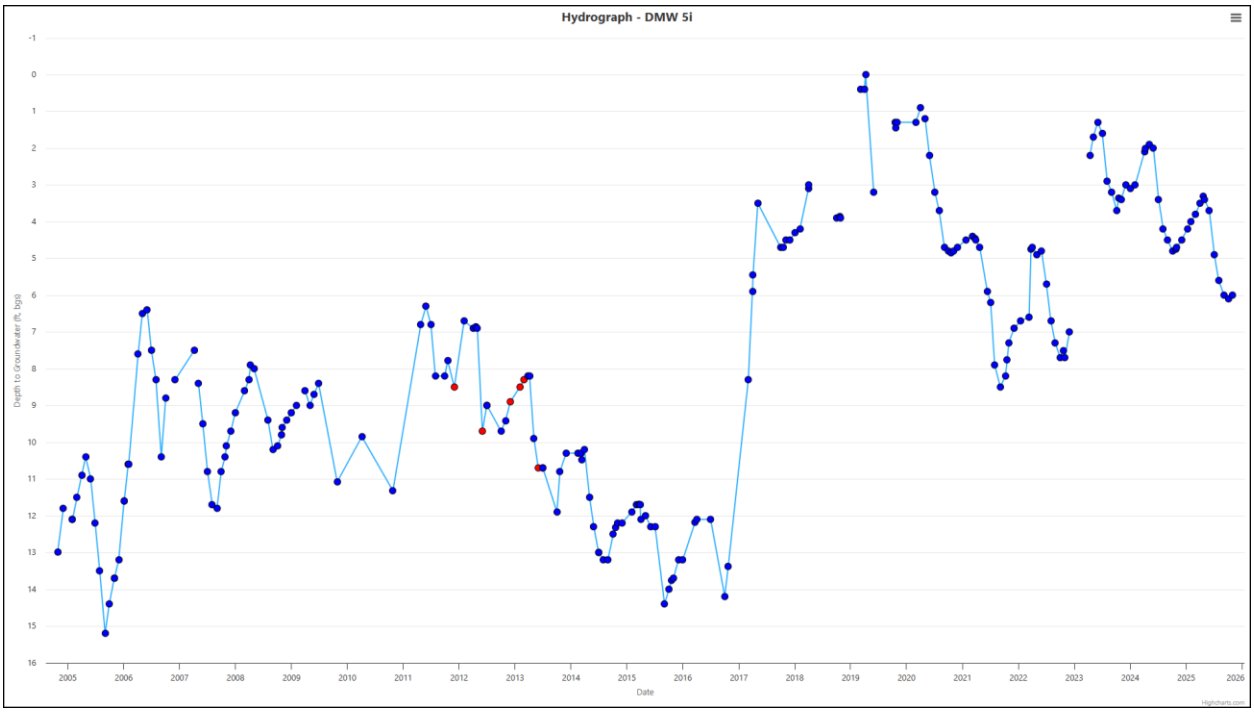
Source: Sierra Valley Groundwater District. Retrieved 5/2/2025.

Figure 4-89 Plumas County – Vinton Water Levels 1980-2016



Source: Sierra Valley Groundwater District. Retrieved 5/2/2025.

Figure 4-90 Plumas County – Chilcoot Water Levels 1980-2016



Source: Sierra Valley Groundwater District. Retrieved 5/2/2025.

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for the Plumas County Planning Area indicate there have been 5 significant droughts in the last 87 years. This equates to a drought every 16.4 years on average or a 6.1 percent chance of a drought in any given year. Based on this data and given the multi-year length of droughts and future climate change affects, the Plumas County Planning Area determined that future drought occurrence continues to be likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that Plumas County may at some time be at risk to both short and prolonged periods of water shortage. Based on this it is possible that water shortages will affect the County in the future during extreme drought conditions. However, to date, Plumas County has continued to have relatively consistent water supply.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and drought and water shortage can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Drought and Water Shortage

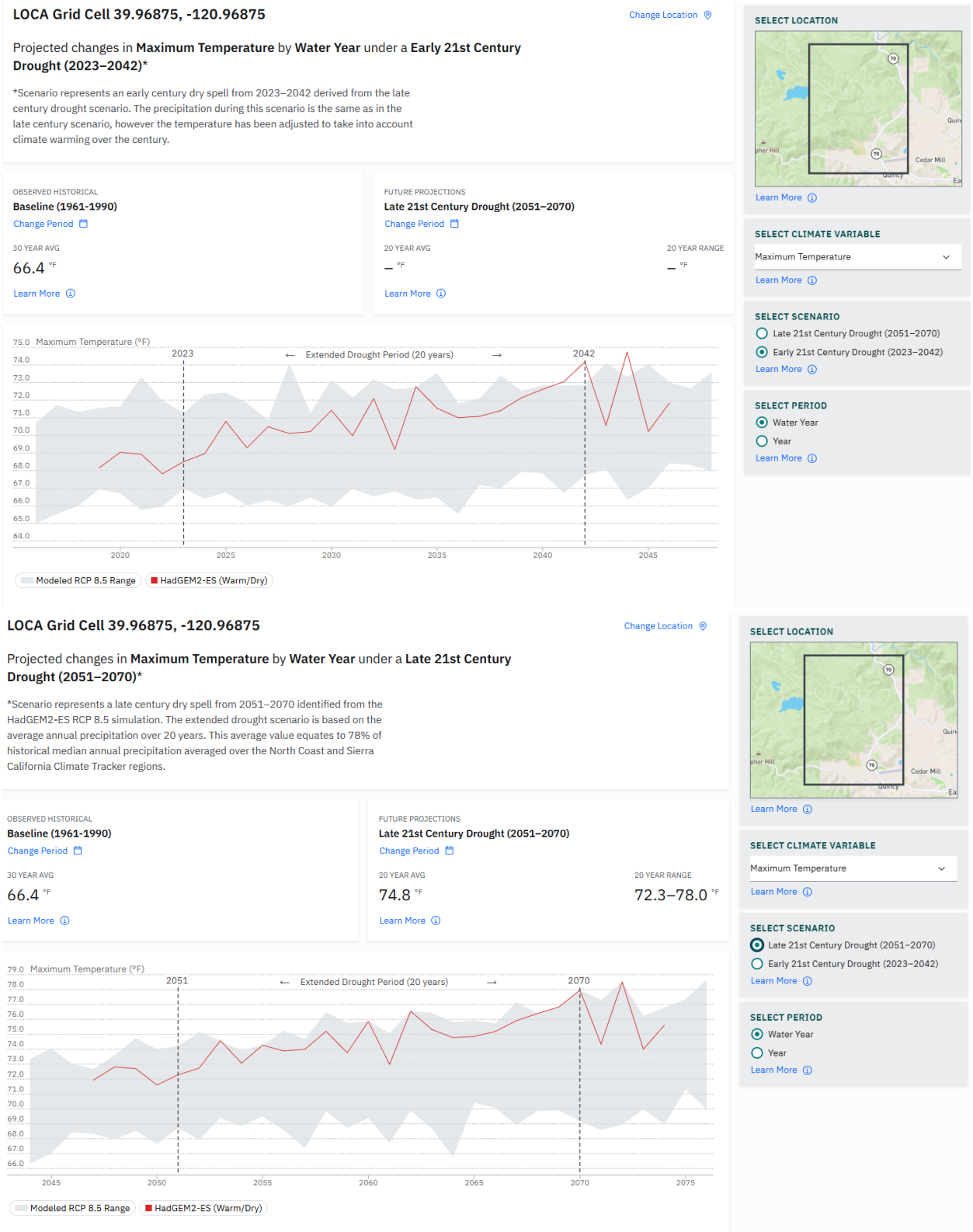
Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the Draft 2024 CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal-Adapt has modeled future risk of drought. Recent research suggests that extended drought occurrence ("mega-drought") could become more pervasive in future decades. This tool explores data for two 20-year drought scenarios (using the quad that contains the City of Portola in Figure 4-91) derived from LOCA downscaled meteorological and hydrological simulations – one for the earlier part of the 21st century, and one for the latter part:

- The upper chart represents a mid-century dry spell from 2023-2042 identified from the HadGEM2-ES RCP 8.5 simulation. The extended drought scenario is based on the average annual precipitation over 30 years. This average value equates to 66.4% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.
- The lower chart represents a late century dry spell from 2051–2070 identified from the HadGEM2-ES RCP 8.5 simulation. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 74.4% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.

Figure 4-91 Plumas County Planning Area – Future Extended Drought Scenarios



Source: Cal Adapt – Extended Drought Scenarios (retrieved 2/26/2025)

Vulnerability Assessment

Vulnerability—High

Based on historical information, the occurrence of drought in California, including the Plumas County Planning Area, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

Tree Mortality and Drought

One of the specific impacts of drought in the Plumas County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the Planning Area, especially in those areas on the west where the elevations increase.

The tree mortality and dieback problem are a high priority because of the issue of hazardous trees and increased wildfire hazard in the wildland areas and the potential for worsening conditions and expansion into other forested sites in future years. Fuel loading and fire potential are greater in stands as compared to healthy stands due to the higher proportion of dead and dying material. Removal of dead and dying trees near structures, powerlines, and roadways is also a high priority because of the immediate falling hazard.

University of California, Berkeley's Department of Environmental Science, Policy, and Management (ESPM) was commissioned in 2021 to investigate the symptoms and possible causes of the dieback. Preliminary results show that the dieback is driven mostly by environmental stressors, including but not limited to drought, predisposing trees to disease caused by opportunistic pathogens. The report includes best management practices to limit the spread of pathogens. It is important to continue investigating the causes of the tree mortality and dieback to help Planning Area jurisdictional staff track changes over time, recognize where other areas may potentially be susceptible to tree mortality, and apply appropriate best management practices.

Under current drought conditions, competition for resources within forested areas will likely continue to intensify with greater stress increasing tree susceptibility to insect damage and disease and ultimately increase mortality.

In all vegetation types, drought extends the length of the fire season because of its effect on live and dead fuel moisture, with critical low fuel moisture levels occurring early in spring or summer and extending at least through the first significant rains that typically come in late fall.

The whole of the Planning Area has some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The County noted that PSPS events, or severe storm events that knock out power, can cause water to stop being pumped by water companies or by individual wells in the County. PSPS events are usually not long-lasting, but severe weather can knock the power out for five to seven days. Water shortage can cause tree mortality issues in the County.

Plumas County is developing a County Drought Resilience Plan to help prepare state small water systems and domestic wells for future droughts and water shortages. Being prepared helps reduce hardships and improves our community's water supply resiliency. That plan noted that there are several areas in the County with more advanced water shortage vulnerability. This can be seen on Figure 4-92.

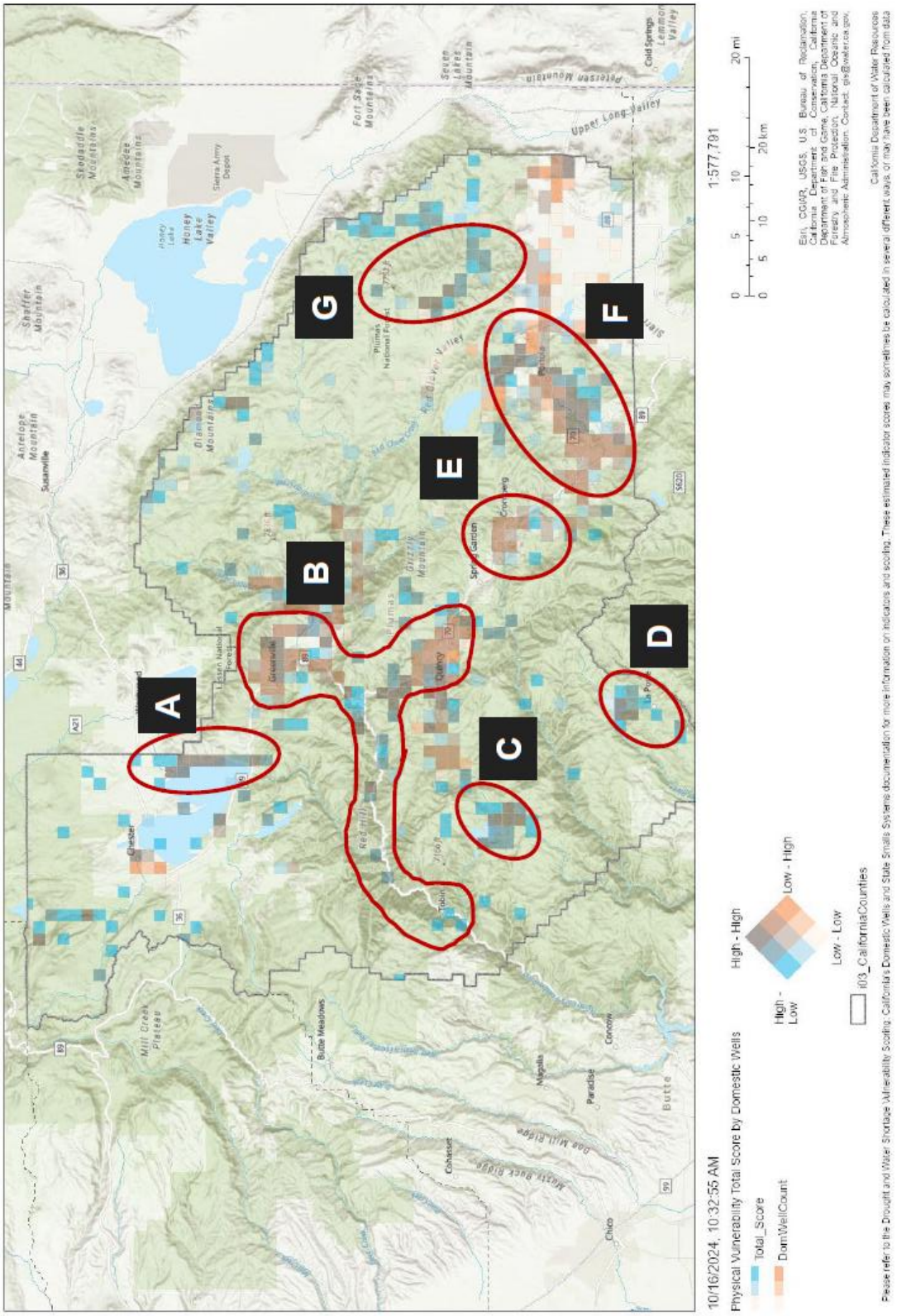
This includes the areas shown on Table 4-67.

Table 4-67 Plumas County Drought Task Force Risk Assessment Findings

Group	Regions with Water Shortage Vulnerability and Domestic Wells/SSWSs	Vulnerability Drivers	Social Vulnerability
A	Warner Valley and East of Lake Almanor	• Wildfire hazard • Fractured rock area • Multiple dry years	Low/Medium
B	Feather River Canyon from Greenville to Quincy, Tobin	• Wildfire hazard • Fractured rock area • Multiple dry years • Water quality and water supply issues • Unhoused population	Medium/High
C	Bucks Lake/Meadow Valley	• Dry well susceptibility in fractured rock area • Seasonal population (small population in the winter, larger population in the summer)	Low/Medium
D	La Porte	• Dry well susceptibility in fractured rock area • Seasonal population (small population in the winter, larger population in the summer)	Low/Medium
E	Cromberg/Sloat	• High density of domestic wells • Multiple dry years • Wildfire hazard	Medium
F	Lake Davis and Southwest of Portola (Iron Horse)	• Water quality and water supply issues • Dry well susceptibility in fractured rock area • Wildfire hazard	Medium/High
G	Dixie Valley and Frenchman Lake	• Water supply – no surface water supply • Wildfire risk • Dry well susceptibility in fractured rock areas • Lacking key infrastructure (e.g., electricity/power) • Seasonal population	Medium

Source: Plumas County Drought Task Force

Figure 4-92 Plumas County Planning Area – Regions with Water Shortage Vulnerability



Source: Plumas County Drought Task Force

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

The people and populations of the Plumas County Planning Area are not directly affected by general drought conditions; although, their turfed areas, trees, and other water-depending resources can all be affected. In extreme drought conditions, however, residents and other populations within the Planning Area may be vulnerable to drought and water shortage issues. Wells can go dry. Drought and water shortage can lead to an increase in wildfires threatening Planning Area residents. Water shortages can have an effect on all populations in the Planning Area but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water-dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased tree mortality and potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and infrastructure. Drought can also stress trees, causing die off. Dead and weakened trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities, often causing power outages. Fallen trees can also temporarily block roads and access which can impact first responders in an emergency.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced, and a loss of wetlands and marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the Planning Area are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to Planning Area residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Increased tree mortality during extended droughts can be substantial and widespread. This potential increase in tree mortality in the Planning Area can also add to the available fuel which can exacerbate the spread of wildfires. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the Planning Area unless they are impacted by a drought precipitated wildfire event.

FEMA NRI Hazard Vulnerability Assessment

The HMPC looked at the FEMA NRI for additional specific data on Plumas County's vulnerability to drought. The NRI contains data and analysis for 18 separate natural hazards, including drought. As shown in Table 4-68, drought could cause a total of $371,450 in expected annual losses, with a historic loss rating of relatively moderate. Drought has a relatively low rating for social vulnerability and a relatively high community resilience, with a risk index score of 87.4 out of 100. According to the NRI, there have been 1,400 drought events between the years 2000-2021 with an average of 61 events per year.

Table 4-68 Plumas County Planning Area – Drought Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Drought	87.4	$371,450	$3,622,270	Relatively moderate

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Drought and Water Shortage

The vulnerability to drought is Countywide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels and fuel loads associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels,

the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought that occurs during periods of extreme heat and high winds can be a contributing factor to PSPS events to be declared in the Planning Area. More information on PSPS can be found above in Section 4.3.

Other qualitative impacts associated with drought in the Plumas County Planning Area are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Drought Impact Reporter

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Table 4-69 show drought impacts for County from 1850 to May 2025. The data represented is skewed, with the majority of these impacts from records within the past ten years.

Table 4-69 Plumas County Drought Impacts 1850-5/1/2025

Category	Plumas County Number of Impacts
Agriculture	28
Business and Industry	11
Energy	8
Fire	16
Plants & Wildlife	30
Relief, Response, and Restrictions	69
Society and Public Health	28
Tourism and Recreation	13
Water Supply and Quality	67
Total	**270**

Source: National Drought Mitigation Center. Retrieved 5/1/2025.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the County to drought and water shortage.
- Future population growth should be considered as having more or less people in a community and can affect the overall hazard vulnerability to the County. Population growth in Plumas County is expected to decrease. Plumas County has access to large quantities of water through its groundwater as well as surface water. However, any future population growth in the County will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. As the population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to affordable clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Potential population growth will be a challenge not only with regard to Plumas County's water access for agricultural production, but state- and nation-wide with regard to food production. Should the County see a growth in population, it will increase the vulnerability and impacts to the County from this hazard.
- Land use planning should be proactive to address future hazard conditions. If the County begins to grow, more cropland may be taken out of production to provide housing to accommodate for population growth. As Plumas County's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, more development will also require an increase in water supply and associated infrastructure. Changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard depending on where and how this future growth occurs.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

4.3.10. Earthquake

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. This section briefly discusses issues related to types of seismic hazards.

Ground Shaking

Ground shaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by ground shaking is among the most serious seismic hazard. Damage to structures from this vibration, or ground shaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion.

Actual ground breakage generally affects only those buildings directly over or nearby the fault. Ground shaking generally has a much greater impact over a greater geographical area than ground breakage. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater. As with most communities in Northern California near active faults, much of Plumas County could be susceptible to moderate to more violent ground shaking.

Seismic Structural Safety

Older buildings constructed before building codes were established, and even newer buildings constructed before earthquake-resistance provisions were included in the codes, are the most likely to be damaged during an earthquake. Buildings one or two stories high of wood-frame construction are considered to be one of the most structurally resistant to earthquake damage. Older masonry buildings without seismic reinforcement (unreinforced masonry) and soft story buildings are the most susceptible to the type of structural failure that causes injury or death.

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions which affect low-rise buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium can cushion low-rise buildings, but it can also accentuate the motion in tall buildings. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Liquefaction Potential

Liquefaction is a process whereby soil is temporarily transformed to a fluid formed during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated (e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are loose to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction.

Liquefaction during major earthquakes can cause severe damage to structures on level ground as a result of settling, titling, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation. Also, of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted.

No known liquefaction areas exist in Plumas County.

Landslide/Debris Flows

Landslides can occur as a result of horizontal seismic inertia induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter. This is discussed in the vulnerability section below, and as a stand-alone hazard in Section 4.3.13.

Settlement

Settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to ground shaking is not available.

Fire Following Earthquake

Fire ignitions and spread following a major earthquake can further compound the potentially catastrophic impacts of a large earthquake event. Fire following earthquake is a major hazard in earthquake-prone areas which are densely developed and have high inventories of wood frame buildings. The capability of fire departments to combat fires following an earthquake is impacted by the regional nature of an earthquake,

damage to transportation and water supply systems, and the potential failure of telecommunications. A local fire department may suffer impacts to its personnel, buildings, equipment, and communications systems. Moreover, fewer resources are immediately available as mutual aid – due to the commitment of nearby fire departments responding to the earthquake within their own jurisdictions. Transportation system damage may adversely impact the mobilization of off-duty personnel and fire and rescue mutual aid resources from unaffected areas. Maneuvering fire crews within the affected areas of the earthquake may be impeded by debris or damage to roads and bridges. Additionally, the municipal water supply system which ordinarily supports firefighting operations is likely to be impacted.

Fire following earthquake is an issue that could impact any California community that experiences an earthquake – both urban and rural. According to the FM Global Insurance company, "Fires after earthquakes commonly initiate from electrical or fuel related sources because their use is widespread. In the US, natural gas is a factor 15 to 50 percent of the time, and electrical ignitions account for 40 percent or more of post-earthquake wildfires. Ignitable liquid spills, chemical reactions, and the contact of combustibles with heat sources have also initiated or contributed to many fires after earthquakes."

Location and Extent

California is seismically active because it sits on the boundary between two of the earth's tectonic plates. Most of the state - everything east of the San Andreas Fault - is on the North American Plate. The cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about two inches per year. The San Andreas Fault is considered the boundary between the two plates, although some of the motion is taken up on faults as far away as central Utah.

Faults

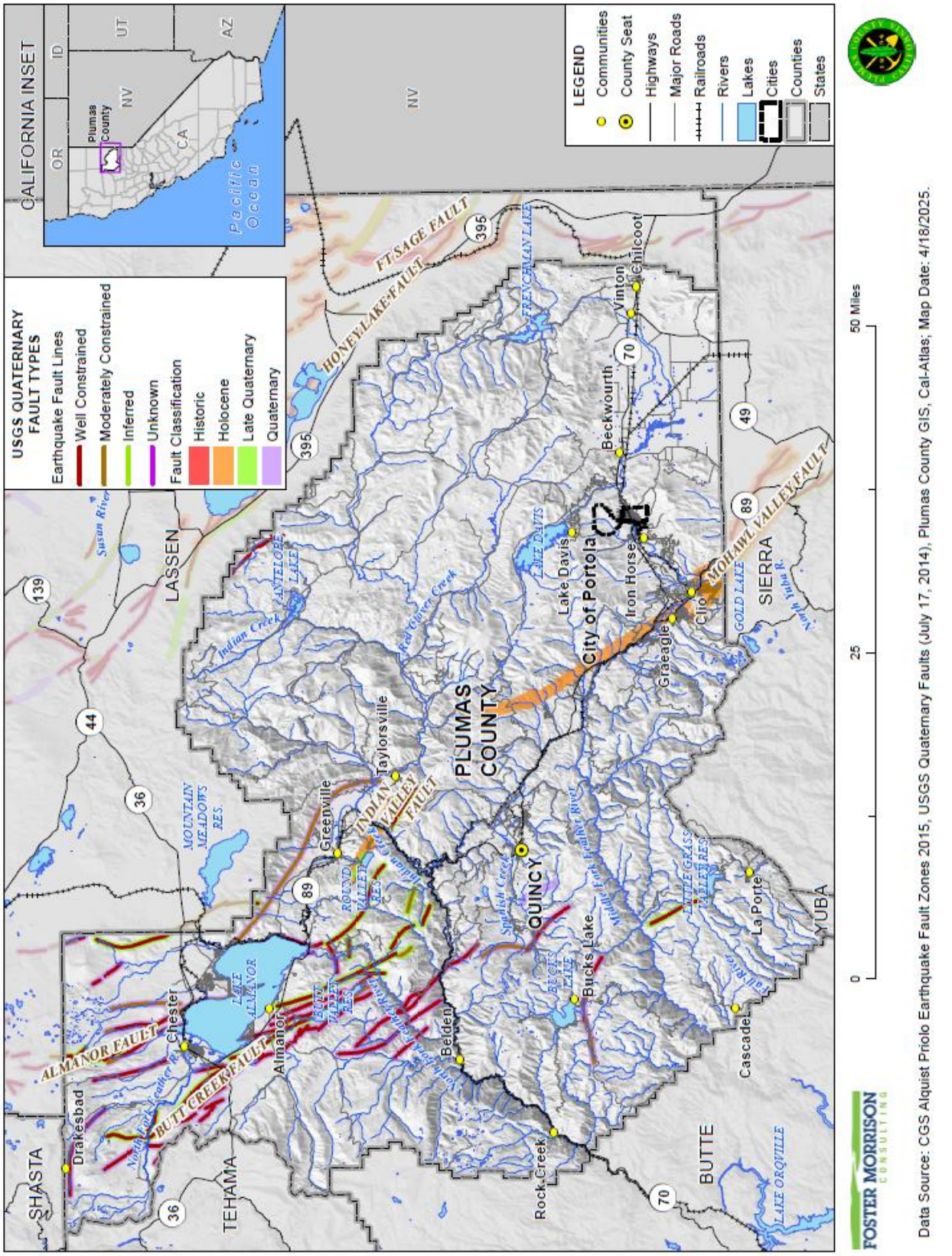
A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another." For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant. This does not mean, however, that faults having no evidence of surface displacement within the last 11,000 years are necessarily inactive. For example, the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active. Potentially active faults are those that have shown displacement within the last 1.6 million years (Quaternary). An inactive fault shows no evidence of movement in historic (last 200 years) or geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible ground shaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

The 2035 Plumas County General Plan Public Health and Safety Element noted that the risk of seismic hazards to residents of Plumas County is based on the approximate location of earthquake faults within and outside of the County. Several potentially active faults pass through Plumas County. The Almanor Fault, Butt Creek Fault Zone, and the Mohawk Valley Fault traverse the County. The Indian Valley Fault is also considered an active fault located within the County. Additionally, the Honey Lake and Fort Sage Faults are two active faults located east of the County that may pose a risk to the County Planning Area.

Figure 4-93 shows fault locations in and near Plumas County. The HMPC noted that an area of concern for the County is the Sierra Valley.

Figure 4-93 Faults in and near Plumas County



The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Table 4-70). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-70 Modified Mercalli Intensity (MMI) Scale

MMI	Felt Intensity
I	Not felt except by a very few people under special conditions. Detected mostly by instruments.
II	Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
III	Felt noticeably indoors. Standing automobiles may rock slightly.
IV	Felt by many people indoors; by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.
V	Felt by nearly everyone. Many people are awakened. Some dishes and windows are broken. Unstable objects are overturned.
VI	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.
VII	Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction.
VIII	Damage is slight in specially designed structures, considerable in ordinary buildings, and great in poorly built structures. Heavy furniture is overturned.
IX	Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.
X	Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Considerable landslides occur on steep slopes.
XI	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.
XII	Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.

Source: Multi-Hazard Identification and Risk Assessment, FEMA 1997

Other Hazards

Earthquakes can also cause landslides and dam failures. Earthquakes may cause landslides (discussed in Section 4.3.13), particularly during the wet season, in areas of high water or saturated soils. Finally, earthquakes can cause dams to fail (see Section 4.3.7 Dam Failure). Earthquakes can also cause levees to fail.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations in the County related to earthquakes, as shown on Table 4-4.

NCDC Events

Earthquake events are not tracked by the NCDC database.

USGS Events

The USGS National Earthquake Information Center database contains data on earthquakes in the Plumas County area. Table 4-71 shows the approximate distances earthquakes can be felt away from the epicenter. According to the table, a magnitude 5.0 earthquake could be felt up to 90 miles away. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Portola in Plumas County. These 43 results are detailed in Table 4-72.

Table 4-71 Approximate Relationships between Earthquake Magnitude and Intensity

Richter Scale Magnitude	Maximum Expected Intensity (MM)*	Distance Felt (miles)
2.0 - 2.9	I – II	0
3.0 - 3.9	II – III	10
4.0 - 4.9	IV – V	50
5.0 - 5.9	VI – VII	90
6.0 - 6.9	VII – VIII	135
7.0 - 7.9	IX – X	240
8.0 - 8.9	XI – XII	365

*Modified Mercalli Intensity Scale.
Source: USGS Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

*Table 4-72 Magnitude 5.0 Earthquakes or greater within 90 Miles of Plumas County**

Date	Richter Magnitude	Location
5/12/2023	5.16	4 km NW of Canyon dam, CA
5/11/2023	5.48	Lake Almanor Earthquake
5/24/2013	5.69	10 km WNW of Greenville, California
4/26/2008	5.1	1 km NW of Mogul, Nevada
8/10/2001	5.2	Northern California
11/26/1998	5.1	7 km NW of Redding, CA
11/28/1980	5.1	Northern California
2/22/1979	5.3	Northern California
11/27/1976	5	Northern California
8/2/1975	5.2	Northern California
8/2/1975	5.1	Northern California
8/1/1975	5.7	0 km WSW of Palermo, California
4/29/1968	5	Northern California
9/12/1966	5.91	Northern California
4/1/1959	5.6	Northern California

Date	Richter Magnitude	Location
9/26/1953	5.3	Nevada
3/22/1953	5	Northern California
5/9/1952	5.1	Nevada
12/14/1950	5.6	Northern California
3/20/1950	5.5	Lassen Peak area, California
12/29/1948	6	Northern California
7/7/1946	5	Lassen Peak area, California
3/30/1943	5.3	Northern California
12/17/1942	5.1	Northern California
12/3/1942	5.5	Nevada
2/8/1940	5.7	Northern California
4/24/1914	6.4	Nevada
2/18/1914	6	Nevada
6/23/1909	5.7	Northern California
3/3/1909	5	Northern California
6/20/1889	5.9	Northern California
4/29/1888	5.9	Northern California
6/3/1887	6.3	Nevada
1/31/1885	5.7	Northern California
1/7/1881	5.6	Near Red Bluff, California
7/10/1877	5.5	Lake Tahoe area, California-Nevada border
1/24/1875	6.2	South of Janesville, California
12/27/1869	6.2	Near Carson City, Nevada
12/27/1869	6.4	Northwest of Virginia City, Nevada
5/30/1868	6	Near Virginia City, Nevada
3/15/1860	6.5	East of Reno, Nevada
9/3/1857	6	California-Nevada Border east of Truckee
1/25/1855	5.5	Sierra County, California

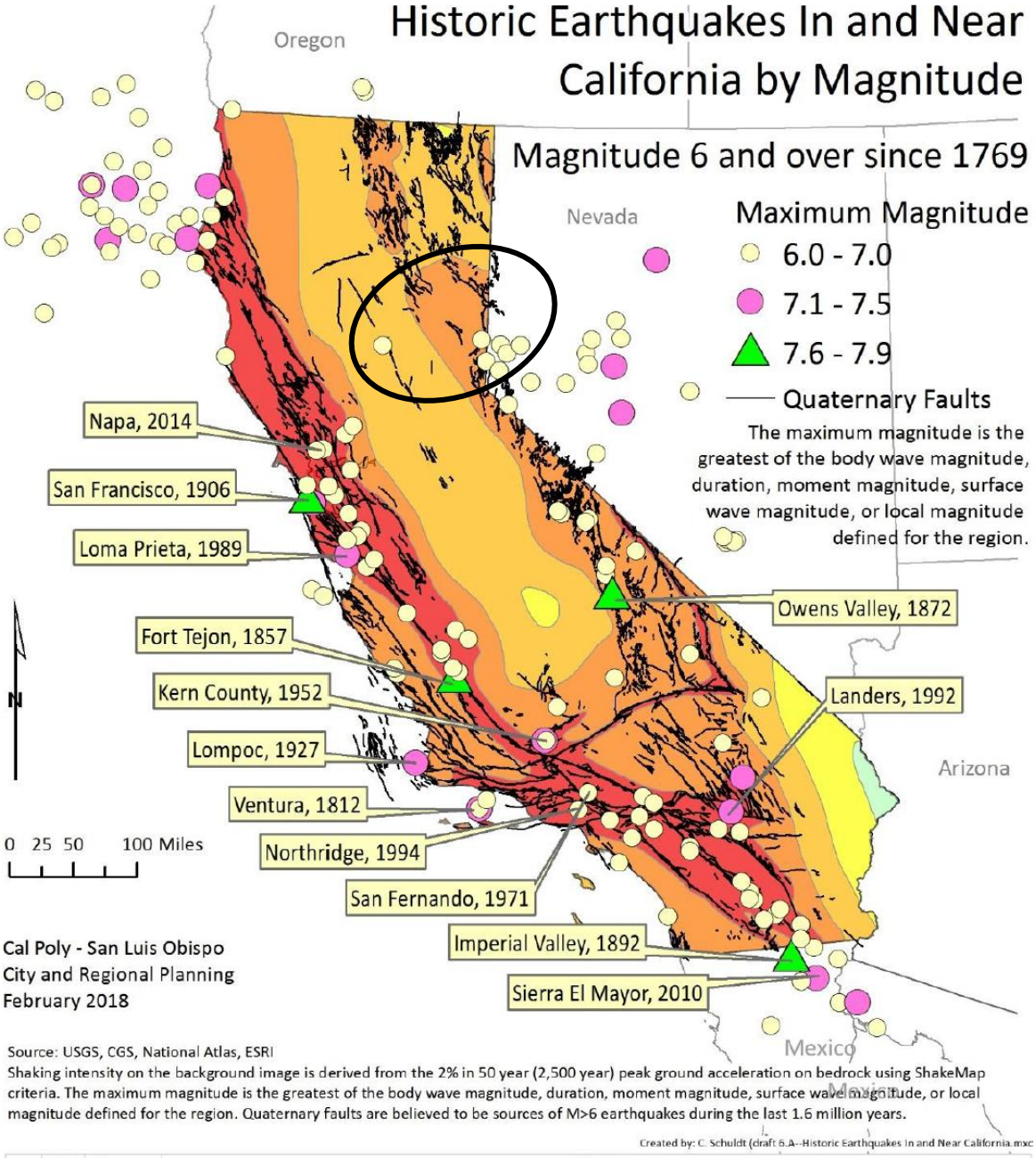
Source: USGS, National Earthquake Information Center
*Search dates 1950 – March 31, 2025

Figure 4-94 shows major historical earthquakes in California from 1769 to 2017. Since 2017, California has experienced four additional 6.0 or greater earthquakes:

- 2022 - 6.4 Ferndal
- 2021 - 6.0 Antelope Valley
- 2019 - 6.4 and 7.1 Ridgecrest

None of these earthquakes (over 6.0) since 2017 have affected the Plumas County Planning Area.

Figure 4-94 Historic Earthquakes in California 1769 to 2017



	MMI	Damage	Effects
	X	Very Heavy	Some well-built, wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
	IX	Heavy	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
	VIII	Moderate to Heavy	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
	VII	Moderate	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly-built or badly designed structures; some chimneys broken.
	VI	Light	Felt by all, many frightened. Some heavy furniture moved; a few instance of fallen plaster. Damage slight.
	V	Very Light	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

Source: 2023 State of California Multi-Hazard Mitigation Plan

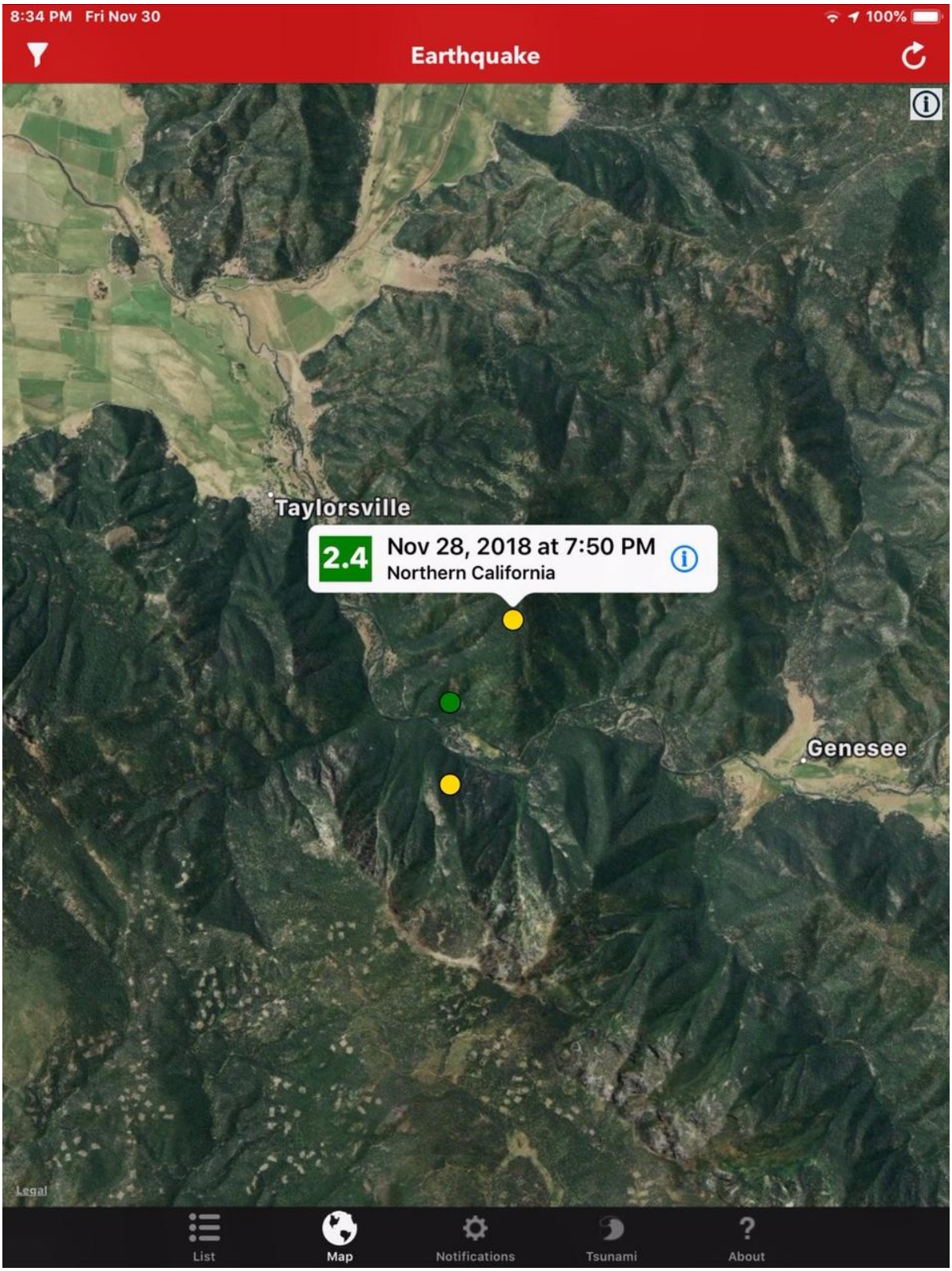
Hazard Mitigation Planning Committee Events

These section separates events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

In **November of 2019**, a small cluster of earthquakes ranging from 2.5 to 3.3 on the Richter Scale occurred near Taylorsville. No damages occurred, but the earthquakes were felt.

Figure 4-95 Taylorsville Earthquakes



Source: Plumas County

May 2023 – a 5.5m earthquake was noted at 15:19 and a 5.2m quake on May 12th at 02:18. Aftershocks were ongoing through 5/13/2023. Seneca Healthcare noted that it conducted a complete facility assessment with no issues noted. Seneca experienced no damage but did prepare for facility evacuation in the event of further quakes causing damage to the facility and roadways. Plumas Pines Resort had the biggest damages.

April 4-5, 2024 – Senecal Healthcare noted earthquakes near Belden in Plumas County – a total of seven earthquakes the largest being 4.4m between the hours of 1834 on 4/4/24 thru 4/5/25 @0346. Assessment showed no issues at Seneca Healthcare due to Earthquakes.

Events before 2019

The HMPC noted that during past regional earthquake events, Plumas County has experienced groundshaking. In addition, in some instances, nearby earthquake events have caused cracking in the plaster on walls and in windowsills.

The HMPC member from Viera Ranch noted that on **August 1, 1975**, the Oroville earthquake occurred in nearby Butte County. There was strong shaking noted in Quincy. Other events noted by this member include:

- **December 24, 1992** – an earthquake of 5.6 magnitude hit, causing ground shaking in Quincy.
- **January 16, 1993 –** a small earthquake was felt in Quincy.
- **August 13, 1994** – a small earthquake of 3.0 magnitude was felt in Quincy.
- **June 8, 1995 –** an earthquake of 4.1 was felt in the Cromberg area.
- **February 1, 1996** – a small earthquake was felt in Quincy.
- **November 5, 1997** – a 4.8 earthquake was felt in the Spring Garden Area.
- **June 5, 2001** – a small earthquake was felt in Quincy.
- **June 10, 2001** – a 5.5 earthquake was felt. It was centered in Portola. The County Courthouse was checked for cracks.
- **January 7, 2003** – a 2.8 earthquake was felt in Quincy.

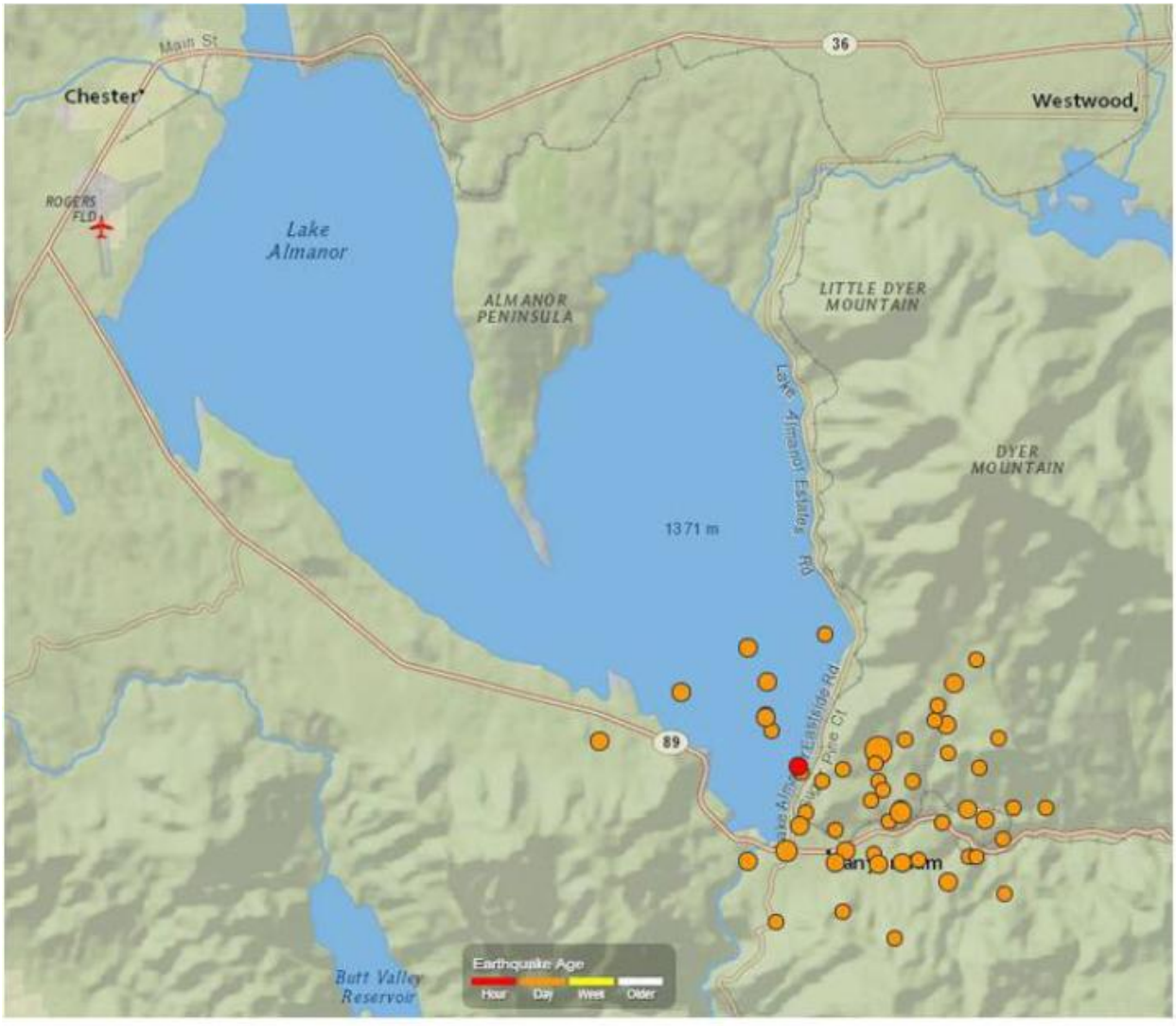
2013 – As shown on Table 4-72, a series of earthquakes occurred near Lake Almanor on May 24, 2013. The series of earthquakes included a 5.7 magnitude earthquake near Canyon Dam, near the southern end of Lake Almanor. See Figure 4-96 for location of the May 24th earthquake series. Injuries were reported and damage to infrastructure and homes were sustained. Lake Almanor Mutual Water Company sustained a water main rupture which resulted in water supply loss, and 600 PG&E customers on the Lake Almanor peninsula lost power.

A USGS Report on this event noted that Felt intensity among the communities around Lake Almanor appeared to vary significantly. Lake Almanor West, Lake Almanor Country Club, and Hamilton Branch experienced MMI ≥7, whereas other communities around the lake experienced MMI ≤6; the maximum observed intensity was MMI 8, in Lake Almanor West. Damage in the high intensity areas consisted of broken and collapsed chimneys, ruptured pipes, and some damage to foundations and to structural elements within houses. Although this shaking damage is not usually expected for an Mw 5.7 earthquake, the intensities at Lake Almanor Country Club correlate with the peak ground acceleration (38 percent g) and peak ground velocity (30 centimeters per second) recorded by the California Strong Motion Instrumentation Program accelerometer located at the nearby Lake Almanor Fire Station. The intensity distribution for the

three hardest hit areas (LAW, LACC, and HB) appears to increase as the azimuth from epicenter to the intensity sites approaches the fault strike. The small communities of Almanor and Prattville on the southwestern shore of Lake Almanor experienced somewhat lower intensities. The town of Canyon Dam experienced a lower intensity as well, despite its location up-dip of the earthquake rupture.

As a result of the 5.7 event, Plumas County BOS instituted an emergency proclamation. This provides businesses and homeowners official documentation in potential damage claim activity. Over one million dollars in damages were reported and over 50 homes in the Lake Almanor basin were impacted. Broken or toppled chimneys were the most common report, however broken water lines caused flooding and water damage. At least one residential structure was shifted off its foundation as a result of ground shaking. Figure 4-97 depicts damage to a home in the Lake Almanor area.

Figure 4-96 Plumas County – May 2013 Canyon Dam Earthquakes



Source: USGS

Figure 4-97 Plumas County – Home Damaged by Canyon Dam Earthquake

Source: Plumas County

Figure 4-98 shows interior damage done to a house in the Lake Almanor Country Club area. Figure 4-99 shows a water tank. The earthquake caused a coupling to break, spilling 50,000 gallons of water before the LACC Mutual Water Company shut off the leak. Figure 4-100 shows the exterior of a house where a chimney collapsed.

Figure 4-98 Damage at Home in Lake Almanor Country Club Area

Source: Chapman, K., Gold, M.B., Boatwright, J., Sipe, J., Quitoriano, V., Dreger, D., and Hardebeck, J., 2016, Faulting, damage, and intensity in the Canyon dam earthquake of May 23, 2013: U.S. Geological Survey Open-File Report 2016-1145, 49 p., http://dx.doi.org/10.3133/ofr20161145.

Figure 4-99 Water Tank in Lake Almanor Country Club Area

Source: Chapman, K., Gold, M.B., Boatwright, J., Sipe, J., Quitoriano, V., Dreger, D., and Hardebeck, J., 2016, Faulting, damage, and intensity in the Canyon dam earthquake of May 23, 2013: U.S. Geological Survey Open-File Report 2016-1145, 49 p., http://dx.doi.org/10.3133/ofr20161145.

Figure 4-100 Chimney Collapse at a Home in Lake Almanor Country Club Area

Source: Chapman, K., Gold, M.B., Boatwright, J., Sipe, J., Quitoriano, V., Dreger, D., and Hardebeck, J., 2016, Faulting, damage, and intensity in the Canyondam earthquake of May 23, 2013: U.S. Geological Survey Open-File Report 2016-1145, 49 p., http://dx.doi.org/10.3133/ofr20161145.

Likelihood of Future Occurrence

Unlikely (major earthquake); Likely (minor earthquake)— A few sizeable earthquakes have been recorded within the County. The possibility of an earthquake is an ever-present phenomenon in California

and Plumas County. The combination of plate tectonics and associated California coastal mountain range building geology essentially guarantees earthquake as a result of the periodic release of tectonic stresses.

It is likely that climate change will not affect the chance of future occurrence as well as future impacts. More information on climate change and earthquake can be found below the Mapping of Future Occurrences section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Mapping of Future Occurrences

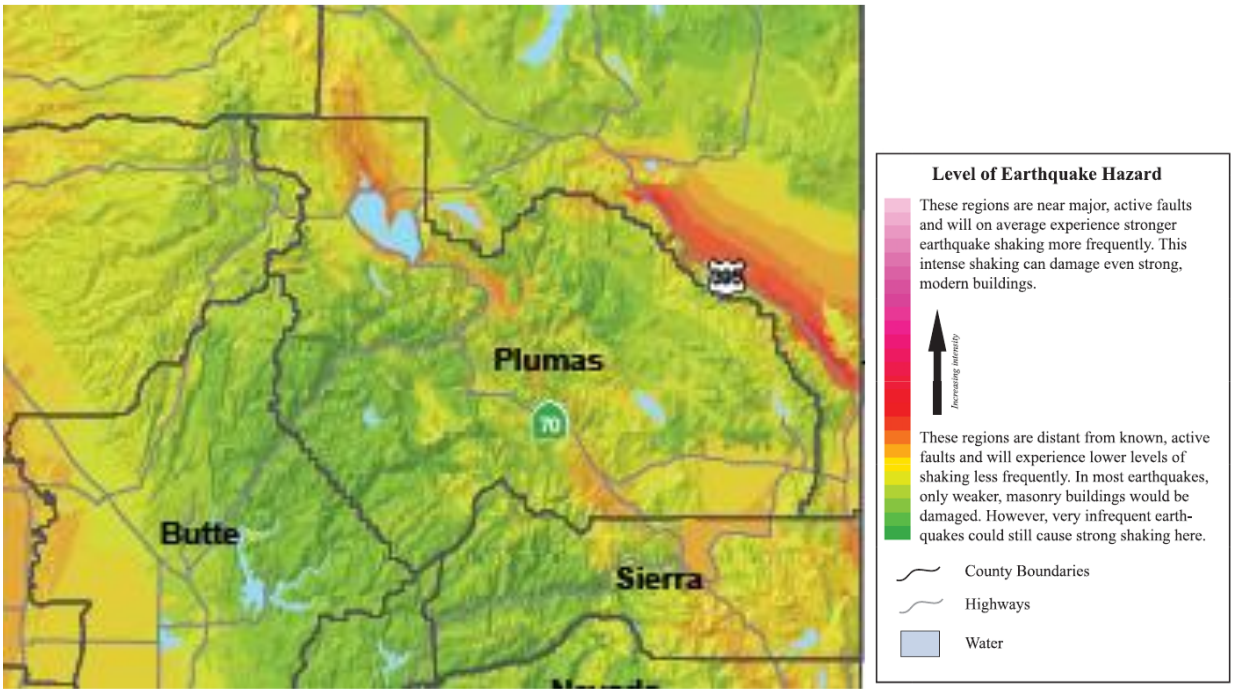
Mapping of future occurrences is presented in the following sections:

- CGS Analysis
- UCERF Analysis

CGS Analysis

Maps indicating the maximum expectable intensity of ground shaking for the County are available through several sources. Figure 4-101, prepared in 2016 by the California Division of Mines and Geology, shows the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2,500-year average repeat time. Although the greatest hazard is in areas of highest intensity as shown on the map, no region is immune from potential earthquake damage.

Figure 4-101 Maximum Expectable Earthquake Intensity – 2% Chance in 50 Years

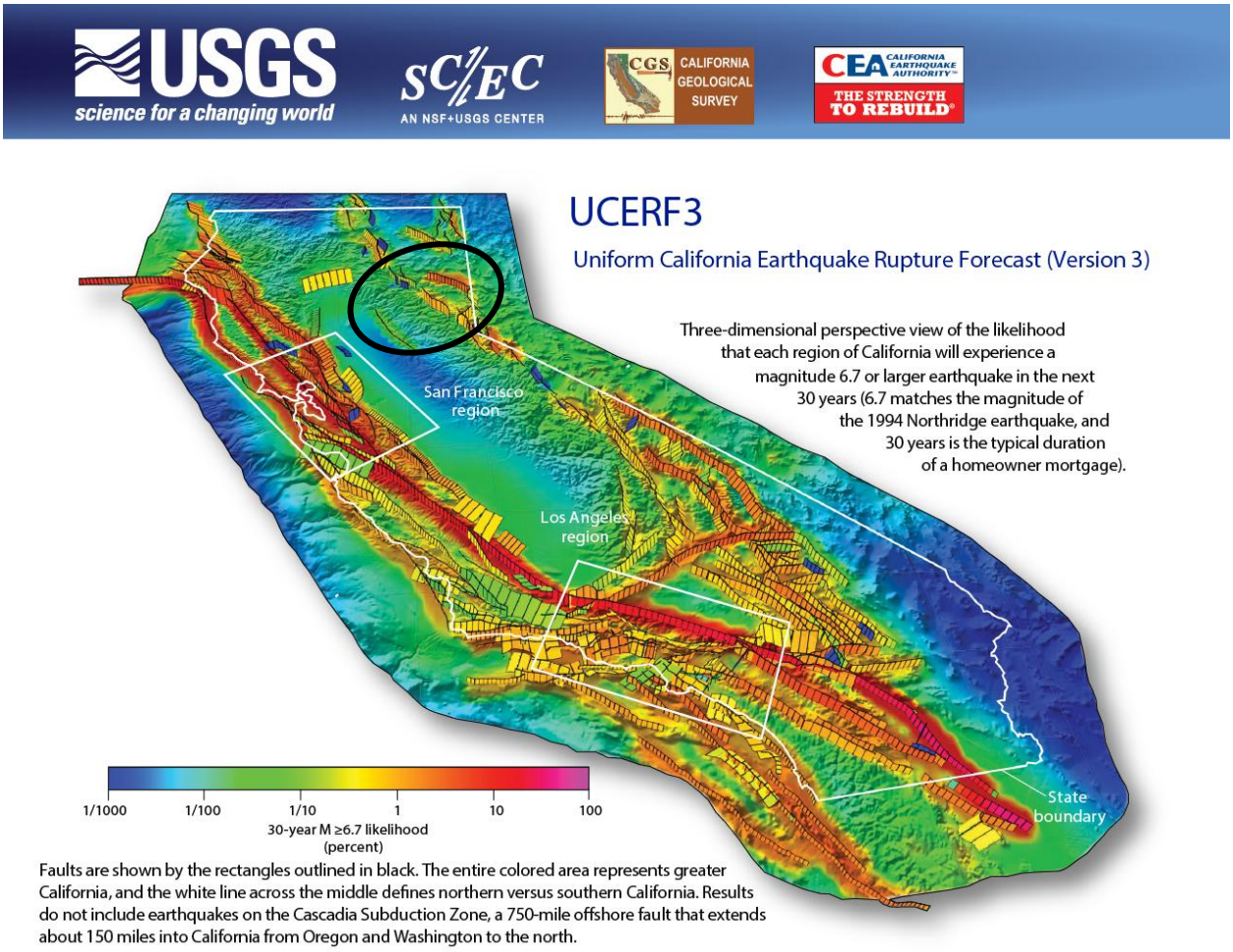


Source: California Division of Mines and Geology (2016)

UCERF Analysis

In 2014, the USGS and the California Geological Survey (CGS) released the time-dependent version of the Uniform California Earthquake Rupture Forecast (UCERF III) model. The UCERF III results have helped to reduce the uncertainty in estimated 30-year probabilities of strong ground motions in California. The UCERF map is shown in Figure 4-102 and indicates that Plumas County has a low to moderate risk of earthquake occurrence.

Figure 4-102 Probability of Earthquake Magnitudes Occurring in 30 Year Time Frame



Source: United States Geological Survey Open File Report 2015-3009

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength.

Vulnerability Assessment

Vulnerability—High

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while more rural areas, such as Plumas County are less vulnerable. The primary impacts of concern are life safety and property damage. Several faults are in and near the Plumas County Planning Area, and seismic hazard mapping indicates that the Planning Area has low to moderate seismic hazard potential. Depending on the location and magnitude of an earthquake event, some degree of structural damage due to stronger seismic shaking could be expected.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Seismic events can have particularly negative effects on older buildings constructed of URM, including materials such as brick, concrete and stone. The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Plumas County is within the less hazardous Zone 3. The County Building Department does not track or keep an inventory of URM buildings. The first building permit was issued in 1959, and at that time they were issued by the Assessor's office. The Building Department did not come into existence until 1968 and at that time the 1967 edition of the Uniform Building Code was in force. Under the 67 UBC Chapter 24, all habitable structures constructed of masonry were required to be reinforced. It would be safe to assume that prior to the existence of the Building Department in 1968, any structure built of masonry may not be reinforced.

The HMPC noted that an area of concern for the County is the Sierra Valley.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from earthquake include people and populations; structures; critical facilities and infrastructure and community lifelines; natural, historic, and cultural resources; and economic assets and

community activities of value. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

All people and populations are at risk from earthquake shaking and other subhazards related to an earthquake event. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP and described in the Hazus Analysis section below.

Structures

All structures in the Plumas County Planning Area are vulnerable to earthquakes, depending on the severity and location of the shake. Older buildings, unreinforced masonry and soft story buildings are at a much greater risk to earthquakes. More information on structures at risk can be seen in the Hazus scenarios below.

Critical Facilities and Infrastructure

Earthquakes present a tremendous threat to critical facilities and infrastructure. More information on structures at risk can be seen in the Hazus scenarios below.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. Earthquakes can significantly damage surrounding habitats. It is also possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Hazus Analysis

Earthquake losses will vary across the Plumas County Planning Area depending on the source and magnitude of the event. To further evaluate potential losses associated with earthquake activity in the Planning Area, four Hazus-MH earthquake scenarios were run for this 2025 LHMP Update as detailed below.

FEMA's Hazus model, utilizing GIS technology, estimates potential losses from earthquakes by analyzing the built environment, including buildings, infrastructure, and population, along with hazard data and damage functions. The model incorporates inventory information about buildings, infrastructure (roads, utilities, etc.), and population to assess the potential impact of a hazard. It uses hazard-specific data, such as earthquake intensity and employs damage functions that relate the intensity of the hazard to the level of damage to buildings and infrastructure based on research and historical data. By combining the inventory, hazard, and damage function data, HAZUS estimates the potential losses in terms of direct physical damage, induced damage, and direct losses (e.g., building damage, debris generation, casualty rates, economic impacts). The results of HAZUS analysis can be used to identify vulnerable areas, prioritize mitigation actions, and develop disaster preparedness plans.

Hazus-MH 6.1 was utilized to model earthquake losses for the County. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. This is a planning level analysis.

HAZUS Level 1 Runs

These events were chosen from data gathered from the Plumas County General Plan Safety Element and the USGS' seismic scenarios catalog. For deterministic Hazus scenarios, a single scenario event is selected based on a specific fault, the epicenter location, and the potential magnitude of the event.

Table 4-73 Hazus Scenario Data from the USGS Earthquake Hazards Program Catalog

Hazus Fault Info	Hazus Catalog Information
Earthquake Fault	**Great Valley 3**
Epicenter	38.757000, -121.877000
Epicenter Location Description	Approximately 80 miles to the southwest of Plumas County
Scenario	Great Valley 03a Dunnigan Hills
Ruptures	Great Valley 03a Dunnigan Hills
Magnitude	6.53
MMI	8.42
Event ID	bssc2014greatvalley03adunnig_m6p53_se
URL	https://earthquake.usgs.gov/scenarios/eventpage/bssc2014greatvalley03adunnig_m6p53_se/origin/detail
Earthquake Fault	**Hat Creek-McArthur-Mayfield**
Epicenter	41.001, -121.477

Hazus Fault Info	Hazus Catalog Information
Epicenter Location Description	Approximately 40 miles to the north/northwest of Plumas County
Scenario	HC-MAC-MAY 7.29
Ruptures	Hat Creek-McArthur-Mayfield
Magnitude	7.29
MMI	8.58
Event ID	bssc2014hatcreekmcarthurmayf_m7p29_se
URL	https://earthquake.usgs.gov/scenarios/eventpage/bssc2014hatcreekmcarthurmayf_m7p29_se
Earthquake Fault	**Honey Lake**
Epicenter	40.174400, -120.289001
Epicenter Location Description	Approximately 5 miles to the northeast of Plumas County
Scenario	HONEY LAKE 7.03
Ruptures	Honey Lake
Magnitude	7.03
MMI	8.72
Event ID	bssc2014honeylake2011cfmshaw_m7p03_se
URL	https://earthquake.usgs.gov/scenarios/eventpage/bssc2014honeylake2011cfmshaw_m7p03_se/executive
Earthquake Fault	**Warm Springs Valley**
Epicenter	39.955002, -119.803001
Epicenter Location Description	Approximately 19 miles to the east of Plumas County
Scenario	Warm Springs Valley 6.92
Ruptures	Warm Springs Valley fault zone
Magnitude	6.92
MMI	8.74
Event ID	bssc20141605_m6p92_se
URL	https://earthquake.usgs.gov/scenarios/eventpage/bssc20141605_m6p92_se/executive

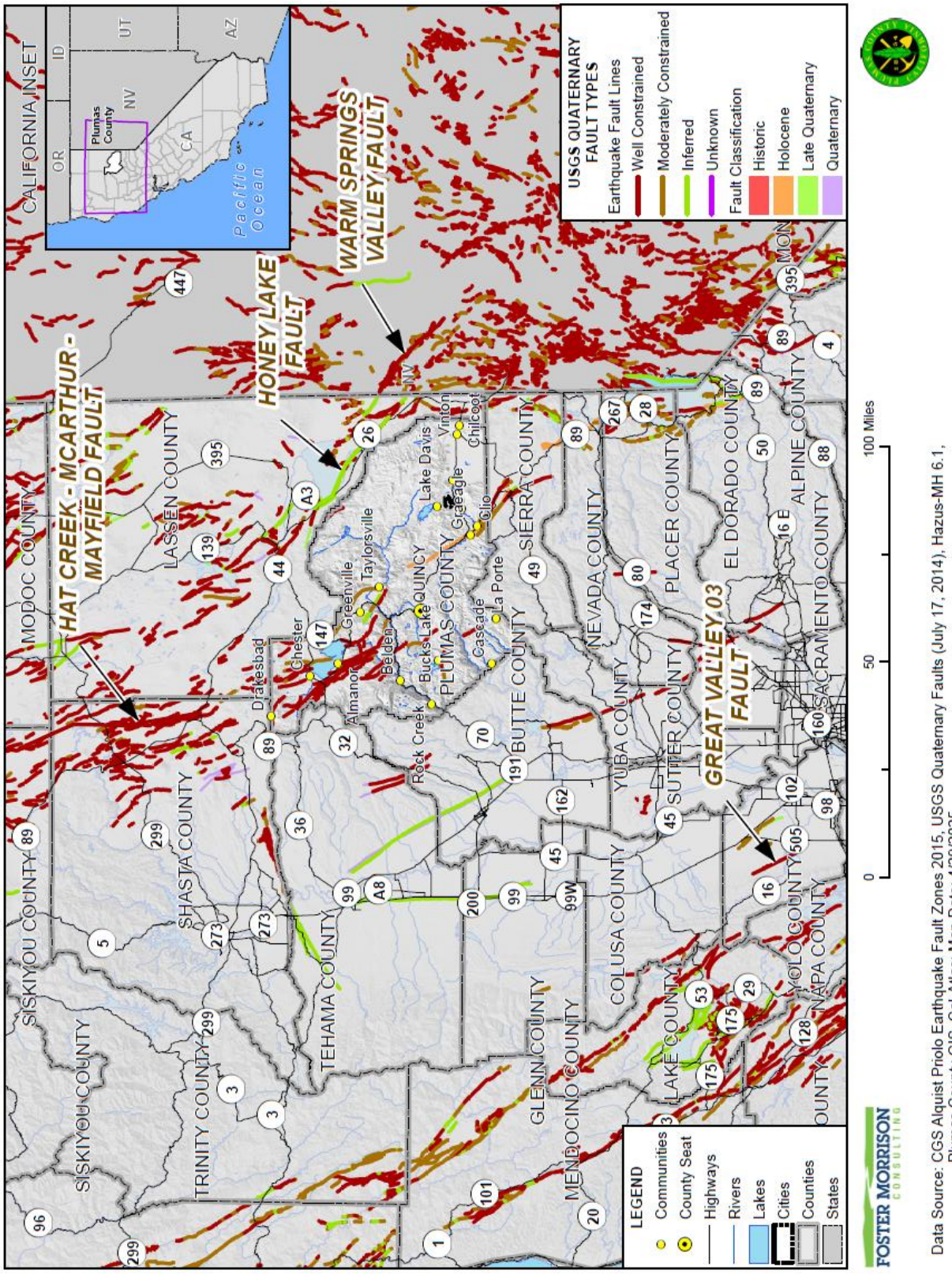
Source: Hazus 6.1

The earthquake scenarios are selected for analysis based on the earthquake fault availability in the FEMA Hazus-MH 6.1 Tool and the corresponding earthquake scenario availability through the USGS Earthquake Hazards Program Data Catalog.

The earthquake faults of concern noted in the 2020 Plumas County LHMP and the County Safety Element were available in the USGS Catalog but were not available in Hazus and therefore were not available for analysis. These faults include: Almanor, Butte Creek, Fort Sage, Indian Valley, and Mohawk Valley.

These Hazus scenarios can be seen on Figure 4-103 and are captured in totality in Appendix I. Summary Hazus results follow the Figure, and include summary tables of all Hazus scenario runs and a Hazus scenario comparison table.

Figure 4-103 Plumas County Planning Area – Hazus Earthquake Faults and Epicenter Locations



Great Valley (03A) Fault 6.53 Hazus Scenario

The results of this deterministic scenario are captured in Table 4-74. Key losses included the following:

- Total economic loss estimated for the earthquake was $0, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were 0.00 (millions of dollars); 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0% of the total loss.
- No buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that 86 hospital beds (almost 100%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100% of the beds will be back in service. By 30 days, 100% will be operational.
- Regardless of the time of the earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-74 Plumas County Planning Area – Great Valley 3 Fault 6.53 Magnitude Scenario Results

Type of Impact	Great Valley 3 6.53 Magnitude Deterministic Scenario
Total Buildings Damaged (based on 16,000 buildings)	Slight: 0 Moderate: 0 Extensive: 0 Complete: 0
Building and Income Related Losses	$0
Total Economic Losses (Includes building, income and lifeline losses)	$1,800,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage
Damage to Utility Systems	There are no electrical power facilities with at least moderate damage. 1 potable water line breaks, 1 wastewater line breaks, and 0 natural gas line breaks.

Type of Impact	Great Valley 3 6.53 Magnitude Deterministic Scenario	
Households without Power/Water Service (Based on 9,216 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	0 displaced households	
Shelter Requirements	0 persons	
Debris Generation	0 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-104 shows the peak ground acceleration due to the Great Valley 6.53 earthquake. Figure 4-105 shows the total losses by census tract in Plumas County due to the Great Valley 6.53 earthquake.

Figure 4-104 Plumas County Planning Area – Great Valley 6.53 Magnitude Peak Ground Accelerations

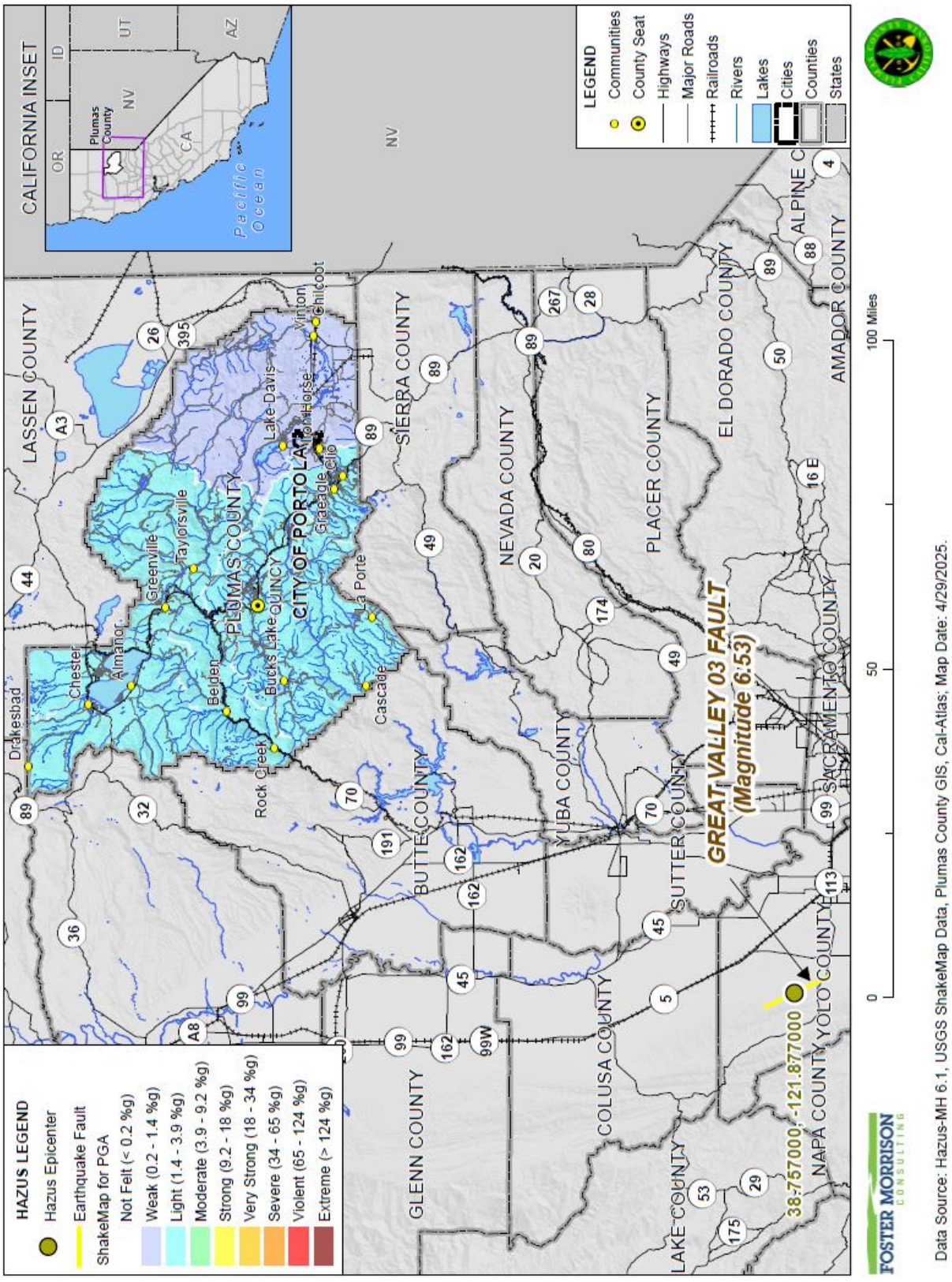
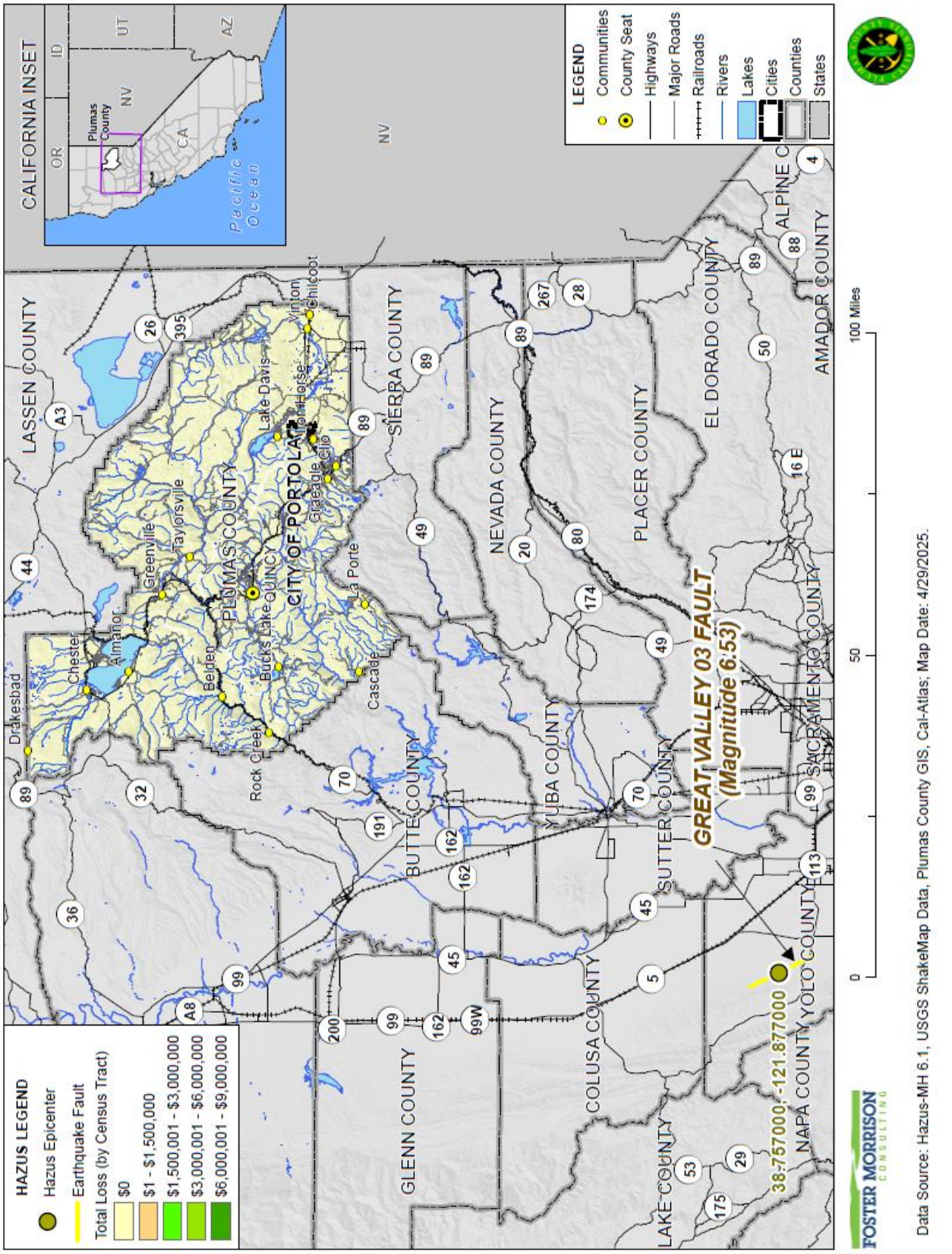


Figure 4-105 Plumas County Planning Area – Great Valley 6.53 Magnitude Hazus Total Loss



Hazus Hat Creek-McArthur-Mayfield Fault 7.29 Hazus Scenario

The results of this deterministic scenario are captured in Table 4-75. Key losses included the following:

- Total economic loss estimated for the earthquake was $154,050,000, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were 19.96 (millions of dollars); 15% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 57% of the total loss.
- 72 buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 82 hospital beds (95%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 99.00% of the beds will be back in service. By 30 days, 100% will be operational.
- Regardless of the time of the earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-75 Plumas County Planning Area – Hat Creek-McArthur-Mayfield 7.29 Magnitude Scenario Results

Type of Impact	Hat Creek-McArthur-Mayfield 7.29 Magnitude Deterministic Scenario
Total Buildings Damaged (based on 16,000 buildings)	Slight: 454 Moderate: 68 Extensive: 4 Complete: 0
Building and Income Related Losses	$19,390,000
Total Economic Losses (Includes building, income and lifeline losses)	$154,050,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage
Damage to Utility Systems	There would be no electrical power facility with at least moderate damage. 17 potable water line breaks, 9 wastewater line breaks, and 3 natural gas line breaks.

Type of Impact	Hat Creek-McArthur-Mayfield 7.29 Magnitude Deterministic Scenario	
Households without Power/Water Service (Based on 9,216 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	1 displaced household	
Shelter Requirements	0 persons	
Debris Generation	2,000 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-106 shows the peak ground acceleration due to the Hat Creek-McArthur-Mayfield 7.29 earthquake. Figure 4-107 shows the total losses by census tract in Plumas County due to the Hat Creek-McArthur-Mayfield 7.29 earthquake.

Figure 4-106 Plumas County Planning Area – Hat Creek-McArthur-Mayfield 7.29 Magnitude Hazus Peak Ground Acceleration

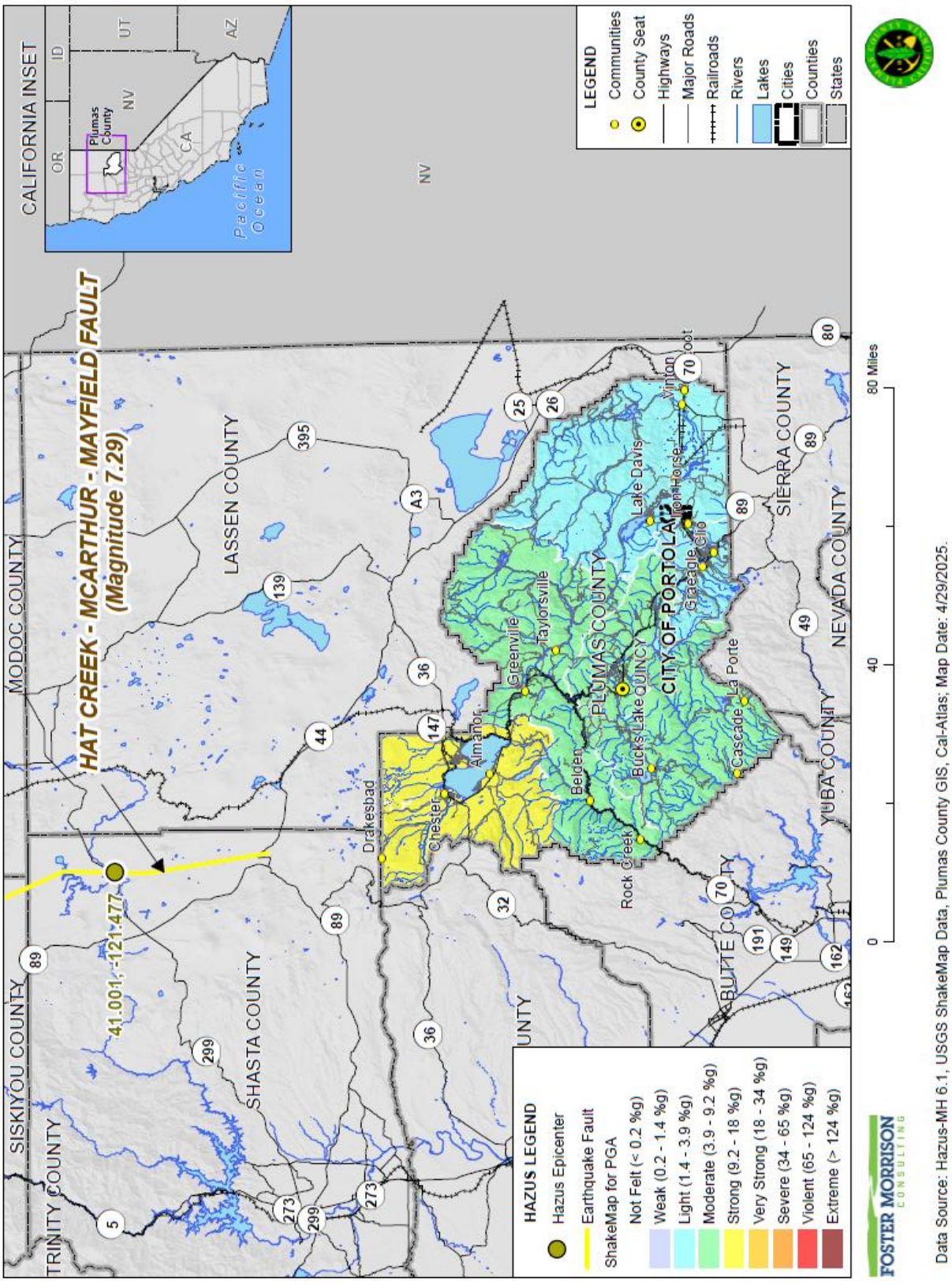
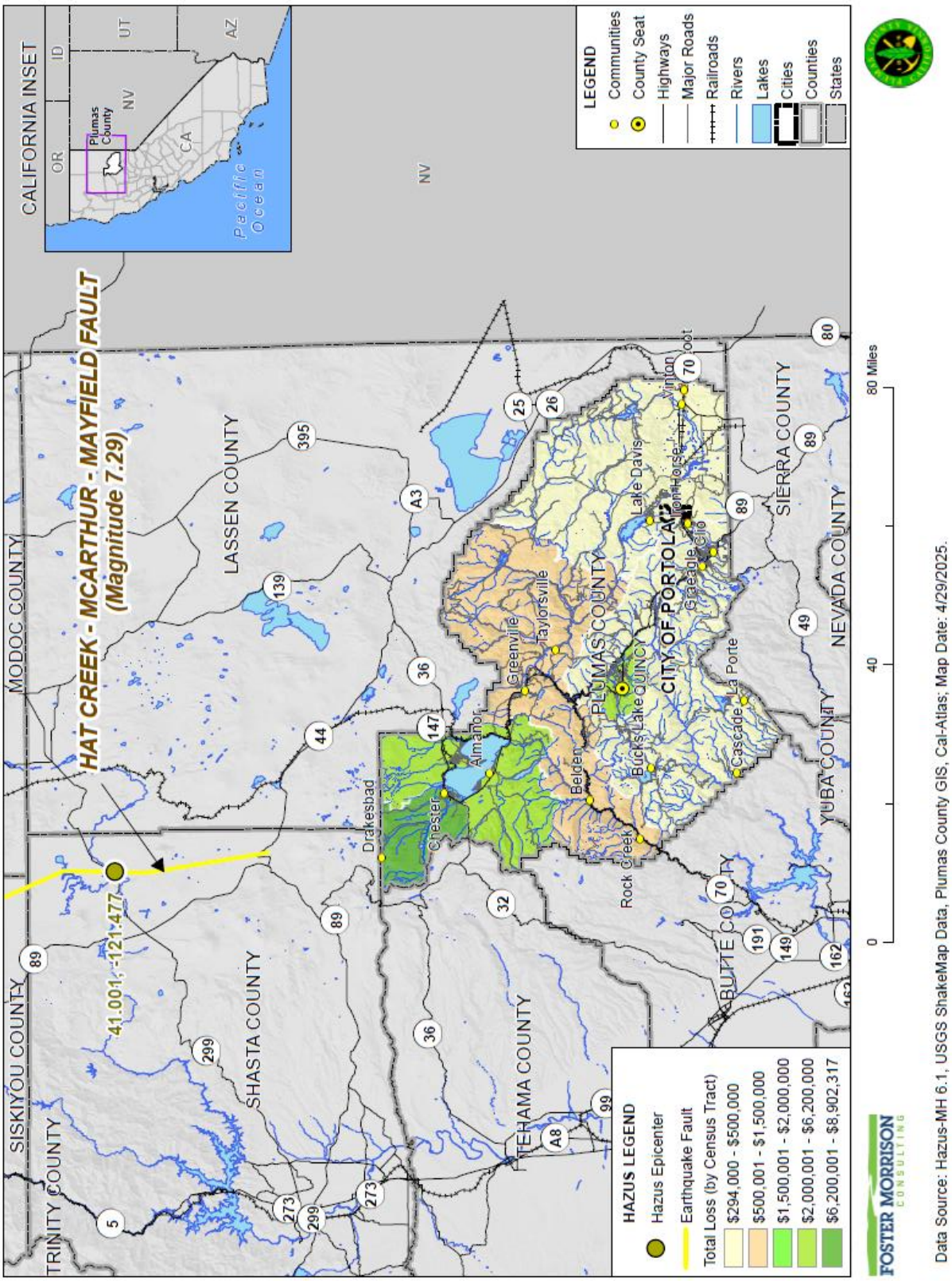


Figure 4-107 Plumas County Planning Area – Hat Creek-McArthur-Mayfield 7.29 Magnitude Hazus Total Loss



Honey Lake 7.03 Hazus Scenario

The results of this probabilistic scenario are captured in Table 4-76. Key losses included the following:

- Total economic loss estimated for the earthquake was $179,640,000, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were 50.87 (millions of dollars); 15% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 54% of the total loss.
- 17 buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 81 hospital beds (93%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 99% of the beds will be back in service. By 30 days, 100% will be operational.
- Regardless of the time of the earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-76 Plumas County Planning Area – Honey Lake 7.03 Magnitude Deterministic Scenario Results

Type of Impact	Honey Lake 7.03 Magnitude Deterministic Scenario
Total Buildings Damaged (based on 16,000 buildings)	Slight: 1,047 Moderate: 198 Extensive: 16 Complete: 1
Building and Income Related Losses	$50,870,000
Total Economic Losses (Includes building, income and lifeline losses)	$179,640,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 2 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 3 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 2 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage
Damage to Utility Systems	There are no electrical power facilities with at least moderate damage. 38 potable water line breaks, 19 wastewater line breaks, and 6 natural gas line breaks.

Type of Impact	Honey Lake 7.03 Magnitude Deterministic Scenario	
Households without Power/Water Service (Based on 9,216 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	5 displaced households	
Shelter Requirements	2 persons	
Debris Generation	5,000 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-104 shows the peak ground acceleration due to the Honey Lake 7.03 earthquake. Figure 4-109 shows the total losses by census tract in Plumas County due to the Honey Lake 7.03 earthquake.

Figure 4-108 Plumas County Planning Area – Honey Lake 7.03 Magnitude Hazus Peak Ground Acceleration

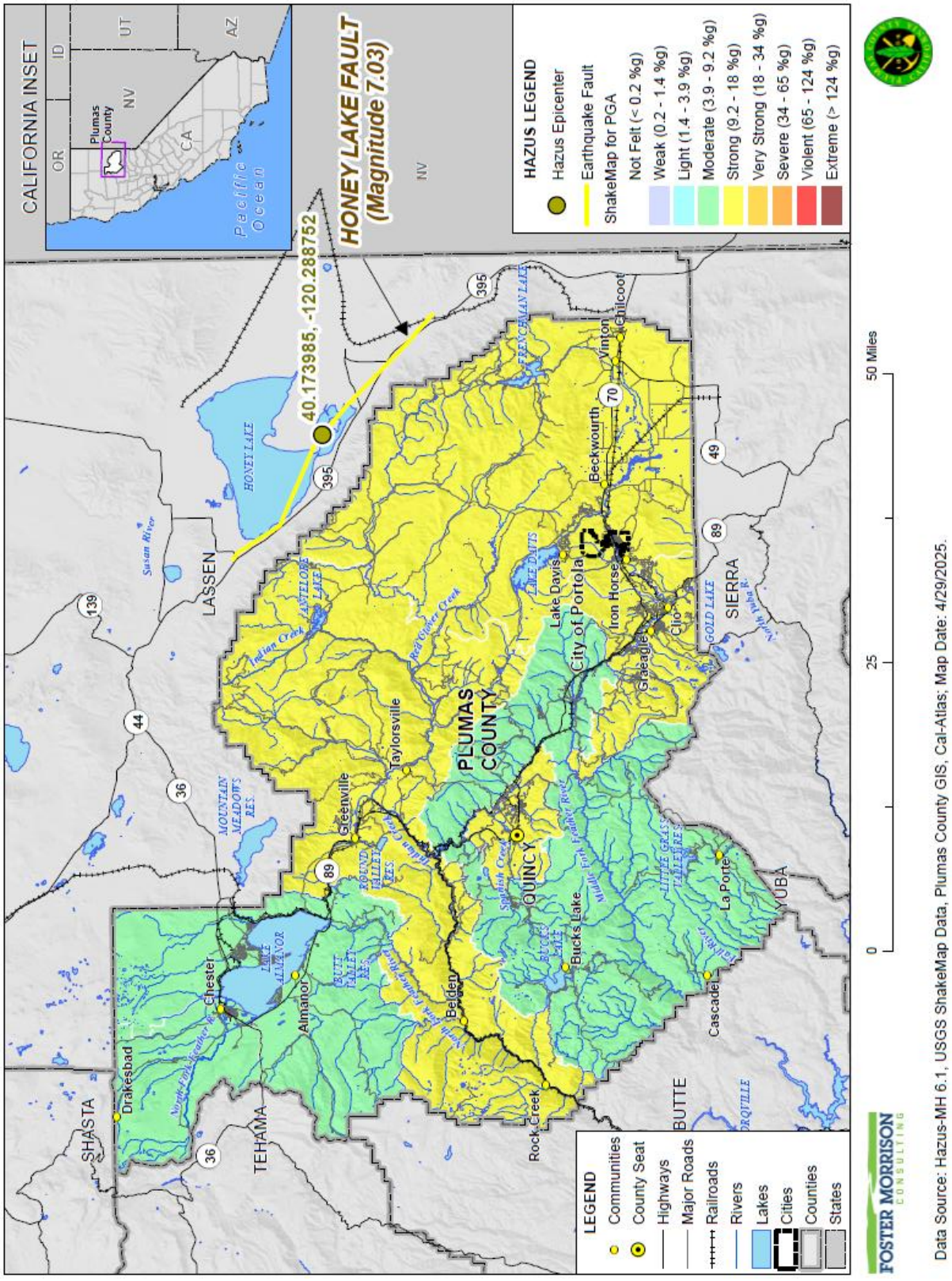
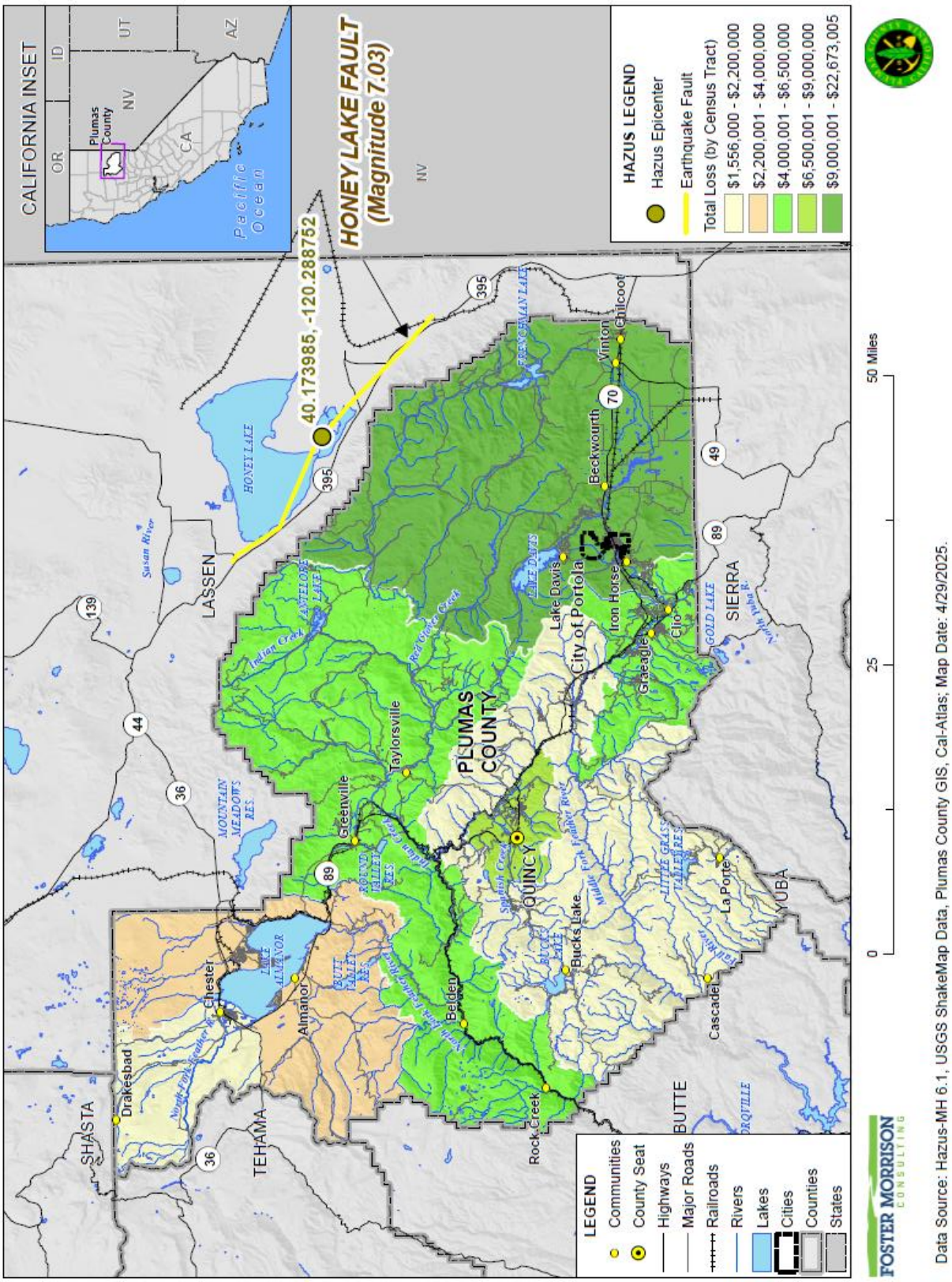


Figure 4-109 Plumas County Planning Area – Honey Lake 7.03 Magnitude Hazus Total Loss



Warm Springs Valley 6.92 Hazus Scenario

The results of this probabilistic scenario are captured in Table 4-76. Key losses included the following:

- Total economic loss estimated for the earthquake was $31,20,000, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were 15.16 (millions of dollars); 17% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up over 52% of the total loss.
- 71 buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 84 hospital beds (98%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100% of the beds will be back in service. By 30 days, 100% will be operational.
- Regardless of the time of the earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-77 Plumas County Planning Area – Warm Springs Valley 6.92 Magnitude Deterministic Scenario Results

Type of Impact	Warm Springs Valley 6.92 Magnitude Deterministic Scenario
Total Buildings Damaged (based on 16,000 buildings)	Slight: 374 Moderate: 66 Extensive: 5 Complete: 0
Building and Income Related Losses	$15,160,000
Total Economic Losses (Includes building, income and lifeline losses)	$31,200,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage
Damage to Utility Systems	There are no electrical power facilities with at least moderate damage. 14 potable water line breaks, 7 wastewater line breaks, and 2 natural gas line breaks.

Type of Impact	Warm Springs Valley 6.92 Magnitude Deterministic Scenario	
Households without Power/Water Service (Based on 9,216 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	1 displaced household	
Shelter Requirements	0 persons	
Debris Generation	2,000 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-104 shows the peak ground acceleration due to the Warm Springs Valley 6.92 earthquake. Figure 4-109 shows the total losses by census tract in Plumas County due to the Warm Spring Valley 6.92 earthquake.

Figure 4-110 Plumas County Planning Area – Warm Springs Valley 6.92 Magnitude Hazus Peak Ground Acceleration

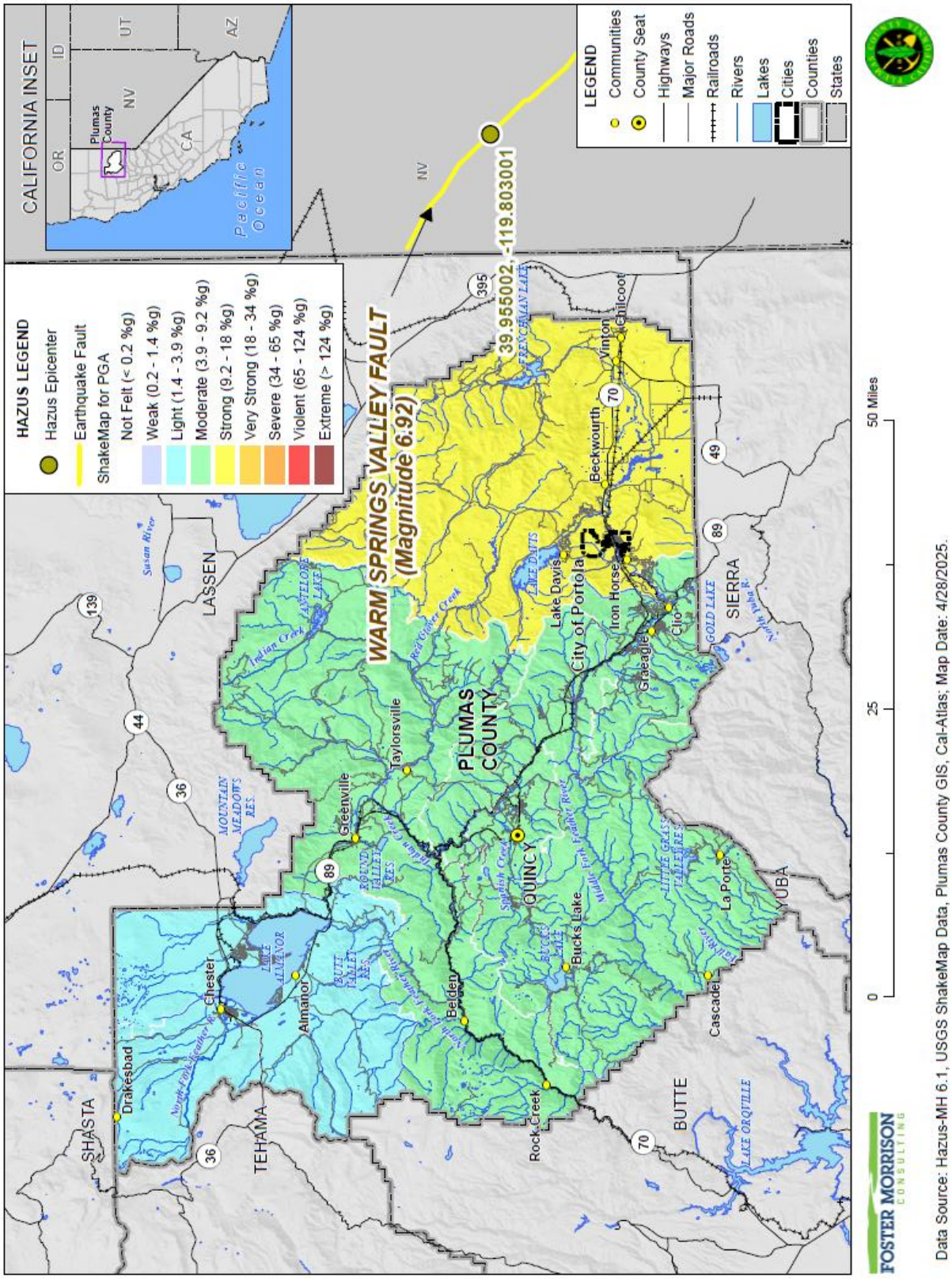
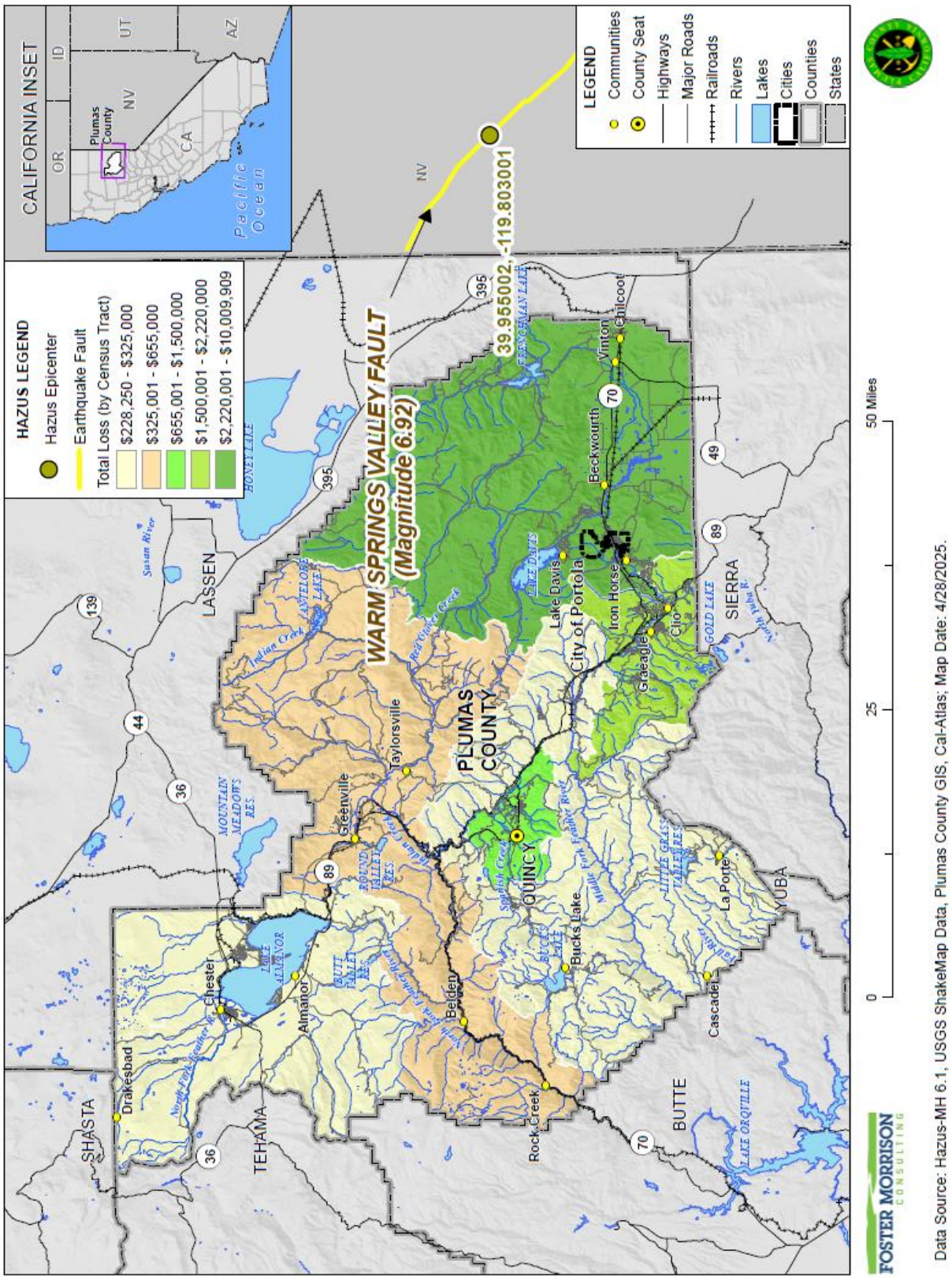


Figure 4-111 Plumas County Planning Area – Warm Springs Valley 6.92 Magnitude Hazus Total Loss



Hazus Scenario Comparisons

A comparison of the results of the four deterministic scenarios is shown on Table 4-78.

Table 4-78 Plumas County Planning Area – Comparison of Hazus Scenarios

Type of Impact	Great Valley 3 6.53 Magnitude Deterministic Scenario	Hat Creek-McArthur-Mayfield 7.29 Magnitude Deterministic Scenario	Honey Lake 7.03 Magnitude Deterministic Scenario	Warm Springs Valley Magnitude 6.92 Deterministic Scenario
Total Buildings Damaged (based on 16,000 buildings)	Slight: 0 Moderate: 0 Extensive: 0 Complete: 0	Slight: 454 Moderate: 68 Extensive: 4 Complete: 0	Slight: 1,047 Moderate: 198 Extensive: 16 Complete: 1	Slight: 374 Moderate: 66 Extensive: 5 Complete: 0
Building and Income Related Losses	$0	$19,390,000	$50,870,000	$15,160,000
Total Economic Losses (Includes building, income and lifeline losses)	$1,800,000	$154,050,000	$179,640,000	$31,200,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 2 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 3 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 2 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage	None with at least moderate damage	None with at least moderate damage	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage	None with at least moderate damage	None with at least moderate damage	None with at least moderate damage
Damage to Utility Systems	There are no electrical power facilities with at least moderate	There would be no electrical power facility with at least moderate	There are no electrical power facilities with at least	There are no electrical power facilities with at least

Type of Impact	Great Valley 3 6.53 Magnitude Deterministic Scenario		Hat Creek-McArthur-Mayfield 7.29 Magnitude Deterministic Scenario		Honey Lake 7.03 Magnitude Deterministic Scenario		Warm Springs Valley Magnitude 6.92 Deterministic Scenario	
	damage. 1 potable water line breaks, 1 wastewater line breaks, and 0 natural gas line breaks.		damage. 17 potable water line breaks, 9 wastewater line breaks, and 3 natural gas line breaks.		moderate damage. 38 potable water line breaks, 19 wastewater line breaks, and 6 natural gas line breaks.		moderate damage. 14 potable water line breaks, 7 wastewater line breaks, and 2 natural gas line breaks.	
Households without Power/Water Service (Based on 9,216 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	0 displaced households		1 displaced household		5 displaced households		1 displaced household	
Shelter Requirements	0 persons		0 persons		2 persons		0 persons	
Debris Generation	0 tons		2,000 tons		5,000 tons		2,000 tons	

Source: Hazus 6.1

FEMA NRI Hazard Vulnerability Assessment

The HMPC looked at the FEMA NRI for additional specific data on Plumas County's vulnerability to earthquakes. The NRI contains data and analysis for 18 separate natural hazards, including earthquakes. As shown in Table 4-79, earthquakes could cause a total of $5,576,231 in expected annual losses, with a historic loss rating of relatively high. Earthquake has a relatively low rating for social vulnerability and a relatively high community resilience, with a risk index score of 93.6 out of 100. According to the NRI, there have been 0 earthquake events during the 2021 dataset with a 0.63% annual chance per year.

Table 4-79 Plumas County Planning Area – Earthquake Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Earthquake	93.6	$5,576,231	$237,969,269,000	Relatively high

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of Plumas County residents and visitors. Earthquakes can cause loss of life and injuries in affected areas. Other impacts to the Plumas County Planning Area would include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; and damages to structures and other development.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs or behind levees might be subject to flooding, if the dams, reservoirs, or levees fail as a result of an earthquake. The County has locations with significant flood risk that include facilities downslope from dams or reservoirs or behind levees.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to have no effect on future earthquake conditions and associated impacts and vulnerability of the County.
- Population in Plumas County is expected to shrink. If this changes, any additional growth in the County would place additional populations at risk to earthquake. Vulnerable population groups could face disproportionate effects from an earthquake and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. County building codes are in effect to reduce structure damage, including damage to critical facilities and infrastructure, and should be updated as necessary to continue to address future earthquake conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community. Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

4.3.11. Flood: 1%/0.2% Annual Chance (w/levee failure)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent;

past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities and can cause life safety issues. Floods can be extremely dangerous. Six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. Floods kill more people trapped in vehicles than anywhere else.

During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

There are three primary types of freshwater flood events in the Plumas County Planning Area: riverine and lake, flash flooding, and urban stormwater. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reaches.

- **Riverine flooding** – Riverine flooding, defined as when a watercourse exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In the Plumas County Planning Area, riverine flooding is largely caused by heavy and continued rains, sometimes combined with snowmelt, and heavy flow from tributary streams. These intense storms can overwhelm the local waterways as well as the integrity of flood control structures. The warning time associated with slow rise floods assists in life and property protection.
- The term "**flash flood**" describes localized floods of great volume and short duration. In contrast to riverine flooding, this type of flood usually results from heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour.
- **Stormwater/Urban** flood events have increased as land has been converted from fields or woodlands to roads and parking lots and lost its ability to absorb rainfall. Urbanization increases runoff by two to six times that of natural terrain. This is discussed in Section 4.3.12 below.

The Plumas County Planning Area is also at risk to flooding resulting from dam failure and levee failure. Dam failure flooding is discussed separately in Section 4.3.8 of this document. Levee failure is discussed

below. The potential for flooding can change and increase through various land use changes and changes to land surface, resulting in a change to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Levee Failure

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower steam channel, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the stream bank, raising the level of the land around the stream.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high-water velocities. It is important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

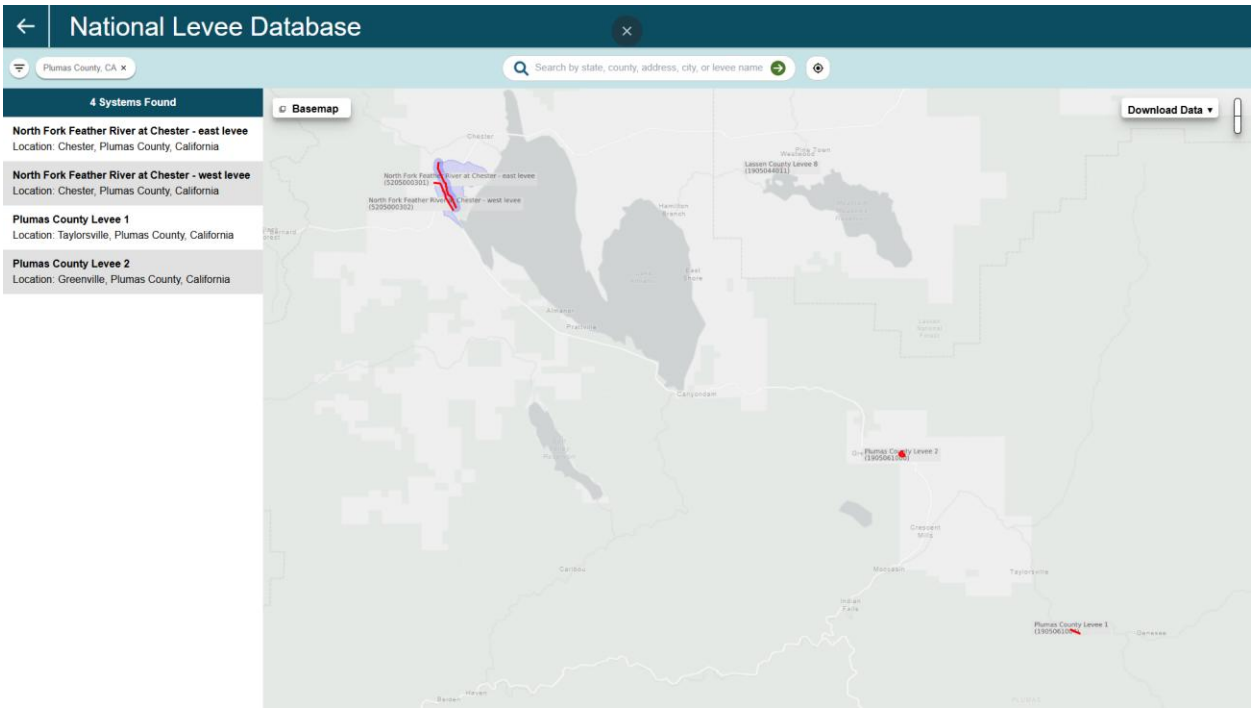
Levee Failure Extent

A search of the National Levee Database identified 3 leveed areas in Plumas County (as shown on Figure 4-112). These levees include:

- Plumas County Levee 1 - near Taylorsville as shown on Figure 4-113).
- Plumas County Levee 2 - near Greenville as shown on Figure 4-114).
- North Fork Feather River at Chester (near Chester) – East and West levees as shown on Figure 4-115 and Figure 4-116.

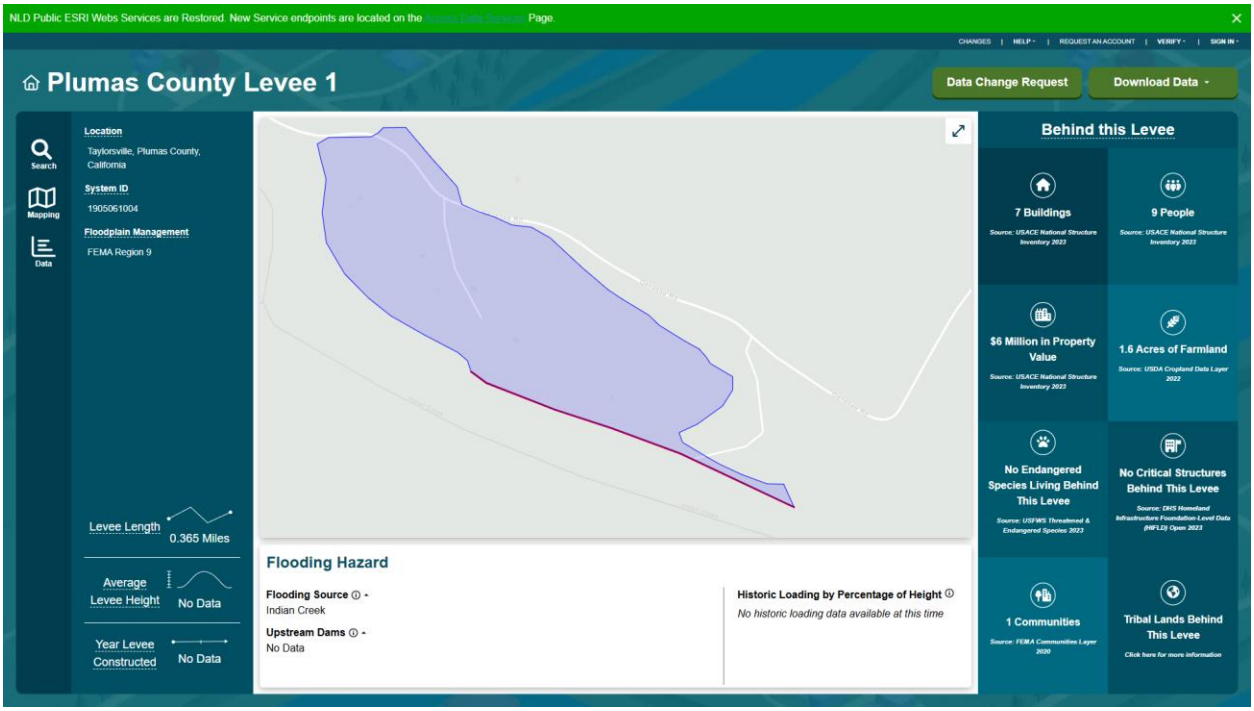
None of these 3 levees are certified as providing protection from the 1% annual chance or other flood. As such, no mapping of these areas is included in the Vulnerability Assessment below as part of the DFIRM analysis as no X-protected by levee flood zones are include in that dataset. However, the vulnerability of the County to these levees to is shown in the Vulnerability Assessment below from data obtained from the National Levee Database.

Figure 4-112 Plumas County – Levee Locations



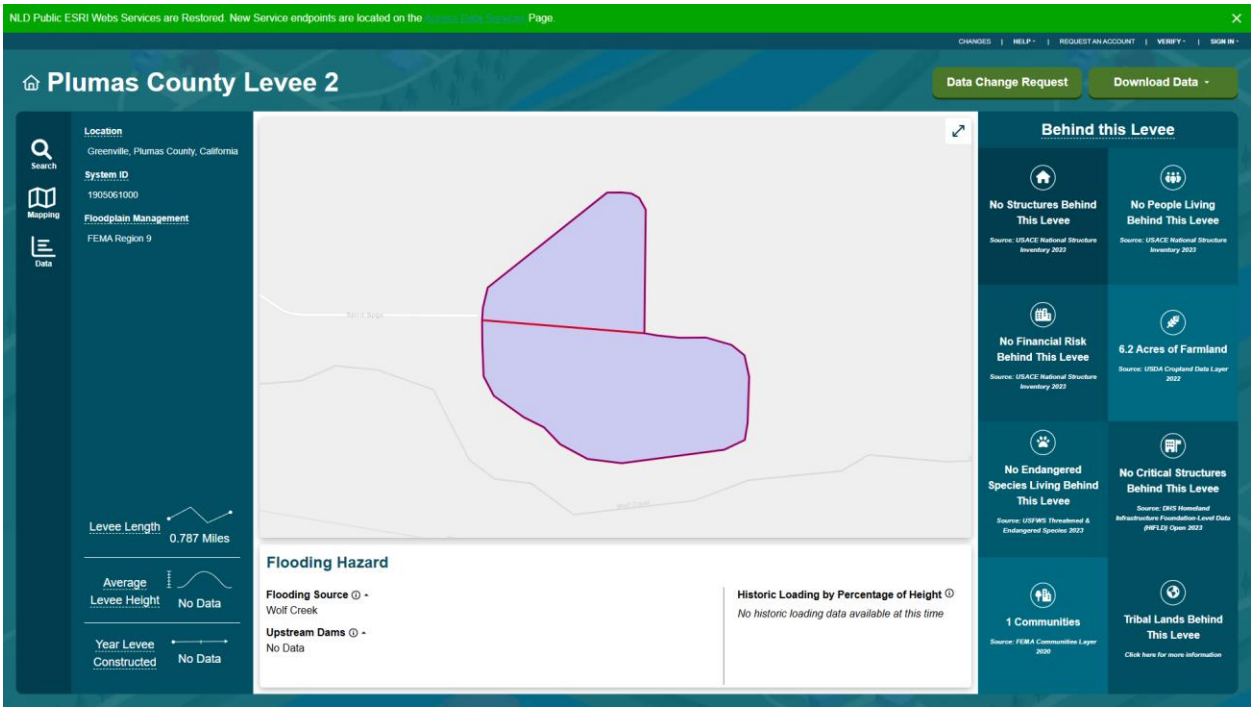
Source: National Levee Database

Figure 4-113 Plumas County – Levee 1



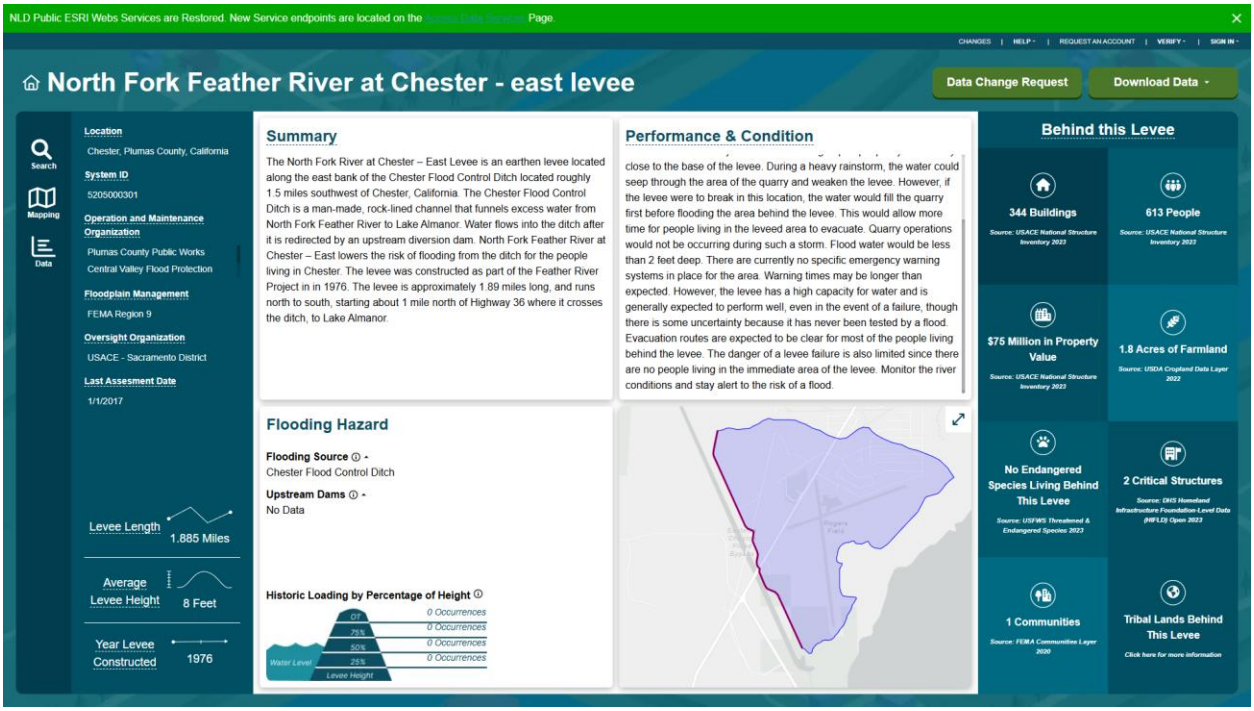
Source: National Levee Database

Figure 4-114 Plumas County – Levee 2



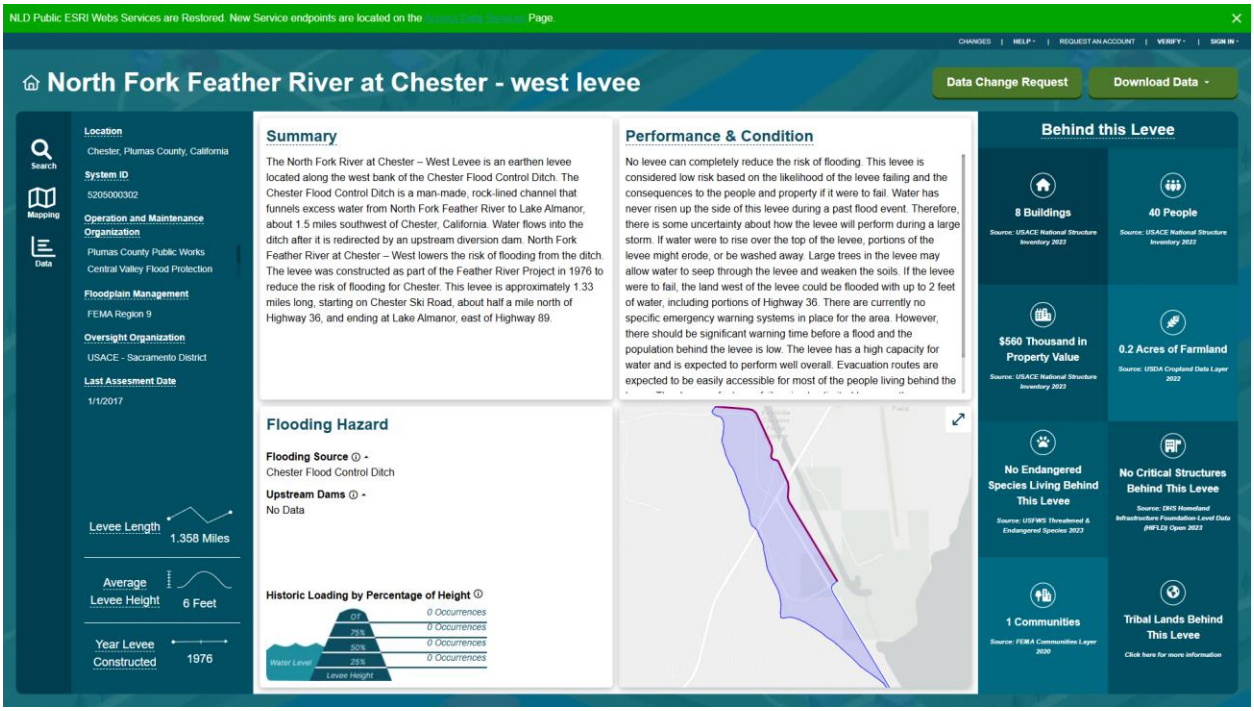
Source: National Levee Database

Figure 4-115 Plumas County – North Fork Feather River at Chester East Levee



Source: National Levee Database

Figure 4-116 Plumas County – North Fork Feather River at Chester West Levee



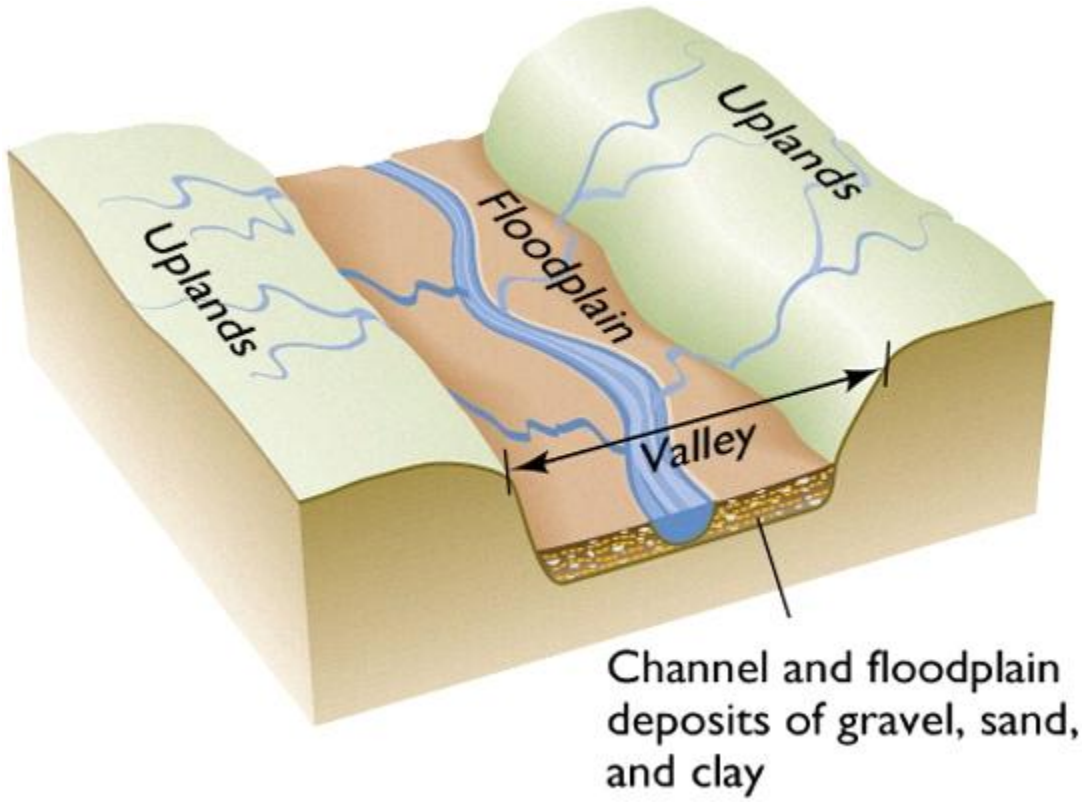
Source: National Levee Database

Location and Extent

Floodplains

The area adjacent to the channel is the floodplain (see Figure 4-117). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 1% annual chance (or 100-year) flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 1% annual chance flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program. The 500-year flood is the flood that has a 0.2% chance of being equaled or exceeded in any given year.

Figure 4-117 Floodplain Schematic



Source: FEMA

According to the 2005 Flood Insurance Study for Plumas County, flooding in Plumas County may be caused by either general rainstorms or cloudburst storms. General rainstorms can occur from late fall to early spring, but mostly in the winter months of December through March. Cloudburst storms can be expected in the spring, summer, and fall. General rain floods resulting from prolonged heavy rainfall over tributary areas are characterized by high peak flows of moderate duration and by a large volume of runoff. Flooding is more severe when antecedent rainfall results in saturated ground conditions, when the ground is frozen and infiltration is minimal, or when rain on snow in the higher elevations adds snowmelt to rain flood runoff.

Cloudburst storms, sometimes lasting as long as 6 hours in the study areas, are high intensity storms that can produce floods characterized by high peak flows, short duration flood flows, and small runoff volume. In small drainage basins such as Portola Tributary, cloudbursts can produce peak flows substantially larger than those of general rainstorms.

The FIS also noted the following flood areas in the County.

- 1% annual chance flood flows on the Middle Fork Feather River are attributed to combined general rain/snowmelt runoff. The 1% annual chance flooding on Portola Tributary is a result of cloudburst storms.
- Flood elevations in Spanish Creek were high enough to necessitate failure scenarios of the embankments along Spanish Creek's right bank. Upstream of the SH 70/89 crossing, the failure of the

right bank of Spanish Creek causes flow into the Clear Stream drainage. This split flow is less than the natural peak from the Clear Stream drainage. The right embankment overflow downstream of the SH 70/89 crossing flows across the valley as sheetflow until it accumulates in the lower Nugget Creek drainage, creating the highest flow condition in this Nugget Creek reach. The last substantial out-of-bank flow from Spanish Creek fills the valley area just upstream of its confluence with Mill Creek, where the flood storage in this portion of the valley significantly attenuates the peak flows downstream in Spanish Creek. Each of these out-of-bank spills along Spanish Creek was analyzed independently of each other as a stand-alone scenario. This is because the spills could not concurrently occur as a worst-case condition.

- The Greenhorn Creek drainage is conveyed through a narrow valley with occasional division of flow at road crossings lacking capacity to convey the entire 100-year flow. Although the main channel does not contain the 100-year and 500-year (0.2-percent-annual-chance) flows, the right and left overbank flows are conveyed parallel and contiguous to Greenhorn Creek, except where a portion of the Greenhorn Creek flows spill into the lower reach of Thompson Creek. This spill is also parallel to Greenhorn Creek, downstream of the SH 70/89 crossing and upstream of the confluence of Greenhorn and Thompson Creeks. Although Greenhorn Creek flooding is not contained in the main channel, the overbank floodplain is generally shallower than Spanish Creek, and the floodplain storage was considered to have negligible effect on the calculated peak flow values.
- Gansner Creek flows out-of-bank from upstream of Bucks Lake Road until beyond its confluence with Clear Stream.
- Clear Stream spills into the upper reaches of the unnamed tributary at SH 70/89 and continues downstream with less than a 10-year capacity.
- Boyle Ravine spills most of its flow over its left bank just upstream of Alder Street and conveys less than a 10-year capacity until just upstream of its confluence with the unnamed tributary, where the Alder Street split flow returns.
- Nugget Creek spills overland and recombines several times within its studied reach upstream and downstream of SH 70/89. The worst-case flooding for the lower reach of Nugget Creek is when the right bank of Spanish Creek fails, and the overflow is conveyed through Nugget Creek.
- Mill Creek spills significant flows over the left bank at locations upstream of SH 70/89, Lee Road, and Bell Lane. These flows are recombined (ponded) upstream of Quincy Junction Road and are again split before reaching the lowest part of the Mill Creek drainage before combining with Spanish Creek. The worst-case flooding for Mill Creek downstream of Quincy Junction Road is when Spanish Creek flows out-of-bank and inundates the portion of the valley upstream of their confluence.
- Thompson Creek splits and recombines several times upstream of SH 70/89; most of its natural drainage spills into Greenhorn Creek just upstream of SH 70/89, before Greenhorn Creek reaches its peak flow.
- Chandler Creek and Taylor Creek spill out-of-bank before they reach Chandler Road. The spills then flow into Greenhorn Creek rather than returning to their respective channels.
- The unnamed tributary to Boyle Ravine appears to be sized to convey its local drainage area while acting as an outlet (overflow) path for the larger spills from the Clear Stream drainage.

The HMPC noted that the north end of Greenville in the Willow area there are flooding issues. The HMPC also noted that most of the stream channels of interest in this hazard planning have been significantly modified, or wholesale moved, to facilitate drainage, irrigation and/or road crossings. Much of this modification effort occurred between the 1890's and 1960's, pre-CEQA. These modifications generally initiated rapid channel incision, which in turn developed numerous gravel deposits and subsequent instream

gravel mining operations. The gravel mining mostly over-drafted the gravel supplies, leading to additional incision. By the late 1990's, California Department of Fish and Wildlife (CDFW) monitoring requirements shut down these operations, with the exception of Green Flat northwest of Meadow Valley. These channels are gradually trying to adjust to new sediment inputs, small and regular or large and episodic, often with abrupt catastrophic results.

There are three primary conditions that contribute to major flooding: high antecedent basin moisture; high intensity, long duration rainfall; and high water content snow at all elevations, compounded by high snow levels. 1986 had low antecedent basin moisture; long duration' high intensity rain, ~25 inches in 6 days; low snow water content, level 7,000 feet. 1997 had fully saturated antecedent moisture; long duration, low/moderate rainfall intensity, ~12 inches in 6 days; and high snow water content, 8" water in 22" of snow in Genesee (personal observation of HMPC members), snow level 10,000 feet. None of these events had all 3 components at max. When these components converge, it will be catastrophic for Plumas County, as well as everything downstream. The 1862 flood is probably the only analog. More information on these events can be found in the Past Occurrences section below.

Hydrologic Regions

According to Cal DWR, California has 10 hydrologic regions. Plumas County sits in the Sacramento hydrologic region. The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of Alpine County are also within the region. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains. The Sacramento metropolitan area and surrounding communities form the major population center of the region. With the exception of Redding, cities and towns to the north, while steadily increasing in size, are more rural than urban in nature, being based in major agricultural areas.

A map of California's hydrological regions is provided in Figure 4-118.

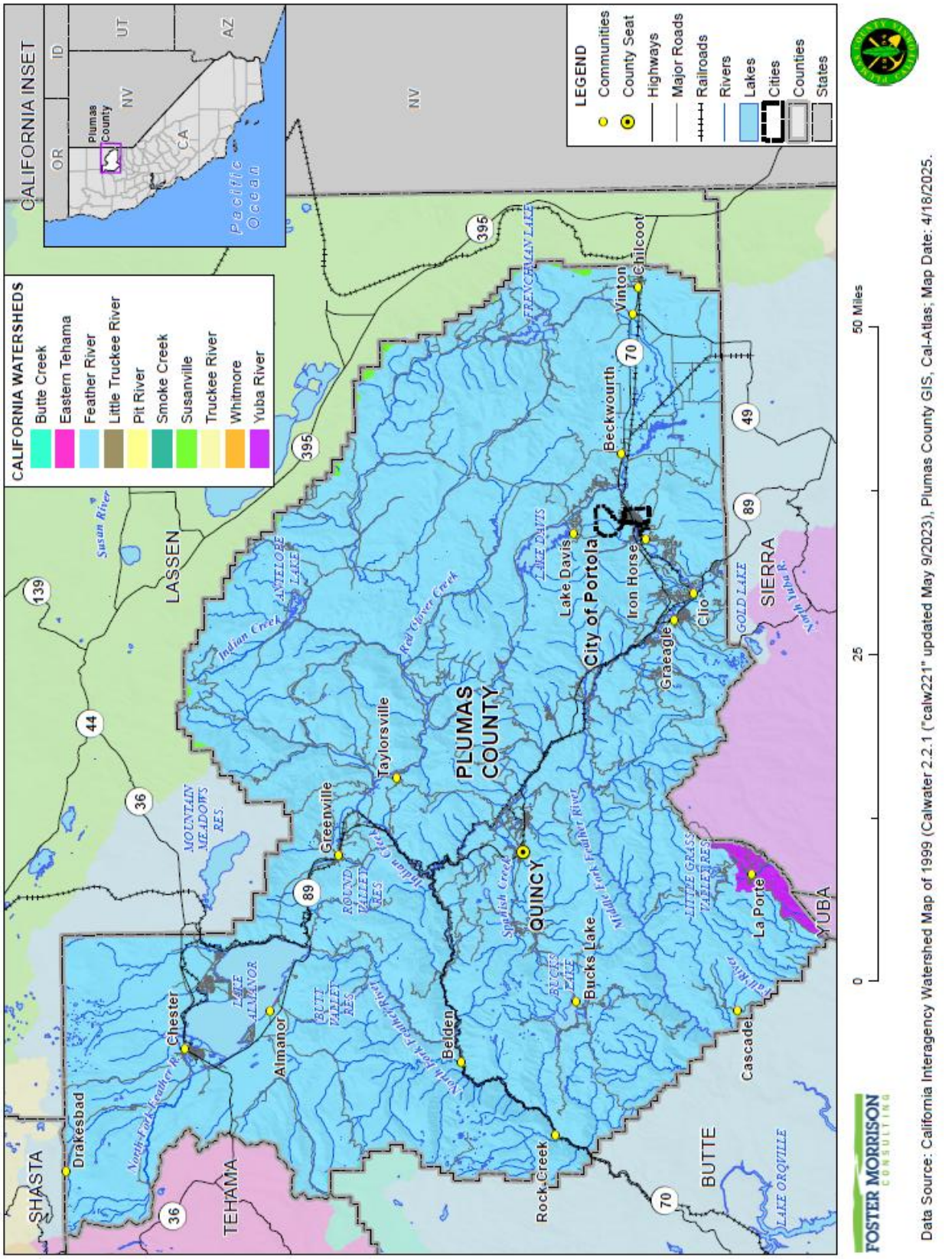
Figure 4-118 California Hydrologic Regions

Source: California Department of Water Resources

The Plumas County Watersheds and Waterway System

Plumas County encompasses multiple rivers, streams, creeks, and associated watersheds. Plumas County is in the Feather River Watershed. Figure 4-119 illustrates the primary watersheds of Plumas County, as well as the primary waterways in the County.

Figure 4-119 Primary Watersheds and Waterways of Plumas County



Feather River Watershed

The Upper Feather River watershed encompasses 2.3 million acres in the northern Sierra Nevada, where that range intersects the Cascade Range to the north and the Diamond Mountains of the Great Basin and Range Province to the east. The watershed drains generally southwest to Lake Oroville, the largest reservoir of the State Water Project.

Land ownership in the Feather River Watershed is approximately 64 percent Federal, 1 percent State, and 35 percent private. Federal lands are managed primarily by the U.S. Forest Service (USFS) except for less than 1 percent of the watershed that is within Lassen Volcanic National Park and some Bureau of Land Management lands in the Sierra Valley watershed. The boundary of the watershed largely corresponds to the boundary of Plumas County but also includes portions of six neighboring counties.

Plumas County Flood Mapping

As part of the County's ongoing efforts to identify and manage their flood prone areas, Plumas County relies on a variety of different mapping efforts. What follows is a brief description of FEMA and CA DWR mapping efforts covering the Plumas County Planning Area.

FEMA Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. A general overview of floodplain mapping is provided in the following paragraphs. Details on the NFIP and mapping specific to the County are in Section 4.3 Vulnerability Assessment.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The current Plumas County FIS is dated March 2, 2005. This study covers both the unincorporated and incorporated areas of the County.

Flood Insurance Rate Map (FIRM)

The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. For floodplain management, the FIRM delineates 1% and 0.2% annual chancer floodplains, floodways, and the locations of selected cross sections used in the hydraulic analysis and local floodplain regulation. The County FIRMs have been replaced by digital flood insurance rate maps (DFIRMs) as part of FEMA's Map Modernization program, which is discussed further below.

Letter of Map Revision (LOMR) and Map Amendment (LOMA)

LOMRs and LOMAs represent separate floodplain studies dealing with individual properties or limited stream segments that update the FIS and FIRM data between periodic FEMA publications of the FIS and FIRM.

Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA is converting paper FIRMS to digital FIRMs, DFIRMS. These digital maps:

- Incorporate the latest updates (LOMRs and LOMAs);
- Utilize community supplied data;
- Verify the currency of the floodplains and refit them to community supplied basemaps;
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable support for GIS analyses and other digital applications; and
- Solicit community participation.

DFIRMs for Plumas County have been developed (dated March 2, 2005), are the most current effective DFIRMs for Plumas County, and are being used for the flood analysis for this LHMP Update. The DFIRM is shown in Figure 4-120 (with the individual inset maps shown as Figure 4-121, Figure 4-122, and Figure 4-123), and DFIRM flood zones are shown on Table 4-80.

Figure 4-120 Plumas County – DFIRM Flood Zones

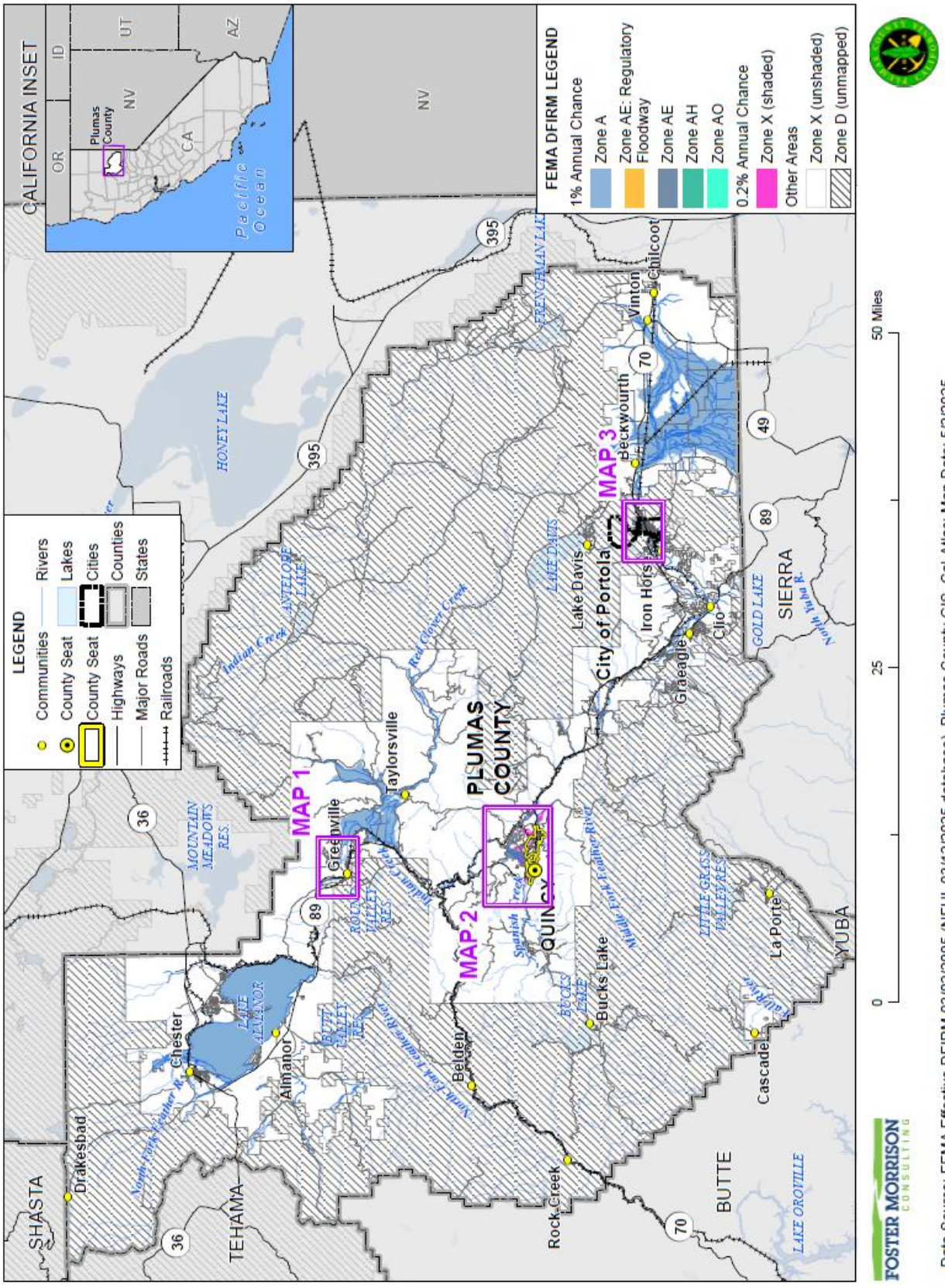


Figure 4-121 Plumas County Planning Area – Map Inset 1 DFIRM Flood Zones

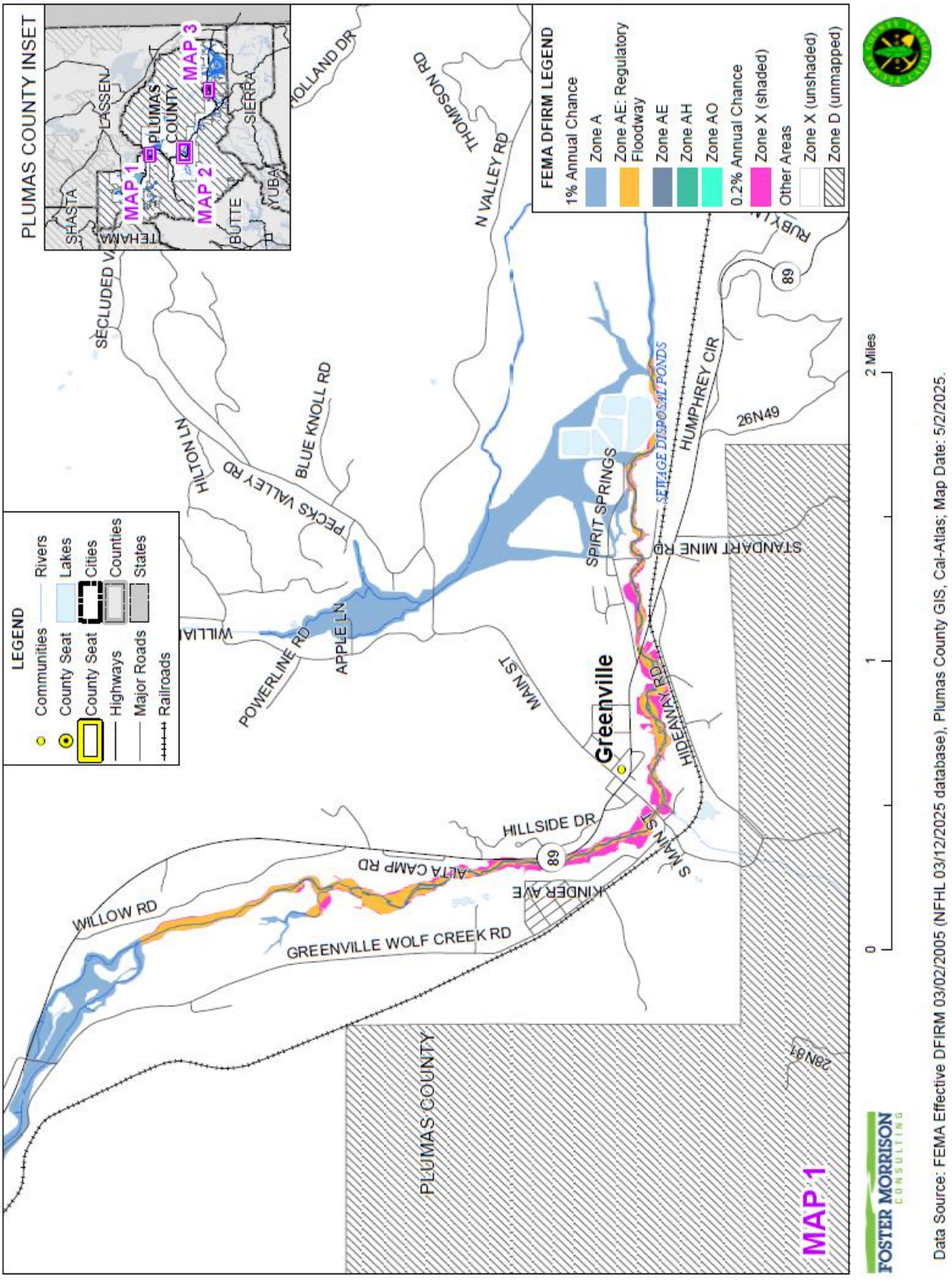


Figure 4-122 Plumas County Planning Area – Map Inset 2 DFIRM Flood Zones

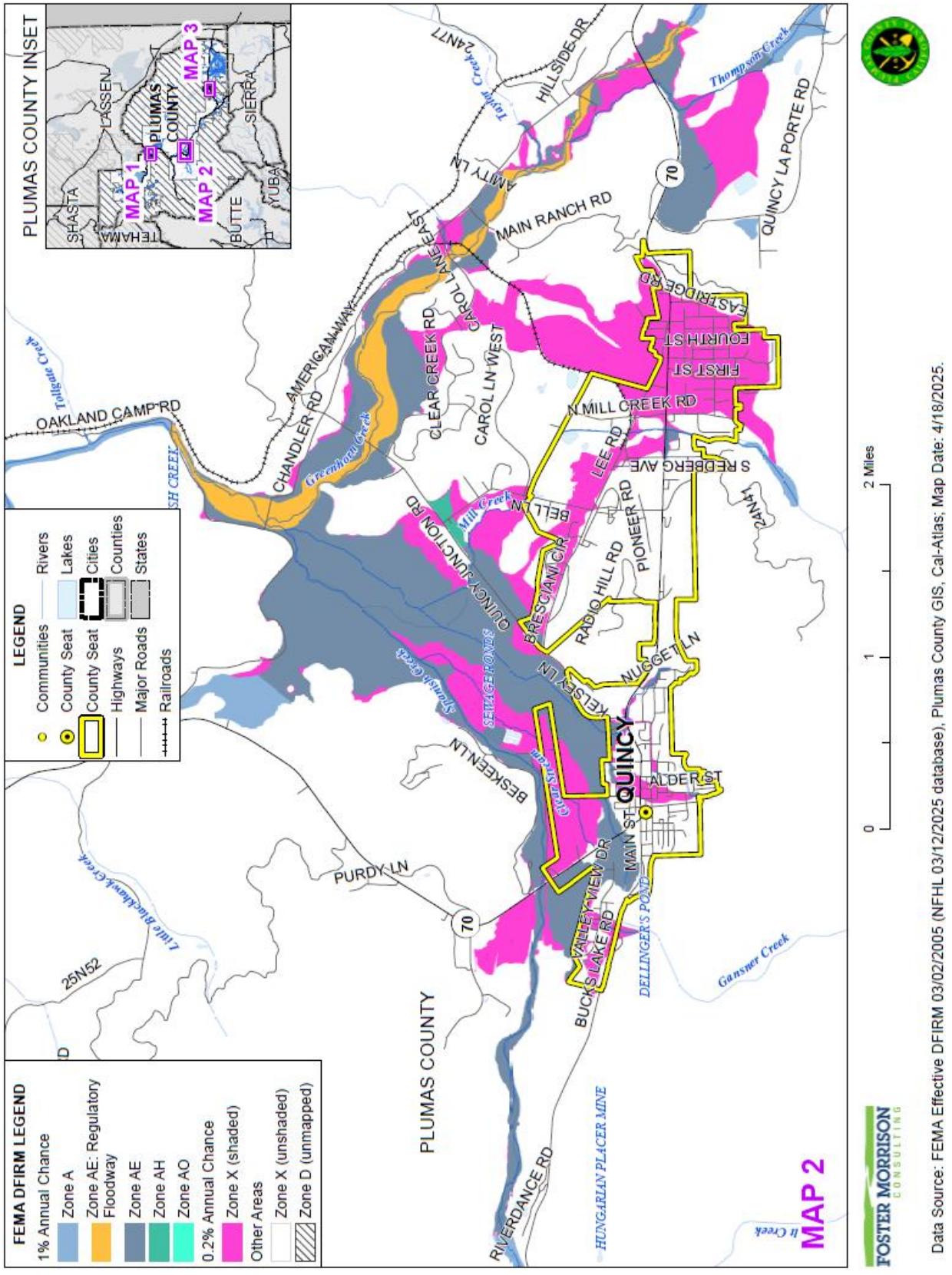


Figure 4-123 Plumas County Planning Area – Map Inset 3 DFIRM Flood Zones

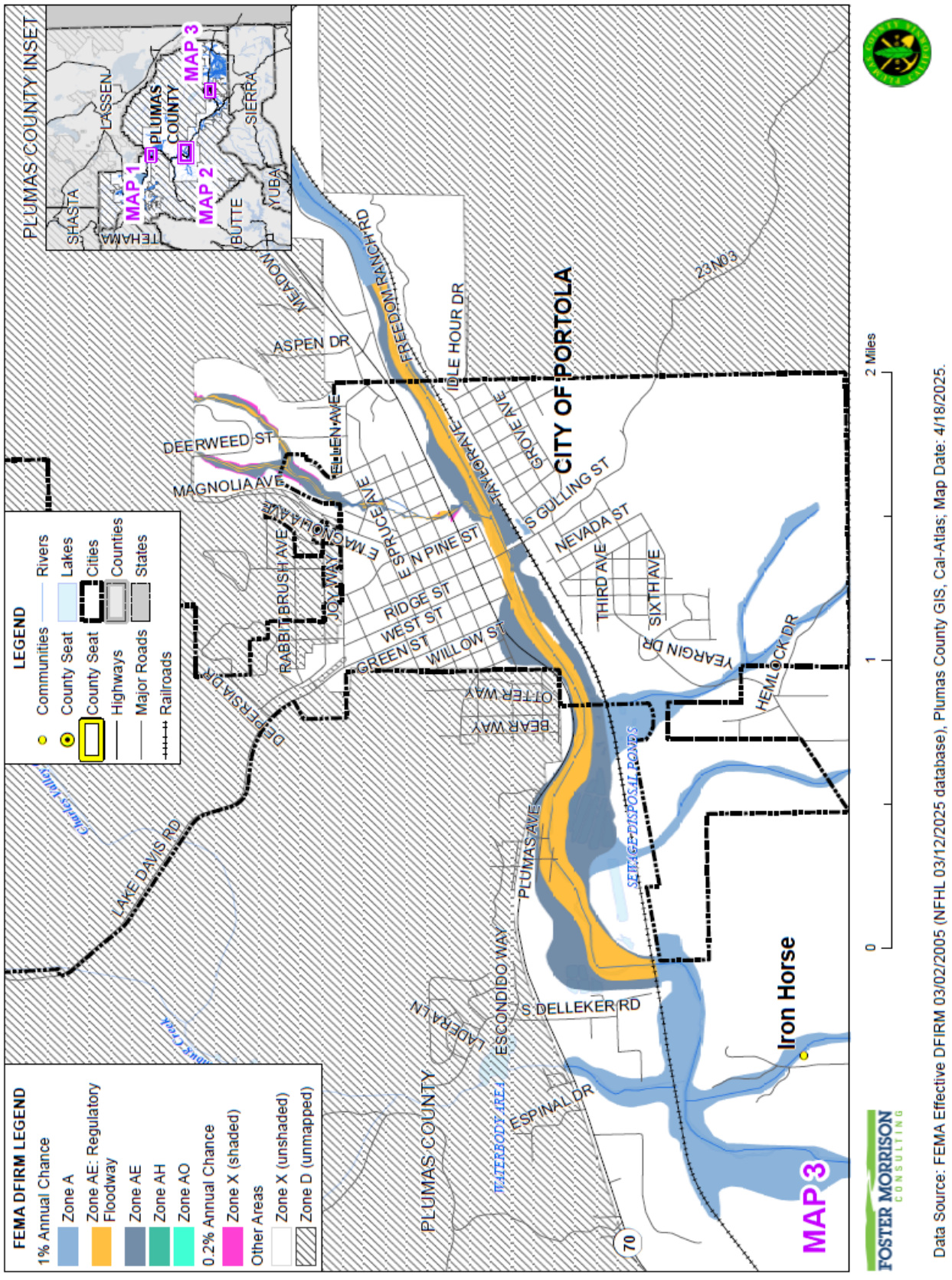


Table 4-80 Plumas County – FEMA DFIRM Flood Zones by Jurisdiction

Flood Zone	Description	Present in City of Portola	Present in Unincorporated County
A	1% annual chance flooding: No base flood elevations provided	X	X
AE	1% annual chance flooding: Base flood elevations provided	X	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided		X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X	X
X (unshaded)	No flood hazard	X	X

Source: FEMA 03/02/2005 DFIRM

California Floodplain Mapping

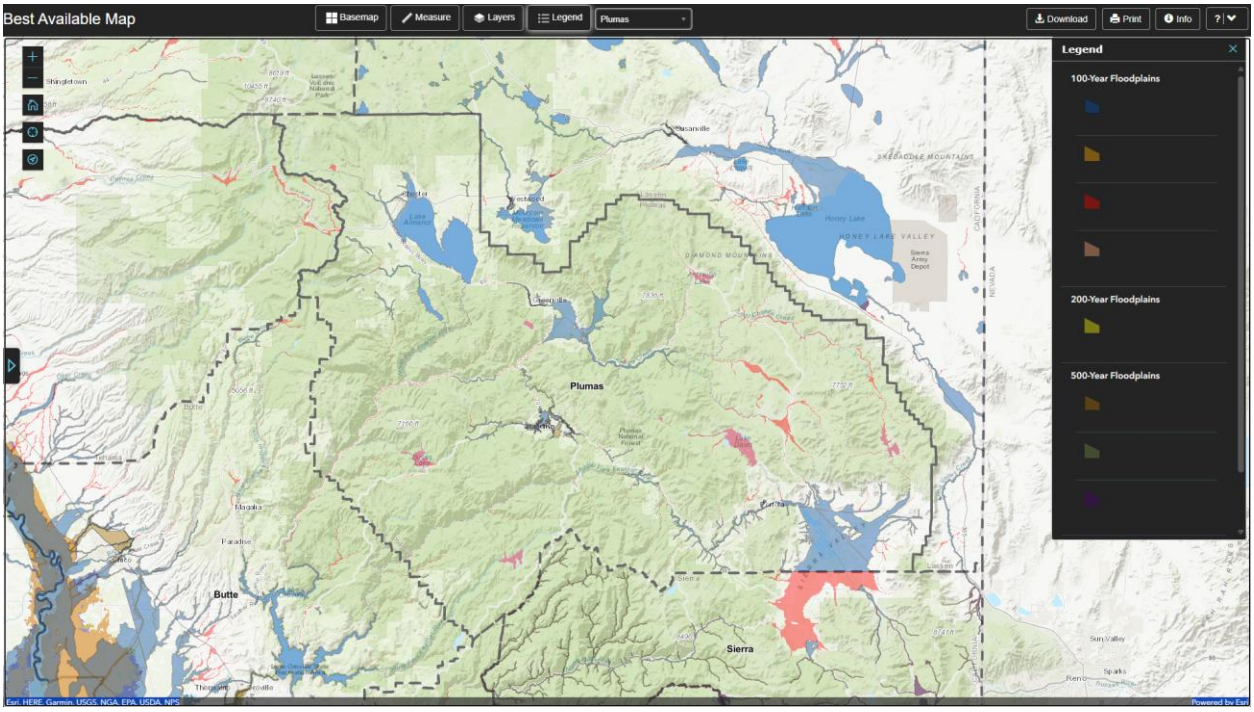
Also to be considered when evaluating the flood risks in Plumas County are various floodplain maps developed by the California DWR for various areas throughout California, and in the Sacramento-San Joaquin Valley cities and counties. The FEMA regulatory maps provide just one perspective on flood risks in Plumas County. Senate Bill 5 (SB 5), enacted in 2007, authorized Cal-DWR to develop the Best Available Maps (BAM) displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance flood zones.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and generally reflect only the 1% and 0.2% annual chance flood risks, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance flood zones. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the County than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection

for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance flood zone, it also supports identification of the need and requirement for flood insurance. Figure 4-124 shows the BAM for the Plumas County Planning Area.

Figure 4-124 Plumas County– Flood Awareness (Best Available) Map



Source: California DWR. Retrieved 3/5/2025.

Legend explanation: **Blue** - FEMA 100-Year, Orange – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, **Grey** – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Flood extents are usually measured in depths of flooding and area flooded. Expected flood depths in the Plumas County Planning Area vary. Flood durations in the County tend to be short to medium term, or until either the storm drainage system can catch up, or flood waters move downstream. Geographical extents of DFIRM flood zones for the Plumas County Planning area are summarized in Table 4-81. Details on the City of Portola and each Special District's DFIRM flood extents can be found in their respective annexes to this LHMP Update.

Table 4-81 Plumas County Planning Area – Geographical Extent of FEMA DFIRM Flood Zones by Jurisdiction

Jurisdiction / Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
1% Annual Chance Flood Hazard	168	0.01%	10	0.01%	157	0.01%
0.2% Annual Chance Flood Hazard	1	0.0001%	0.1	0.0001%	1	0.00005%
Other Areas	3,323	0.20%	2,227	2.39%	1,096	0.07%
City of Portola Total	**3,491**	**0.21%**	**2,237**	**2.41%**	**1,254**	**0.08%**
Unincorporated Plumas County						
1% Annual Chance Flood Hazard	84,609	5.06%	23,036	24.77%	61,573	3.90%
0.2% Annual Chance Flood Hazard	1,431	0.09%	667	0.72%	764	0.05%
Other Areas	1,582,631	94.65%	67,072	72.11%	1,515,559	95.97%
Unincorporated Plumas County Total	**1,668,671**	**99.79%**	**90,775**	**97.59%**	**1,577,896**	**99.92%**
Grand Total	**1,672,162**	**100.00%**	**93,013**	**100.00%**	**1,579,150**	**100.00%**

Source: FEMA 03/02/2005 DFIRM

There is not a scientific scale or measurement system in place for levee failure. It is usually measured in area covered and depth of flooding. Maps showing inundation depths due to a levee failure in the County do not exist. The speed of onset is slow as the river rises, but if a levee fails the warning times are short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back.

Past Occurrences

Disaster Declaration History

A list of federal and state disaster declarations for Plumas County from flooding, (including heavy rains and storms) is shown on Table 4-82.

Table 4-82 Plumas County – Federal and State Disaster Declaration from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storm)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA
*included a landslide component.

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Table 4-83 shows events in Plumas County since 1993.

*Table 4-83 NCDC Flood Events in Plumas County 1993 to 7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Flash Flood	3	0	0	0	0	$0	$0
Flood	12	0	0	1	0	$3,140,000	$0
Total	**15**	**0**	**0**	**1**	**0**	**$3,140,000**	**$ 0**

Source: NCDC
*Note: Losses reflect totals for all impacted areas, much of which fell outside of Plumas County

Hazard Mitigation Planning Committee Events

These sections separate events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

It was noted that there have been many atmospheric river events since 2017. These are shown on Table 4-84.

Table 4-84 Plumas County Planning Area – Atmospheric River Events and Floods 2017-2025

Date/Timeframe of Atmospheric River Event	Portola Middle Fork River Gauge (feet above mean sea level)	Portola (or Lake Davis where Portola is not reported) Precipitation (inches)	Spanish Creek AB Blackhawk Creek at Keddie Stream Gauge (feet)	Spanish Creek AB Blackhawk Creek at Keddie Discharge (ft3/s)	Quincy Precipitation (inches)	Greenville Precipitation (inches)	Chester Precipitation (inches)
2/5/2025		7.90	10.19	8740.00	15.38	10.71	10.50
11/22-24/2024		4.54	7.31	3780.00	15.64	11.68	9.86

Date/Timeframe of Atmospheric River Event	Portola Middle Fork River Gauge (feet above mean sea level)	Portola (or Lake Davis where Portola is not reported) Precipitation (inches)	Spanish Creek AB Blackhawk Creek at Keddie Stream Gauge (feet)	Spanish Creek AB Blackhawk Creek at Keddie Discharge (ft3/s)	Quincy Precipitation (inches)	Greenville Precipitation (inches)	Chester Precipitation (inches)
3/15-16/2023	4854.42	26.47	9.08	6680.00	49.71	37.76	34.49
2/1/2023 (snow event)		18.98	3.38	540.00	37.20	27.61	26.63
12/26/22 to 1/20/23		10.64	7.67	4370.00	19.85	13.70	14.27
1/3/23 to 1/17/23		7.14	7.67	4370.00	13.05	9.84	10.48
12/26/22 to 1/2/23		3.24	6.53	2950.00	6.00	3.43	3.48
October 17-26, 2021		8.22	6.73	3160.00	12.00	9.72	6.36
2/14/2017-2/22/2017		3.54	10.27	9000.00	9.38	7.01	5.02
2/1/2017 - 2/11/2017	4856.27	8.93	13.85	16700.00	13.15	11.15	7.55
01/17/2017 - 01/23/2017		2.83	4.77	1470.00	5.27	5.49	4.04
01/02/2017 - 01/13/2017	4853.55	11.07	13.87	14300.00	16.86	11.97	8.28
November 27-December 3, 2012		7.65	10.44	5000.00	12.25	9.64	6.68

Source: Plumas County Volunteers Active in Disasters

It was also noted that in **2019** Indian Valley had snow on rain events that caused flooding.

CAN THE COUNTY PROVIDE INFORMATION ON AFFECTED AREAS AND DAMAGES RESULTING FROM FLOOD EVENTS OCCURRING SINCE THE 2020 LHMP – ESPECIALLY THOSE FROM THE 2023 STORM DECLARATIONS?

Events before 2019

Regional and localized flooding in Plumas County has been a continuous occurrence dating back to at least 1893 when Quincy experienced its first photographed flood, shown in Figure 4-125.

Figure 4-125 1893 Quincy Flooding

Source: Plumas County

Winter storms in **1986, 1995, 1997, 2017, and 2019** caused tremendous flood damage to properties and infrastructure throughout the Upper Feather River Watershed. Discharge values are from the historic USGS gage (#11401500) at the outlet of Indian Valley (**1906-1993** period of record). Subsequent values from Plumas Corp and/or USGS extrapolation. Recent flood values of note: **1986** (36,600 cfs); **1995** (24,000 cfs), **1997** (46,600 cfs); **2017** (greater than 1986, less than 1997). At ~25,000 cfs Arlington bridge is impassible, along with Stampfli Ln. and North Valley Road. Taylorsville and Genesee are isolated. At <30,000 cfs Genesee is isolated from Taylorsville. Those communities have no medical services. Minor floods occurred in the **1990s** in burn scar areas of the County. These were prevalent in the eastern margin by the escarpment.

1986

From February 8-20, **1986,** a large storm lasting 13 days precipitated rain and snow across Northern California. Plumas County was located within the interior of the storm extent and experienced tremendous rainfall, causing the ground to saturate and allowed surface water to flow freely. As rain fell over the county filling creeks and drainage ditches, it also flowed downhill through the Feather River system, incrementally adding more water to the lower elevation valleys and the river canyons. By the 11th day of the storm the capacity of the hydrologic system was exceeded, and extensive damage was experienced throughout Plumas County. The most visually impressive damage was found in the North Fork Feather River Canyon, along CA-70 and the Railroad, due to the large volume of water that was funneled through the canyon. A member

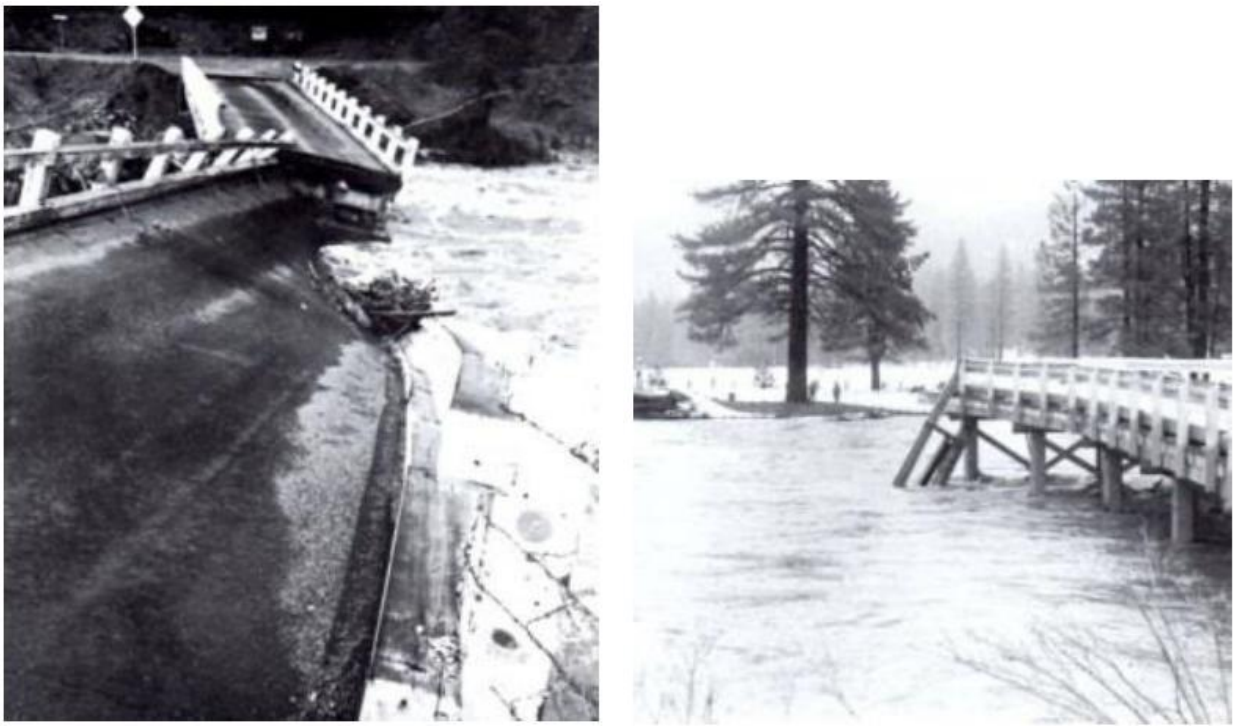
of the HMPC from Viera ranch noted that during this time, 22.08" of rain were recorded at their ranch. Quincy was effectively cut off. Highway 70 in Feather River Canyon was washed out.

The flood damage was extensive, as numerous bridges were severely damaged or destroyed, large sections of roadway and railroad were wiped out (see Figure 4-126), bridges were destroyed (see Figure 4-127), many houses were flooded with over one foot of water, and debris was deposited in throughout Plumas County. Train service was disrupted for at least 3 days through the Feather River Canyon, and several state highways were temporarily out of commission to public traffic for several weeks. In addition, many residential wells were flooded.

Figure 4-126 1986 Railroad Bed Flood Damages

Source: The Storm of '86 by Robert Moon, Feather River Publishing, Quincy, CA 1986

Figure 4-127 Bridges Destroyed by Flooding – Indian Creek Bridge (left) and Mohawk Valley Bridge (right)



Source: The Storm of '86 by Robert Moon, Feather River Publishing, Quincy, CA 1986

1995

Heavy rains caused flooding in the County.

Figure 4-128 Plumas County – 1995 Flooding at Arlington Bridge

Source: HMPC member Jim Wilcox

1997

Winter storms in **late December 1996 through January 1997** poured tremendous amounts of rain throughout Plumas County. This was the biggest flood on record for the County. Such as in 1986, the ground became saturated, and the river system overflowed with excess water. On January 2nd the State declared a disaster and on January 4th a federal disaster was declared. The extent and severity of flooding and related damage exceeded the 1986 event throughout Plumas County, from the high-elevation valleys to the low-elevation river canyons. The type of damage experienced was similar to that in 1986. Examples can be seen in the following figures.

In the first image, the home was not flooded, but Indian Creek moved laterally several hundred feet in less than 24 hours to undermine the main structure and topple it into the channel. The remains of the garage followed a few days later. Homeowners reportedly had no flood insurance. The gravel bar on the left rapidly extended under sediment input from Little Grizzly Creek 1/3 mile upstream. The Indian Creek channel has radically shifted alignment in this area 3 times since 1977.

Figure 4-129 Erosion from Floodwaters Cause Home to fall into Indian Creek

Source: Feather River Bulletin, Wednesday January 29, 1997

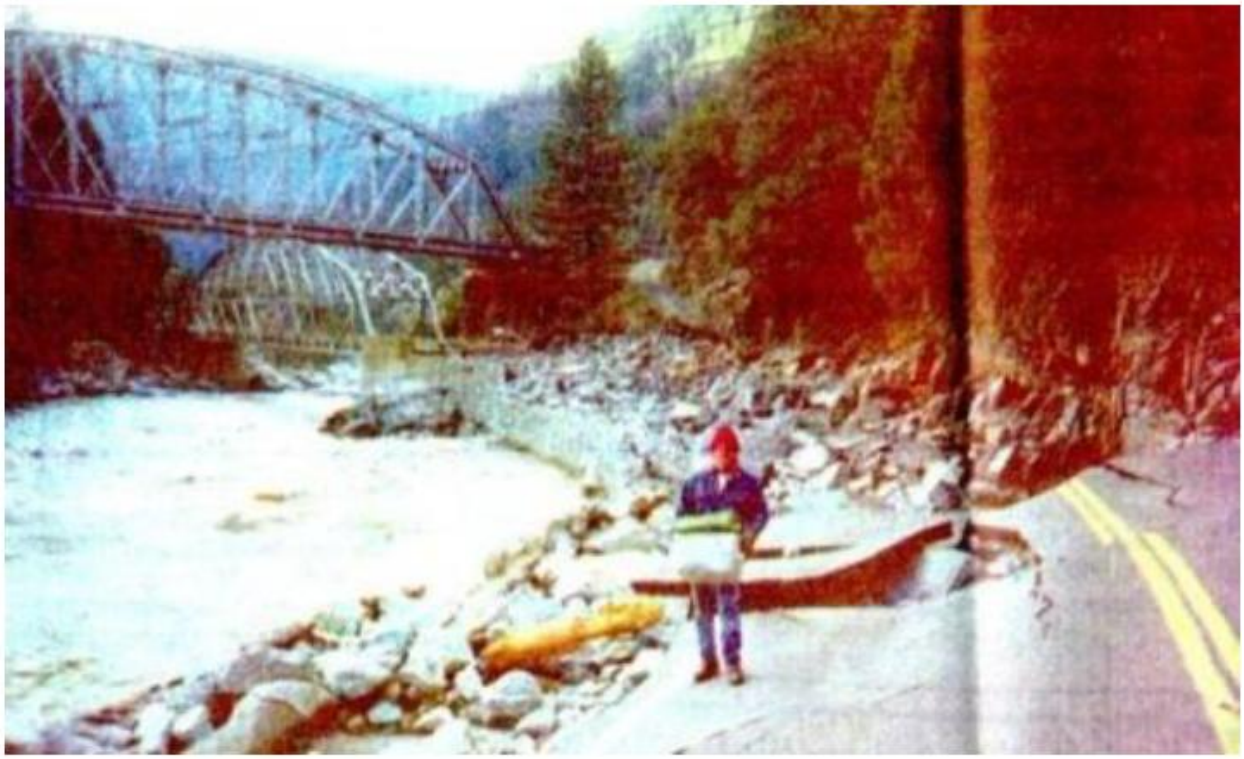
Figure 4-130 Damage to Home in Genesee from 1997 Flood

Source: Feather River Bulletin, Wednesday January 29, 1997

Figure 4-131 Sloat Bridge Damage from 1997 Flood

Source: Plumas County Road Department

Figure 4-132 Damage to CA-70 near Tobin



Source: Feather River Bulletin, Wednesday January 29, 1997

Figure 4-133 High Water Marks from 1986 and 1987 in North Fork Feather Canyon

Source: Plumas County

2017

January and February of 2017 brought heavy rains from atmospheric rivers that struck Plumas County, resulting in a federal disaster declaration (DR-4301).

Many damages occurred in the County. One area hit hard was the Plumas Eureka Community Services District. The District area saw flood damage to 26 condominiums, and two single family homes (see Figure 4-134). Erosion caused the loss of half a backyard requiring the owner to reinforce the riverbank bordering

the property (see Figure 4-135). Erosion to roads and water main right of way, damage to sewer pumps, debris removal from fallen trees occurred. Sewer service was shut down for 12 hours. There was also a road closure to flooded areas for 12 hours.

Figure 4-134 Plumas County 2017 Flooding in the Plumas Eureka Community Services District

Source: Plumas Eureka Community Services District

Figure 4-135 Erosion to Backyard of Home during 2017 Floods (left – during flood, right – after flood)

Source: Plumas Eureka Community Services District

Private property damage in the District came from both flooding and from fallen trees. Amount unknown, but one property owner stated that flood damage related costs exceeded $120,000 of which he received $67,000 for his claim. The District received $12,189 from damages sustained.

Additionally, the HMPC noted that there were issues with **flooding of agriculture in 2017 and 2018**. In the Sierra Valley and Beckwourth areas, rains caused a 30% decrease in hay production and caused a 25% loss in calves. It was thought that $200,000 in damages to hay and $19,000 in damages to calves was suffered in both 2017 and 2018, respectively. Other areas of the Sierra Valley suffered field erosion and additional hay losses. $1.6 million in hay was lost, and $230,000 in damages was suffered from field erosion.

Figure 4-136 2017 Flooding – Arlington Bridge

Source: Plumas County Agriculture Commissioner

Figure 4-137 2017 Road Flooding

Source: Plumas County Agriculture Commissioner

Figure 4-138 2017 Flooding – Flooded Meadow

Source: Plumas County Agriculture Commissioner

Figure 4-139 2017 Flooding

Source: Plumas County Agriculture Commissioner

The HMPC noted that there were washouts near Laporte and Thompson Creek. These can be seen in Figure 4-140 and Figure 4-141.

Figure 4-140 Plumas County – LaPorte Road Washout

Source: Plumas County

Figure 4-141 Plumas County – Thompson Creek Washout

Source: Plumas County

Additionally, Plumas County Public Works kept a tally of damages from the **2017 storms**:

- 2017 Storm Damage Debris Removal:
  - ✓ CR 507 Johnsville-Mccrea Road
  - ✓ CR 423 Big Creek Road
  - ✓ Lindan Channel next to CR QU30, Lindan Avenue
  - ✓ CR TV03, Thompson Street
  - ✓ CR 112, North Valley Rd. at Lights Creek (Br. No. 9C-0012)
  - ✓ CR 207, Arlington Road at Hough Creek
  - ✓ CR 206, Stampfli Lane Br. 9C-0053
  - ✓ CR 207C, Old Arlington Road
  - ✓ CR CM08, Wagon Road
  - ✓ CR 317, Rush Creek Road
  - ✓ CR 511, Quincy-Laporte Rd. (LaPorte - to Yuba Co. line)
  - ✓ CR 311, Section - Old Red Bluff Road, Br. 9C-0052
  - ✓ CR 414, Bucks Lake Road at Clear Creek
  - ✓ CR 517, Mt. Tomba Road.
  - ✓ CR 202, Greenville-Wolf Creek Rd.
  - ✓ CR 404A, Oakland Camp Road
  - ✓ CR 511, From the M.F.F.R. to Silver Tip
  - ✓ CR 511, From Silver Tip to Laporte
  - ✓ CR 219, Williams Valley Rd
  - ✓ CR 312, Chester-Warner Valley Road, Br. 9C-0050 at Warner Creek

- 2017 Storm Damage Unplug Culverts / Culvert Washouts:
  - ✓ CR 507 Johnsville-Mccrea Road
  - ✓ Mill Creek next to Maintenance yard
  - ✓ CR 423 Big Creek Road
  - ✓ CR 520, Little Bear Road at Bonta Creek
  - ✓ CR CM03, Main St. in Crescent Mills
  - ✓ CR 115, Clio-State 40A Road at Willow Creek
  - ✓ CR 306, Seneca Road at Davis Creek
  - ✓ CR 420, Blackhawk Road
  - ✓ CR 408, West's Ranch Road
  - ✓ CR 529, Gill Ranch Road
  - ✓ CR 308, Humboldt Road
  - ✓ CR 516, Mohawk Vista Drive
  - ✓ CR 403, Mt. Hough-Crystal Lake Road
  - ✓ CR 532, Harrison Road
  - ✓ CR 507, Johnsville-McCrea Road
  - ✓ CR 301, Highlands Road

- 2017 Storm Damage Road Washouts:
  - ✓ CR 507 Johnsville-Mccrea Road
  - ✓ CR 420 Blackhawk

- ✓ CR 305, Prattville - Butt Reservoir Road
- ✓ CR 124, Rocky Point Road
- ✓ CR 103, Dotta Guidici Road
- ✓ CR 304, Rich Bar Rd.
- ✓ CR 417, Butterfly Valley - Twain Rd.
- ✓ CR 303A, Howells Road (February Storm)
- ✓ CR 510, Radio Hill Road
- ✓ CR 202A, Setzer Camp Road at Wolf Creek, Br. No, 9C-0131
- ✓ CR 306, Seneca Road at Owl Creek
- ✓ CR402A, Old State Highway
- ✓ CR 214, North Arm Road, Br 9C-0143 (Peters Creek)
- ✓ CR 118, Harriet Lane
- ✓ CR 107, Dyson Lane
- ✓ CR 108, Beckwourth-Loyalton Road
- ✓ CR 404, Chandler Road
- ✓ CR 206, Stampfli Lane (road - not the bridges)
- ✓ CR 303A, Howells Road (January Storm)

- ➢ 2017 Storm Damage Bank Failure / Streambank Erosion:
  - ✓ CR 409, Beskeen Lane
  - ✓ CR 509B, Sloat-Poplar Valley Road Bridge Rock Slope Bank Repair

Likelihood of Future Occurrence

1% Annual Chance Flood

Occasional— The 1% annual chance flood (100-year) is the flood that has a 1 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence occasional. However, the 100-year flood could occur more than once in a relatively short period of time.

0.2% Annual Chance Flood

Unlikely—The 0.2% annual chance flood (500-year) is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence unlikely.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and flood can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Flood

Climate change and its effect on flooding is discussed using three sources:

- ➢ 2021 CAS

- Cal-Adapt
- National Center for Atmospheric Research

California Climate Adaptation Strategy

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California and the Planning Area. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperatures, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams.

Cal Adapt

Cal Adapt future precipitation projections were shown in Figure 4-57 in Section 4.3.4 Severe Weather: Heavy Rains and Storms. These could affect future flooding in the Plumas County Planning Area.

National Center for Atmospheric Research

Also, according to the National Center for Atmospheric Research in Boulder, Colorado, atmospheric rivers are likely to grow more intense in coming decades, as climate change warms the atmosphere enabling it to hold more water.

Vulnerability Assessment

Vulnerability—High

Historically, the Plumas County Planning Area has always been at risk to flooding during the rainy season from November through April. Historically, the Plumas County Planning Area has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas. The vulnerability of the County to severe flooding is high as it can result in significant life safety and property damage.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Overall Flood Concerns

Floods have been a part of Plumas County's historical past and will continue to be so in the County's future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damages. Historically, much of the growth in the County has occurred adjacent to rivers or streams, resulting in significant damages to property, and losses from disruption of community activities during periods of flooding. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Rain on snow events are also a concern in the County.

Wolf Creek Flooding

The County provided a 2025 County memo regarding an area of the County at risk from accelerated bank erosion. This is known locally as the Wolf Creek Phase 4 area. 2025 saw calls by residents in the area to the County stating concern about bank erosion issues in this area. This is a continuation of similar effects since Wolf Creek was captured by 4th Water Trough Creek in 1997. Now a deeply incised, confined channel, Wolf Creek is subject to periodic episodes of mineral and organic debris loading during high intensity rain/saturated soils/wind events. These loads are derived from both upstream and onsite sources, exacerbated by Dixie Fire effects. This is the reason Wolf Creek was included in the original LHMP process and a Hazard Mitigation grant application. This HMGP grant has been approved by FEMA, but a local match is still being sought. The worry here is a repeat of a previous incident in the County. Figure 4-129 above is a photo of a home that was victim of rapid channel migration of Indian Creek in Genesee in 1997. The channel moved laterally +400 ft. in 24 hrs. The home was never flooded, just undermined by bank erosion until it fell in. This type of local flood disaster is a threat in numerous places in Plumas County.

Two principal conditions stand out: the amount of catastrophic burn area above the reach under discussion, and the width of the original floodplain to the current floodplain (or lack thereof). Over time Wolf Creek will erode and deposit until a similarly expansive floodplain is developed. There are residents located in these areas

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from 1% and 0.2% annual chance floods include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

Methodology (Parcel and Structures)

The Planning Area has mapped FEMA DFIRMs with flood hazard areas. GIS was used to determine the possible impacts of flooding within the Planning Area and how the risk varies across the Plumas County Planning Area. The following methodology was utilized in determining assets at risk to the 1% annual chance flood event and 0.2% annual chance flood event.

2024 Plumas County Parcel/Assessor Data was used as the basis for the Plumas County inventory of parcels, values, and acres. Plumas County has a FEMA effective DFIRM dated 3/27/2024, which was obtained from FEMA's National Flood Hazard Layer to perform the flood analysis. In some cases, there are parcels in multiple flood zones, such as Zone A, Zone X, or Shaded X. GIS was used to analyze the data. Since it is possible for any given parcel to intersect with multiple categories for purposes of this analysis, the most conservative (or highest risk) DFIRM flood zone that intersected each parcel was used to determine which flood zone to assign to each parcel. Once completed, the flood zone parcel layer was joined to the assessor data to determine the number of parcels and values falling within each DFIRM flood zone. Based on this approach, the flood zones for the Planning Area and unincorporated Plumas County were determined and further broken out by property use and included information on both land and improved values, personal property values, and estimated contents values. Improved parcels include those with improved structure values identified in the Plumas County Assessor's database. The property use categories for the Plumas County Planning Area (derived from general plan property use descriptions) were used to develop estimated content replacement values (CRV) that are potentially at loss from hazards, using FEMA Hazus methodologies as previously described in Section 4.2. The CRVs were added to the land, improved parcel, and personal property values.

The parcels and associated values were segregated and analyzed in this fashion to determine parcels, structures, and values at risk to the flood hazard for the Plumas County Planning Area. This flood analysis can be misleading since multiple classes may fall within one polygon, and there are many large polygons throughout the County.

Methodology (Loss Estimate)

The loss estimate for flood is based on the total of improved and contents value. Only improved parcels and the value of their structure improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of

improvements and structure contents. The land value is represented in the detailed flood tables but is primarily present to show the value of the land associated with parcels and leach flood zone.

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total loss of an area or building. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percentage of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an assumed average flood depth of 2 feet. The end result of this more refined flood hazard loss estimate analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Plumas County Planning Area residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the Planning Area's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer and linked to the Assessor Data. Those residential parcel polygons that intersect the flood zones were counted and multiplied by the 2023 Census Bureau American Community Survey average household factors for each jurisdiction. This is shown in Table 4-85.

Table 4-85 Plumas County Planning Area – Improved Residential Parcels and Populations in FEMA DFIRM Flood Zones by Jurisdiction

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
City of Portola	36	82	0	0
Unincorporated County	1,497	3,578	680	1,625

Source: FEMA DFIRM 03/02/05, Plumas County 2024 Parcel/Assessor's Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29); Unincorporated Plumas County (2.39).

Structures

Results are presented here first for the Plumas County Planning Area and secondly for unincorporated County.

Plumas County Planning Area

Certain structures in the Plumas County Planning Area are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the Planning Area. Table 4-86 shows parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), personal property values, content replacement values, and total values in the Planning Area. This is shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones.

Table 4-86 Plumas County Planning Area – Count and Value of Parcels and Structures in FEMA DFIRM 1% and 0.2% Annual Chance Flood Zones by Jurisdiction

Jurisdiction / Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
1% Annual Chance Flood Hazard	136	50	$5,846,857	$23,227,628	$1,322,526	$20,717,340	$51,114,351
0.2% Annual Chance Flood Hazard	2	1	$137,332	$374,544	$0	$374,544	$886,420
Other Areas	1,505	970	$31,966,182	$127,648,862	$592,546	$73,550,325	$233,757,915
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**
Unincorporated Plumas County							
1% Annual Chance Flood Hazard	3,035	1,714	$436,754,330	$533,266,332	$68,252,298	$300,503,098	$1,338,776,058
0.2% Annual Chance Flood Hazard	943	787	$42,128,297	$144,725,179	$34,596,689	$91,002,831	$312,452,996
Other Areas	20,256	10,926	$1,186,112,101	$2,524,953,767	$38,678,576	$1,342,652,693	$5,092,397,137
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**
Grand Total	**25,877**	**14,448**	**$1,702,945,099**	**$3,354,196,312**	**$143,442,635**	**$1,828,800,830**	**$7,029,384,876**

Source: FEMA 03/02/2005 DFIRM, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table 4-87 shows Planning Area loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. More detailed tables and discussions can be found in each jurisdiction's respective annex to this Base Plan.

Table 4-87 Plumas County Planning Area – FEMA DFIRM Flood Loss Estimates

Flood Zone	Total Parcel Count	Imp. Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	3,171	1,764	$442,601,187	$556,493,960	69,574,824	$321,220,438	$947,289,222	$189,457,845	3.75%
0.2% Annual Chance Flood Hazard	945	788	$42,265,629	$145,099,723	$34,596,689	$91,377,375	$271,073,787	$54,214,758	1.07%
Grand Total	**4,116**	**2,552**	**$484,866,816**	**$701,593,683**	**$104,171,513**	**$412,597,813**	**$1,218,363,009**	**$243,672,603**	**4.82%**

Source: FEMA 03/02/2005 DFIRM, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to the information in Table 4-86 and Table 4-87, the Plumas County Planning Area has 1,764 improved parcels and roughly $947.3 million of structure and contents value in the 1% annual chance floodplain. There are an additional 788 improved parcels and roughly $271.1 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 3.75% and 1.07% indicates that while the Plumas County Planning Area does have structural assets at risk to flood, the County should be able to effectively recover from a major flood event.

Unincorporated Plumas County

Numerous structures in unincorporated Plumas County are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the unincorporated County. Table 4-88 shows parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), personal property values, estimated content replacement values, and total values in the unincorporated County. This is shown for the detailed flood zones by 1% and 0.2% annual chance flood zones by property use, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones.

Table 4-88 Unincorporated Plumas County – Count and Value of Parcels and Structures in Detailed FEMA DFIRM 1% and 0.2% Annual Chance Flood Zones by Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard							
Zone A							
Agricultural	297	79	$38,287,431	$14,953,243	$1,997,675	$14,953,243	$70,191,592
Commercial	66	35	$9,813,026	$14,638,475	$1,748,420	$14,638,475	$40,838,396
Federal Lands	42	0	$0	$0	$0	$0	$0
Government	79	0	$0	$0	$0	$0	$0
Industrial	27	14	$2,357,231	$2,918,804	$0	$4,378,206	$9,654,241
Institutional	6	0	$0	$0	$0	$0	$0
Miscellaneous	2	0	$0	$0	$0	$0	$0
Recreational	39	28	$7,020,109	$9,854,924	$699,406	$9,854,924	$27,429,363
Residential	1,772	1,279	$346,035,966	$413,794,910	$5,541,684	$206,897,455	$972,270,015
ROW/Utilities	168	0	$0	$0	$0	$0	$0
Zone A Total	**2,498**	**1,435**	**$403,513,763**	**$456,160,356**	**$9,987,185**	**$250,722,303**	**$1,120,383,607**
Zone AE							
Agricultural	16	4	$1,449,736	$601,029	$50,970	$601,029	$2,702,764
Commercial	38	28	$5,744,975	$13,653,796	$241,593	$13,653,796	$33,294,160
Government	14	0	$0	$0	$0	$0	$0
Industrial	12	9	$1,017,704	$2,587,779	$0	$3,881,669	$7,487,152
Residential	212	170	$14,823,192	$46,546,047	$57,234,227	$23,273,024	$141,876,490
ROW/Utilities	35	0	$0	$0	$0	$0	$0
Zone AE Total	**327**	**211**	**$23,035,607**	**$63,388,651**	**$57,526,790**	**$41,409,517**	**$185,360,565**
Zone AE: Regulatory Floodway							
Agricultural	16	6	$1,308,547	$988,581	$74,000	$988,581	$3,359,709
Commercial	14	4	$1,403,253	$1,913,256	$658,482	$1,913,256	$5,888,247
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	3	0	$0	$0	$0	$0	$0
Industrial	4	2	$406,737	$61,697	$0	$92,546	$560,980
Institutional	1	0	$27,886	$0	$0	$0	$27,886
Miscellaneous	1	0	$0	$0	$0	$0	$0
Residential	133	48	$6,412,558	$8,964,199	$5,841	$4,482,100	$19,864,698
ROW/Utilities	21	0	$0	$0	$0	$0	$0

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Zone AE: Regulatory Floodway Total	**196**	**60**	**$9,558,981**	**$11,927,733**	**$738,323**	**$7,476,482**	**$29,701,519**
Zone AH							
Government	1	0	$0	$0	$0	$0	$0
Residential	11	8	$645,979	$1,789,592	$0	$894,796	$3,330,367
ROW/Utilities	2	0	$0	$0	$0	$0	$0
Zone AH Total	**14**	**8**	**$645,979**	**$1,789,592**	$0	**$894,796**	**$3,330,367**
1% Annual Chance Flood Hazard Total	**3,035**	**1,714**	**$436,754,330**	**$533,266,332**	**$68,252,298**	**$300,503,098**	**$1,338,776,058**
0.2% Annual Chance Flood Hazard							
Zone X (shaded)							
Agricultural	2	1	$25,857	$574,148	$0	$574,148	$1,174,153
Commercial	103	90	$11,112,003	$27,549,347	$603,156	$27,549,347	$66,813,853
Government	9	0	$0	$0	$0	$0	$0
Industrial	21	12	$1,796,224	$2,900,367	$33,531,160	$4,350,551	$42,578,302
Institutional	9	4	$272,853	$3,356,253	$3,050	$3,356,253	$6,988,409
Residential	758	680	$28,921,360	$110,345,064	$459,323	$55,172,532	$194,898,279
ROW/Utilities	41	0	$0	$0	$0	$0	$0
Zone X (shaded) Total	**943**	**787**	**$42,128,297**	**$144,725,179**	**$34,596,689**	**$91,002,831**	**$312,452,996**
0.2% Annual Chance Flood Hazard Total	**943**	**787**	**$42,128,297**	**$144,725,179**	**$34,596,689**	**$91,002,831**	**$312,452,996**
Other Areas							
Zone X (unshaded)							
Agricultural	570	21	$16,443,313	$6,917,572	$643,882	$6,917,572	$30,922,339
Commercial	585	371	$47,503,071	$101,167,535	$28,731,777	$101,167,535	$278,569,918
Federal Lands	85	0	$0	$0	$0	$0	$0
Government	299	0	$95,301	$0	$0	$0	$95,301
Industrial	74	47	$5,101,553	$9,957,202	$19,048	$14,935,803	$30,013,606
Institutional	64	35	$1,844,377	$10,579,916	$193,330	$10,579,916	$23,197,539
Miscellaneous	10	0	$0	$0	$0	$0	$0
Recreational	172	54	$9,503,364	$10,937,803	$1,114,080	$10,937,803	$32,493,050
Residential	13,414	8,787	$939,342,063	$2,161,874,103	$6,744,374	$1,080,937,052	$4,188,897,592
ROW/Utilities	660	0	$0	$0	$0	$0	$0

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Zone X (unshaded) Total	**15,933**	**9,315**	**$1,019,833,042**	**$2,301,434,131**	**$37,446,491**	**$1,225,475,681**	**$4,584,189,345**
Zone D (unmapped)							
Agricultural	409	7	$12,767,933	$945,072	$0	$945,072	$14,658,077
Commercial	47	28	$3,023,552	$5,422,003	$292,457	$5,422,003	$14,160,015
Federal Lands	87	0	$0	$0	$0	$0	$0
Government	194	0	$29,655	$0	$0	$0	$29,655
Industrial	2	1	$54,172	$23,684	$0	$35,526	$113,382
Miscellaneous	13	0	$9,591	$0	$0	$0	$9,591
Recreational	308	9	$1,666,675	$4,419,946	$638	$4,419,946	$10,507,205
Residential	3,124	1,566	$148,727,481	$212,708,931	$938,990	$106,354,466	$468,729,868
ROW/Utilities	139	0	$0	$0	$0	$0	$0
Zone D (unmapped) Total	**4,323**	**1,611**	**$166,279,059**	**$223,519,636**	**$1,232,085**	**$117,177,013**	**$508,207,793**
Other Areas Total	**20,256**	**10,926**	**$1,186,112,101**	**$2,524,953,767**	**$38,678,576**	**$1,342,652,693**	**$5,092,397,137**
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**

Source: FEMA 03/02/2005 DFIRM, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table 4-89 shows unincorporated Plumas County loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table 4-89 Unincorporated Plumas County – FEMA DFIRM Flood Loss Estimates

Flood Zone	Total Parcel Count	Imp. Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	3,035	1,714	$436,754,330	$533,266,332	$68,252,298	$300,503,098	$902,021,728	$180,404,346	3.6%
0.2% Annual Chance	943	787	$42,128,297	$144,725,179	$34,596,689	$91,002,831	$270,324,699	$54,064,940	1.1%

Flood Zone	Total Parcel Count	Imp. Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
Flood Hazard									
Total	**3,978**	**2,501**	**$478,882,627**	**$677,991,511**	**$102,848,987**	**$391,505,929**	**$1,172,346,427**	**$234,469,286**	**4.7%**

Source: FEMA 03/02/2005 DFIRM, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to the information in Table 4-88 and Table 4-89, the unincorporated Plumas County has 1,714 improved parcels and roughly $902.0 million of structure and contents value in the 1% annual chance floodplain. There are an additional 787 improved parcels and roughly $270.3 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 3.6% and 1.1% indicates that while the County does have structural assets at risk to flood, the County should be able to effectively recover from a major flood event.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood for structures located within a 1% annual chance floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain. Flood insurance promotion and outreach will be important moving forward to ensure these vulnerable structures are adequately insured and protected.

Unincorporated Plumas County joined the NFIP on September 24, 1984. The County does not participate in the CRS. NFIP insurance data provided by CA DWR indicates that as of December 2, 2024, there were 93 policies in force in the unincorporated County, resulting in $61,661,100 of insurance in force. There have been 59 closed paid losses totaling $1,099,373.04. Of these losses, 46 were parcels in A zones and 12 parcels were in B, C, or X zone, with 1 claim unknown. Of the 59 claims, 52 claims were associated with pre-FIRM structures and 6 with post-FIRM structures, with 1 claim unknown. There have been 4 repetitive loss (RL) structures, and 0 severe repetitive loss (SRL) structures in the County. There have been 9 substantial damage claims since 1978. There has been 1 Increased Cost of Compliance (ICC) loss totaling $0.

Based on this analysis of insurance coverage, unincorporated Plumas County has significant values at risk to the 1% annual chance and greater floods. Of the 1,505 improved parcels within the 1% annual chance flood zone, only 93 (or 6.2 percent) of those parcels maintain flood insurance. This can be seen on Table 4-90, along with insurance information from City of Portola.

Table 4-90 Plumas County Planning Area – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Portola	36	2	5.5%
Unincorporated Plumas County	1,505	93	6.2%

Source: FEMA 03/02/2005 DFIRM, FEMA CIS 2024, Plumas County 2024 Parcel/Assessor's Data

FEMA also supplied data from their PIVOT database, which provides property use information specific to the RL and SRL properties. However, according to FEMA, there is a discrepancy between CIS and the PIVOT database on numbers of RL and SRL properties based on how information is transferred between systems. According to the PIVOT database, there are 3 RL properties and 1 SRL properties in the unincorporated County. This can be seen for all communities on Table 4-91. FEMA's CIS data does not include searchable information on property use for RL and SRL properties.

Table 4-91 Plumas County Planning Area – RL and SRL Properties and their Status

Jurisdiction	RL Properties	SRL Properties
City of Portola	0	0
Unincorporated Plumas County		
Single-family dwelling	3	1

Source: FEMA, PIVOT, 3/24/2025

Critical Facilities and Infrastructure

Flooding presents a threat to critical facilities and infrastructure, and community lifelines. Critical facilities and infrastructure play an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on critical infrastructure for drinking water, wastewater service, and draining streets of rainwater. Other utilities play an important role in providing critical services to area residents. Fire, police and other emergency response facilities and functions are also critical to the wellbeing of the community and the ability to respond and recover from hazard events, such as floods. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California. The following GIS analysis identifies critical facilities and infrastructure at risk to 1% and 0.2% annual chance flooding.

A separate analysis was performed on the critical facility inventory in the Plumas County Planning Area to determine critical facilities in the 1% and 0.2 annual chance flood zones. Using GIS, the DFIRM flood zones were overlayed on the critical facility GIS layer. Figure 4-142 shows critical facilities and the detailed DFIRM flood zones (with the inset maps shown). These inset maps are shown in Figure 4-143 through Figure 4-145. Table 4-92 details critical facilities in detailed DFIRM flood zones by facility type and count for the Plumas County Planning Area broken out by jurisdiction. Details of critical facilities by type, name, and address by flood zone are listed in Appendix G.

As shown on these tables, 3 critical facilities in the City of Portola fall in the 1% annual chance flood zone; 111 and 27 critical facilities in the unincorporated County fall in the 1% and 0.2% annual chance flood zone, respectively; and 2 and 1 of the critical facilities in the surrounding counties fall in the 1% and 0.2% annual chance flood zone, respectively.

Figure 4-142 Plumas County Planning Area – Critical Facilities in DFIRM Flood Zones (Overview Maps with Insets)

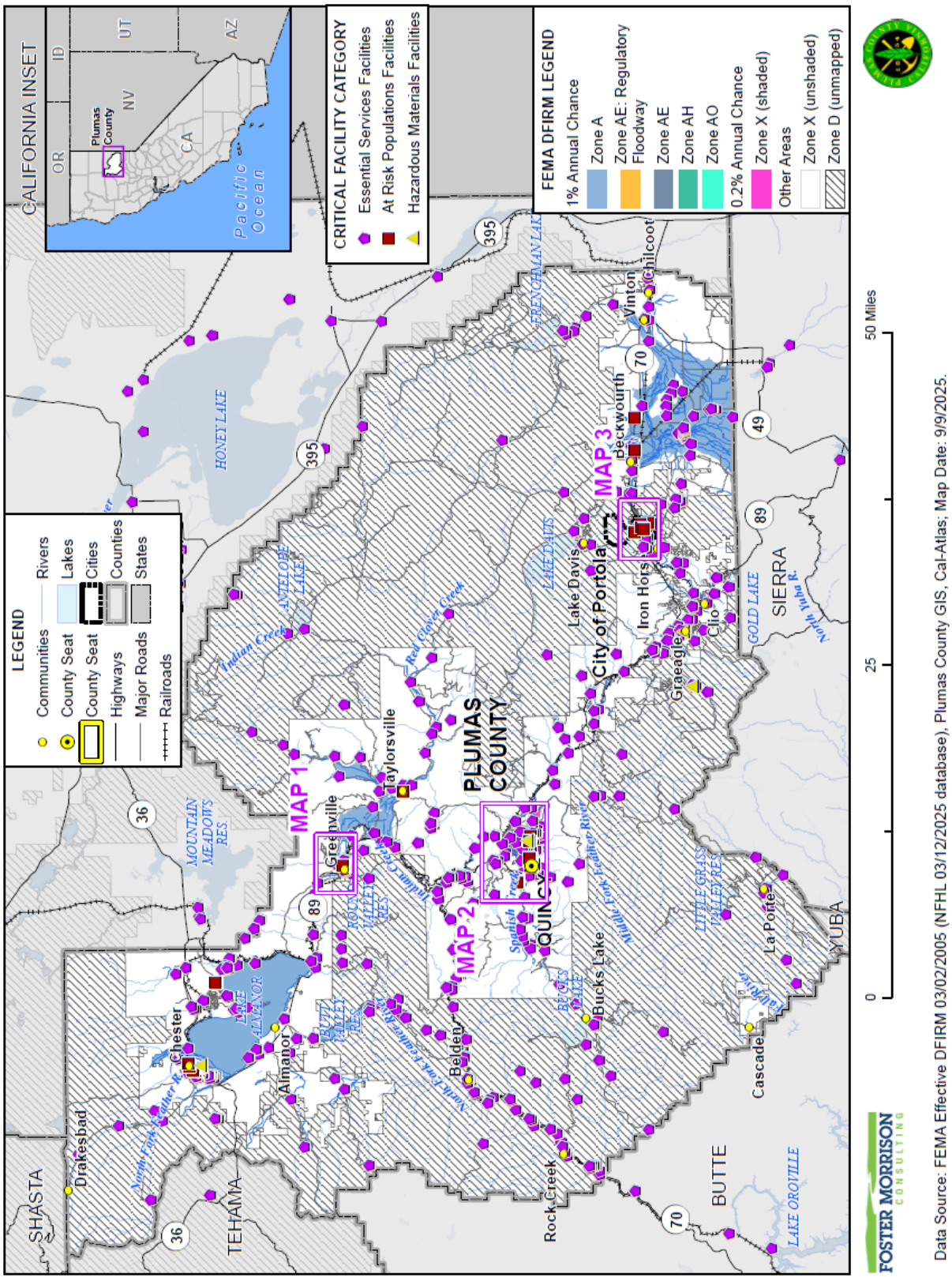


Figure 4-143 Plumas County Planning Area – Critical Facilities in DFIRM Flood Zones (Map Inset 1)

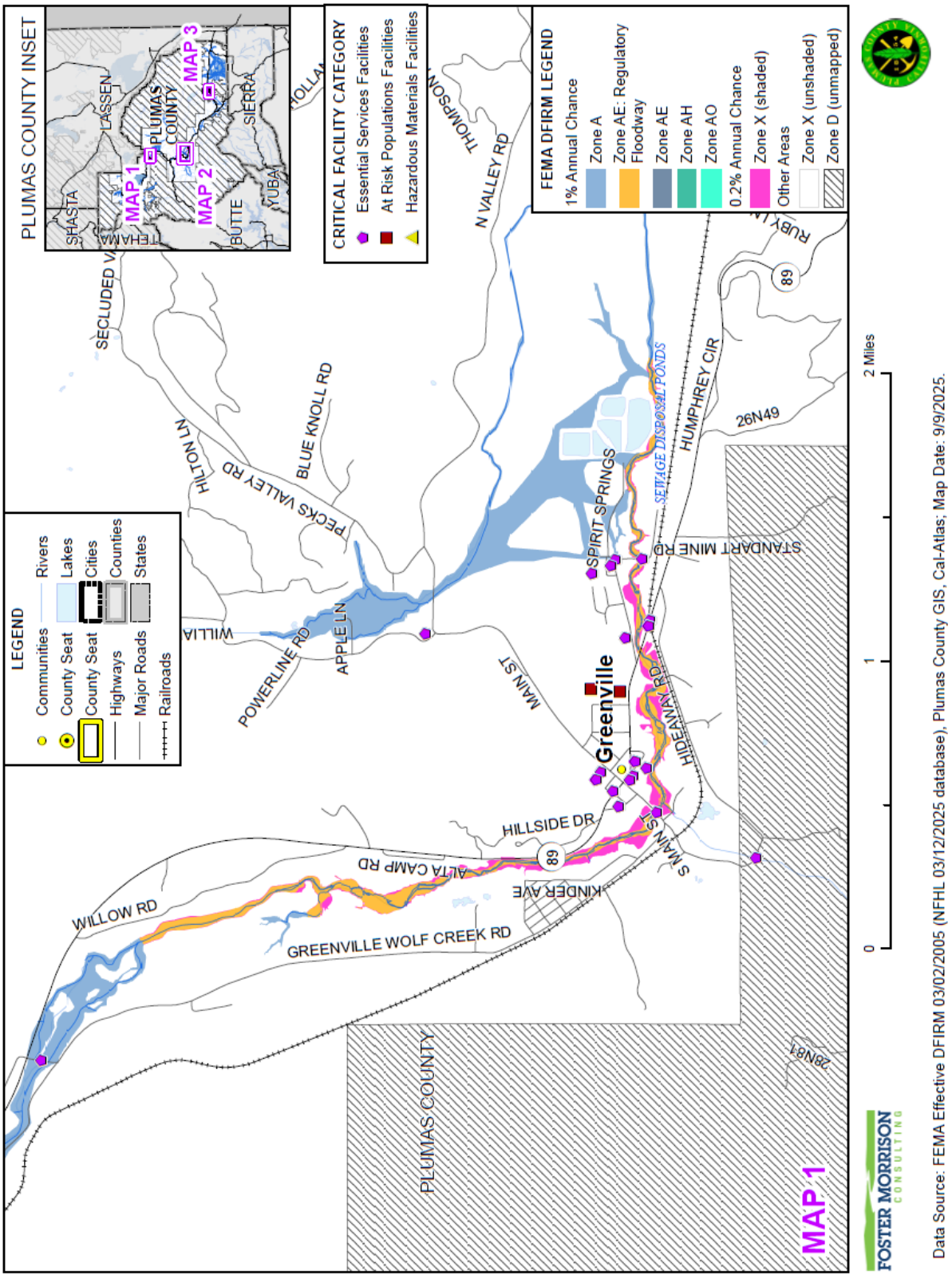


Figure 4-144 Plumas County Planning Area – Critical Facilities in DFIRM Flood Zones (Map Inset 2)

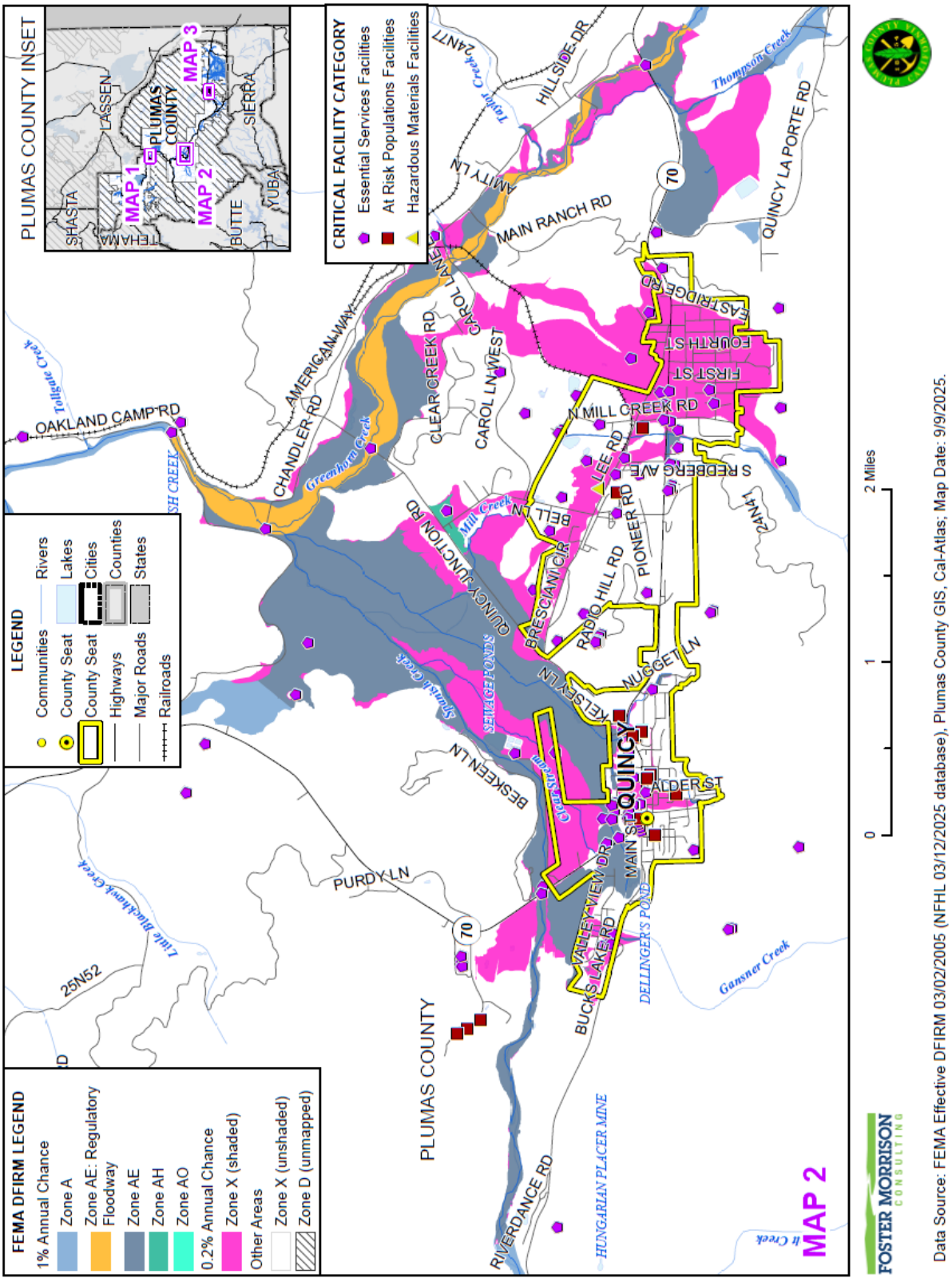


Figure 4-145 Plumas County Planning Area – Critical Facilities in DFIRM Flood Zones (Map Inset 3)

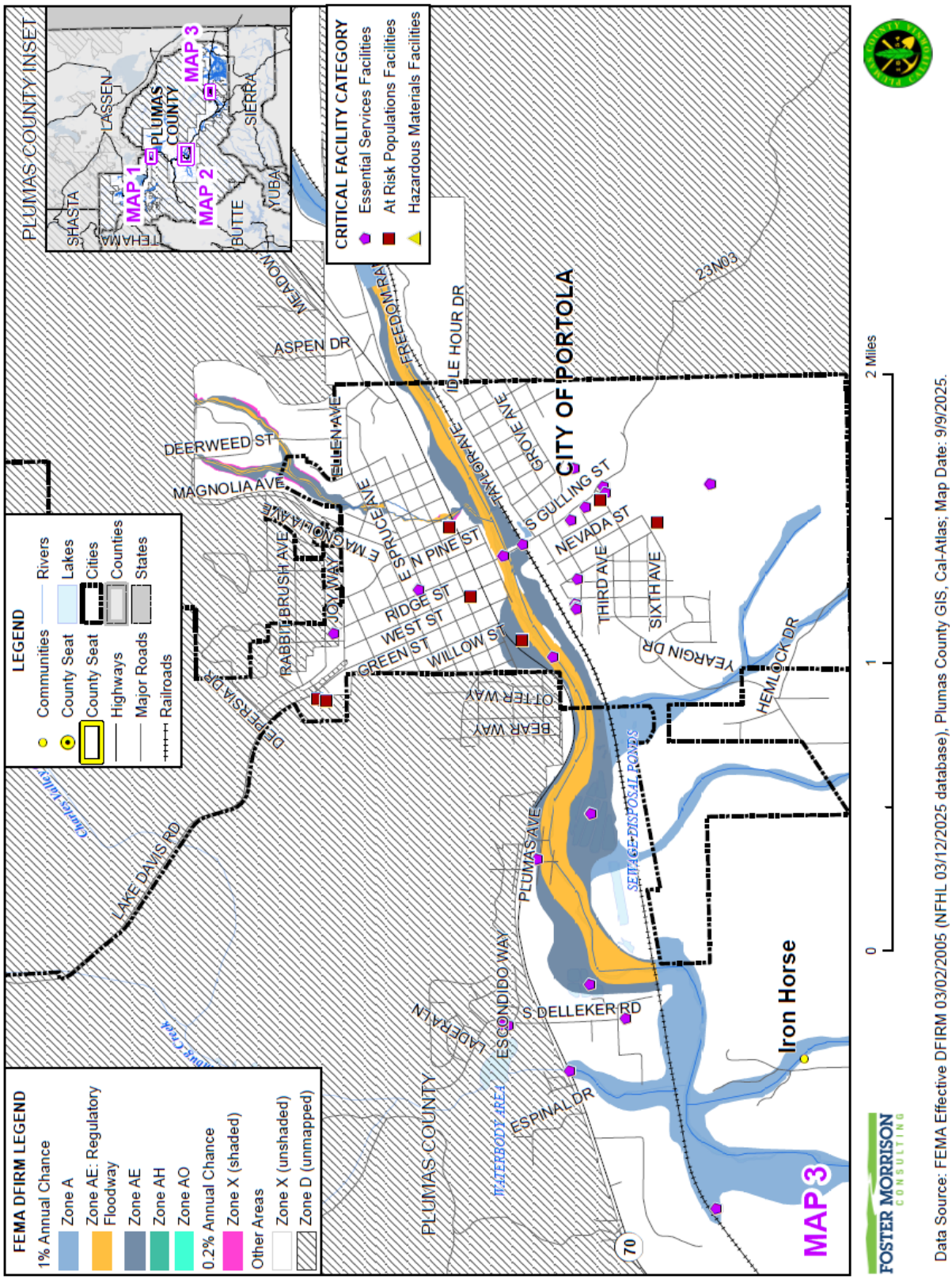


Table 4-92 Plumas County Planning Area – Critical Facilities in Detailed DFIRM Flood Zones by Jurisdiction and Critical Facility Category

Jurisdiction / Flood Zone	Critical Facility Category	Facility Count
Portola		
1% Annual Chance Flood Hazard	Essential Services Facilities	2
	At Risk Populations Facilities	1
	Hazardous Materials Facilities	0
	1% Annual Chance Total	**3**
Other Areas	Essential Services Facilities	14
	At Risk Populations Facilities	7
	Hazardous Materials Facilities	0
	Other Areas Total	**21**
Portola Total		**24**
Unincorporated Plumas County		
1% Annual Chance Flood Hazard	Essential Services Facilities	111
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	1% Annual Chance Flood Hazard Total	**111**
0.2% Annual Chance Flood Hazard	Essential Services Facilities	26
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	1
	0.2% Annual Chance Flood Hazard Total	**27**
Other Areas	Essential Services Facilities	692
	At Risk Populations Facilities	33
	Hazardous Materials Facilities	3
	Other Areas Total	**728**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
Other Areas	Essential Services Facilities	4
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Other Areas Total	**4**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
1% Annual Chance Flood Hazard	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	1% Annual Chance Flood Hazard Total	**2**

Jurisdiction / Flood Zone	Critical Facility Category	Facility Count
0.2% Annual Chance Flood Hazard	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	0.2% Annual Chance Flood Hazard Total	**1**
Other Areas	Essential Services Facilities	31
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Other Areas Total	**31**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
Other Areas	Essential Services Facilities	4
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Other Areas Total	**4**
Unincorporated Sierra County Total		**4**
Unincorporated Tehama County		
Other Areas	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Other Areas Total	**2**
Unincorporated Tehama County Total		**2**
Grand Total		**934**

Source: FEMA 3/2/2005 DFIRM, Plumas County GIS

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these resources that fall in the flood zones would be vulnerable.

FEMA NRI Hazard Vulnerability Assessment

The HMPC looked at the FEMA NRI for additional specific data on Plumas County's vulnerability to Flood: 1%/0.2% annual chance and Flood: Localized Flooding. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Plumas County's Flood: 1%/0.2% annual chance and Flood: Localized Flooding is riverine flooding. As shown in Table 4-93, riverine flooding could cause a total of $1,910,839 in expected annual losses, with a historic loss rating of relatively moderate. Riverine flooding has a relatively low rating for social vulnerability and relatively high community resilience, with a risk index score of 85.9 out of 100. According to the NRI, there have been 11 riverine flooding events between the years 1996-2019 with an average of 0.5 events per year.

Table 4-93 Plumas County Planning Area – Riverine Flooding Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Riverine Flooding	85.9	$1,910,839	$8,960,873,982	Relatively moderate

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Flood: 1% and 0.2% Annual Chance Flood

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Health Hazards from Flooding

Certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where cattle, hogs, and other livestock are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease-causing agents.

The second type of health problems arise after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a city or county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in

population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Population in Plumas County is expected to decrease. Additional growth within the flood-risk areas of the County would place additional populations at risk to flooding. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from a flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. However, County building codes and the County's floodplain ordinance are in effect to reduce this risk and should be updated as necessary to continue to address future flood conditions. Depending on the location of new development and adherence to protective building codes and the floodplain ordinance, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

This section discusses considerations in evaluating future flooding conditions and also provides an analysis of the flood hazard and proposed future development within the County based on FEMA floodplains.

Future Development: General Considerations

Communities that participate in the NFIP adopt regulations and codes that govern development in special flood hazard areas (SFHAs) and enforce those requirements through their local floodplain management ordinances through the issuance of permits. Plumas County's floodplain management ordinance provides

standards for development, subdivision of land, construction of buildings, and improvements and repairs to buildings that generally meet the minimum requirements of the NFIP.

The International Residential Code (IRC) and International Building Code (IBC), by reference to ASCE 24, include requirements that govern the design and construction of buildings and structures in flood hazard areas. FEMA has determined that the flood provisions of the I-Codes are consistent with the requirements of the NFIP (the I-Code requirements shown either meet or exceed NFIP requirements). ASCE 24, a design standard developed by the American Society of Civil Engineers, expands on the minimum NFIP requirements with more specificity, additional requirements, and some limitations.

With the adoption of the International Codes, communities will be moving towards a more stringent approach to regulatory floodplain management, beyond the minimum requirements of the NFIP. The adoption and enforcement of disaster-resistant building codes is a core community action to promote effective mitigation. When communities ensure that new buildings and infrastructure are designed and constructed in accordance with national building codes and construction standards, they significantly increase local resilience now and in the future. With continued advancements in building codes, local ordinances should be reviewed and updated to meet and exceed standards as practicable to protect new development from future flood events and to further promote disaster resiliency.

One of the most effective ways to reduce vulnerability to potential flood damage is through careful land use planning that fully considers applicable flood management information and practices. Master planning will also be necessary to assure that open channel flood flow conveyances serving the smaller internal streams and drainage areas are adequately prepared to accommodate the flows. Preservation and maintenance of natural and riparian areas should also be an ongoing priority to realize the flood control benefits of the natural and beneficial functions of these areas.

Future development in the County may be built in the floodplain, in conformance to the standards of the floodplain ordinance. The County enforces the floodplain ordinance on new development in unincorporated Plumas County.

Future development areas and their vulnerability to DFIRM flooding is discussed further in the below GIS analysis.

Future Development: GIS Analysis

Plumas County provided 13 future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Where multiple parcels are listed, the parcels are merged to form one polygon, and the hazards are assigned to the highest annual chance flood zone category. Figure 4-146 shows the locations of the future development areas and FEMA DFIRM flood zones as well as the National Levee Database areas. As shown, some of these areas fall inside of the 1% and 0.2% annual chance flood zones, as shown on Table 4-94.

Figure 4-146 Unincorporated Plumas County – Future Development in FEMA DFIRM Flood Zones

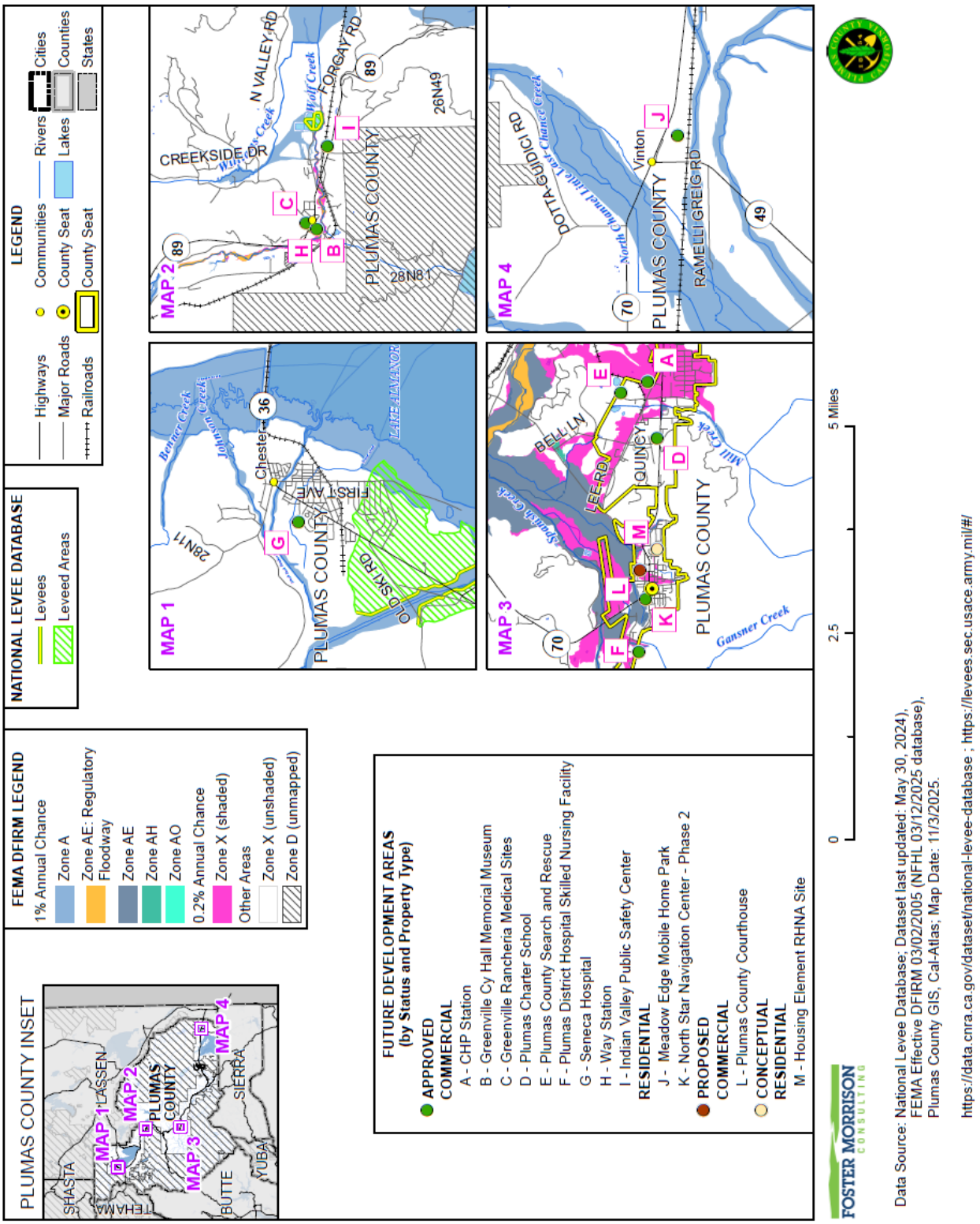


Table 4-94 Unincorporated Plumas County – Future Development in FEMA DFIRM Flood Zones with Parcel Counts and Acreages

Flood Zones / Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
1% Annual Chance Flood Hazard						
Approved						
K - North Star Navigation Center - Phase 2	1	1	0	1.00	1.00	0.00
Approved Total	**1**	**1**	**0**	**1.00**	**1.00**	**0.00**
Proposed						
L - Plumas County Courthouse	1	1	0	2.86	2.86	0.00
Proposed Total	**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
1% Annual Chance Flood Hazard Total	**2**	**2**	**0**	**3.86**	**3.86**	**0.00**
0.2% Annual Chance Flood Hazard						
Approved						
A - CHP Station	1	0	1	5.00	0.00	5.00
F - Plumas District Hospital Skilled Nursing Facility	1	0	1	4.12	0.00	4.12
Approved Total	**2**	**0**	**2**	**9.12**	**0.00**	**9.12**
0.2% Annual Chance Flood Hazard Total	**2**	**0**	**2**	**9.12**	**0.00**	**9.12**
Other Areas						
Approved						
B - Greenville Cy Hall Memorial Museum	1	0	1	0.11	0.00	0.11
C - Greenville Rancheria Medical, Dental Clinic, and Pharmacy	1	0	1	1.58	0.00	1.58
D - Plumas Charter School	1	0	1	0.89	0.00	0.89

Flood Zones / Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
E - Plumas County Search and Rescue	1	1	0	4.50	4.50	0.00
G - Seneca Hospital	1	0	1	11.80	0.00	11.80
H - Way Station	1	0	1	0.28	0.00	0.28
I - Indian Valley Public Safety Center	1	0	1	5.00	0.00	5.00
J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
Approved Total	**8**	**2**	**6**	**66.90**	**47.24**	**19.66**
Conceptual						
M - Housing Element RHNA Site	1	1	0	3.64	3.64	0.00
Conceptual Total	**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Other Areas Total	**9**	**3**	**6**	**70.54**	**50.88**	**19.66**
Grand Total	**13**	**5**	**8**	**83.52**	**54.74**	**28.78**

Source: FEMA 03/02/2005 DFIRM, Plumas County GIS

4.3.12. Flood: Localized Flooding

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Flooding occurs in areas other than the FEMA mapped floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the Plumas County Planning Area during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated

ground conditions. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

Location and Extent

There is no established scientific scale or measurement system for localized flooding. Localized flooding is generally measured by depth of flooding and the area affected. Localized flooding often happens quickly and has a short speed of onset. In the County this happens more often during the winter months, as was shown on Figure 4-50 above. Localized flooding often has a short duration. Specific locations in the County can be seen in the Local Concerns section below.

Past Occurrences

Disaster Declarations

There are no identified state or federal disaster declarations for localized flooding, as shown in Table 4-4. However, localized flooding was likely an issue during previous declarations for severe storms, heavy rains and floods.

NCDC Events

The past occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile in Section 4.3.11.

Hazard Mitigation Planning Committee Events

These sections separate events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

The HMPC noted the following events:

- **2023** – Spring flooding caused localized flooding to occur in many areas of the County. Roads and culverts were damaged. Juniper Lake Road saw roadway impacted by excessive storm surge and debris dislodging/plugging two culverts and subsequently washing out the roadway. Warner Valley Road saw excessive storm surge resulted in a landslide uphill from the roadway which plugged and/or buried three culvert sites servicing Warner Valley Road. The landslide also diverted streams uphill from the roadway resulting in branches of the stream no longer leading towards the current culvert locations and presently flowing over the roadway. Three culverts along Butterfly Valley Road and Twain Road were plugged and/or washed out by storm debris as well as a section of roadway underneath the railroad washed out by excessive storm surge.

Events before 2019

The HMPC noted the following events:

- Each year there are flood issues throughout the County due to stormwater. There is significant stormwater runoff that occurs throughout the County, and the County has very little stormwater infrastructure
- During large storms, such as those in **1986 and 1997**, the entire Sierra Valley will fill with several feet of water.
- In **February of 2017**, heavy rains combined with previous heavy snow to cause localized flooding issues throughout the County. The heavy snow blocked the rain from getting into drainage ditches. Creeks also rose above their banks (discussed in Section 4.3.11). The Greenhorn Creek Community was particularly hard hit. Greenhorn Ranch Road Greenhorn Creek CSD well-house #1 sustained water damage from Estray Creek rising above its banks and flooding the well-house. Greenhorn Ranch Rd. was closed until waters receded and the road could be repaired. Approximately 1 day. Flood damage to Greenhorn Creek CSD properties/buildings was covered by insurance. More information on some of the damages from this flood can be found in the Past Occurrences in Section 4.3.11.

Figure 4-147 2017 Localized Flooding at High Street in Quincy

Source: Plumas County Ag Commissioner

- The HMPC noted that there are yearly bottlenecks in Spanish Creek, for example at Oakland Camp, that create backups into American Valley to varying degrees.

Likelihood of Future Occurrence

Highly Likely—Natural drainage systems located throughout the Plumas County Planning Area have a finite capacity to convey water. Likewise, storm drainage systems have a finite capacity generally based on the design criteria. When rainfall exceeds the capacity of natural and storm drainage systems or systems clog, water accumulates until it reaches a level of overland release. Due to aging and often undersized infrastructure, this type of flooding will continue to occur annually during heavy rains.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and localized flood can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Localized Flood

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability Assessment

Vulnerability—Medium

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the Plumas County Planning Area during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant economic impacts to certain areas of the Plumas County Planning Area. However, while flooding can cause significant impacts depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the Planning Area are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the Planning Area are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

According to Plumas County, numerous parcels and roads throughout the County not included in the FEMA 1% and 0.2% annual chance floodplains are subject to flooding in heavy rains. In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, mudslides, debris

areas, and downed trees. The frequency and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff.

It was noted that the County has 6 maintenance yards with backhoes to assist with managing areas of localized flooding. In Quincy, the County has all the supplies to be dispatched to areas as needed.

Localized flood areas within Plumas County can be organized by elevation within the Upper Feather River watershed, thus examining the impact of water as it travels downhill on its journey to the Central Valley. The primary areas at risk of loss from flooding are: Sierra Valley, Chester, Indian Valley, American Valley, and the North Fork Feather River Canyon.

Sierra Valley

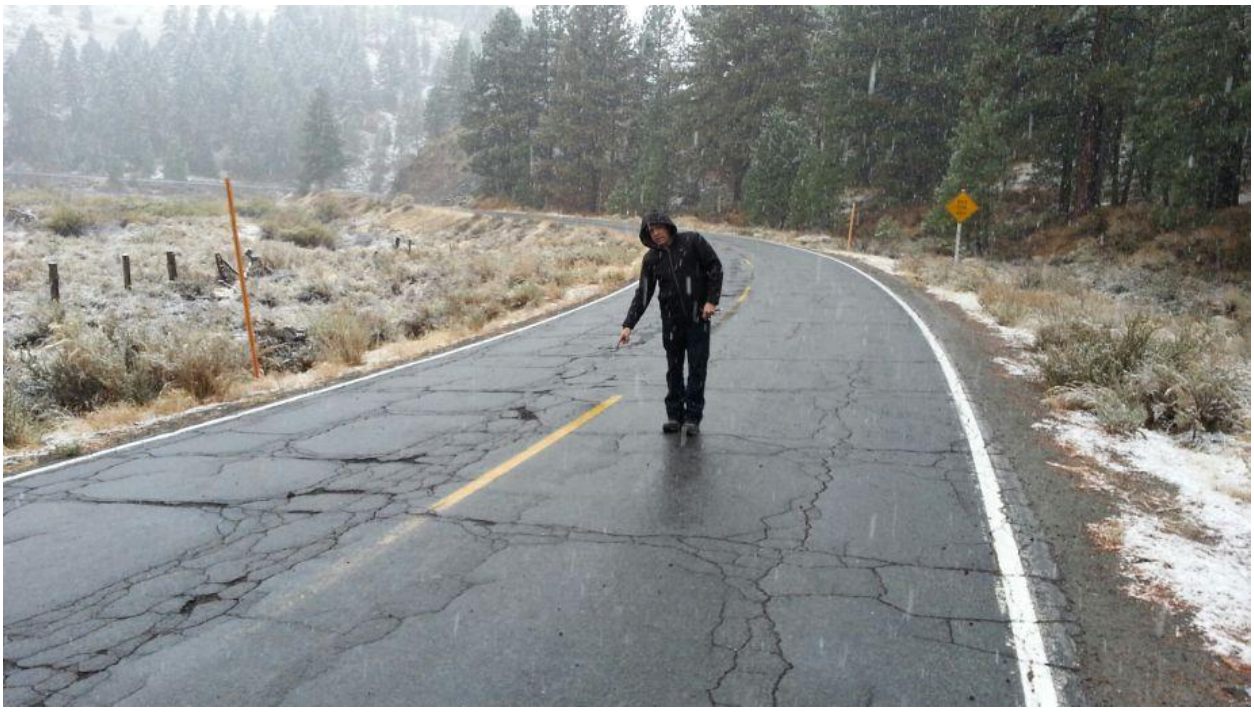
The Sierra Valley is a large intermountain valley on the eastern edge of Plumas County. It has an area of 120,000 acres and is primarily located in Plumas County but also extends southward into Sierra County. The valley has an average elevation of 4,850 feet and serves as the headwaters for the Middle Fork Feather River. The Sierra Valley has minimal topographic relief, and flooding is generally shallow and low velocity. Table 4-95 provides a summary of the primary localized flooding problems in the Sierra Valley. See Figure 4-148 through Figure 4-151 for photos of localized flooding in the Sierra Valley.

Table 4-95 Sierra Valley Localized Flooding Issues

Sierra Valley Areas	Issues	Road Impacts	Home and Business Impacts	Evacuation Route
Marble Hot Springs Road	Annual flooding in various locations from rain and irrigation 0.7 mile stretch east of the historic bridge experiences repeated flooding Closed in winter due to snow Primary evacuation route	X		X
Rocky Point Road (Old Highway 70)	Experiences shoulder and bank erosion and repeated flooding Will flood nearly up to road centerline during major events One or two homes have been damaged	X	X	
Harriet Lane	Experiences sheet flow across road Often inundates nearby agricultural/ranch facilities, specifically around Island Ranch Road has sub-layer integrity issues and contains clay road base requiring constant repair Major corridor for Hay transportation	X		
Dyson Lane	Experiences sheet flow and shallow flooding Flooded with entire valley in 1992 0.1 mile low spot across the valley drainage area Serves local population and as a bypass	X		X
Sloat Road	Flooding in Sloat is limited to little Long Valley Creek flooding SR70 during high flow events and high flows in the Middle Fork Feather River, which has flooded houses near Sloat Bridge crossing.	X	X	

Source: Plumas County 2014 LHMP, HMPC

Figure 4-148 High Water Mark from 1992 Flood Event on Rocky Point Road



Source: Plumas County 2014 LHMP

Figure 4-149 Sierra Valley Marble Hot Springs Road – Localized Flood Area

Source: Plumas County 2014 LHMP

Figure 4-150 Rocky Point Road – Shoulder Erosion from Localized Flooding

Source: Plumas County 2014 LHMP

Figure 4-151 Harriet Lane – Pavement Deterioration from Localized Flooding

Source: Plumas County 2014 LHMP

Chester/Lake Almanor

Lake Almanor is a higher elevation alpine reservoir located in the northwestern portion of Plumas County. Chester is the largest community of several that surround the lake and is located at the inlet of the North Fork Feather River. The outflow of the North Fork Feather River is controlled by Canyon Dam at the southern edge of the lake. The dam and outflow rates are managed and maintained by PG&E. The Canyon dam spillway elevation is 4,505 FT and PG&E property ownership around the lake resides at 4,500 FT. Currently, PG&E's FERC license allows lake levels to be operated at 4,494 FT. Flooding issues in this region are minimal due to the construction of the Chester Flood Control Channel, or ACE bypass, a large diversion channel from the North Fork Feather River upstream of Chester/Lake Almanor. The diversion channel allows river water to enter once it reaches a certain height and directs it around Chester into Lake Almanor. The bypass also has a secondary set-back levee system outside of the channel for extreme flooding events. The hydrography in the Lake Almanor area is important to understand as all water that flows through this region travels down into the Feather River Canyon that contains major road and rail transportation routes and a number of communities.

Indian Valley

Indian Valley is located in the north-central portion of Plumas County at an average elevation of 3,500 feet. It contains several developed communities and is also utilized for farming. Indian Valley is the meeting place of four creeks: Wolf Creek, Cooks Creek, Lights Creek, and Indian Creek. Indian Creek is the dominant stream reach as the other three creeks confluence with it and then exits the valley past Arlington Bridge.

Indian Valley exhibits a number of flooding issues due to its flat topography and hydrography. Much of the water that flows through the Upper Feather River watershed makes its way through Indian Valley on its journey into the Feather River Canyon. Table 4-96 provides a summary of the primary localized flooding issues in Indian Valley: Figure 4-152 through Figure 4-156 provide photos and descriptions of localized Indian Valley flooding issues.

Table 4-96 Summary of Indian Valley Localized Flooding Issues

Indian Valley Areas	Issues	Road Impacts	Home and Business Impacts	Evacuation Route
Williams Creek @ North Valley Road	Road over culverts that drain water from upstream private land into the valley Road has been overtopped resulting from debris blockage in culverts Road Department uses logging equipment/poles to remove debris during high flows preventing flooding, which is a dangerous activity Major flooding in 1986 and 1997 Roadway serves large populations in Taylorsville and Diamond Valley and is heavily trafficked during winter due to its tendency to receive less snow and ice than alternative routes	X		X
Cassidy's Turn	Shows high water mark from 1997 flood			

Indian Valley Areas	Issues	Road Impacts	Home and Business Impacts	Evacuation Route
Stampfli Lane	Cross-valley road traveling E-W sits at low point in drainage area Annual flooding of 0.5-1.0 feet of water on roadway often renders road impassible Repeated flooding of residential structures Poor drainage and flooding are caused by saturation of adjacent agricultural fields	X	X	X
Mt. Hough Estates	Low-lying subdivision, portion of which has repeated flooding Houses appear to be slab-on-grade Typically, during valley-flooding events Residents aware of impending flooding by the presence of water in neighboring fields		X	
Old Wagon Road, Crescent Mills	Residential structure flooded repeatedly (5-6 times) High water mark 6 feet high in some locations House built at drain point for basin		X	
Arlington Bridge (State# 09C-007)	Bridge overtopped by 3 feet during 1997 flood Flows often approach height of bridge deck Major drainage point for entire valley Sedimentation issues on downstream side Adding culverts may improve drainage	X		X
Genesee Road @ Little Grizzly Creek	Flooding can close road cutting off access for 15-20 homes	X		X

Source: Plumas County 2014 LHMP

Figure 4-152 Indian Valley Localized Flooding – North Valley Road crossing Williams Creek where Culverts often Clog with Debris

Source: Plumas County 2014 LHMP

Figure 4-153 Indian Valley Localized Flooding – Ponding area of Stampfli Lane has Poor Drainage and Floods Annually

Source: Plumas County 2014 LHMP

Figure 4-154 Indian Valley Localized Flooding – Low-lying area of Mt. Hough Estates Subdivision Subject to Flooding from Indian Valley Creeks.

Source: Plumas County 2014 LHMP

Figure 4-155 Indian Valley Localized Flooding – Residential Structure in Crescent Mills built at Drain Point of Basin Experiences Repeated Flooding

Source: Plumas County 2014 LHMP

Figure 4-156 Indian Valley Localized Flooding – Location along Genesee Road Where Flood Waters Can Cover Road and Cut Off Access

Source: Plumas County 2014 LHMP

American Valley

American Valley is located in the geographic center of Plumas County and sits at an average elevation of 3,500 feet. In American Valley, Greenhorn Creek confluences with Spanish Creek upstream near the Town of Quincy. A majority of the flooding issues are caused by localized drainage as opposed to valley-flooding events. The water in Spanish Creek that passes through American Valley confluences with Indian Creek flowing out of Indian Valley into the Feather River Canyon. Table 4-97 provides a summary of the primary localized flooding issues in American Valley. Figure 4-157 through Figure 4-166 provides photos and descriptions of American Valley localized flooding issues.

Table 4-97 American Valley Localized Flooding Issue Summary

American Valley Areas	Issues	Road Impacts	Home and Business Impacts	Evacuation Route
Les Schwab	Storm grate behind facility becomes clogged with debris causing water to overtop and flow into building Typically, only floods with major events, not large storms; recalled events were in 1986, 1993, and 1997 Overtopping waters also flow into a nearby home and businesses further downhill		X	

American Valley Areas	Issues	Road Impacts	Home and Business Impacts	Evacuation Route
Lindan Avenue	The drainage ditch that runs behind the Lindan Avenue properties (west side of street) provides drainage for a large area of Quincy including the shopping center and housing developments to the south. The ditch doesn't have enough capacity to contain larger flood events, since it pre-dates all the construction of the shopping center and housing on the southeast side of Quincy. Potential build of 30 units south Lindan.		X	
Paradise Grill	Water can overtop edges of earthen ditch Water flooding from behind Les Schwab will flow down street and into businesses in strip mall Historic flooding up to 2 feet of water in strip mall businesses	X	X	
Hentschel	Storm drain on small creek gets clogged with debris and backs up, causing water to flow onto roadway and into the school and neighboring building across the street Grate is not easily accessible	X	X	
Old Sewer Plant (at bike path)	Drainage path takes 90-degree turn into culverts underneath bike path Water drains poorly and overtops path	X		
West's Ranch Road (at CA-70)	Road needs to be elevated and larger pipes installed	X		
East Quincy Drains	Drainage problems at high water Pipes/drainage too small and becomes clogged with debris			
Vieira's Field	Better/safer access and larger pipe. Runs behind and alongside private property Small drain on private property can clog with debris During heavy rains and large-scale events water will bypass drain and flow down gravel road toward CA-70	X		
Chandler Road (West)	Beddell Ranch and Green Bridge areas often flood Easy fix is to elevate road and install culverts where needed	X		
Oakland Camp Road	Floods from intersection with Chandler Road to Oakland Camp gate Easy fix is to elevate road and install culverts where needed	X		
Gansner Creek	Storm grate on south side of West Main Street becomes clogged with debris causing water to overtop and flow across road Flood water flows down into hospital flooding the ambulance entrance, ER entrance, and X-ray doors Hospital flooded in 1986, 1993, and 1997	X	X	X
Mill Creek	Runs behind and alongside private property Small drain on private property can clog with debris During heavy rains and large-scale events water will bypass drain and flow down gravel road toward CA-70	X	X	

American Valley Areas	Issues	Road Impacts	Home and Business Impacts	Evacuation Route
Clear Creek	Located in Meadow Valley outside of American Valley Grate clogs with debris causing water to back up Water can back up high enough to swirl around the base of Meadow Valley Road potentially causing erosion and damage to roadway System is stressed several times annually	X		
Oakland Camp at Spanish Creek	Oakland Camp Road floods regularly during high flow events when Spanish Creek flows over the low water crossing adjacent to the Oakland Camp Bridge. The concrete low water crossing is designed for high water to flow over	X		

Source: Plumas County 2014 LHMP

Figure 4-157 American Valley Localized Flooding – Storm Grate behind Les Schwab Becomes Clogged with Debris Causing Flooding

Source: Plumas County 2014 LHMP

Figure 4-158 American Valley Localized Flooding – Strip Mall Containing Paradise Grill and other Businesses. Water can Overtop Earthen Ditch on Right, or Flow Down Street on Left when Storm Drain Floods behind Les Schwab

Source: Plumas County 2014 LHMP

Figure 4-159 American River Localized Flooding – Lindan Avenue in 2012

Source: Member of HMPC (Marty Walters)

Figure 4-160 American Valley Localized Flooding – Hentschel's Storm Grate, Small Grate for Localized Drainage Clogs with Debris and Causing Flooding over Roadway.

Source: Plumas County 2014 LHMP

Figure 4-161 American Valley Localized Flooding – Flood Water from Hentschel's Flows Across Street and into School.

Source: Plumas County 2014 LHMP

Figure 4-162 American Valley Localized Flooding – Water Overtops Drainage at Culverts Where Forced to take 90-degree Right Turn.

Source: Plumas County 2014 LHMP

Figure 4-163 American Valley Localized Flooding – View of Plumas District Hospital from Storm Grate along Gansner Creek. Apparent that Hospital is Down Slope from Culvert and Subject to Flooding from Overtopping Water.

Source: Plumas County 2014 LHMP

Figure 4-164 American Valley Localized Flooding – Plumas District Hospital downhill from West Main Street, Susceptible to Flooding from Waters Overtopping Storm Grate on Gansner Creek

Source: Plumas County 2014 LHMP

Figure 4-165 American Valley Localized Flooding – Small drain for Mill Creek can be Bypassed During Larger Storms Causing Water to Flow Down Adjacent Gravel Road.

Source: Plumas County 2014 LHMP

Figure 4-166 American Valley Localized Flooding – Culvert on Clear Creek in Meadow Valley Becomes Clogged with Debris. Rising and Swirling Water poses Erosion Issue that Could Jeopardize Roadway.

Source: Plumas County 2014 LHMP

Feather River Canyon

The Feather River Canyon is a narrow river valley occupied by the North Fork Feather River and East Branch North Fork Feather River. At its upstream end is the confluence of Indian Creek, flowing from Indian Valley, and Spanish Creek, flowing from American Valley; here is the beginning of the East Branch North Fork Feather River. The East Branch meets the North Fork Feather River, flowing from Lake Almanor, about two miles upstream from Belden.

The Feather River Canyon is occupied by CA-70 and the Union Pacific Railroad, which comprise the two major E-W transportation routes through Plumas County. The canyon is home to a number of small towns adjacent to the riverbanks, highway, and train tracks.

Flooding issues in the Canyon are primarily related to larger events involving the North Fork Feather River, such as the 1986 and 1997 floods. Typical damage is washouts to roadways or train tracks. Much of the precipitation that falls in Plumas County flows through the Canyon.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

People and populations are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the Planning Area.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Ground saturation can result in instability, collapse, or other damage to structures. Trees can also be compromised and uprooted falling on structures causing damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high-water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the Planning Area actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

FEMA NRI Hazard Vulnerability Assessment

Localized flooding is not an NRI hazard; therefore, no data is presented.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the County to localized flood.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population in Plumas County is expected to decrease. Vulnerable population groups such as low-income individuals and households living in floodprone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

The potential for flooding may increase as stormwater is channeled due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Mitigating the root causes of the localized stormwater flooding or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Floodplain modeling and master planning should be based on build out property conditions to ensure that all new development remains safe from future flooding.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

4.3.13. Hazardous Materials Transportation

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

According to the Environmental Protection Agency (EPA), a hazardous material is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained.

The U.S. Occupational Safety and Health Administration's (OSHA) definition of hazardous material includes any substance or chemical which is a "health hazard" or "physical hazard," including: chemicals which are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, oxidizers, pyrophorics, unstable-reactive or water-reactive; and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapors, mists or smoke which may have any of the previously mentioned characteristics.

The EPA incorporates the OSHA definition and adds any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. The EPA maintains a list of 366 chemicals that are considered extremely hazardous substances (EHS). This list was developed under the Superfund Amendments and Reauthorization Act. The presence of EHSs in amounts in excess of a threshold planning quantity requires that certain emergency planning activities be conducted.

A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of water, people, and property. The effects may involve a local area or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual, such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Location and Extent

In Plumas County there are multiple hazardous materials transportation routes. State Roads 36, 49, 70, 89, and 147 are all hazardous materials routes. The Union Pacific (UP), Burlington Northern Santa Fe (BNSF), Quincy Railroad, and Almanor Railroad are railroad hazardous materials routes. Figure 4-167 shows the hazardous materials transportation corridors (for roadways and rail) in the County as well as the one-mile buffer zone (on each side of the corridor for a two-mile total buffer) used for this analysis as detailed further in the methodology below. This map shows three insets for communities within the County. Maps zoomed to these areas are shown in Figure 4-168, Figure 4-169, and Figure 4-170.

Geographic hazardous materials buffer zones for the unincorporated County are detailed by highway in Table 4-98 and by railroad in Table 4-99.

Figure 4-167 Plumas County Planning Area – Hazardous Materials Transportation Routes and Buffer Zones (Overview Map with Insets)

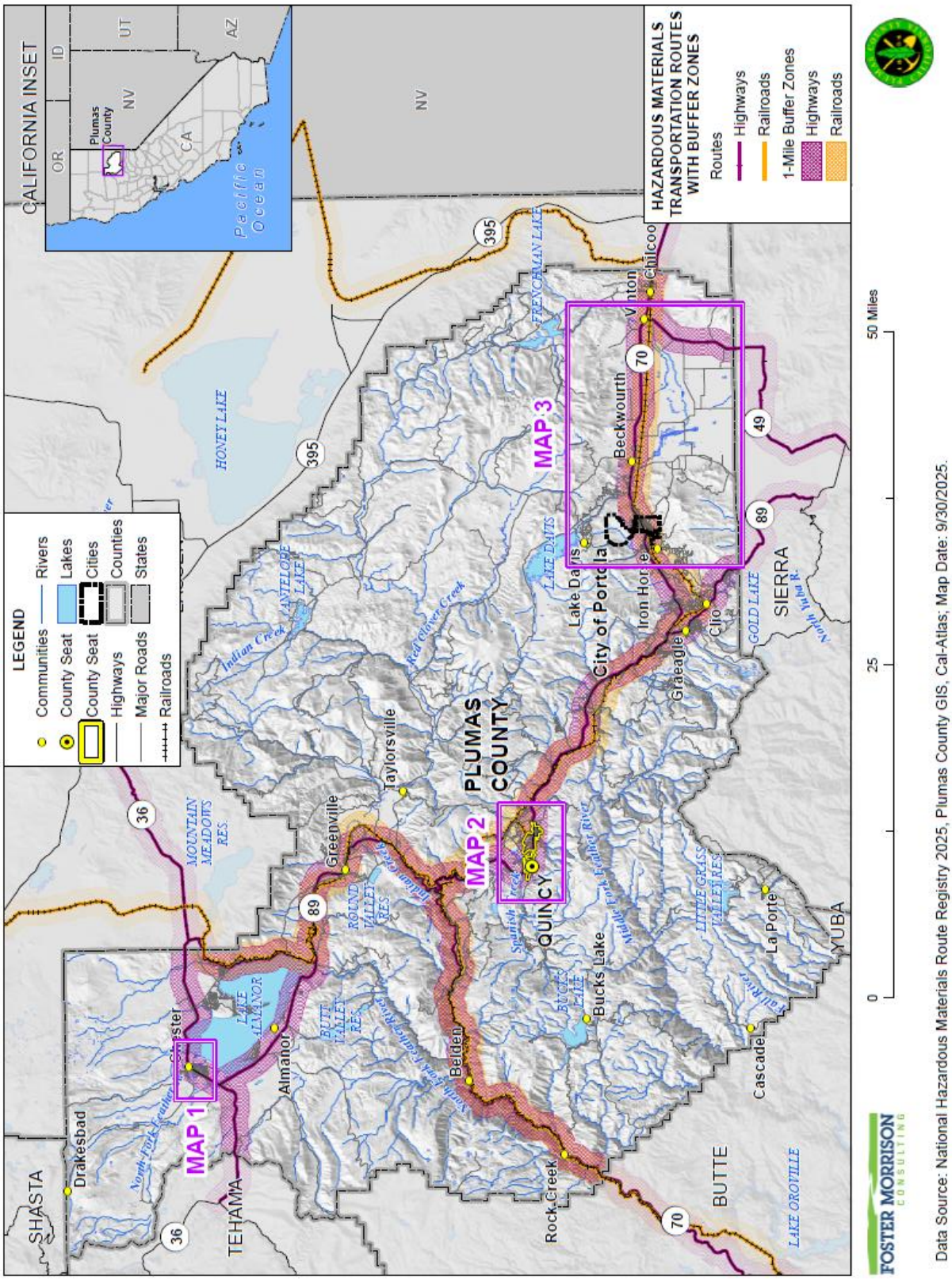


Figure 4-168 Plumas County Planning Area – Hazardous Materials Transportation Routes and Buffer Zones (Inset 1)

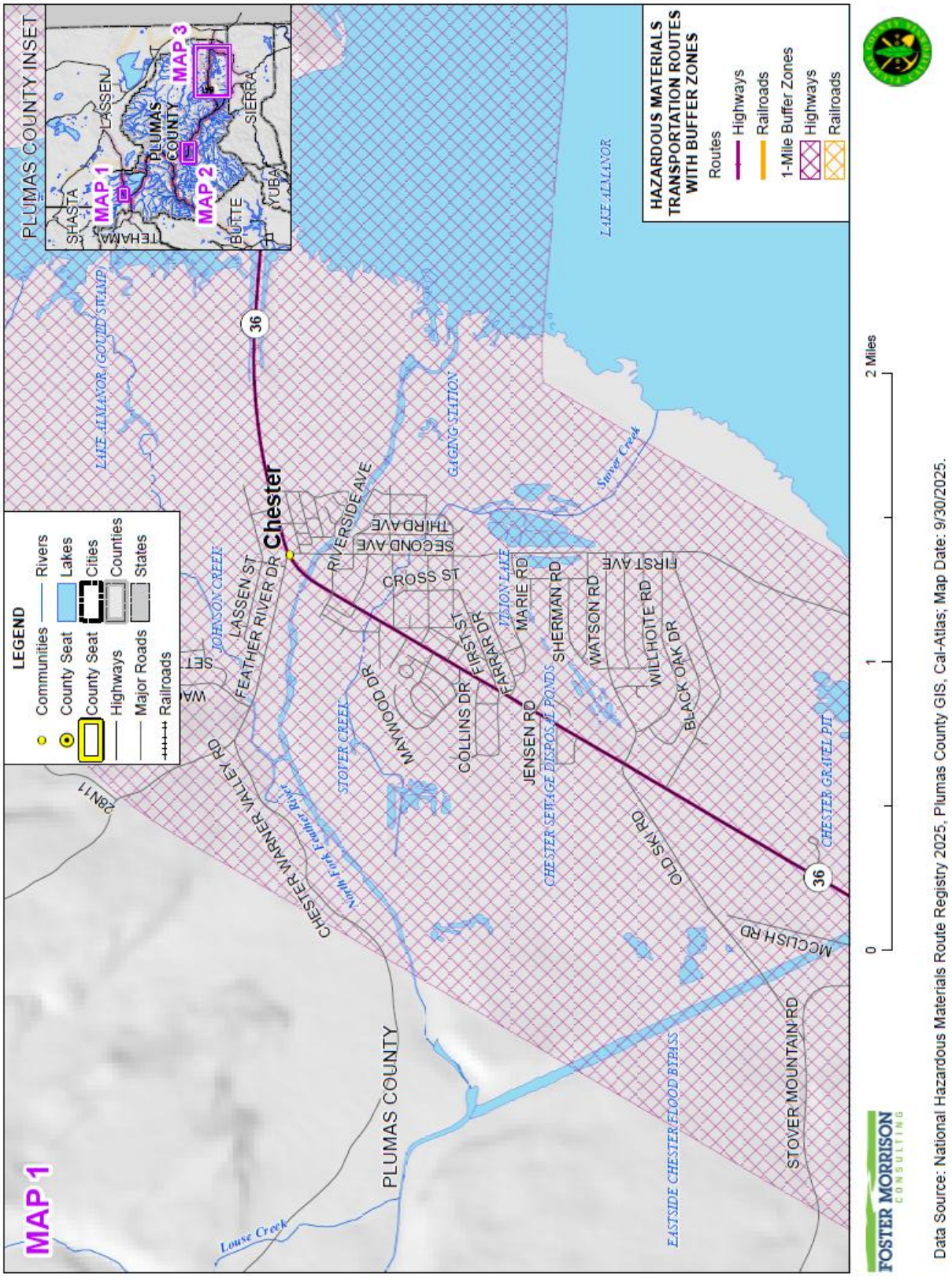


Figure 4-169 Plumas County Planning Area – Hazardous Materials Transportation Routes and Buffer Zones (Inset 2)

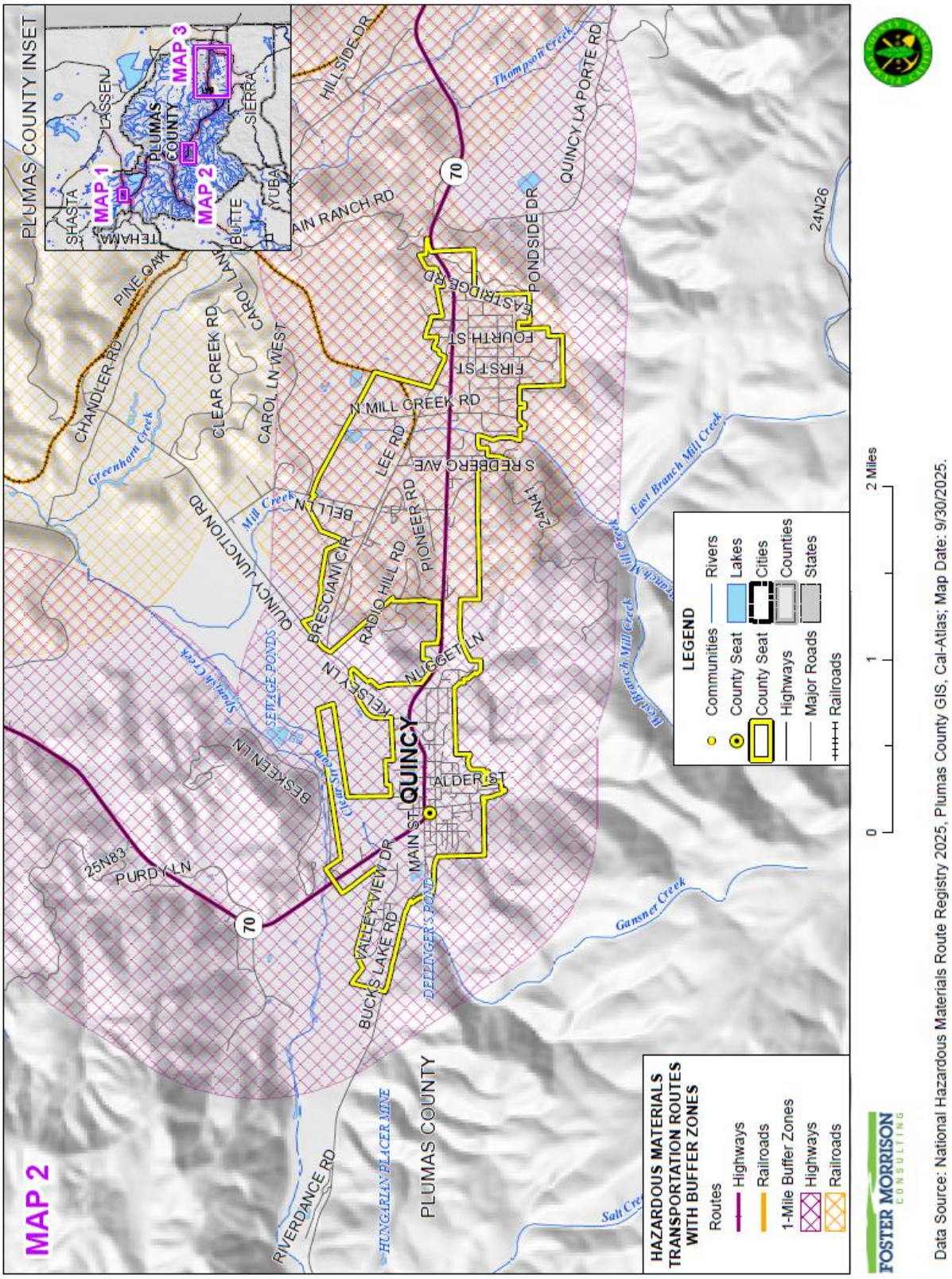


Figure 4-170 Plumas County Planning Area – Hazardous Materials Transportation Routes and Buffer Zones (Inset 3)

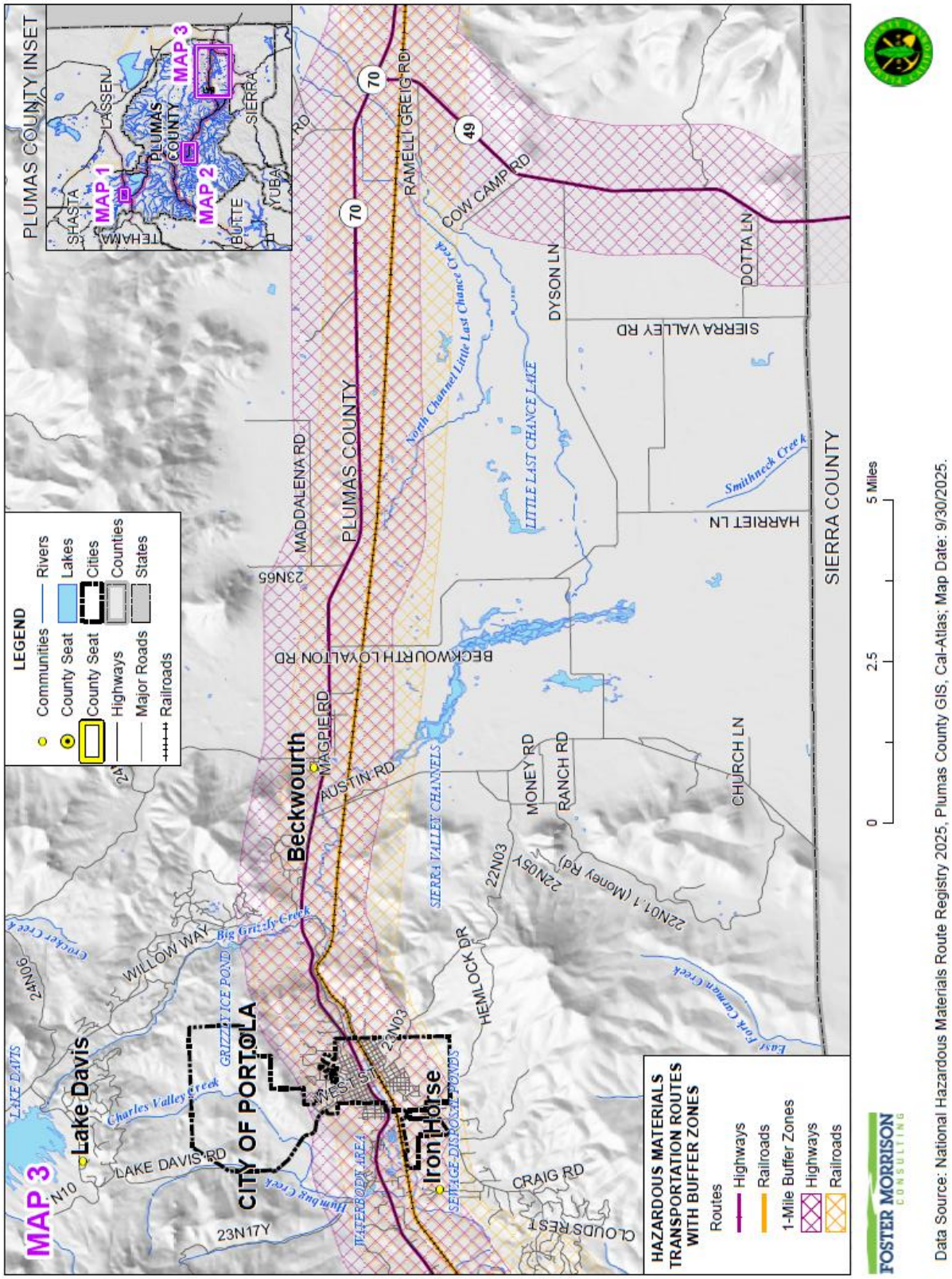


Table 4-98 Plumas County Planning Area – Geographical Extent of Hazardous Materials Transportation Buffer Zones for Highways

Hazardous Materials Routes	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
Highway 70	1,357	38.9%	303	13.6%	1,053	84.0%
Unincorporated Plumas County						
Highway 147	13,535	1%	599	1%	12,936	1%
Highway 36	25,562	2%	1,527	2%	24,035	2%
Highway 49	10,503	1%	6,459	7%	4,044	0.3%
Highway 70	122,574	7%	23,388	26%	99,187	6%
Highway 89	99,818	6%	13,463	15%	86,355	5%

Source: National Hazardous Materials Routes Registry (2025)

Table 4-99 Plumas County Planning Area – Geographical Extent of Hazardous Materials Transportation Buffer Zones for Railroads

Hazardous Materials Routes	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
UP / BNSF	1,403	40%	279	12%	1,124	90%
Unincorporated Plumas County						
BNSF	45,223	2.7%	3,745	4.1%	41,478	2.6%
Quincy Railroad	5,479	0.3%	1,961	2.2%	3,518	0.2%
UP / BNSF	130,941	7.8%	20,940	23.1%	110,000	7.0%

Source: National Hazardous Materials Routes Registry (2025)

In addition, while most routes are known, Plumas County has not quantified the amount of hazardous materials that are transported through it en route to local deliveries or to adjoining counties. Accidents involving the transportation of hazardous materials could be just as catastrophic as accidents involving stored chemicals, possibly more so, since the location of a transportation accident is not predictable. The U.S. Department of Transportation (USDOT) divides hazardous materials into nine major hazard classes. A hazard class is a group of materials that share a common major hazardous property, i.e., radioactivity, flammability, etc. These hazard classes include:

- Class 1—Explosives
- Class 2—Compressed Gases
- Class 3—Flammable Liquids
- Class 4—Flammable Solids; Spontaneously Combustible Materials; Dangers When Wet Materials/Water-Reactive Substances
- Class 5—Oxidizing Substances and Organic Peroxides

- Class 6—Toxic Substances and Infectious Substances
- Class 7—Radioactive Materials
- Class 8—Corrosives
- Class 9—Miscellaneous Hazardous Materials/Products, Substances, or Organisms

The speed of onset of a hazardous materials spill is generally short. The duration is typically short as well, though certain chemicals can pollute earth and groundwater for long periods of time. The actual extent of any given incident will depend on the type of release, location, and nature and extent of any release.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations for hazardous materials in the County, as shown on Table 4-4.

NCDC Events

The NCDC does not track hazardous materials events.

Pipeline and Hazardous Materials Safety Administration Events

The USDOT Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety performs a range of functions to support the safe transport of hazardous materials. One of these functions is the tracking of hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in the County. A summary of rail and highway incidents since 1970 in the Plumas County Planning Area are shown in Table 4-100. 11 separate events were contained in the database.

Table 4-100 Plumas County Planning Area – Hazardous Materials Transportation Incidents Since 1970

Date of Incident	Incident Route	Mode of Transportation	Commodity Short Name	Quantity Released	Amount of Damages
11/21/1995	State Route 70	Highway	Fuel Oil	2,200 gallons	$37,000
7/14/1992	Highway 70	Highway	Methanol	1 gallon	$1,100
11/19/2012	348 Questa Way	Highway	Liquefied Petroleum Gas	40 gallons	$0
9/14/2018	Hwy 70 & Spanish Creek	Highway	Gasoline Includes Gasoline Mixed With Ethyl Alcohol, With Not More Than 10% Alcohol	1,762 gallons	$377,246
4/19/2006	Main Track, Milepost 202.8, BNSF	Railroad	Methanol	3.5 gallons	$61,005
6/30/2007	Milepost 252.50	Highway	Alcohols, N.O.S.	29,357 gallons	$2,035,200

Date of Incident	Incident Route	Mode of Transportation	Commodity Short Name	Quantity Released	Amount of Damages
2/5/2004	State Route 166	Highway	Petroleum Gases, Liquefied Or Liquefied Petroleum Gas	0	$10,000
12/20/2007	Not reported	Highway	Petroleum Distillates, N.O.S. Or Petroleum Products, N.O.S.	1,641 gallons	$20,865
8/31/1999	560 Cresent Street	Highway	Fuel, Aviation, Turbine Engine	100 gallons	$0
12/1/2014	1690 E. Main	Highway	Liquefied Petroleum Gas	6.684	$0
12/30/2002	State Highway 70	Highway	Petroleum Gases, Liquefied Or Liquefied Petroleum Gas	0	$75,000

Source: PHMSA Database – Search dates 01/01/1970 – 04/01/2025

Hazard Mitigation Planning Committee Events

These sections separate events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

In addition to what was reported to the PHMSA, the HMPC reported the following transportation event.

February 11, 2024 – there was a main line derailment in Plumas County near Blairsden, CA. UPRR mainline structure was eroded due to heavy rain elements and rock/mudslide event. 15 Bituminous Coal hopper cars derailed and released. Out of the 15 cars, 3 had entered the Middle Fork River and resulted in a mass recovery operation in the Feather River. The HMPC were of the opinion that there is a moderate to high future event probability to occur again as topography and terrain continuously migrate during inclement weather.

Summer 2025 – The HMPC recalled a hazardous materials spill from a truck release. 1,200 gallons of fuel spilled at Highway 89 near Arlington. Clean up occurred but the load was lost.

Events before 2019

The HMPC noted that events occurred but could recall no events with specific dates or damages.

Likelihood of Future Occurrence

Occasional – Given that 11 minor hazardous materials incidents have happened in transport through the County in the past 53 years, a hazardous materials incident will occur in the County occasionally. It should be noted, however, that small hazardous materials spills happen often and are cleaned up locally and go unreported to national databases. According to Caltrans, most incidences are related to releases during loading and unloading of cargo, and the release of fluids/materials from the transporting vehicles themselves and not the cargo.

Climate Change and Hazardous Materials

Climate change is unlikely to affect hazardous materials transportation incidents.

Vulnerability Assessment

Vulnerability—Medium

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. The most significant impact from hazardous materials transport is life safety and public health. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key Planning Area values relative to the hazardous materials transportation corridors identified above.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The 2023 Plumas County HazMat Response Plan noted that the highest potential for a highway transportation incident exists along the County's main east-west thoroughfare, State Highway 70. This route follows the Feather River in a steep, rocky canyon and has long been recognized for its history and potential for a significant hazardous materials incident. An additional potential exists on the other State Highways which traverse the county, namely State Highways 36 and 89. The materials transported on these highways are typically destined for a facility within the county. However, when the major trans-Sierra route (Interstate 80) is closed during inclement weather, local highways and especially Highway 70 may see an increase in both the volume and variety of hazardous materials shipments.

As identified during the 2009 commodity flow study, ninety percent of the hazardous materials identified on state highways were bulk petroleum products, which included heating fuels, gasoline, diesel, and propane. Other hazardous materials identified included industrial/medical cylinders and general industrial products. Approximately 10 (ten) percent of all truck traffic on Plumas County roadways were found to be transporting a hazardous commodity.

Rail transport through the county also poses a significant hazmat release potential. This is confirmed by both historical releases and the 2009 commodity flow study. Both UP and Burlington Northern Santa Fe BNSF currently maintain track in Plumas County, and, through the commodity flow study, BNSF was found to be the primary rail shipper of hazardous materials through the county.

BNSF's primary rail line, known as the High Line route, runs north and south starting near the Feather River Canyon town of Keddie and passing through the northern section of Plumas County east of Lake

Almanor. BNSF also has an agreement with UP to lease track time for all UP rail lines in Plumas County. Their highest traffic section of leased line that they use is the Feather River Canyon Route, allowing them to ship between the Bay Area and the Pacific Northwest.

Union Pacific's rail line passes east-west through Plumas County, connecting the Sacramento Valley to Northern Nevada and includes the Portola rail yard. The majority of UP's traffic through Plumas County consists of mixed cargo containers, single and doubled stacked. While UP never reported shipping unit trains of light crude on this route, they did report shipping smaller quantities as part of mixed load trains. Again, while most rail transport includes mixed loads of hazardous materials, the potential for encountering light crude rail shipments in significant volumes in Plumas County should not be overlooked.

The geography of the County can influence the development of incidents and the way in which they are handled. A steep river canyon can restrict or even prevent access to an incident. The Middle Fork of the Feather River below the LaPorte Road Bridge, for example, is not accessible by vehicle. If a spill is not contained by this point, it may not be possible to reach it again until the spill reaches Lake Oroville. As another example, in the Feather River canyon the highway is often on one side of the river and the rail line is on the other. Consequently, a rail incident may not be directly accessible from the highway. Depending on river flows, one of various bridge crossings may be needed, and personnel and equipment may need to be taken to the scene by railroad personnel via a high rail. Another consideration in the Feather River Canyon is that a highway incident may block the highway. With local first responders coming primarily from the Quincy or the Indian Valley/Lake Almanor basin areas, local responders may not be able to access the westerly downriver side of an incident. In such cases early calls for mutual aid from Butte County resources would be important.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk from Hazardous Materials Transportation

Assets at risk from hazardous materials transportation release include: people and populations; structures; critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections. The methodology used to analyze hazardous materials transportation for the population, structures, and critical facilities is discussed in the section below.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

Methodology: Transportation Release and Buffer Zone

An analysis of the potential vulnerability of the Planning Area to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable, a one-mile buffer was applied to both sides of Highways 36, 49, 70, 89, and 147, as well as the Union Pacific, BNSF, Quincy Railroad, and Almanor Railroad lines. The result is a two-mile buffer zone around each transportation corridor that is included in this analysis. The buffer distance was based on

guidelines in the USDOT's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. Actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

This hazardous materials buffer zone analysis can be misleading since there are many large polygons throughout the County.

People and Populations

All populations are at some vulnerability to a hazardous materials transportation release. Certain vulnerable populations are at the greatest risk to the effects of hazardous materials. Vulnerable populations include:

- The unsheltered
- Those with breathing difficulties or other underlying health conditions
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals who work, exercise, or physically train outdoors
- Individuals with impaired mobility

To determine the overall populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway and railroad corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel and structure data and results tabulated for the Planning Area, as found in Table 4-101. Those residential parcel polygons that intersect the buffered corridor were counted and multiplied by the 2023 Census Bureau average household factors for Portola and the unincorporated County. According to the analysis, there are 2,075 residents in the City and 19,674 residents in the overall County in the hazardous materials buffer zones associated with the hazardous materials transportation routes and potentially at risk.

Table 4-101 Plumas County Planning Area–Improved Residential Parcels and Populations at Risk in Hazardous Materials Buffer Zones

Jurisdiction	Improved Residential Parcels	Population at Risk
City of Portola		
Highways		
Highway 70	906	2,075
Railroads		
UP/BNSF	899	2,059

Jurisdiction	Improved Residential Parcels	Population at Risk
Unincorporated Plumas County		
Highways		
Highway 147	618	1,479
Highway 36	1,110	2,653
Highway 36 and 147	0	0
Highway 36 and Highway 89	0	0
Highway 49	1	3
Highway 49 and Highway 70	19	45
Highway 70	1,126	2,692
Highway 70 and Highway 89	2,817	6,733
Highway 89	2,015	4,816
Highway 89 and Highway 147	4	13
Railroads		
BNSF	1,010	2,414
BNSF and UP / BNSF	30	72
Quincy Railroad	822	1,965
Quincy Railroad and UP / BNSF	223	533
UP / BNSF	2,819	6,737

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29); Unincorporated Plumas County (2.39).

Structures

Structures in the County have some measure of risk to hazardous materials which can affect the built environment of the County. During a hazardous materials transportation spill, it is generally the people that are at risk to the effects of the spill. During a spill, buildings, property, and their values are at a lessor risk; however, given the location and breadth of hazardous materials routes in the County, an analysis is performed here. This analysis is shown in Table 4-102 for highways and in Table 4-103 for railroads. These tables summarize by total parcel counts, improved parcel (structure) counts, and their improved and land values, personal property values, and the estimated contents replacement values based on the CRV factors detailed in Table 4-9.

Table 4-102 Plumas County Planning Area – Count and Value of Parcels and Structures in Highway Hazardous Materials Transportation Buffer Zone by Jurisdiction and Route

Jurisdiction/ Hazardous Materials Routes	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
Highway 70	1,389	906	$29,280,690	$113,448,396	$283,632	$56,724,198	$199,736,916

Jurisdiction/ Hazardous Materials Routes	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Unincorporated Plumas County							
Highway 147	804	618	$100,061,736	$159,628,234	$380,288	$79,814,117	$339,884,375
Highway 36	1,437	1,110	$67,198,419	$199,727,901	$792,726	$99,863,951	$367,582,997
Highway 36 and Highway 89	1	1	$36,214	$18,106	$0	$9,053	$63,373
Highway 49	3	1	$496,763	$7,374	$0	$3,687	$507,824
Highway 49 and Highway 70	26	19	$974,931	$1,534,625	$54,018	$767,313	$3,330,887
Highway 70	1,840	1,126	$83,808,531	$180,178,813	$1,500,463	$90,089,407	$355,577,214
Highway 70 and Highway 89	3,424	2,817	$203,563,790	$571,022,756	$58,484,315	$285,511,378	$1,118,582,239
Highway 89	3,358	2,015	$320,453,952	$600,807,297	$622,601	$300,403,649	$1,222,287,499
Highway 89 and Highway 147	18	4	$951,740	$167,078	$1,221	$83,539	$1,203,578

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data
To avoid duplication of parcel count, the parcels located in areas where multiple haz-mat route buffers overlap were assigned the route grouping listed above.

Table 4-103 Plumas County Planning Area – Count and Value of Parcels and Structures in Railroad Hazardous Materials Transportation Buffer Zone by Jurisdiction and Railway

Jurisdiction/ Hazardous Materials Routes	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
UP / BNSF	1,379	899	$28,873,512	$112,305,977	$283,632	$56,152,989	$197,616,110
Unincorporated Plumas County							
BNSF	1,849	1,010	$134,325,701	$195,217,680	$523,760	$97,608,840	$427,675,981
BNSF and UP / BNSF	64	30	$3,768,034	$4,392,811	$0	$2,196,406	$10,357,251
Quincy Railroad	926	822	$39,751,756	$142,273,400	$57,695,029	$71,136,700	$310,856,885
Quincy Railroad and UP / BNSF	272	223	$18,882,230	$56,093,035	$0	$28,046,518	$103,021,783
UP / BNSF	4,250	2,819	$259,724,454	$605,239,651	$3,508,993	$302,619,826	$1,171,092,924

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data
To avoid duplication of parcel count, the parcels located in areas where multiple haz-mat route buffers overlap were assigned the route grouping listed above.

Table 4-104 and Table 4-110 show additional analysis for the unincorporated County. Table 4-104 shows the specific hazardous materials routes for highways and then separates by property use the total parcel counts, improved parcel and structure counts, improved and land values, personal property values, and the

estimated contents replacement values. Table 4-110 shows the specific hazardous materials routes for railways and then separates by property use the total parcel counts, improved parcel and structure counts, improved and land values, personal property values, and the estimated contents replacement values.

Table 4-104 Unincorporated Plumas County – Count and Value of Parcels and Structures in Highway Hazardous Materials Transportation Buffer Zone by Route and Property Use

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Highway 147							
Agricultural	17	0	$872,664	$0	$0	$0	$872,664
Commercial	27	17	$2,784,129	$3,026,622	$16,313	$3,026,622	$8,853,686
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	4	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	1	0	$0	$0	$0	$0	$0
Miscellaneous	3	0	$0	$0	$0	$0	$0
Recreational	10	9	$2,687,977	$384,191	$2,024	$384,191	$3,458,383
Residential	804	618	$100,061,736	$159,628,234	$380,288	$79,814,117	$339,884,375
ROW/Utilities	68	0	$0	$0	$0	$0	$0
Highway 147 Total	**934**	**644**	**$106,406,506**	**$163,039,047**	**$398,625**	**$83,224,930**	**$353,069,108**
Highway 36							
Agricultural	81	0	$1,581,818	$0	$0	$0	$1,581,818
Commercial	164	120	$15,241,185	$35,154,836	$24,613,536	$35,154,836	$110,164,393
Federal Lands	1	0	$0	$0	$0	$0	$0
Government	25	0	$0	$0	$0	$0	$0
Industrial	19	13	$1,454,167	$2,954,682	$671	$4,432,023	$8,841,543
Institutional	16	9	$307,206	$1,412,790	$11,680	$1,412,790	$3,144,466
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	8	7	$674,402	$1,155,503	$0	$1,155,503	$2,985,408
Residential	1,437	1,110	$67,198,419	$199,727,901	$792,726	$99,863,951	$367,582,997
ROW/Utilities	74	0	$0	$0	$0	$0	$0
Highway 36 Total	**1,826**	**1,259**	**$86,457,197**	**$240,405,712**	**$25,418,613**	**$142,019,103**	**$494,300,625**
Highway 36 and Highway 147							
Agricultural	4	1	$221,688	$45,572	$0	$45,572	$312,832
Commercial	1	0	$139,896	$0	$0	$0	$139,896

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Highway 36 and Highway 147 Total	**5**	**1**	**$361,584**	**$45,572**	$0	**$45,572**	**$452,728**
Highway 36 and Highway 89							
Agricultural	21	0	$576,678	$0	$0	$0	$576,678
Commercial	10	2	$4,038,947	$256,995	$10,220	$256,995	$4,563,157
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	20	0	$0	$0	$0	$0	$0
Industrial	1	0	$114,530	$0	$0	$0	$114,530
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	1	1	$36,214	$18,106	$0	$9,053	$63,373
ROW/Utilities	12	0	$0	$0	$0	$0	$0
Highway 36 and Highway 89 Total	**67**	**3**	**$4,766,369**	**$275,101**	**$10,220**	**$266,048**	**$5,317,738**
Highway 49							
Agricultural	15	5	$2,406,411	$1,261,116	$103,680	$1,261,116	$5,032,323
Commercial	1	0	$0	$0	$0	$0	$0
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	3	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	3	1	$496,763	$7,374	$0	$3,687	$507,824
ROW/Utilities	2	0	$0	$0	$0	$0	$0

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Highway 49 Total	**24**	**6**	**$2,903,174**	**$1,268,490**	**$103,680**	**$1,264,803**	**$5,540,147**
Highway 49 and Highway 70							
Agricultural	15	9	$6,887,098	$1,519,906	$260,631	$1,519,906	$10,187,541
Commercial	5	5	$210,304	$623,600	$550	$623,600	$1,458,054
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	2	0	$0	$0	$0	$0	$0
Industrial	2	1	$191,990	$258,916	$0	$388,374	$839,280
Institutional	1	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	26	19	$974,931	$1,534,625	$54,018	$767,313	$3,330,887
ROW/Utilities	8	0	$0	$0	$0	$0	$0
Highway 49 and Highway 70 Total	**59**	**34**	**$8,264,323**	**$3,937,047**	**$315,199**	**$3,299,193**	**$15,815,762**
Highway 70							
Agricultural	66	14	$5,732,257	$3,487,673	$1,555,244	$3,487,673	$14,262,847
Commercial	95	76	$8,176,275	$22,612,548	$2,566,331	$22,612,548	$55,967,702
Federal Lands	13	0	$0	$0	$0	$0	$0
Government	62	0	$0	$0	$0	$0	$0
Industrial	38	23	$3,163,313	$5,871,624	$190	$8,807,436	$17,842,563
Institutional	8	3	$179,834	$1,706,933	$6,650	$1,706,933	$3,600,350
Miscellaneous	2	0	$0	$0	$0	$0	$0
Recreational	4	4	$573,844	$4,183,042	$638	$4,183,042	$8,940,566
Residential	1,840	1,126	$83,808,531	$180,178,813	$1,500,463	$90,089,407	$355,577,214
ROW/Utilities	93	0	$0	$0	$0	$0	$0
Highway 70 Total	**2,221**	**1,246**	**$101,634,054**	**$218,040,633**	**$5,629,516**	**$130,887,039**	**$456,191,242**
Highway 70 and Highway 89							
Agricultural	90	8	$3,469,408	$2,848,019	$108,566	$2,848,019	$9,274,012
Commercial	281	220	$27,539,816	$66,969,308	$3,020,467	$66,969,308	$164,498,899
Federal Lands	29	0	$0	$0	$0	$0	$0
Government	80	0	$70,569	$0	$0	$0	$70,569
Industrial	57	40	$4,542,641	$8,414,087	$33,549,347	$12,621,131	$59,127,206
Institutional	26	15	$627,402	$5,094,875	$171,670	$5,094,875	$10,988,822

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	70	43	$5,187,298	$9,442,318	$36,430	$9,442,318	$24,108,364
Residential	3,424	2,817	$203,563,790	$571,022,756	$58,484,315	$285,511,378	$1,118,582,239
ROW/Utilities	218	0	$0	$0	$0	$0	$0
Highway 70 and Highway 89 Total	**4,275**	**3,143**	**$245,000,924**	**$663,791,363**	**$95,370,795**	**$382,487,029**	**$1,386,650,111**
Highway 89							
Agricultural	93	5	$4,719,327	$776,986	$12,150	$776,986	$6,285,449
Commercial	99	31	$6,123,411	$9,834,193	$755,529	$9,834,193	$26,547,326
Federal Lands	12	0	$0	$0	$0	$0	$0
Government	75	0	$18,612	$0	$0	$0	$18,612
Industrial	19	6	$1,064,529	$847,891	$0	$1,271,837	$3,184,257
Institutional	16	8	$366,013	$1,533,086	$0	$1,533,086	$3,432,185
Miscellaneous	4	0	$0	$0	$0	$0	$0
Recreational	95	5	$2,031,858	$1,142,034	$1,132,489	$1,142,034	$5,448,415
Residential	3,358	2,015	$320,453,952	$600,807,297	$622,601	$300,403,649	$1,222,287,499
ROW/Utilities	205	0	$0	$0	$0	$0	$0
Highway 89 Total	3,976	2,070	$334,777,702	$614,941,487	$2,522,769	$314,961,784	$1,267,203,742
Highway 89 and Highway 147							
Agricultural	7	0	$74,224	$0	$0	$0	$74,224
Commercial	8	2	$404,047	$12,100	$5,500	$12,100	$433,747
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	1	0	$79,590	$0	$0	$0	$79,590
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	18	4	$951,740	$167,078	$1,221	$83,539	$1,203,578
ROW/Utilities	5	0	$0	$0	$0	$0	$0
Highway 89 and Highway 147 Total	**41**	**6**	**$1,509,601**	**$179,178**	**$6,721**	**$95,639**	**$1,791,139**

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Unincorporated Plumas County Total	**13,428**	**8,412**	**$892,081,434**	**$1,905,923,630**	**$129,776,138**	**$1,058,551,138**	**$3,986,332,340**

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data

Table 4-105 Unincorporated Plumas County – Count and Value of Parcels and Structures in Railroad and Highway Hazardous Materials Transportation Buffer Zone by Property Use

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
BNSF							
Agricultural	98	5	$6,570,808	$881,719	$20,260	$881,719	$8,354,506
Commercial	122	44	$7,367,205	$10,387,360	$777,342	$10,387,360	$28,919,267
Federal Lands	10	0	$0	$0	$0	$0	$0
Government	48	0	$16,728	$0	$0	$0	$16,728
Industrial	19	6	$1,144,119	$847,891	$0	$1,271,837	$3,263,847
Institutional	17	9	$379,500	$1,587,499	$0	$1,587,499	$3,554,498
Miscellaneous	7	0	$0	$0	$0	$0	$0
Recreational	16	11	$2,873,781	$661,752	$42,163	$661,752	$4,239,448
Residential	1,849	1,010	$134,325,701	$195,217,680	$523,760	$97,608,840	$427,675,981
ROW/Utilities	162	0	$0	$0	$0	$0	$0
BNSF Total	**2,348**	**1,085**	**$152,677,842**	**$209,583,901**	**$1,363,525**	**$112,399,007**	**$476,024,275**
BNSF and UP / BNSF							
Agricultural	5	0	$0	$0	$0	$0	$0
Commercial	2	0	$130,254	$0	$0	$0	$130,254
Federal Lands	5	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	1	1	$272,070	$297,381	$0	$297,381	$866,832
Residential	64	30	$3,768,034	$4,392,811	$0	$2,196,406	$10,357,251
ROW/Utilities	12	0	$0	$0	$0	$0	$0

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
BNSF and UP / BNSF Total	**90**	**31**	**$4,170,358**	**$4,690,192**	**$0**	**$2,493,787**	**$11,354,337**
Quincy Railroad							
Agricultural	8	2	$350,868	$450,809	$1,420	$450,809	$1,253,906
Commercial	94	76	$9,875,331	$25,223,745	$437,135	$25,223,745	$60,759,956
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	10	0	$0	$0	$0	$0	$0
Industrial	39	23	$3,301,515	$5,283,807	$33,549,347	$7,925,711	$50,060,380
Institutional	13	7	$426,060	$2,515,174	$13,960	$2,515,174	$5,470,368
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	926	822	$39,751,756	$142,273,400	$57,695,029	$71,136,700	$310,856,885
ROW/Utilities	56	0	$0	$0	$0	$0	$0
Quincy Railroad Total	**1,148**	**930**	**$53,705,530**	**$175,746,935**	**$91,696,891**	**$107,252,139**	**$428,401,495**
Quincy Railroad and UP / BNSF							
Agricultural	21	8	$2,050,131	$1,582,542	$74,000	$1,582,542	$5,289,215
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	2	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	272	223	$18,882,230	$56,093,035	$0	$28,046,518	$103,021,783
ROW/Utilities	24	0	$0	$0	$0	$0	$0
Quincy Railroad and UP / BNSF Total	**322**	**231**	**$20,932,361**	**$57,675,577**	**$74,000**	**$29,629,060**	**$108,310,998**
UP / BNSF							
Agricultural	138	20	$13,590,936	$4,507,019	$1,244,367	$4,507,019	$23,849,341
Commercial	182	120	$13,329,365	$44,648,465	$3,991,541	$44,648,465	$106,617,836
Federal Lands	38	0	$0	$0	$0	$0	$0
Government	106	0	$0	$0	$0	$0	$0
Industrial	47	31	$3,750,554	$6,461,503	$190	$9,692,255	$19,904,502

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Institutional	12	3	$184,744	$1,706,933	$6,650	$1,706,933	$3,605,260
Miscellaneous	2	0	$0	$0	$0	$0	$0
Recreational	75	47	$5,535,663	$15,377,033	$497,081	$15,377,033	$36,786,810
Residential	4,250	2,819	$259,724,454	$605,239,651	$3,508,993	$302,619,826	$1,171,092,924
ROW/Utilities	237	0	$0	$0	$0	$0	$0
UP / BNSF Total	**5,087**	**3,040**	**$296,115,716**	**$677,940,604**	**$9,248,822**	**$378,551,530**	**$1,361,856,672**
Unincorporated Plumas County Total	**8,995**	**5,317**	**$527,601,807**	**$1,125,637,209**	**$102,383,238**	**$630,325,521**	**$2,385,947,775**

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data

Critical Facilities and Infrastructure

A separate analysis was performed on the critical facility inventory in the Plumas County Planning Area to determine critical facilities in the hazardous materials buffer zones. Using GIS, the hazardous material buffer zones were overlayed on the critical facility GIS layer. Figure 4-171 shows critical facilities and the highway and railroad hazardous material buffer zones (with the inset maps shown). These inset maps are shown in Figure 4-172 through Figure 4-174. Table 4-106 and Table 4-107 detail critical facilities in highway and railroad (respectively) hazardous material buffer zone zones by facility type and count for the Plumas County Planning Area broken out by jurisdiction. Details of critical facilities by type, name, and address by flood zone are listed in Appendix G.

As shown on these tables, 24 critical facilities in the City of Portola fall in both the highway and railroad hazardous material buffer zone. In Plumas County, 464 critical facilities fall in the highway hazardous materials buffer zone, while 286 fall in the railroad hazardous materials buffer zone. Additionally, 8 of the critical facilities in the surrounding counties fall in the highway hazardous materials buffer zone, while 9 fall in the railroad hazardous materials buffer zone.

Figure 4-171 Plumas County Planning Area – Critical Facilities in Highway and Railroad Hazardous Materials Buffer Zones (Overview Map with Insets)

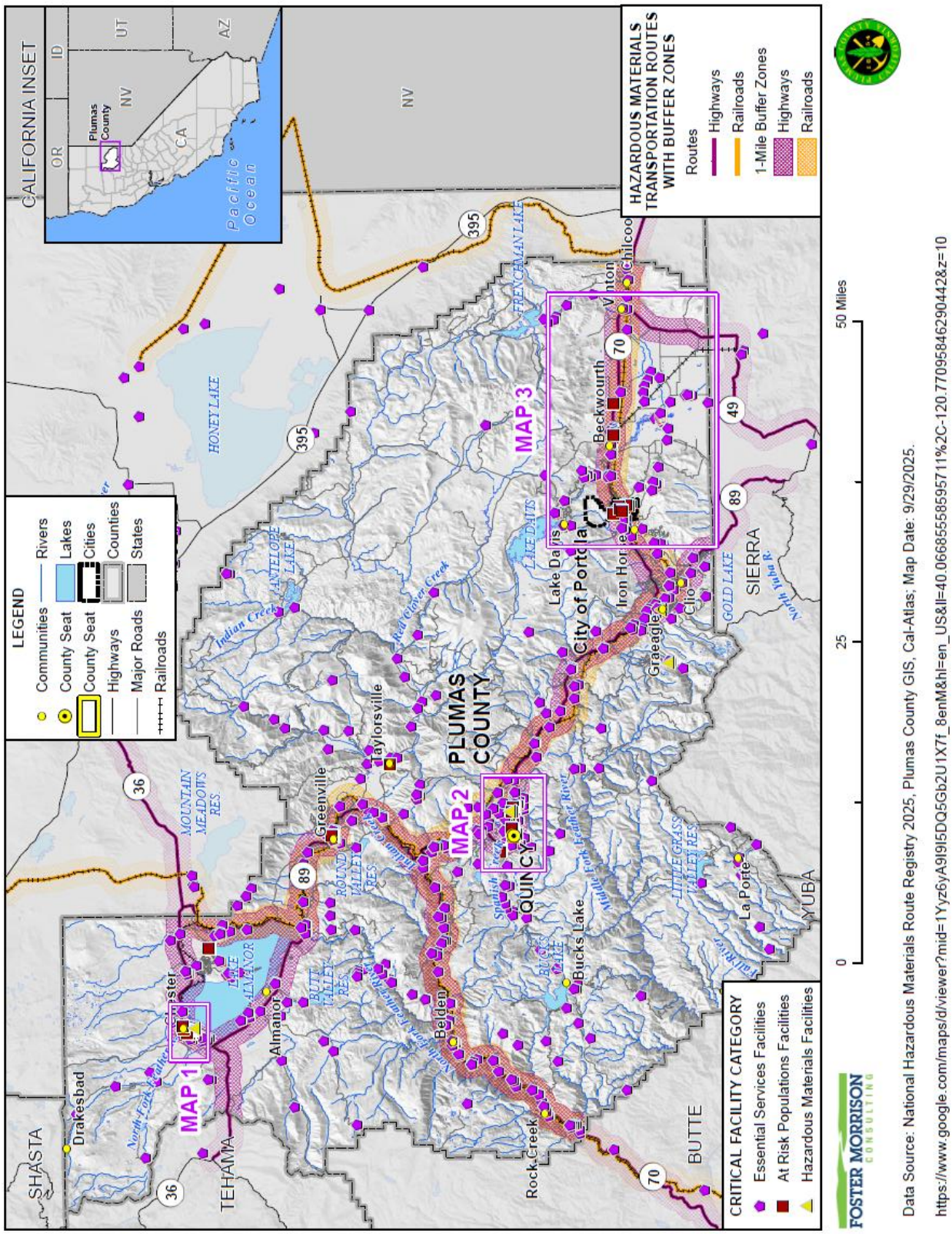


Figure 4-172 Plumas County Planning Area – Critical Facilities in Highway and Railroad Hazardous Materials Buffer Zones (Map Inset 1)

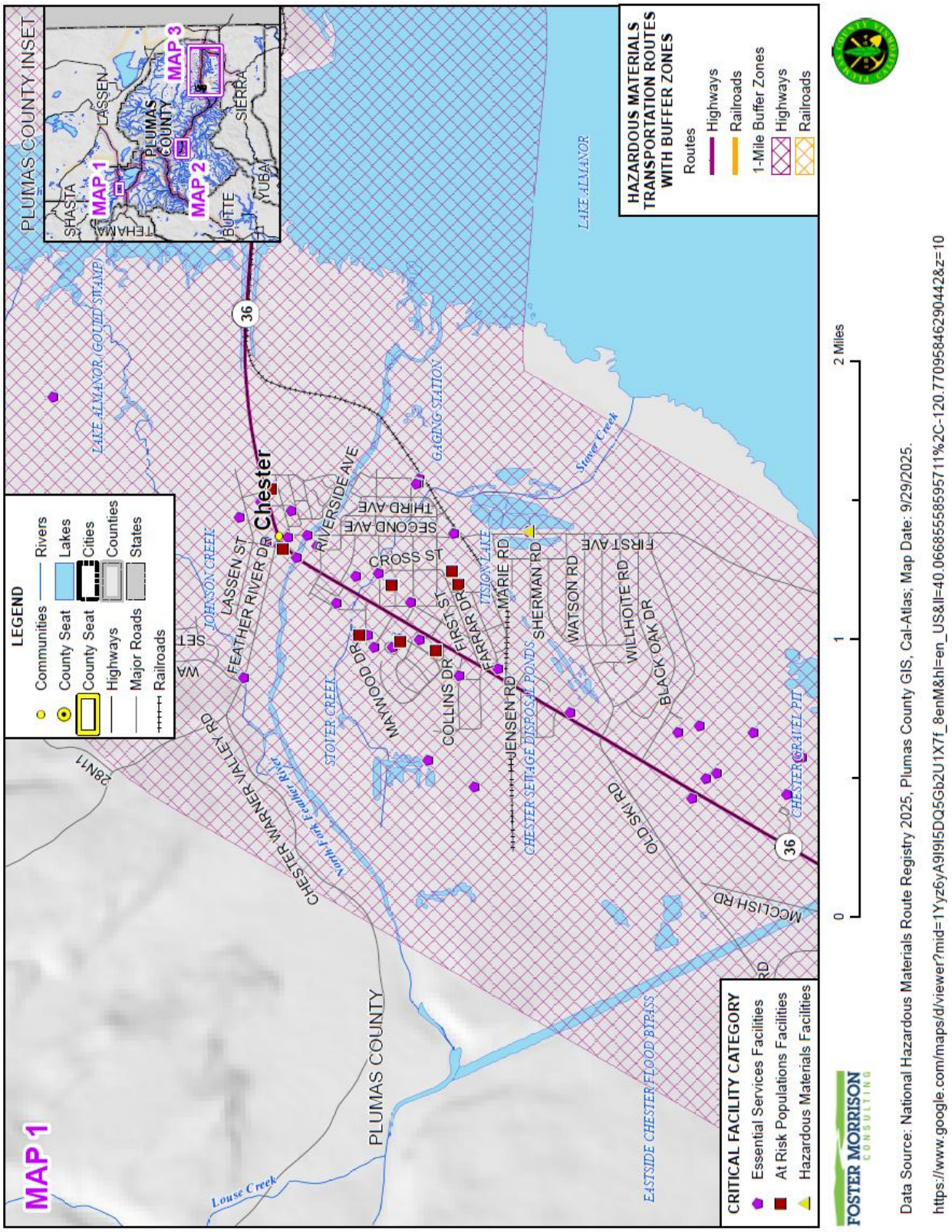


Figure 4-173 Plumas County Planning Area – Critical Facilities in Highway and Railroad Hazardous Materials Buffer Zones (Map Inset 2)

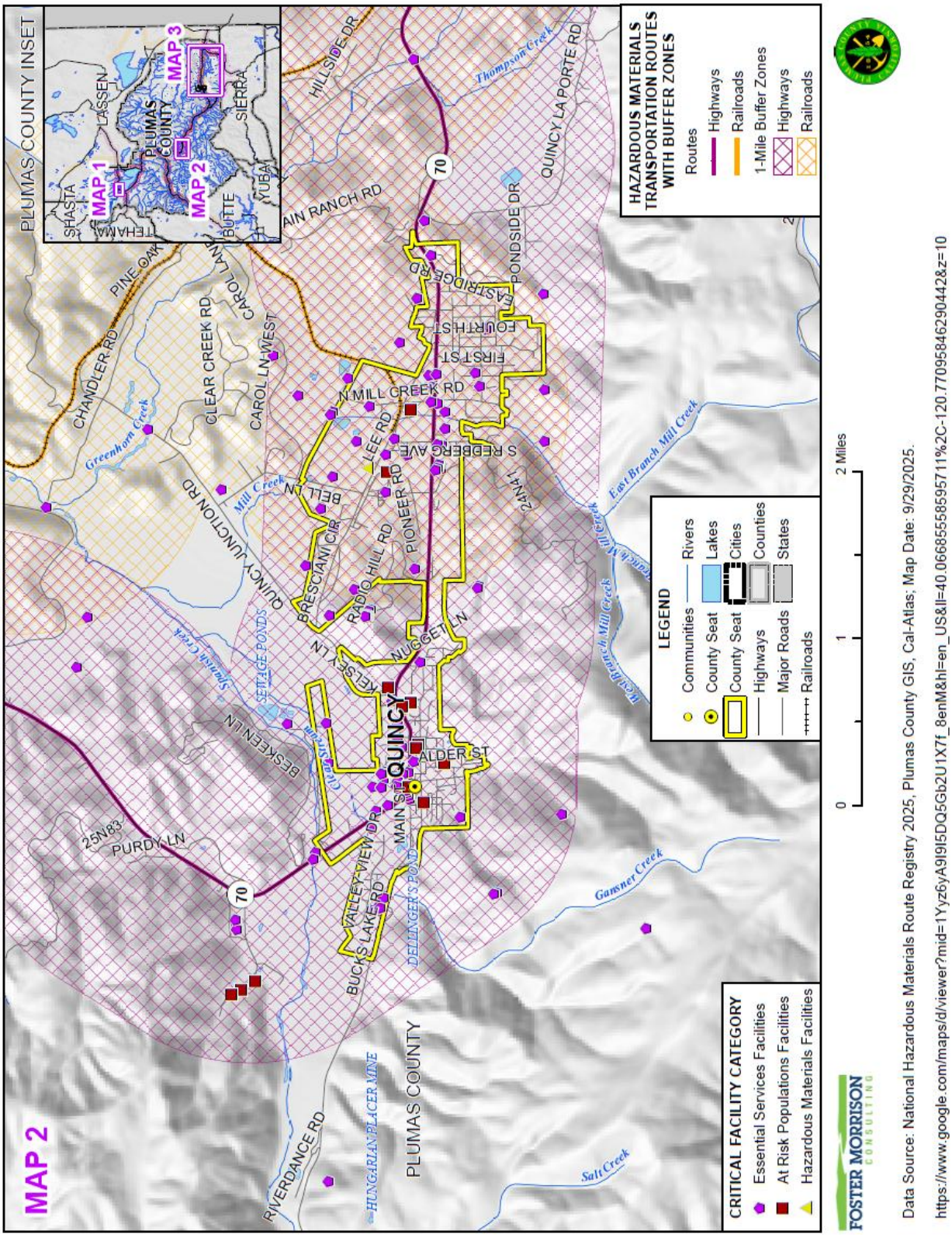


Figure 4-174 Plumas County Planning Area – Critical Facilities in Highway and Railroad Hazardous Materials Buffer Zones (Map Inset 3)

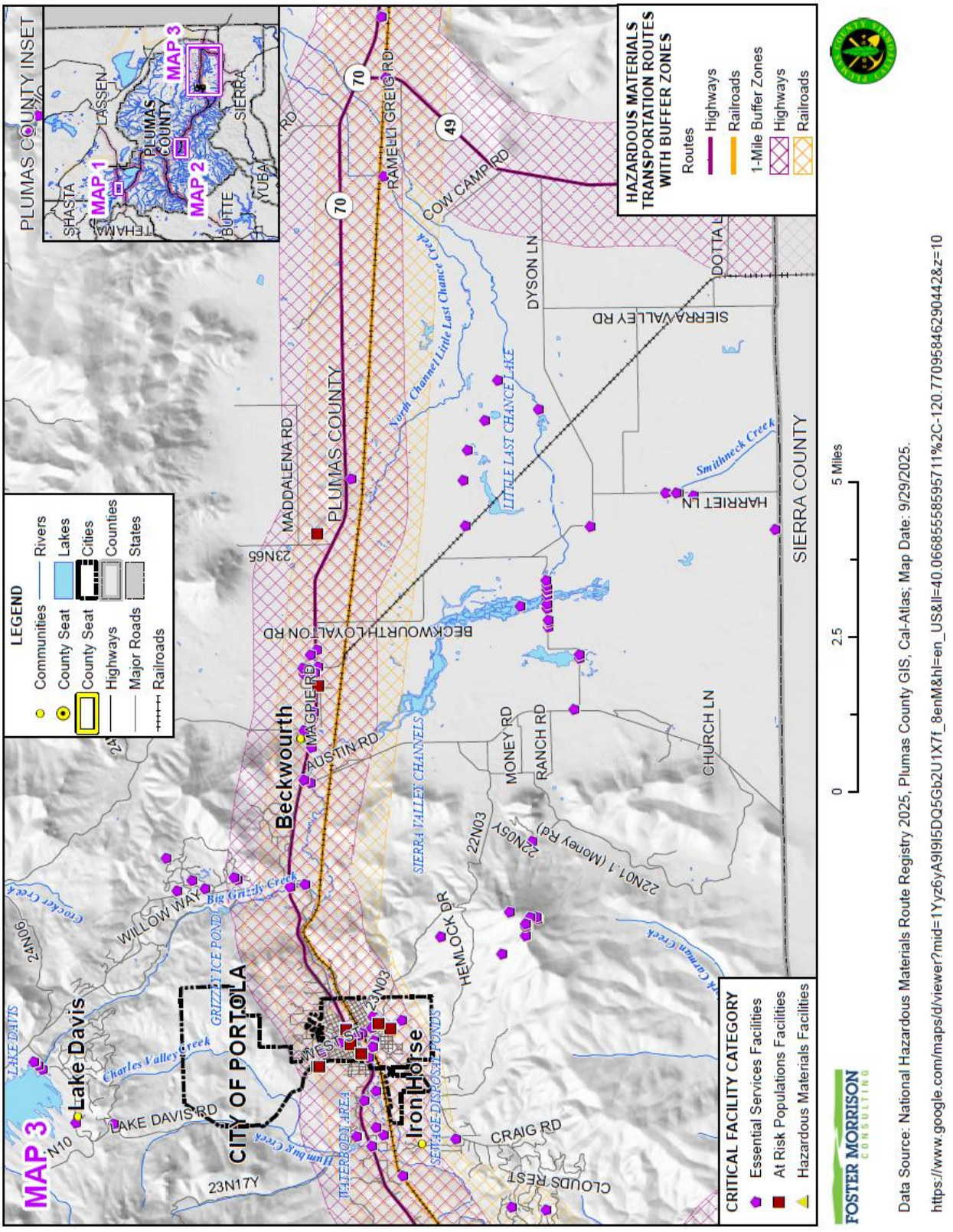


Table 4-106 Plumas County Planning Area – Critical Facilities in Critical Facilities in Highway Hazardous Materials Buffer Zones by Jurisdiction and Critical Facility Category

Jurisdiction / Hazardous Materials Routes	Critical Facility Category	Facility Count
Portola		
Highway 70	Essential Services Facilities	16
	At Risk Populations Facilities	8
	Total	**24**
Portola Total		**24**
Unincorporated Plumas County		
Highway 147	Essential Services Facilities	13
	Total	**13**
Highway 147 and Highway 89	Essential Services Facilities	8
	Total	**8**
Highway 36	Essential Services Facilities	45
	At Risk Populations Facilities	10
	Hazardous Materials Facilities	1
	Total	**56**
Highway 36 and Highway 89	Essential Services Facilities	8
	Total	**8**
Highway 49 and Highway 70	Essential Services Facilities	3
	Total	**3**
Highway 70	Essential Services Facilities	98
	At Risk Populations Facilities	2
	Total	**100**
Highway 70 and Highway 89	Essential Services Facilities	202
	At Risk Populations Facilities	14
	Hazardous Materials Facilities	2
	Total	**218**
Highway 89	Essential Services Facilities	55
	At Risk Populations Facilities	3
	Total	**58**
Unincorporated Plumas County Total		**464**
Unincorporated Butte County		
Highway 70	Essential Services Facilities	1
	Total	**1**
Unincorporated Butte County Total		**1**

Jurisdiction / Hazardous Materials Routes	Critical Facility Category	Facility Count
Unincorporated Lassen County		
Highway 36	Essential Services Facilities	4
	Total	**4**
Unincorporated Lassen County Total		**4**
Unincorporated Sierra County		
Highway 49	Essential Services Facilities	2
	Total	**2**
Unincorporated Sierra County Total		**2**
Unincorporated Tehama County		
Highway 36	Essential Services Facilities	1
	Total	**1**
Unincorporated Tehama County Total		**1**
Grand Total		**496**

Source: National Hazardous Route Registry, Plumas County GIS

Table 4-107 Plumas County Planning Area – Critical Facilities in Critical Facilities in Railroad Hazardous Materials Buffer Zones by Jurisdiction and Critical Facility Category

Jurisdiction / Hazardous Materials Routes	Critical Facility Category	Facility Count
Portola		
UP / BNSF	Essential Services Facilities	16
	At Risk Populations Facilities	8
	Total	**24**
Portola Total		**24**
Unincorporated Plumas County		
BNSF	Essential Services Facilities	55
	At Risk Populations Facilities	3
	Total	**58**
BNSF and UP / BNSF	Essential Services Facilities	15
	Total	**15**
Quincy Railroad	Essential Services Facilities	44
	At Risk Populations Facilities	2
	Hazardous Materials Facilities	1
	Total	**47**
Quincy Railroad and UP / BNSF	Essential Services Facilities	5

Jurisdiction / Hazardous Materials Routes	Critical Facility Category	Facility Count
	Total	**5**
UP / BNSF	Essential Services Facilities	158
	At Risk Populations Facilities	2
	Hazardous Materials Facilities	1
	Total	**161**
Unincorporated Plumas County Total		**286**
Unincorporated Butte County		
UP / BNSF	Essential Services Facilities	3
	Total	**3**
Unincorporated Butte County Total		**3**
Unincorporated Lassen County		
BNSF	Essential Services Facilities	3
	Total	**3**
UP / BNSF	Essential Services Facilities	3
	Total	**3**
Unincorporated Lassen County Total		**6**
Grand Total		**319**

Source: National Hazardous Route Registry, Plumas County GIS

Natural, Historic, and Cultural Resources

Any natural, historic, or cultural resource that falls in the buffer zone shown on Figure 4-167 has some measure of vulnerability. If a release caused a fire, it could affect historic and cultural resources in the County. Natural resources can be more greatly affected by a hazardous materials spill. Clean up of a spill into a natural resource (such as a creek, stream, or river) may be difficult to complete. Hazardous releases can significantly harm wildlife and habitat areas. The contamination also can make its way up the food chain, affecting the food supply. Open water and wetland environments experience significant exposure to hazardous materials events, which may result in further loss of ecosystem functions.

FEMA NRI Hazard Vulnerability Assessment

Hazardous material transport is not an NRI hazard; therefore, no data is presented.

Impacts from Hazardous Materials Transportation

Impacts from hazardous materials transportation incidents vary by location and severity of any given event and will likely only affect certain areas of the County during specific times. Based on the risk assessment, it a hazardous materials transportation release could have potential adverse impacts to affected areas of the County as described below. However, the majority of releases in the County are minor, localized events

that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Contaminated water supplies
- Contaminated buildings
- Soil contamination that results in mass die-off of vegetation
- Fire and explosions
- Public health impacts
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Business closures and significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is unlikely to exacerbate future hazardous material transportation events and associated impacts and vulnerability of the County.
- Population in Plumas County is expected to decrease. Vulnerable population groups could face disproportionate effects from a hazardous materials release and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. However, it is difficult to locate development outside of the hazardous materials buffer zones, due to the location of rail lines and highways in the County. Building codes do not account for hazardous materials spills or incidents. More development within the hazardous materials buffer zones is likely to increase the vulnerability of the County to this hazard.

Development will continue to happen within hazardous materials transportation corridors due to the large area within the County located within these corridors. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route. Future development areas and their vulnerability to hazardous materials transport are discussed further in the below GIS analysis.

GIS Analysis

Plumas County provided 13 future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Many facilities fall in either the highway or railroad hazardous materials buffer zone. Figure 4-179 show the locations of the future development areas and both the highway and railroad hazardous materials buffer zone. Table 4-108 shows the details of the future development areas that are located in the highway hazardous materials buffer zone. Table 4-109 shows the details of the future development areas that are located in the railroad hazardous materials buffer zone.

Figure 4-175 Unincorporated Plumas County – Future Development in Highway and Railroad Hazardous Materials Buffer Zones

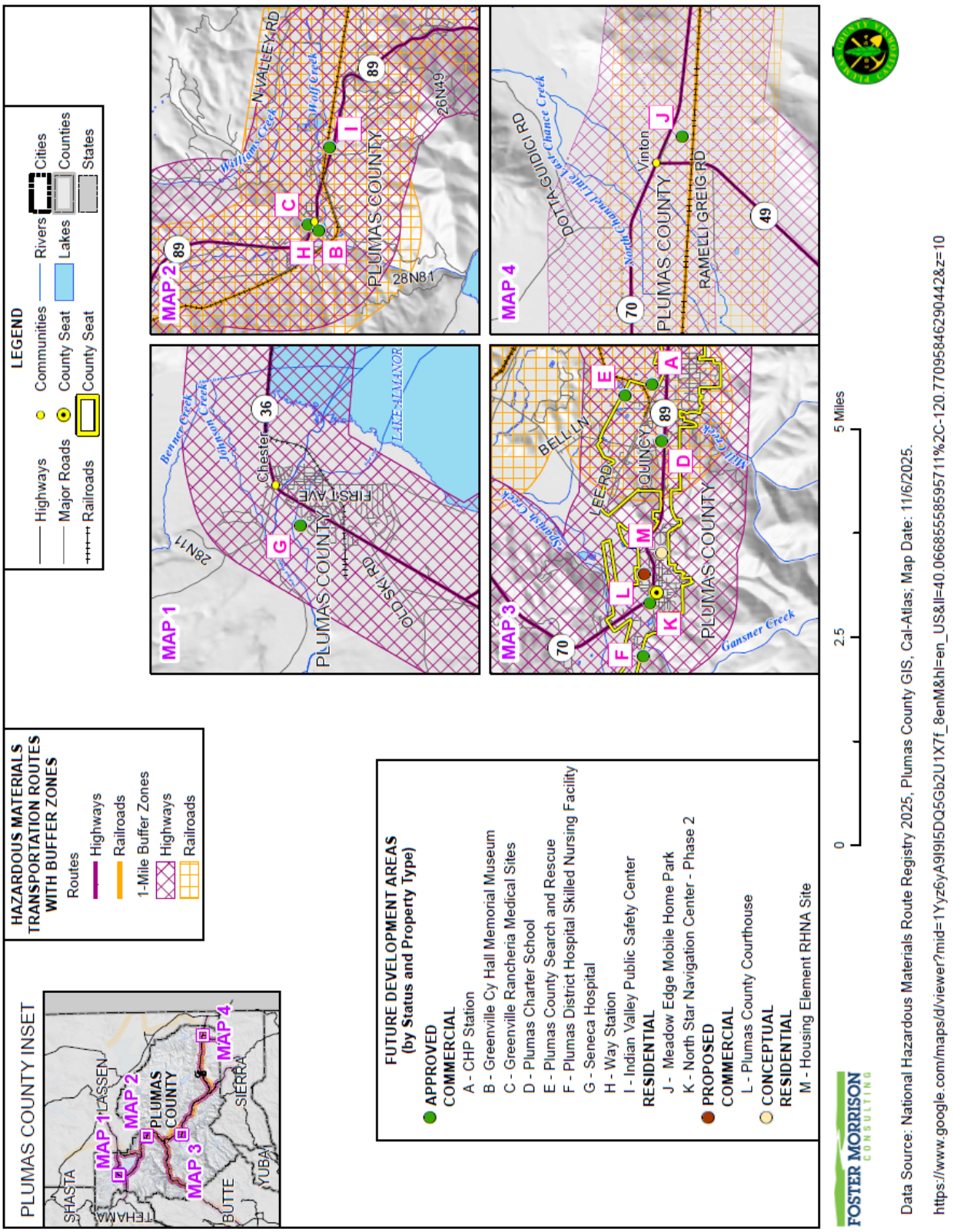


Table 4-108 Unincorporated Plumas County – Future Development in Highway Hazardous Materials Buffer Zones with Parcel Counts and Acreages

Hazardous Materials Routes /Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Highway 36						
Approved						
G - Seneca Hospital	1	0	1	11.80	0.00	11.80
Approved Total	**1**	**0**	**1**	**11.80**	**0.00**	**11.80**
Highway 49 and Highway 70						
Approved						
J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
Approved Total	**1**	**1**	**0**	**42.74**	**42.74**	**0.00**
Highway 70 and Highway 89						
Approved						
A - CHP Station	1	0	1	5.00	0.00	5.00
D - Plumas Charter School	1	0	1	0.89	0.00	0.89
E - Plumas County Search and Rescue	1	1	0	4.50	4.50	0.00
F - Plumas District Hospital Skilled Nursing Facility	1	0	1	4.12	0.00	4.12
K - North Star Navigation Center - Phase 2	1	1	0	1.00	1.00	0.00
Approved Total	**5**	**2**	**3**	**15.51**	**5.50**	**10.01**
Proposed						
L - Plumas County Courthouse	1	1	0	2.86	2.86	0.00
Proposed Total	**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
Conceptual						
M - Housing Element RHNA Site	1	1	0	3.64	3.64	0.00

Hazardous Materials Routes /Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Conceptual Total	**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Highway 89						
Approved						
B - Greenville Cy Hall Memorial Museum	1	0	1	0.11	0.00	0.11
C - Greenville Rancheria Medical, Dental Clinic, and Pharmacy	1	0	1	1.58	0.00	1.58
H - Way Station	1	0	1	0.28	0.00	0.28
I - Indian Valley Public Safety Center	1	0	1	5.00	0.00	5.00
Approved Total	**4**	**0**	**4**	**6.97**	**0.00**	**6.97**

Source: National Hazardous Materials Route Registry, Plumas County GIS

Table 4-109 Unincorporated Plumas County – Future Development in Railroad Hazardous Materials Buffer Zones with Parcel Counts and Acreages

Hazardous Materials Routes /Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
BNSF						
Approved						
B - Greenville Cy Hall Memorial Museum	1	0	1	0.11	0.00	0.11
C - Greenville Rancheria Medical, Dental Clinic, and Pharmacy	1	0	1	1.58	0.00	1.58
H - Way Station	1	0	1	0.28	0.00	0.28

Hazardous Materials Routes /Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
I - Indian Valley Public Safety Center	1	0	1	5.00	0.00	5.00
Approved Total	**4**	**0**	**4**	**6.97**	**0.00**	**6.97**
Quincy Railroad						
Approved						
A - CHP Station	1	0	1	5.00	0.00	5.00
D - Plumas Charter School	1	0	1	0.89	0.00	0.89
E - Plumas County Search and Rescue	1	1	0	4.50	4.50	0.00
Approved Total	**3**	**1**	**2**	**10.39**	**4.50**	**5.89**
UP / BNSF						
Approved						
J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
Approved Total	**1**	**1**	**0**	**42.74**	**42.74**	**0.00**

Source: National Hazardous Materials Route Registry, Plumas County GIS

4.3.14. Landslides, Mudslides, and Debris Flows

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during

landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality and can eventually impact stream flows and contribute to flooding potential. Conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in Section 4.3.15)
- Road building, excavation, and grading
- Earthquake

The 2023 State of California Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the mountainous, sloped areas within the Planning Area where the topography is characterized by more substantial elevation changes.

Location and Extent

Landslides can be expected in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time.

Figure 4-176 shows the CGS areas susceptible to deep seated landslides. The legend on Figure 4-176 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength.

Geographic extents of these classes for the unincorporated Plumas County are shown on Table 4-110. Details on each participating jurisdiction's CGS deep-seated landslide extents can be found in their respective annexes to this LHMP Update. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that much of the County and surrounding area have areas at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors.

The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time. In Plumas County, landslides generally occur where there is very little population or infrastructure.

Figure 4-176 Plumas County Planning Area – Susceptibility to Deep Seated Landslides

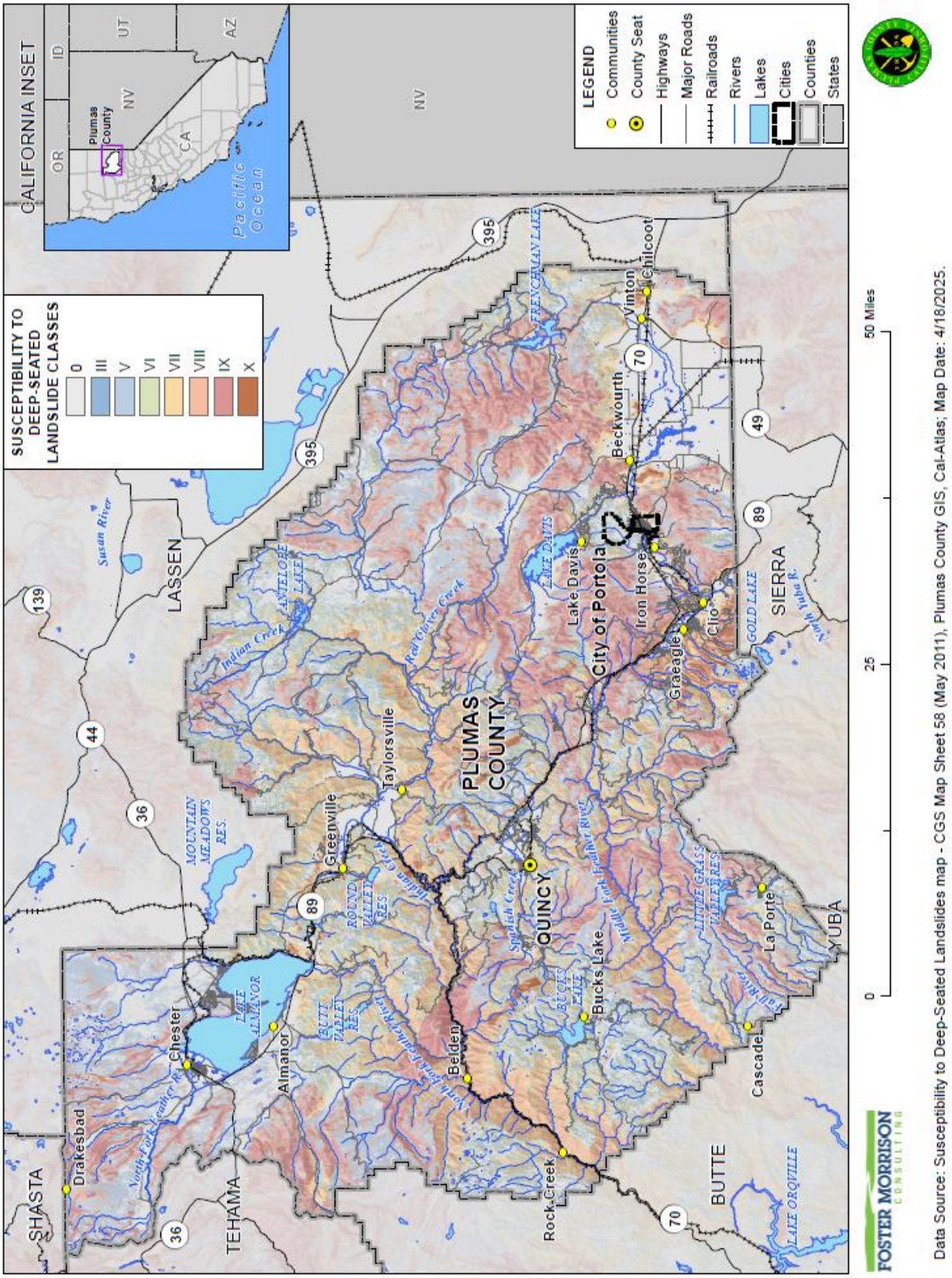


Table 4-110 Plumas County Planning Area – Geographical Extent of Deep-Seated Landslide Classes

Deep Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
0	2,001	57%	1,372	61%	629	50%
III	402	12%	402	18%	0.5	0.04%
V	116	3%	5	0.2%	111	9%
VI	248	7%	248	11%	-	
VII	598	17%	204	9%	394	31%
VIII	60	2%	1	0.03%	59	5%
IX	59	2%	4	0.2%	55	4%
X	6	0.2%	1	0.1%	5	0.4%
Grand Total	**3,491**	**100%**	**2,237**	**100%**	**1,254**	**100%**
Unincorporated Plumas County						
0	269,918	21%	17,483	36%	252,435	20%
III	111,182	8%	2,240	5%	108,941	9%
V	171,220	13%	5,456	11%	165,764	13%
VI	110,673	8%	1,821	4%	108,851	9%
VII	224,116	17%	12,774	26%	211,342	17%
VIII	223,848	17%	2,774	6%	221,074	17%
IX	180,031	14%	4,154	9%	175,876	14%
X	21,713	2%	1,782	4%	19,931	2%
Grand Total	**1,312,701**	**100%**	**48,485**	**100%**	**1,264,216**	**100%**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011)

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated solely with landslides in Plumas County; however, as shown in Table 4-111, there have been 7 state and 5 federal disaster declarations for flood which included landslides as a component.

Table 4-111 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (those events that included landslide)	7	1992*, 1995 (twice*), 2017 (twice*), 2023 (twice*)	5	2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993, which can be seen in Table 4-111.

*Table 4-112 NCDC Landslide and Debris Flow Events for Plumas County 1993-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Debris Flows	21	0	0	0	0	$2,000	$0

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Plumas County

Hazard Mitigation Planning Committee Events

There are certain areas within the County that are susceptible to slope failure resulting in localized landslides, mudslides, and debris flows. These areas are detailed in the Local Concern section below.

These sections separate events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

EVENTS SINCE 2020? DATES? DAMAGES?

Events before 2019

The HMPC reported the following events of landslide in the County:

- **2006** – A rockslide occurred on State Route 70 1.5 miles west of Pulga. No injuries or deaths occurred. Damages were unknown from this event.
- **2009** – A rockslide occurred on State Route 70 near Rich bar. Some injuries were reported, but details could not be recalled. Damages were unknown from this event.
- **2010** – A landslide occurred on the USFS Road (Scales Road). No injuries or deaths occurred. Damages were unknown from this event.
- **2010** – A rockslide occurred on State Route 70 between Greenville Way and Elephant Butte Tunnel. No injuries or deaths occurred. Damages were unknown from this event.
- **2013** – A rockslide occurred. There was damage to County Road 411 5 miles west of State Route 70 at Quincy in the Bucks Lake area. No injuries or deaths occurred. Damages were unknown from this event.
- **2013** – Major slope failure has occurred on Johnsville Road / County Highway A14 approximately 4.6 miles west of the intersection of the intersection of SR89 at Blairsdale / Graeagle. The slope failure condition has been prevalent for more than 5 years, and is a result of weak soils, slop and water related erosion. This particular roadway is the only paved road that connects Graeagle to Johnsville. The only other transportation route connecting Johnsville is a dirt road which is essentially impassable in the winter. As a safety precaution, the roadway shoulder has been narrowed several times in order to avoid the on-site erosion issues. Slope saturation by water is a primary cause of landslide issue at this location.

Figure 4-177 Slope Failure near Johnsonville on County Highway A14

Source: Plumas County

- **2017** – A flood occurred in a canyon above Greenville in February. This caused multiple mudslides that blocked Highway 89. This road is an ingress and egress route for Indian Valley.

Likelihood of Future Occurrence

Likely—Based on data provided by the HMPC, landslides are naturally occurring events that will inevitably happen as long as gravity itself is a controlling factor upon the landscape. Since Plumas County's mountainous terrain in much of the County challenges gravity as it rapidly rises to upper elevations, much of the high-relief topography in the County can be identified as land with the potential for landslides. Much of that land though is in remote and undeveloped locales, which reduces the risk and vulnerability of this natural hazard. Given the nature of localized problems identified within the County, landslides will likely continue to impact the area when heavy precipitation occurs, as they have in the past.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and landslide and debris flow can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.3. While total average annual rainfall may decrease only slightly, rainfall is

predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data and landslide hazard mapping, landslides can occur in the Plumas County Planning Area. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The 2035 Plumas County General Plan Public Health & Safety Element noted that areas with steep slopes in the County could be prone to landslides, mud slides and avalanches. Landslides, or ground failure, are dependent on slope, geology, rainfall, excavation or seismic activity. Mud slides are often caused by heavy rainfall. Areas that have recently been subject to wildfire are susceptible to mud slides. In Plumas County, landslides generally occur where there is very little population or infrastructure. However, there are certain areas throughout the Plumas County Planning Area prone to landslides and where damages have occurred. Though not shown on the USGS map, the 2035 General Plan Public Health and Safety Element noted that the volcanic soils in the eastern portion of the Plumas National Forest are prone to landslides. It was also noted that areas concentrated along the North and Middle Forks of the Feather River are also susceptible to landslides, as well as post-wildfire fire areas.

Plumas County Public Works also noted areas of reoccurring slope failure on County Roads:

- Hwy 89 on the way to Greenville
- Hwy 70 continuous
- Chester/Warner Valley drainage has changed
- Butterfly/Twain Road
- Beckwourth/Genesse Road
- Arlington Road
- Gold Lake Forest Highway
- Quincy-LaPorte Road
- Bucks Lake Road
- Big Creek Road
- North Valley Road

- Mill Creek at SR70

AREAS TO ADD? SPECIFIC VULNERABILITY CONCERNS? WHICH AREAS WILL MITIGATION EFFORTS FOCUS ON?

Local concerns for Portola and the special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from landslide include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

Methodology (Parcels and Structures)

The 2011 California Geologic Survey Deep Seated Landslide Susceptibility data was obtained for the Plumas County Planning Area. The 2024 Plumas County Parcel/Assessor Data was used as the basis for the inventory of all parcels within the Plumas County Planning Area. GIS was used to overlay the landslide hazard layer onto the parcel layer. Since it is possible for any given parcel to intersect with multiple categories for purposes of this analysis, the most conservative (or highest risk) deep-seated landslide class that intersected each parcel was used to determine which class to assign to each parcel. Once completed, the deep-seated landslide class parcel layer was joined to the assessor data to determine the number of parcels and values falling within each class. Based on this approach, the deep-seated landslide classes for the Planning Area and unincorporated Plumas County were determined and further broken out by property use and included information on both land and improved values and estimated contents values.

Note: similar to other hazard analyses, all analyses were performed on the parcel polygon. For the landslide (and other) hazard, the highest hazard category applied to the parcel polygon. This landslide analysis can be misleading since multiple classes may fall within one polygon, and there are many large polygons throughout the County.

People and Populations

All populations located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Plumas County Planning Area residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to Planning Area's residential population residing within these hazard areas, an analysis was conducted of those who physically reside in the mapped landslide susceptibility areas. The CGS Susceptibility to Deep Seated Landslide maps were overlayed on the parcel layer and linked to the assessor data. Those residential parcel polygons that intersect the High or Very High risk areas (Class VII or higher) were counted and multiplied by the 2023 Census Bureau American Community Survey average household factors each jurisdiction in the Planning Area. Analysis results are shown in Table 4-113.

Table 4-113 Plumas County Planning Area – Residential Populations in High or Very High Deep Seated Landslide Classes

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population at Risk
Class VII		
City of Portola	513	1,175
Unincorporated County	2,710	6,477
Class VIII		
City of Portola	0	0
Unincorporated County	933	2,230
Class IX		
City of Portola	44	101
Unincorporated County	1,444	3,451
Class X		
City of Portola	9	21
Unincorporated County	830	1,984

Source: CGS, Plumas County 2024 Parcel/Assessor's Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29); Unincorporated Plumas County (2.39).

Structures

Landslides can affect the built environment of the Plumas County Planning Area and those structures located within the high to very high hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The CGS Deep Seated Landslide Susceptibility layer was overlaid with the County parcel (structure) layer in GIS and linked to the assessor data. The mapped landslide areas are shown on Figure 4-176. Table 4-114 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), personal property values, estimated content replacement values, and total values in the Planning Area for deep seated landslide classes. Table 4-115 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), personal property values, estimated content replacement values, and total

values by property use for the unincorporated County for deep seated landslide classes. As shown, many improved parcels fall in Classes VII to X in the Portola as well as in the unincorporated County.

Table 4-114 Plumas County Planning Area – Count and Value of Parcels and Structures in Deep Seated Landslide Class by Jurisdiction

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
0	540	395	$12,942,889	$49,148,720	$53,696	$29,001,715	$91,147,020
III	2	0	$56,463	$0	$0	$0	$56,463
V	22	10	$560,793	$2,627,044	$0	$2,241,074	$5,428,911
VI	1	1	$21,106	$2,429	$0	$1,215	$24,750
VII	940	557	$19,519,134	$86,443,389	$1,678,026	$55,910,625	$163,551,174
VIII	2	1	$529,643	$1,400,712	$0	$1,400,712	$3,331,067
IX	105	48	$2,773,597	$6,470,686	$35,120	$3,507,842	$12,787,245
X	31	9	$1,546,746	$5,158,054	$148,230	$2,579,027	$9,432,057
Not in a Landslide Class	0	0	$0	$0	$0	$0	$0
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	$1,915,072	**$94,642,209**	**$285,758,686**
Unincorporated Plumas County							
0	7,133	4,848	$377,748,466	$941,215,911	$98,515,649	$546,539,951	$1,964,019,977
III	426	188	$18,511,321	$33,844,115	$203,800	$17,392,879	$69,952,115
V	3,478	1,991	$313,658,890	$620,338,134	$1,853,913	$316,361,786	$1,252,212,723
VI	447	184	$18,609,277	$30,571,867	$183,993	$15,715,842	$65,080,979
VII	4,899	2,847	$282,021,385	$605,509,339	$6,302,556	$319,914,993	$1,213,748,273
VIII	2,196	970	$191,923,312	$284,500,071	$1,141,051	$150,585,108	$628,149,542
IX	3,466	1,486	$293,745,442	$446,129,929	$2,611,482	$230,868,937	$973,355,790
X	2,188	912	$167,960,204	$239,869,245	$30,715,119	$136,295,794	$574,840,362
Not in a Landslide Class	1	1	$816,431	$966,667	$0	$483,334	$2,266,432
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**
Grand Total	**25,877**	**14,448**	**$1,702,945,099**	**$3,354,196,312**	**$143,442,635**	**$1,828,800,830**	**$7,029,384,876**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), Plumas County 2024 Parcel/Assessor Data

Table 4-115 Unincorporated Plumas County – Count and Value of Parcels and Structures in Deep Seated Landslide Class by Property Use

Susceptibility to Deep-Seated Landslide Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
0							
Agricultural	117	25	$10,455,490	$3,300,763	$95,569	$3,300,763	$17,152,585
Commercial	544	375	$48,461,504	$105,470,321	$4,369,631	$105,470,321	$263,771,777
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	128	0	$46,383	$0	$0	$0	$46,383
Industrial	112	73	$8,641,335	$16,776,154	$33,550,208	$25,164,231	$84,131,928
Institutional	52	25	$1,072,469	$6,582,289	$183,350	$6,582,289	$14,420,397
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	100	43	$2,932,129	$2,958,310	$42,163	$2,958,310	$8,890,912
Residential	5,859	4,307	$306,139,156	$806,128,074	$60,274,728	$403,064,037	$1,575,605,995
ROW/Utilities	217	0	$0	$0	$0	$0	$0
0 Total	**7,133**	**4,848**	**$377,748,466**	**$941,215,911**	**$98,515,649**	**$546,539,951**	**$1,964,019,977**
III							
Agricultural	4	0	$59,483	$0	$0	$0	$59,483
Commercial	3	2	$159,876	$938,111	$69,620	$938,111	$2,105,718
Federal Lands	4	0	$0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	45	1	$318,263	$3,531	$0	$3,531	$325,325
Residential	341	185	$17,973,699	$32,902,473	$134,180	$16,451,237	$67,461,589
ROW/Utilities	27	0	$0	$0	$0	$0	$0
III Total	**426**	**188**	**$18,511,321**	**$33,844,115**	$203,800	**$17,392,879**	**$69,952,115**
V							
Agricultural	25	0	$185,335	$0	$0	$0	$185,335
Commercial	48	24	$3,923,156	$6,030,434	$603,043	$6,030,434	$16,587,067
Federal Lands	1	0	$0	$0	$0	$0	$0
Government	25	0	$1,884	$0	$0	$0	$1,884
Industrial	3	2	$410,326	$283,628	$0	$425,442	$1,119,396
Institutional	3	2	$644,990	$4,127,648	$6,380	$4,127,648	$8,906,666
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	143	14	$1,058,206	$1,660,099	$4,080	$1,660,099	$4,382,484
Residential	3,099	1,949	$307,434,993	$608,236,325	$1,240,410	$304,118,163	$1,221,029,891
ROW/Utilities	130	0	$0	$0	$0	$0	$0

Susceptibility to Deep-Seated Landslide Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
V Total	**3,478**	**1,991**	**$313,658,890**	**$620,338,134**	**$1,853,913**	**$316,361,786**	**$1,252,212,723**
VI							
Agricultural	9	0	$65,468	$0	$0	$0	$65,468
Commercial	7	4	$317,418	$619,186	$2,140	$619,186	$1,557,930
Federal Lands	2	0	$0	$0	$0	$0	$0
Government	12	0	$0	$0	$0	$0	$0
Institutional	1	0	$0	$0	$0	$0	$0
Recreational	48	1	$889,560	$240,630	$0	$240,630	$1,370,820
Residential	340	179	$17,336,831	$29,712,051	$181,853	$14,856,026	$62,086,761
ROW/Utilities	28	0	$0	$0	$0	$0	$0
VI Total	**447**	**184**	**$18,609,277**	**$30,571,867**	**$183,993**	**$15,715,842**	**$65,080,979**
VII							
Agricultural	145	31	$11,886,009	$6,169,855	$1,744,048	$6,169,855	$25,969,767
Commercial	123	84	$10,104,580	$23,790,387	$2,577,642	$23,790,387	$60,262,996
Federal Lands	8	0	$0	$0	$0	$0	$0
Government	87	0	$0	$0	$0	$0	$0
Industrial	17	7	$1,369,781	$1,121,799	$0	$1,682,699	$4,174,279
Institutional	14	9	$230,101	$1,448,564	$0	$1,448,564	$3,127,229
Miscellaneous	4	0	$718	$0	$0	$0	$718
Recreational	102	6	$1,712,467	$668,243	$638	$668,243	$3,049,591
Residential	4,124	2,710	$256,717,729	$572,310,491	$1,980,228	$286,155,246	$1,117,163,694
ROW/Utilities	275	0	$0	$0	$0	$0	$0
VII Total	**4,899**	**2,847**	**$282,021,385**	**$605,509,339**	**$6,302,556**	**$319,914,993**	**$1,213,748,273**
VIII							
Agricultural	293	4	$6,834,080	$3,147,203	$14,808	$3,147,203	$13,143,294
Commercial	44	26	$7,903,254	$8,373,995	$455,031	$8,373,995	$25,106,275
Federal Lands	43	0	$0	$0	$0	$0	$0
Government	77	0	$70,569	$0	$0	$0	$70,569
Industrial	1	1	$29,916	$239,168	$0	$358,752	$627,836
Institutional	2	0	$0	$0	$0	$0	$0
Miscellaneous	9	0	$4,158	$0	$0	$0	$4,158
Recreational	35	6	$5,098,413	$4,670,611	$643,730	$4,670,611	$15,083,365
Residential	1,586	933	$171,982,922	$268,069,094	$27,482	$134,034,547	$574,114,045
ROW/Utilities	106	0	$0	$0	$0	$0	$0
VIII Total	**2,196**	**970**	**$191,923,312**	**$284,500,071**	**$1,141,051**	**$150,585,108**	**$628,149,542**

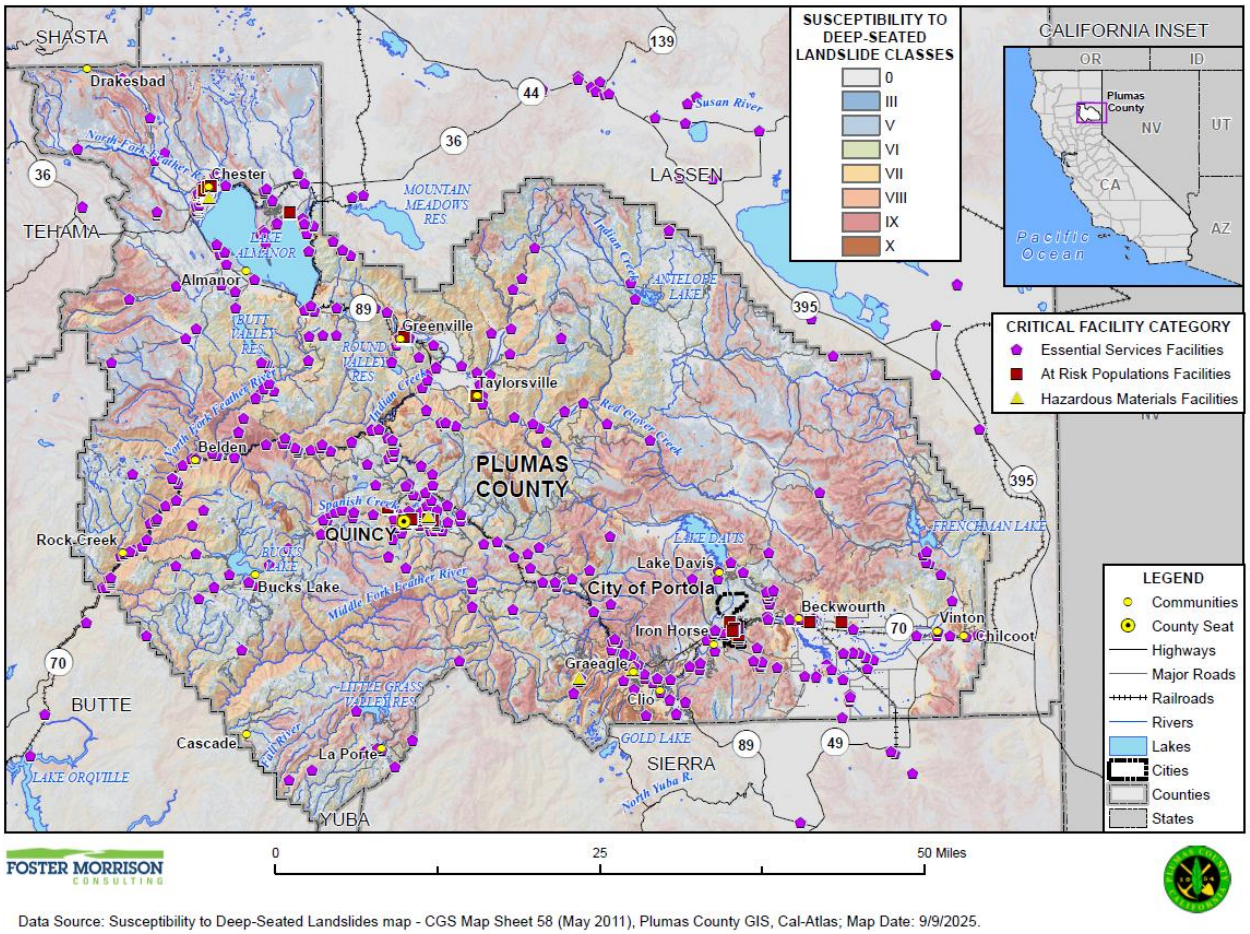
Susceptibility to Deep-Seated Landslide Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
IX							
Agricultural	470	14	$23,445,085	$3,827,148	$50,490	$3,827,148	$31,149,871
Commercial	49	20	$3,040,750	$7,712,649	$190,618	$7,712,649	$18,656,666
Federal Lands	61	0	$0	$0	$0	$0	$0
Government	133	0	$6,120	$0	$0	$0	$6,120
Industrial	6	2	$191,926	$28,784	$0	$43,176	$263,886
Institutional	4	0	$0	$0	$0	$0	$0
Miscellaneous	6	0	$4,715	$0	$0	$0	$4,715
Recreational	24	6	$1,833,144	$4,010,580	$627,070	$4,010,580	$10,481,374
Residential	2,547	1,444	$265,223,702	$430,550,768	$1,743,304	$215,275,384	$912,793,158
ROW/Utilities	166	0	$0	$0	$0	$0	$0
IX Total	**3,466**	**1,486**	**$293,745,442**	**$446,129,929**	**$2,611,482**	**$230,868,937**	**$973,355,790**
X							
Agricultural	247	44	$17,351,867	$8,534,676	$861,612	$8,534,676	$35,282,831
Commercial	35	21	$4,689,342	$11,409,329	$24,008,160	$11,409,329	$51,516,160
Federal Lands	95	0	$0	$0	$0	$0	$0
Government	136	0	$0	$0	$0	$0	$0
Industrial	1	0	$90,337	$0	$0	$0	$90,337
Institutional	4	3	$197,556	$1,777,668	$6,650	$1,777,668	$3,759,542
Miscellaneous	4	0	$0	$0	$0	$0	$0
Recreational	22	14	$4,347,966	$11,000,669	$496,443	$11,000,669	$26,845,747
Residential	1,527	830	$141,283,136	$207,146,903	$5,342,254	$103,573,452	$457,345,745
ROW/Utilities	117	0	$0	$0	$0	$0	$0
X Total	**2,188**	**912**	**$167,960,204**	**$239,869,245**	**$30,715,119**	**$136,295,794**	**$574,840,362**
Not in a Landslide Class							
Residential	1	1	$816,431	$966,667	$0	$483,334	$2,266,432
Not in a Landslide Class Total	**1**	**1**	**$816,431**	**$966,667**	**$0**	**$483,334**	**$2,266,432**
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), Plumas County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Landslides present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Plumas County Planning Area to determine critical facilities by deep-seated landslide class. Using GIS, the landslide classes were overlayed on the critical facility GIS layer. Figure 4-178 shows critical facilities, as well as the deep-seated landslide classes. Table 4-116 details critical facilities by deep seated landslide class by facility category and count for the Planning Area. Details of critical facility category, type, name and address by deep-seated landslide classes are listed in Appendix G. As shown, 276 critical facilities fall in classes VII to X, 5 of which are in Portola, 265 in the unincorporated County, and the 6 in the surrounding counties.

Figure 4-178 Plumas County Planning Area – Critical Facilities in Deep-Seated Landslide Class



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table 4-116 Plumas County Planning Area – Critical Facilities in Deep-Seated Landslide Class by Jurisdiction and Critical Facility Category

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Count
Portola		
0	Essential Services Facilities	14
	At Risk Populations Facilities	5
	Hazardous Materials Facilities	0
	0 Total	**19**
VII	Essential Services Facilities	1
	At Risk Populations Facilities	3
	Hazardous Materials Facilities	0
	VII Total	**4**
IX	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	IX Total	**1**
Portola Total		**24**
Unincorporated Plumas County		
0	Essential Services Facilities	407
	At Risk Populations Facilities	25
	Hazardous Materials Facilities	3
	0 Total	**435**
III	Essential Services Facilities	52
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	III Total	**52**
V	Essential Services Facilities	70
	At Risk Populations Facilities	2
	Hazardous Materials Facilities	
	V Total	**72**
VI	Essential Services Facilities	41
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	VI Total	**41**
VII	Essential Services Facilities	154
	At Risk Populations Facilities	6
	Hazardous Materials Facilities	0

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Count
	VII Total	**160**
IX	Essential Services Facilities	94
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	IX Total	**94**
X	Essential Services Facilities	11
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	1
	X Total	**12**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
0	Essential Services Facilities	3
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	0 Total	**3**
VII	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	VII Total	**1**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
0	Essential Services Facilities	27
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	0 Total	**27**
V	Essential Services Facilities	4
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	V Total	**4**
VII	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	VII Total	**2**
IX	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Count
	IX Total	**1**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
0	Essential Services Facilities	4
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	0 Total	**4**
Unincorporated Sierra County Total		**4**
Unincorporated Tehama County		
V	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	V Total	**1**
VIII	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	VIII Total	**1**
Unincorporated Tehama County Total		**2**
Grand Total		**934**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), Plumas County GIS

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility classes shown on Figure 4-176 would be most vulnerable, as well as those in the run out areas. As shown on the map, this would include a relatively small area of the developed area, since most of the higher risk areas occur in the undeveloped areas of the Planning Area.

FEMA NRI Hazard Vulnerability Assessment

The HMPC looked at the FEMA NRI for additional specific data on Plumas County's vulnerability to Landslides, Mudslides, and Debris Flow. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Plumas County's Landslides, Mudslides, and Debris Flow is only landslide. As shown in Table 4-117, landslides could cause a total of $233,919 in expected annual losses, with a historic loss rating of very low. Landslide has a relatively low rating for social vulnerability and a

relatively high community resilience, with a risk index score of 94.9 out of 100. According to the NRI, there have been 6 landslide events between the years 2010-2021 with an average of 0.1 events per year.

Table 4-117 Plumas County Planning Area – Landslide Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Landslide	94.9	$233,919	$132,005,510,075	Very low

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas.

Landslides can collapse into water bodies, causing tsunamis or seiches. In 1958, a magnitude 8 earthquake collapsed a hillside into Lituya Bay, Alaska, causing a water splash wave that reached 1,720 feet up a mountain slope, stripping all vegetation. A massive landslide into the Vaoint Reservoir in Italy in 1963 caused a water splash wave that swept 800 feet over the top of a dam, causing a major flood that killed an estimated 2,600 people below. Landslides can relocate river channels, as occurred during the Oso mudslide in Washington State in March 2014. This occurred in an area not considered landslide prone on local maps. Landslides and debris flows can impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the Planning Area susceptible to landslide. Based on the risk assessment, there is a potential for significant landslides to occur in the Planning Area. However, most, but not all, of the historic landslides in the Plumas County Planning Area have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and

- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future landslide conditions and associated impacts and vulnerability of the County to landslides. This is especially true in burn scar areas that are at greater risk to landslides.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to decrease in Plumas County. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of landslide risk may put additional development at risk. However, County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide conditions. It should be noted that most of the growth in the County is occurring in areas outside the landslide risk areas. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community. Although new growth and development corridors would fall in the area affected by moderate risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide areas will continue to occur.

GIS Analysis

Plumas County provided 13 future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Figure 4-179 show the locations of the future development areas and deep-seated landslide classes. Table 4-118 shows the details of the future development areas that are located in each deep-seated landslide class.

Figure 4-179 Unincorporated Plumas County – Future Development in Deep-Seated Landslide Classes

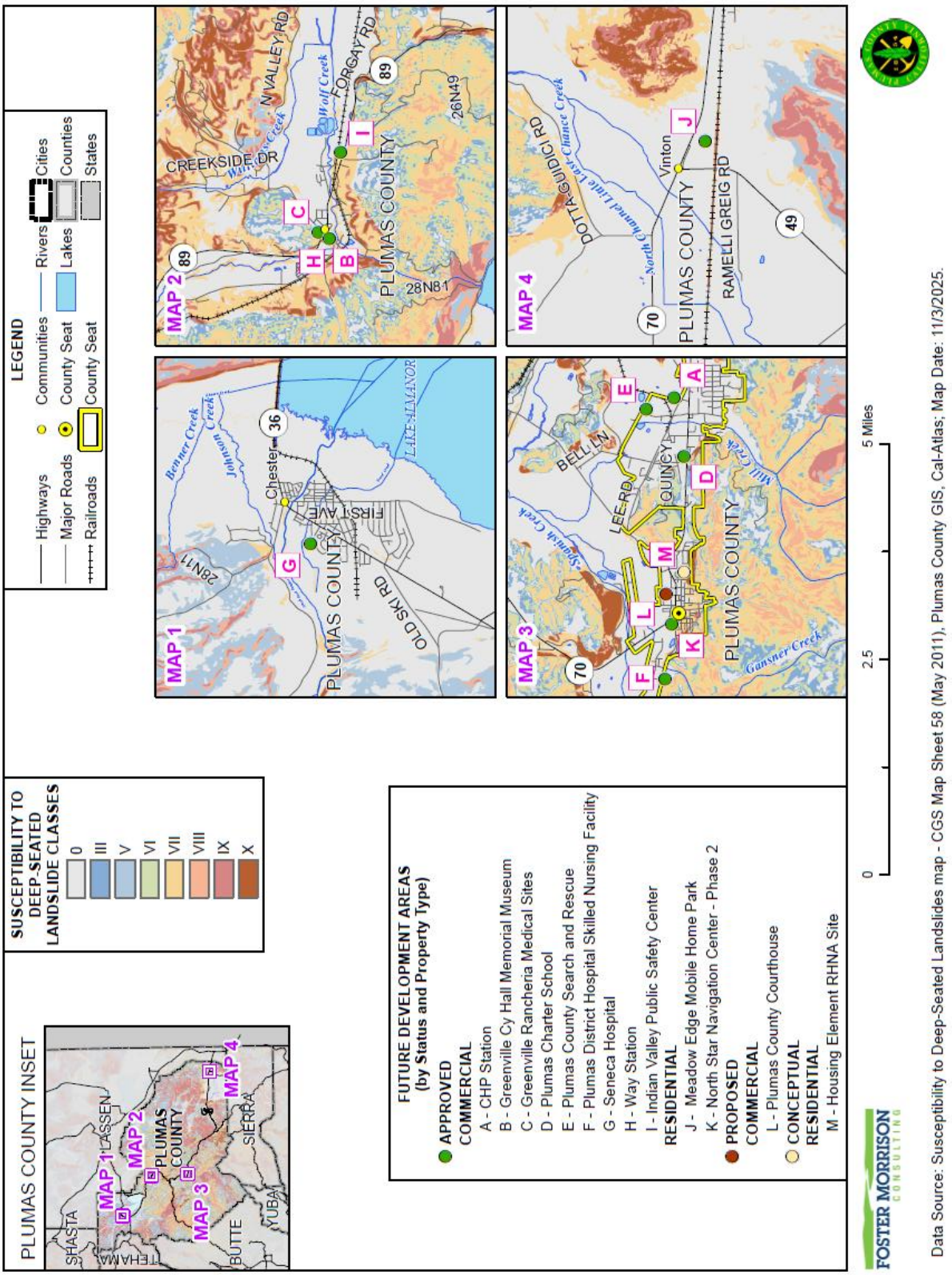


Table 4-118 Unincorporated Plumas County – Future Development in Deep-Seated Landslide Classes with Parcel Counts and Acreages

Susceptibility to Deep-Seated Landslide Class / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
0							
Approved							
Commercial	A - CHP Station	1	0	1	5.00	0.00	5.00
	B - Greenville Cy Hall Memorial Museum	1	0	1	0.11	0.00	0.11
	C - Greenville Rancheria Medical, Dental Clinic, and Pharmacy	1	0	1	1.58	0.00	1.58
	D - Plumas Charter School	1	0	1	0.89	0.00	0.89
	E - Plumas County Search and Rescue	1	1	0	4.50	4.50	0.00
	G - Seneca Hospital	1	0	1	11.80	0.00	11.80
	H - Way Station	1	0	1	0.28	0.00	0.28
	I - Indian Valley Public Safety Center	1	0	1	5.00	0.00	5.00
	Commercial Total	**8**	**1**	**7**	**29.16**	**4.50**	**24.66**
Residential	K - North Star Navigation Center - Phase 2	1	1	0	1.00	1.00	0.00
	Residential Total	**1**	**1**	**0**	**1.00**	**1.00**	**0.00**
Approved Total		**9**	**2**	**7**	**30.16**	**5.50**	**24.66**
Proposed							
Commercial	L - Plumas County Courthouse	1	1	0	2.86	2.86	0.00

Susceptibility to Deep-Seated Landslide Class / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
	Commercial Total	**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
Proposed Total		**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
0 Total		**10**	**3**	**7**	**33.02**	**8.36**	**24.66**
VI							
Approved							
Commercial	F - Plumas District Hospital Skilled Nursing Facility	1	0	1	4.12	0.00	4.12
	Commercial Total	**1**	**0**	**1**	**4.12**	**0.00**	**4.12**
	Approved Total	**1**	**0**	**1**	**4.12**	**0.00**	**4.12**
VI Total		**1**	**0**	**1**	**4.12**	**0.00**	**4.12**
X							
Approved							
Residential	J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
	Residential Total	**1**	**1**	**0**	**42.74**	**42.74**	**0.00**
Approved Total		**1**	**1**	**0**	**42.74**	**42.74**	**0.00**
Conceptual							
Residential	M - Housing Element RHNA Site	1	1	0	3.64	3.64	0.00
	Residential Total	**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Conceptual Total		**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
X Total		**2**	**2**	**0**	**46.38**	**46.38**	**0.00**
Grand Total		**13**	**5**	**8**	**83.52**	**54.74**	**28.78**

Source: CGS, Plumas County GIS

4.3.15. Volcano

Hazard Profile

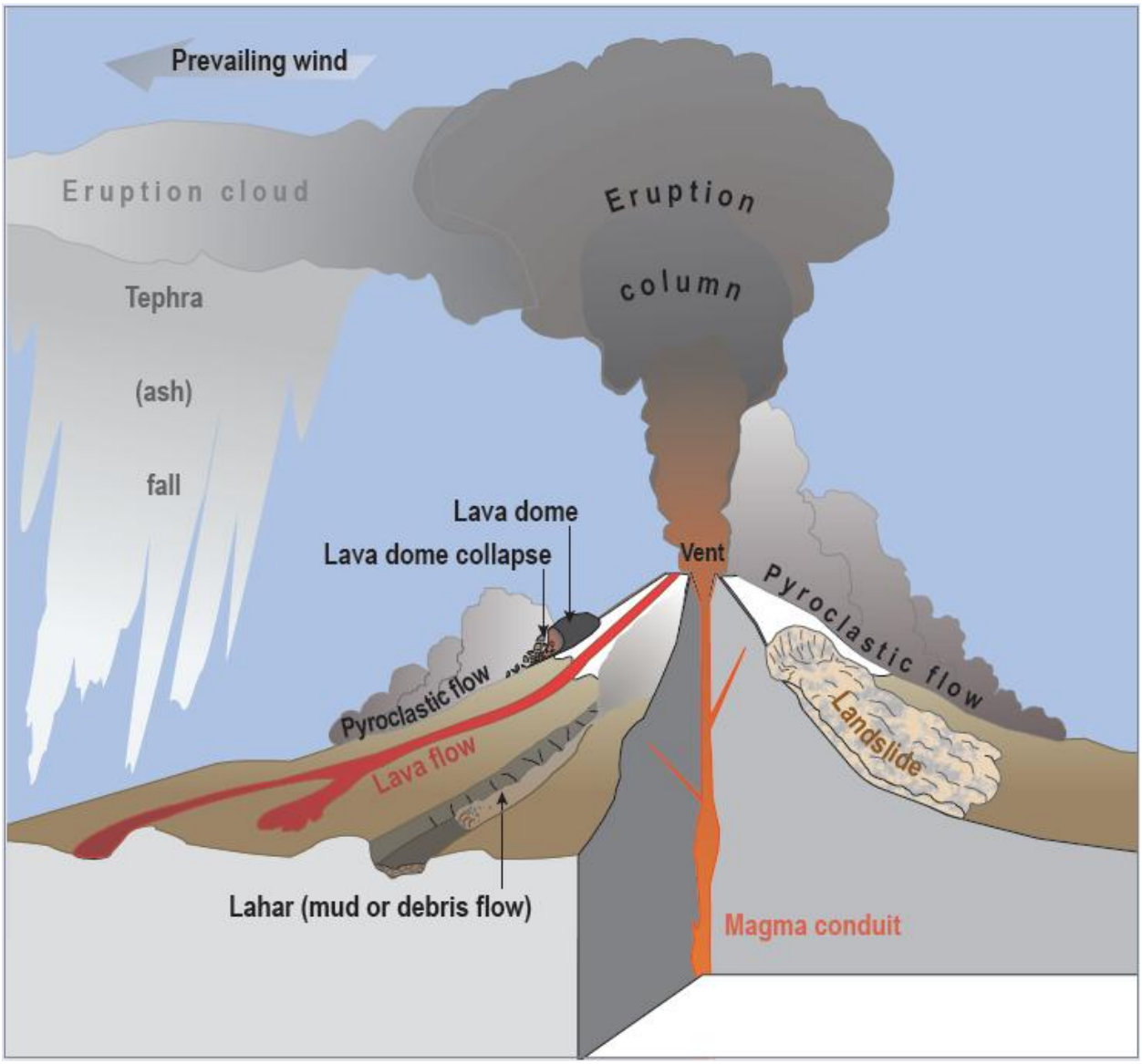
This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

The 2023 California State Hazard Mitigation Plan identifies volcanoes as one of the hazards that can adversely impact the State. However, there have been few losses in California from volcanic eruptions. Along with this, the State Plan does not list volcano as one of Plumas County's high impact hazards.

As shown in Figure 4-180, active volcanoes pose a variety of natural hazards. Explosive eruptions blast lava fragments and gas into the air with tremendous force. The finest particles (ash) billow upward, forming an eruption column that can attain stratospheric heights in minutes. Simultaneously, searing volcanic gas laden with ash and coarse chunks of lava may sweep down the flanks of the volcano as a pyroclastic flow. Ash in the eruption cloud, carried by the prevailing winds, is an aviation hazard and may remain suspended for hundreds of miles before settling to the ground as ash fall. During less energetic effusive eruptions, hot, fluid lava may issue from the volcano as lava flows that can cover many miles in a single day. Alternatively, a sluggish plug of cooler, partially solidified lava may push up at the vent during an effusive eruption, creating a lava dome. A growing lava dome may become so steep that it collapses, violently releasing pyroclastic flows potentially as hazardous as those produced during explosive eruptions.

Figure 4-180 Volcanoes and Associated Hazards

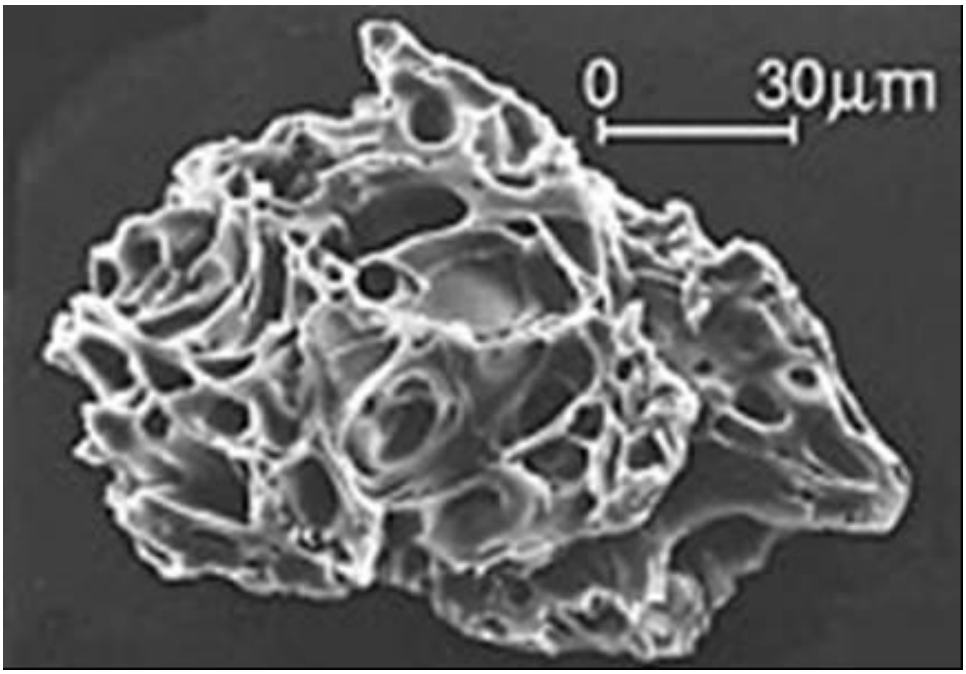


Source: USGS Publication 2014-3120

During and after an explosive or effusive eruption, loose volcanic debris on the flanks of the volcano can be mobilized by heavy rainfall or melting snow and ice, forming powerful floods of mud and rock (lahars) resembling rivers of wet concrete. These can rush down valleys and stream channels as one of the most destructive types of volcano hazards.

The USGS notes specific characteristics of volcanic ash. Volcanic ash is composed of small jagged pieces of rocks, minerals, and volcanic glass the size of sand and silt, as shown in Figure 4-181. Very small ash particles can be less than 0.001 millimeters across. Volcanic ash is not the product of combustion, like the soft fluffy material created by burning wood, leaves, or paper. Volcanic ash is hard, does not dissolve in water, is extremely abrasive and mildly corrosive, and conducts electricity when wet.

Figure 4-181 Ash Particle from 1980 Mt. St Helens Eruption Magnified 200 Times



Source: US Geological Survey: Volcanic Ash: Effect & Mitigation Strategies.

Volcanic ash is formed during explosive volcanic eruptions. Explosive eruptions occur when gases dissolved in molten rock (magma) expand and escape violently into the air, and also when water is heated by magma and abruptly flashes into steam. The force of the escaping gas violently shatters solid rocks. Expanding gas also shreds magma and blasts it into the air, where it solidifies into fragments of volcanic rock and glass. Once in the air, wind can blow the tiny ash particles tens to thousands of miles away from the volcano.

The average grain-size of rock fragments and volcanic ash erupted from an exploding volcanic vent varies greatly among different eruptions and during a single explosive eruption that lasts hours to days. Heavier, large-sized rock fragments typically fall back to the ground on or close to the volcano and progressively smaller and lighter fragments are blown farther from the volcano by wind. Volcanic ash, the smallest particles (2 mm in diameter or smaller), can travel hundreds to thousands of kilometers downwind from a volcano depending on wind speed, volume of ash erupted, and height of the eruption column.

The size of ash particles that fall to the ground generally decreases exponentially with increasing distance from a volcano. Also, the range in grain size of volcanic ash typically diminishes downwind from a volcano (becoming progressively smaller). At specific locations, however, the distribution of ash particle sizes can vary widely.

The USGS has ranked the volcanic threat at all U.S. volcanoes using volcano age, types of potential hazards, and estimates of the societal exposure to those hazards. Sixteen volcanoes are on California's watch list to monitor. Research suggests that partially molten rock (magma) lies beneath seven of these volcanoes—Medicine Lake Volcano, Mount Shasta, Lassen Volcanic Center, Clear Lake Volcanic Field, the Long Valley Volcanic Region, Coso Volcanic Field, and Salton Buttes. At these volcanoes, earthquakes

(seismicity), hot springs, volcanic gas emissions, and (or) ground movement (deformation) attest to their restless nature. Information on the Lassen Volcanic Center threat, the volcano with the greatest potential to affect Plumas County, is shown in Table 4-119.

Table 4-119 Volcano Threat near Plumas County

Volcano	Lassen Volcanic Center
Threat	Very High Threat
Information	Lassen Volcanic National Park, located about 50 miles east of Redding, showcases the dynamic history of this area and draws more than 350,000 visitors each year. Lassen Peak erupted violently in the early twentieth century.

Source: USGS Fact Sheet 2014-3120

Though the table above shows the threat as very high, given the likelihood of future occurrences, the HMPC still ranks the risk to this hazard as low for this LHMP.

Location and Extent

Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Lassen Peak is the closet potential threat to Plumas County. Figure 4-182 shows volcanoes in or near California and their location relative to the Plumas County.

Figure 4-182 Active Volcanoes in California and in the Plumas County Area

Source: 2018 State of California Hazard Mitigation Plan

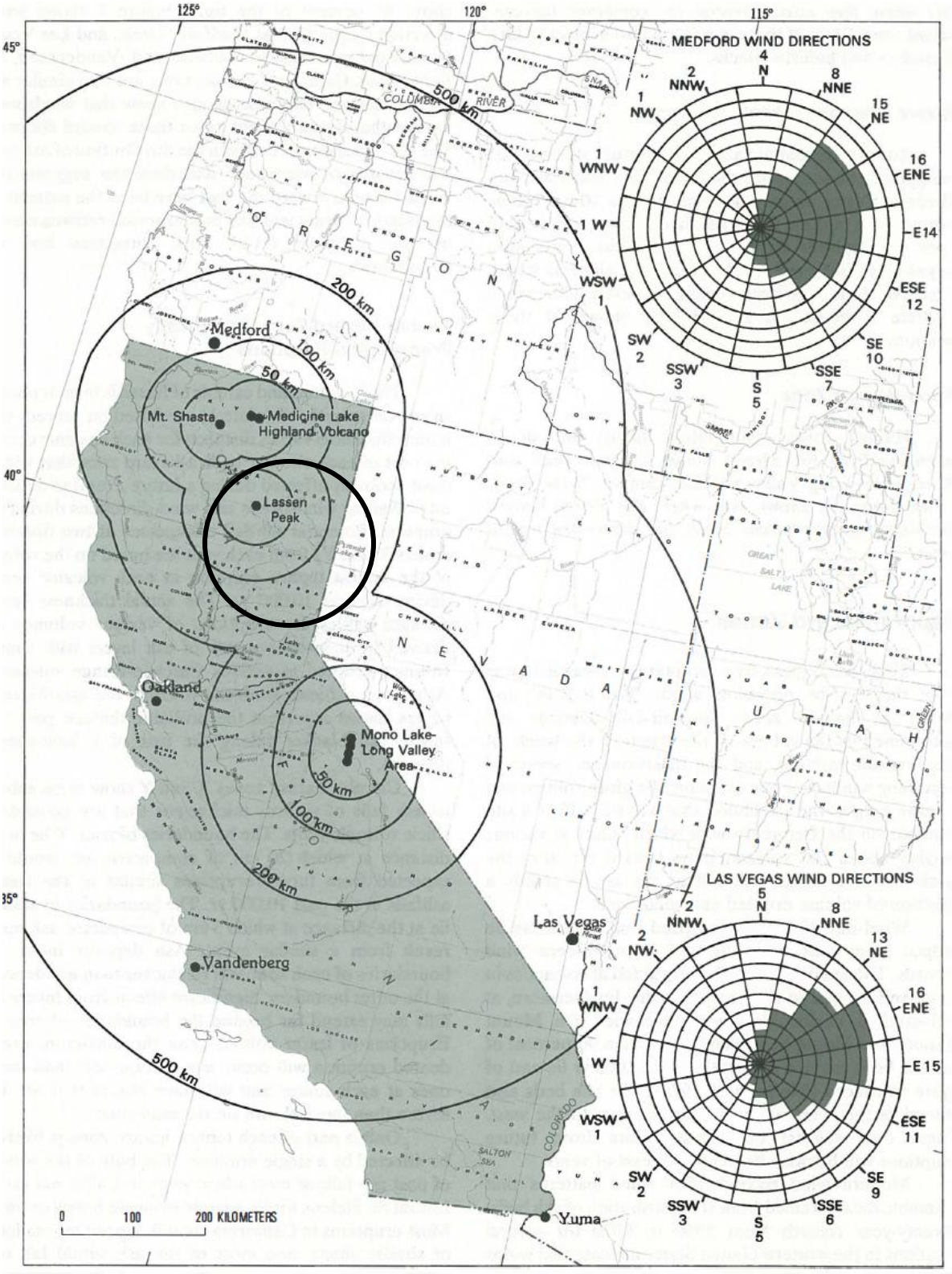
According to the USGS, Lassen Volcanic Center lies in Lassen Volcanic National Park 55 mi east of Redding. The park draws over 350,000 visitors each year with its spectacular volcanic landscapes. Lassen Volcanic Center is located at the southern edge of the Cascade Range, which is bounded on the west by the Sacramento Valley and the Klamath Mountains, on the south by the Sierra Nevada, and on the east by the

Basin and Range geologic provinces. Volcanism in the Lassen segment is a result of subduction of the Juan de Fuca oceanic plate eastward beneath the North American continental plate.

Volcano extent is traditionally measured in magma production and ashfall. Maps showing ashfall or magma affected areas have been created for the Lassen Volcanics Area:

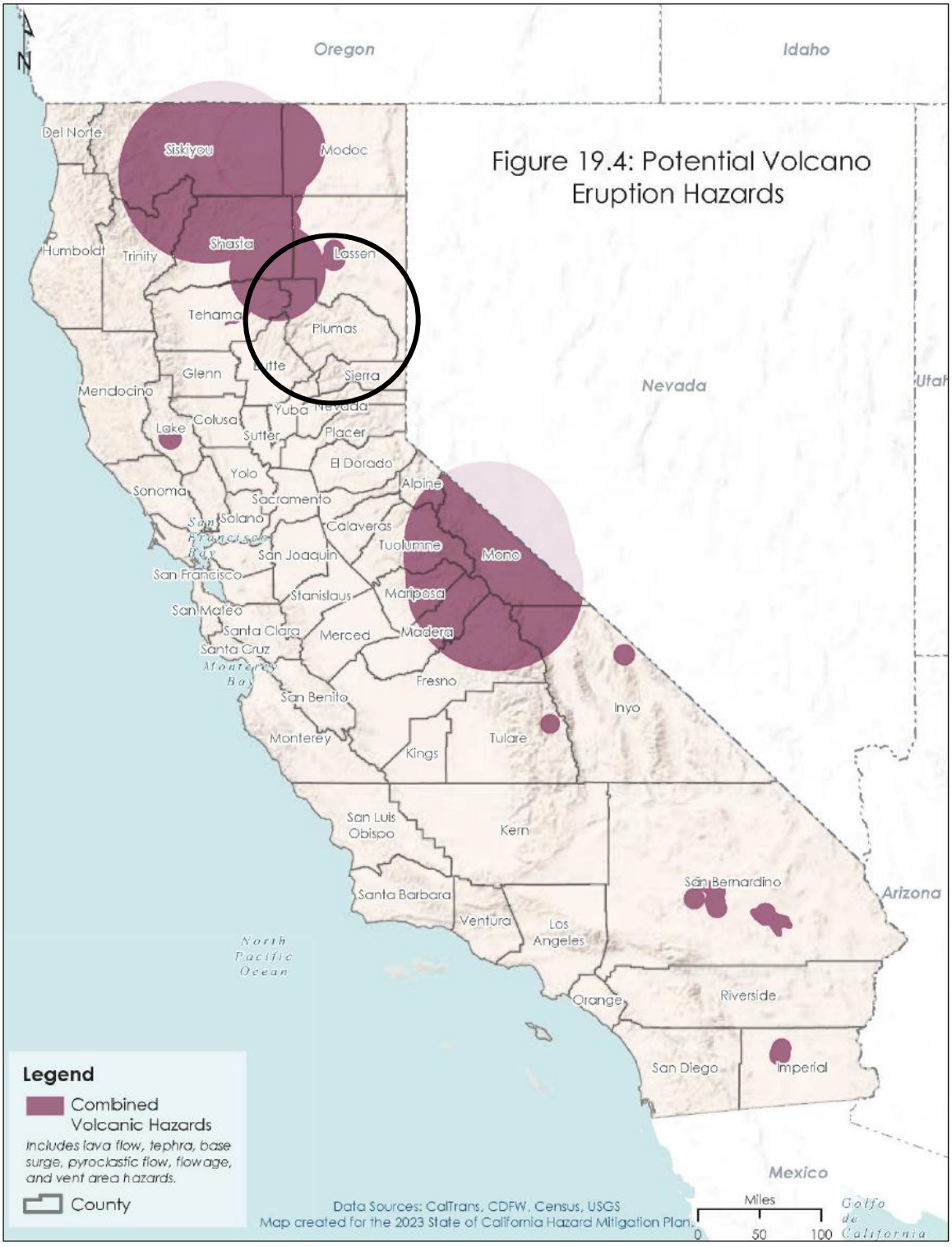
- These potential ashfall zones can be seen in Figure 4-183. The USGS noted that basaltic eruptions may build cinder cones as high as a few hundred meters (around 1,000 ft) and blanket many square kilometers with ash a few centimeters to meters thick. However, these eruptions would not typically impact human life if they occurred at Lassen volcanic center, because they are relatively nonviolent. More devastating ash eruptions occur when dacite magma charged with volcanic gases reaches the surface. In this case, an explosive vertical column of gas and ash may rise several kilometers into the atmosphere. Fallout from the eruption column can blanket areas within a few kilometers of the vent with a thick layer of tephra and high-altitude winds may carry finer ash tens to hundreds of kilometers from the volcano and pose a hazard to aircraft.
- Potential lava flow (among other volcanic issues) were mapped in the 2023 State of California Hazard Mitigation Plan. These areas touch the northeast portion of the County, as shown on Figure 4-184.

Figure 4-183 Potential Ashfall Areas for California Volcanoes



Source: USGS Bulletin 1847

Figure 4-184 Potential Volcano Eruption Hazards



Source: 2023 California State Hazard Mitigation Plan

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disasters related to volcano, as shown in Table 4-4. There have been no USDA disaster declarations for volcano.

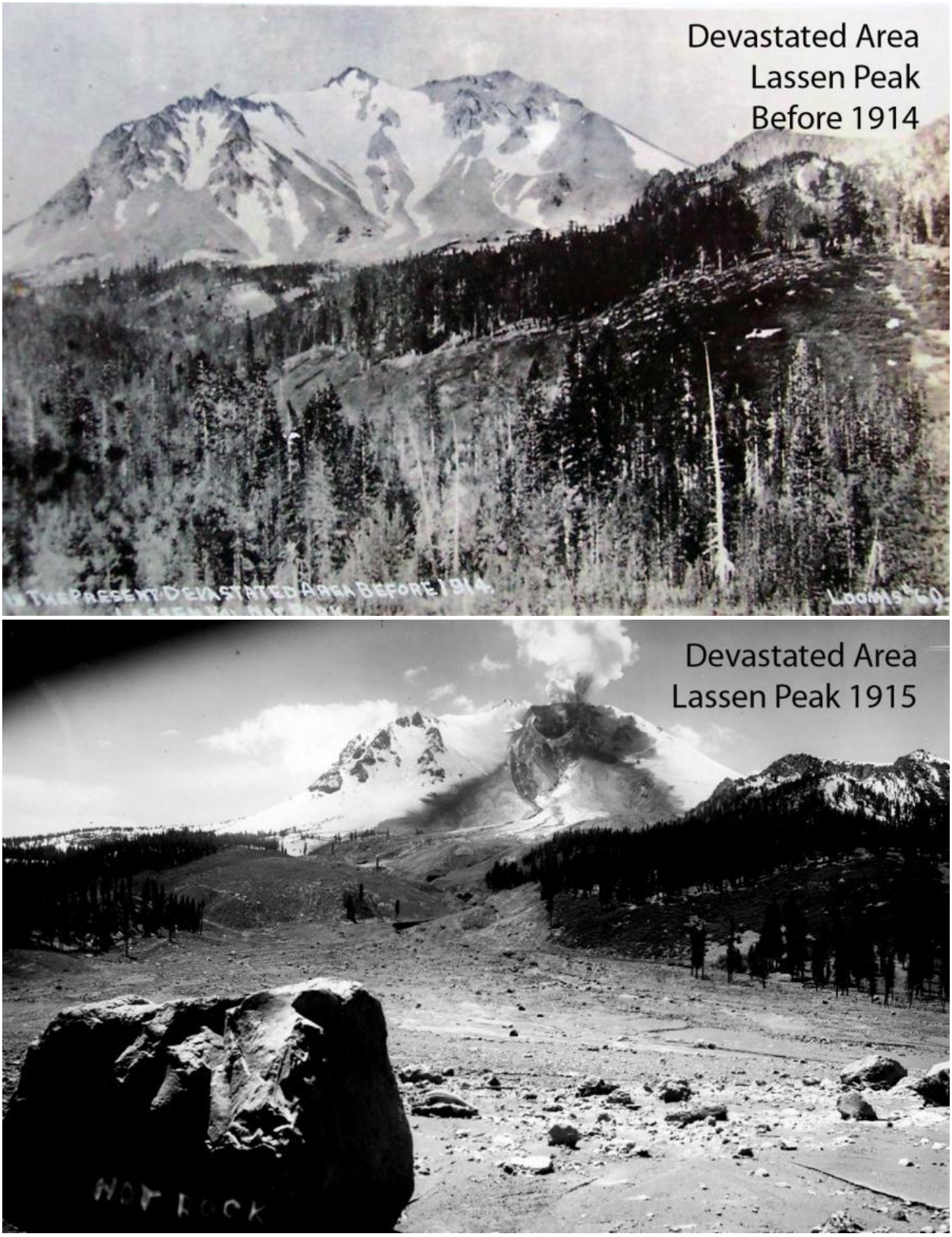
NCDC Events

The NCDC does not track volcanic activity.

USGS Events

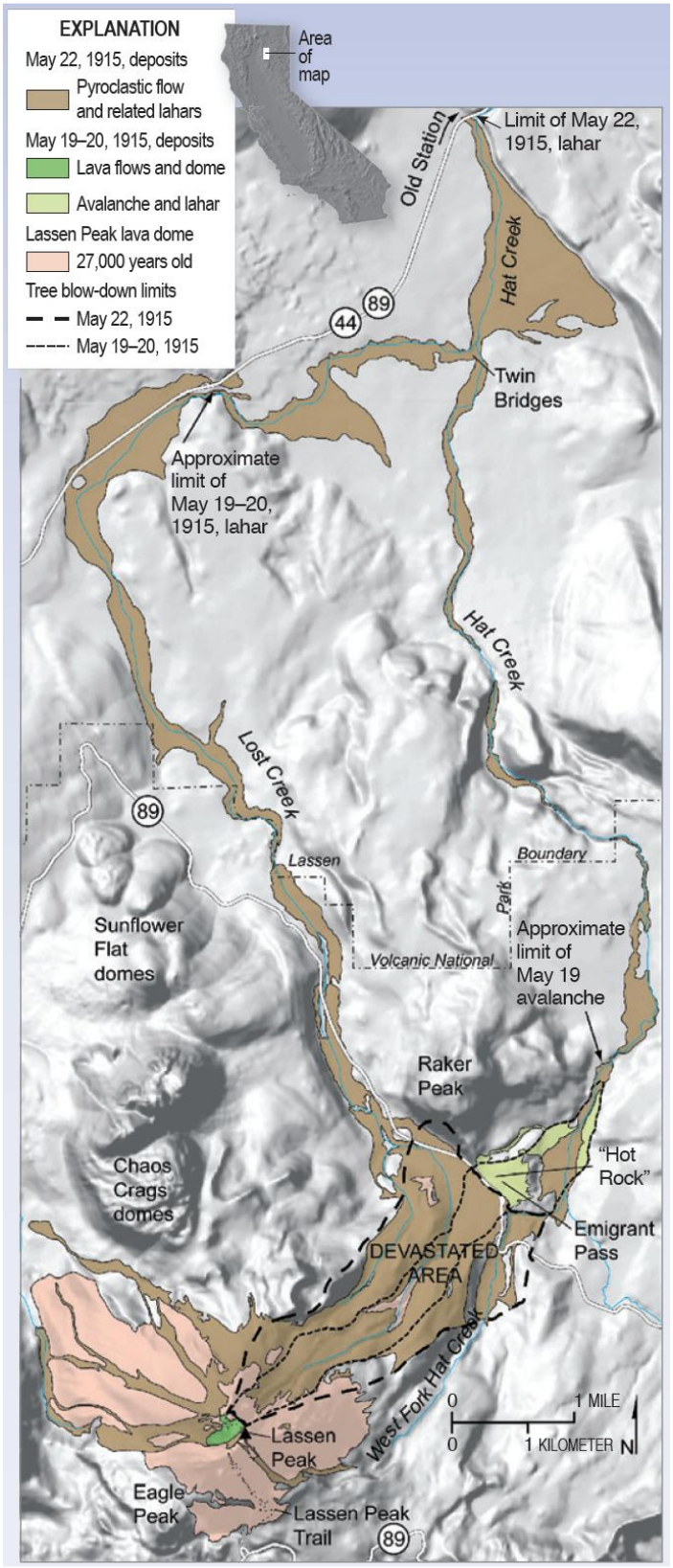
Within the last 825,000 years, hundreds of explosive eruptions came from vents scattered over approximately 200 mi^2. Surrounding Lassen Volcanic Center, over fifty effusive (non-explosive) eruptions have occurred in the last 100,000 years. The area has been relatively quiet for the last 25,000 years with three notable exceptions—the Chaos Crags eruption (1,100 years ago), the eruption of Cinder Cone (1666 A.D.), and the Lassen Peak eruption (A.D. 1914 to 1917). The Lassen Peak eruption consisted mostly of sporadic steam blasts. In May of 1915, however, partially molten rock oozing from the vent began building a precarious lava dome. The dome collapsed on May 19, sending an avalanche of hot rock down the north flank of the volcano. Three days later, a vertical column of ash exploded from the vent reaching altitudes of 30,000 feet. The ash column spawned a high-speed ground flow of hot gas and fragmented lava. Ash from the top of the column drifted downwind 200 miles to the east, as far as Winnemucca, NV. On both days, melting snow fueled mudflows, flooding drainages 20-30 miles away. Before and after pictures are shown on Figure 4-185, while Figure 4-186 shows the extent of damages due to the eruption.

Figure 4-185 1915 Lassen Volcano Eruption



Source: USGS

Figure 4-186 Deposits from Lassen Peak May 1915 Eruptions



Source: USGS – A Sight "Fearfully Grans" – Eruptions of Lassen Peak California, 1914 to 1917

The older Chaos Crags eruption was similar in style, but considerably larger in magnitude. Lassen Volcanic Center hosts a vigorous geothermal system, numerous hot springs, steam vents, and boiling mud pots. Volcanic earthquakes are common, although most are too small to be felt. Non-volcanic earthquakes along regional faults also occur—earthquake swarms in 1936, 1945-1947, and 1950 included several events above magnitude 4.0, with the two largest registering 5.0 and 5.5. Ground surveys show localized subsidence of the volcano, probably due to motion on regional faults.

Hazard Mitigation Planning Committee Events

The HMPC noted no volcanic events.

Likelihood of Future Occurrence

Unlikely—According to the USGS, volcanoes in the Lassen area tend to erupt infrequently, and may be inactive for periods lasting centuries or even millennia. The most recent eruptions in the Lassen area were the relatively small events that occurred at Lassen Peak between 1914 and 1917. The most recent large eruption produced Chaos Crags about 1,100 years ago. Such large eruptions in the Lassen area have an average recurrence interval of about 10,000 years. However, the geological history of the Lassen area indicates that volcanism there is episodic, having periods of relatively frequent eruptions separated by long quiet intervals. For example, the last large event before Chaos Crags eruption was the one that built Lassen Peak 27,000 years.

Climate Change and Volcano

Climate change is unlikely to influence volcanic eruptions.

Vulnerability Assessment

Vulnerability—Low

The population of Plumas County, California, faces low vulnerability to volcanic impacts due to the absence of active or high-threat volcanoes within or near the County. Lassen, located in Shasta County, last erupted in 1914-1917, and while it poses risks such as pyroclastic flows, ashfall, and lahars, these hazards diminish with distance. While lava flow wouldn't be a concern to the County, volcanic ash and gases could pose respiratory risks, particularly for vulnerable populations (e.g., the elderly, who make up a significant portion of Plumas County's residents).

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Low-level volcanic unrest can persist for decades or even hundreds of years without an eruption. Although steady, low-level unrest is normal for many young volcanoes, rapidly accelerating unrest is cause for concern. At California's most threatening volcanoes, monitoring sensors are in place to continuously track levels of unrest. Such monitoring is necessary to determine the baseline, or background level, of activity at a volcano to help volcanologists know what is normal. An uptick in unrest may be a sign of increased volcanic threat.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from volcano include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for both the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

People and Populations

Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away and cause problems for aviation. Vulnerable populations with respiratory issues would be at greatest vulnerability to the volcano hazard. The USGS, in Bulletin 1847, described the nature and probable distribution of potentially hazardous volcanic phenomena and their threat to people and property. It included hazard zonation maps that depicted areas relatively likely to be affected by future eruptions in California. Affected areas fall in Plumas County. This is shown on Figure 4-183.

Structures

Volcanic magma is expected to see limited impact to structures in Plumas County. Structures may be damaged by accumulation of falling lava fragments or burnt by their high heat. Ashfall can affect solar panels and other appurtenances. Ash may affect air conditioning and other HVAC systems. There is a risk of wildfires that may be ignited due to coarse ash that could impact structures within the County depending on where the wind would be blowing.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by a volcanic eruption. Ash can cause ventilation issues and large deposits can even clog pipes. Schools may have to close or operate on a reduced schedule due to health concerns of breathing in the ash. Hospitals may be temporarily overrun with patients with breathing issues.

Natural, Historic, and Cultural Resources

Park areas and natural resource assets in the Plumas County Planning Area may be vulnerable to a volcano. These include turfed areas; landscapes, trees, wildlife and habitat areas, and wetlands and marsh lands. Environmentally, ash contains toxic elements that can contaminate water, degrade soils, and disrupt local ecosystems. Historic and cultural resources that are protected by structures are not expected to be affected by this hazard.

FEMA NRI Hazard Vulnerability Assessment

Volcano is not an NRI hazard; therefore, no data is presented.

Impacts from Volcano

With respect to Plumas County, it is unlikely that lava flows would impact the Planning Area given the distance from Mt. Lassen; it is the potential for ash and gases associated with an eruption that could extend into the County causing issues. The impact of coarse ash fall is limited to the immediate area of the volcanic vent. Structures may be damaged by accumulation of falling lava fragments or burnt by their high heat. Wildfires may be ignited by coarse ash. Although generally non-lethal, fine ash fall is the most widespread and disruptive volcanic hazard. People exposed to fine ash commonly experience various eye, nose, and throat symptoms. Short-term exposures are not known to pose a significant health hazard. Long-term health effects have not been demonstrated conclusively. Ash deposited downwind of the volcano covers everything like a snowfall, but also infiltrates cracks and openings in machinery, buildings, and electronics. Falling ash can obscure sunlight, reducing visibility to zero. When wet, it can make paved surfaces slippery and impassable. Fine ash is abrasive, damaging surfaces and moving parts of machinery, vehicles, and aircraft. Life-threatening and costly damage can occur to aircraft that fly through fine ash clouds. Newly fallen volcanic ash may result in short-term physical and chemical changes in water quality. Close to the volcano, heavy ash fall may cause roofs to collapse, wastewater systems to clog, and power systems to shut down. In agricultural areas, fine ash can damage crops, and sicken livestock. Resuspension of ash by human activity and wind cause continuing disruption to daily life.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is unlikely to affect volcanic eruptions and associated impacts and vulnerability of the County.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to decrease for Plumas County and, as such, the vulnerability to this hazard may decrease. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard.
- Land use planning will have limited to no effects on volcanic eruption. There are no building codes in effect that take volcano into account. Additionally, there are no land use restrictions in volcano prone areas. Changes in land use are unlikely to increase or decrease the vulnerability of the County to a volcanic eruption.

Future development in the County may be at risk to volcanic activity; however, future development is at no greater risk to volcanic activity than current development. Further, given the uncertainties with regard to volcanic activity, it is unlikely that future development activities would be constrained in any manner.

4.3.16. Wildfire

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Plumas County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for the Plumas County Planning Area. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months. However, in recent years, wildfire season is more of a year around event. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Economic losses could also result. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides and mudflows, and erosion during the rainy season. Additional losses could occur if PG&E or

PSREC initiates a power shutdown during extreme fire weather conditions. This is discussed in greater detail at the beginning of Section 4.3.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the 2019/2020 LHMPs have created significant air pollution affecting area residents. County residents have been affected by wildfire smoke and poor air quality, from fires both within the Planning Area and from those much further away. The County has seen air quality impacts from smoke from wildfires since the 2019/2020 LHMPs. During these times, air sensors in the County showed periods of very poor air quality in Plumas County. This was especially a concern during Covid. A document titled Smoke Impacts CA: 2020 Lessons – 2021 Actions that was published by the US Forest Service noted that wildfire smoke exposure could result in greater susceptibility to COVID-19 and other viruses/bacteria (decrease in local and systemic immune function).

According to FirstStreet.org, a climate risk data organization, elderly individuals are at an adversely high risk of experiencing negative health impacts from poor air quality, like worsening of heart disease and the potential for stroke, reduced lung capacity, and increase in lung disease.

The paper "Wildland fire management and air quality in the southern Sierra Nevada: Using the Lion Fire as a case study with a multi-year perspective on PM2.5 impacts and fire policy" by D. Schweizer and R. Cisneros explores the impacts of smoke from high-intensity, stand replacing fires versus lower intensity fires in the Sierra Nevada and explains that while smoke and fire mitigation is important with any fire, we the extreme effects of smoke from large wildfires can be prevented by managing forests and allowing low intensity fires to burn.

Location and Extent

Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time or may have durations lasting for a week or more. Wildfire can affect any area of the Planning Area; however, CAL FIRE has mapped areas in California that are at risk to wildfire. Maps showing the various Fire Hazard Severity Zones, which range from Non-Wildland/Non-Urban to Very High, can be found below. CAL FIRE Fire Hazard Severity Zones have been developed specific to Fire Responsibility Areas located in the County which details the responsible fire agency for each area of the County; specifically, federal, state, and local areas also shown in the below maps.

This section is broken down into three parts: a discussion on the wildland urban interface in Plumas, the Plumas County wildfire setting, and the (CAL FIRE) Fire Responsibility Area and Fire Hazard Severity Zone Mapping.

Wildland Urban Interface

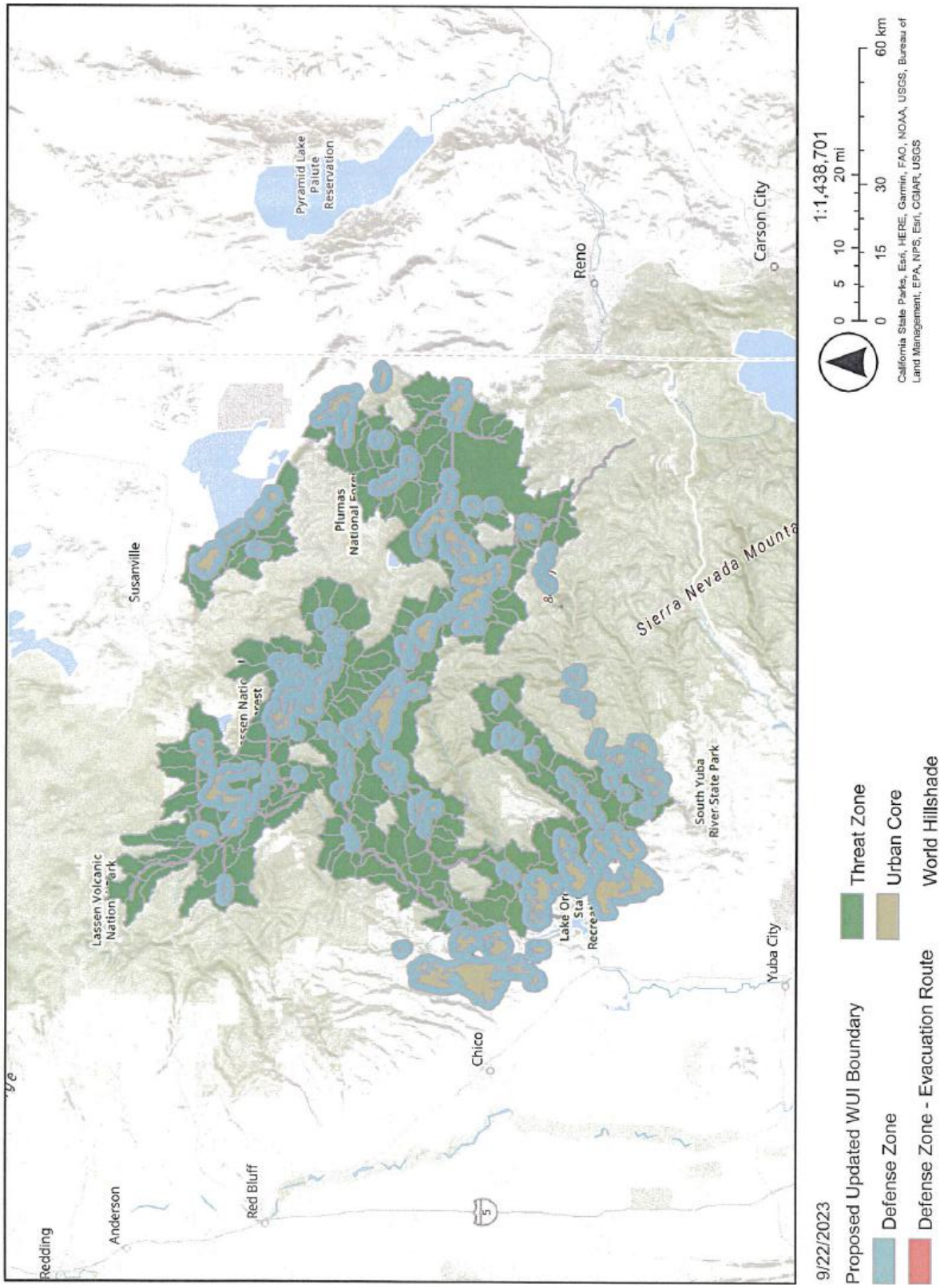
Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. The WUI defines the community development into the foothills and mountainous areas of California. The WUI describes those communities that are mixed in with grass, brush and timbered covered lands (wildland). These are areas where wildland fire once burned only vegetation but now burns homes as well. The WUI for Plumas County consists of communities at risk (shown in Section 4.3.15) as well as the area around the communities that pose a fire threat.

There are two types of WUI environments. The first is the true urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low-density communities where homes are intermixed in wildland areas. Wildland urban intermix communities are difficult to defend because they are sprawling communities over a large geographical area with wild fuels throughout. This profile makes access, structure protection, and fire control difficult as fire can freely run through the community.

WUI fires are often the most damaging. WUI fires occur where the natural forested landscape and urban built environment meet or intersect. Even relatively small acreage fires may result in disastrous damages. The damages are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

The WUI for Plumas County adopted by the County is shown on Figure 4-187.

Figure 4-187 WUI Boundaries in Plumas County



Source: Plumas County Fire Safe Council

The HMPC did note that there is no standard definition of how to delineate the boundaries of any particular WUI area. The Fire Safe Council map that is embedded in the document was approved by the Plumas County Board of Supervisors. From the CWPP regarding Plumas County's WUI:

> ***In 2004-2005 when the first Plumas County WUI map was developed the concept was to have two WUI boundaries, an "Adjacent WUI" and an Extended WUI", (0-.75 and.75 to 1.5 mile respectively). Consequently, the GIS program generated WUI's with circles around the CAR's, using the above criteria.***
>
> ***In 2010, the WUI boundaries were expanded to better link communities and the WUI. While implementing the CWPP since 2005, it became apparent to PC FSC during collaborative project outreach & development that the earlier computer generated WUI boundaries should be more contiguous with respect to connecting communities and logical in terms of watersheds, ridges, valleys or roads. Earlier WUI circle maps weren't well suited to watershed scale and larger community project planning. On November 2, 2010, the Plumas County Board of Supervisors approved the updated "Wildland Urban Interface" Map.***

Plumas County Wildfire Setting

As previously stated, there are areas in the County that are prone to wildfire. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Generally, there are four major factors that contribute to and sustain wildfires and allow for predictions of a given area's potential for ignitions and to burn. These factors include fuel, topography, weather, and human actions.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source, are man-made structures and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for fire spread. The volume of available fuel is described in terms of Fuel Loading. Certain areas in and surrounding Plumas County are extremely vulnerable to fires as a result of overgrown fuels combined with a growing number of structures being built near and within rural lands. Fuel is the only factor that is under human control.
- **Topography** – An area's terrain and land slopes affect its susceptibility to wildfire spread. Fire intensities and rates of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The natural arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes. According to the Plumas County 2019 CWPP, Plumas County sits mostly in the Sierra Nevada Range and lies between the Central Valley and Great Basin. There are about 30 mountain peaks over 7,000 feet in elevation. Most of the population centers are over 3,400 feet. Wide ranges of elevation (1,600- 8,000+ feet) are responsible in part for the variety of climates and vegetation found in the County. Another significant factor is the continuous interaction of maritime

air masses with those of continental origin. The combination of these influences results in pronounced climatic changes within short distances.

- **Weather** – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater the wind, the faster a fire will spread, and the more intense it will be. Winds can be significant at times in Plumas County. Wind from the Central Valley is especially conducive to hot, dry conditions, in the Sierra Foothills, which can lead to extreme fire danger. Wind shifts, in addition to wind speed, can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Most wind shifts in Plumas County occur in the Feather River Canyon. According to the 2019 CWPP, since 1970, most of the acres burned have been under southwest and north wind conditions. Critical fire weather patterns vary within the County, but mostly a southwest flow, which occurs across Plumas County due to the general wind flow associated with air moving from sea to land and California lying in the "Belt of the Westerlies" global circulation pattern. In addition to the general southwesterly flow, topography and local up canyon flow from diurnal heating of the Sacramento Valley complement this air movement, usually increasing speeds. The strongest southwest winds are associated with frontal system or low-pressure trough. These winds tend to cause most of the large fires in the county to burn from the southwest to the northeast. On the western slopes of the County, before the crest of the Sierras, most large fires are driven from east to west by north and east winds, when a high-pressure form over the Great Basin and reversing normal air flows from land to sea. These conditions are magnified at night and in the early morning hours when down canyon winds are accelerated by the local diurnal process, the general flow and channeled topographically. These north and east wind events usually occur in the spring and fall and have the largest impacts in the Feather River Canyons. In these events, relative humidity is also lower as the air mass originates on land versus sea, and as the air moves downslope it compresses, creating additional lowering. This is similar to what occurs in Southern California during Santa Ana conditions. Meteorologists with the US Forest Service conducted a study of these wind events. They found that while these patterns only occurred about 25% of the time in fire season, that 90% of large fires, on the western slopes, burned during those events. As part of a weather system, lightning also ignites wildfires, often in difficult to reach terrain for firefighters. Related to weather is the issue of recent drought conditions contributing to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases.
- **Human Actions** – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

California Department of Forestry and Fire Protection (CAL FIRE) Fire Responsibility Area and Fire Hazard Severity Zone Mapping

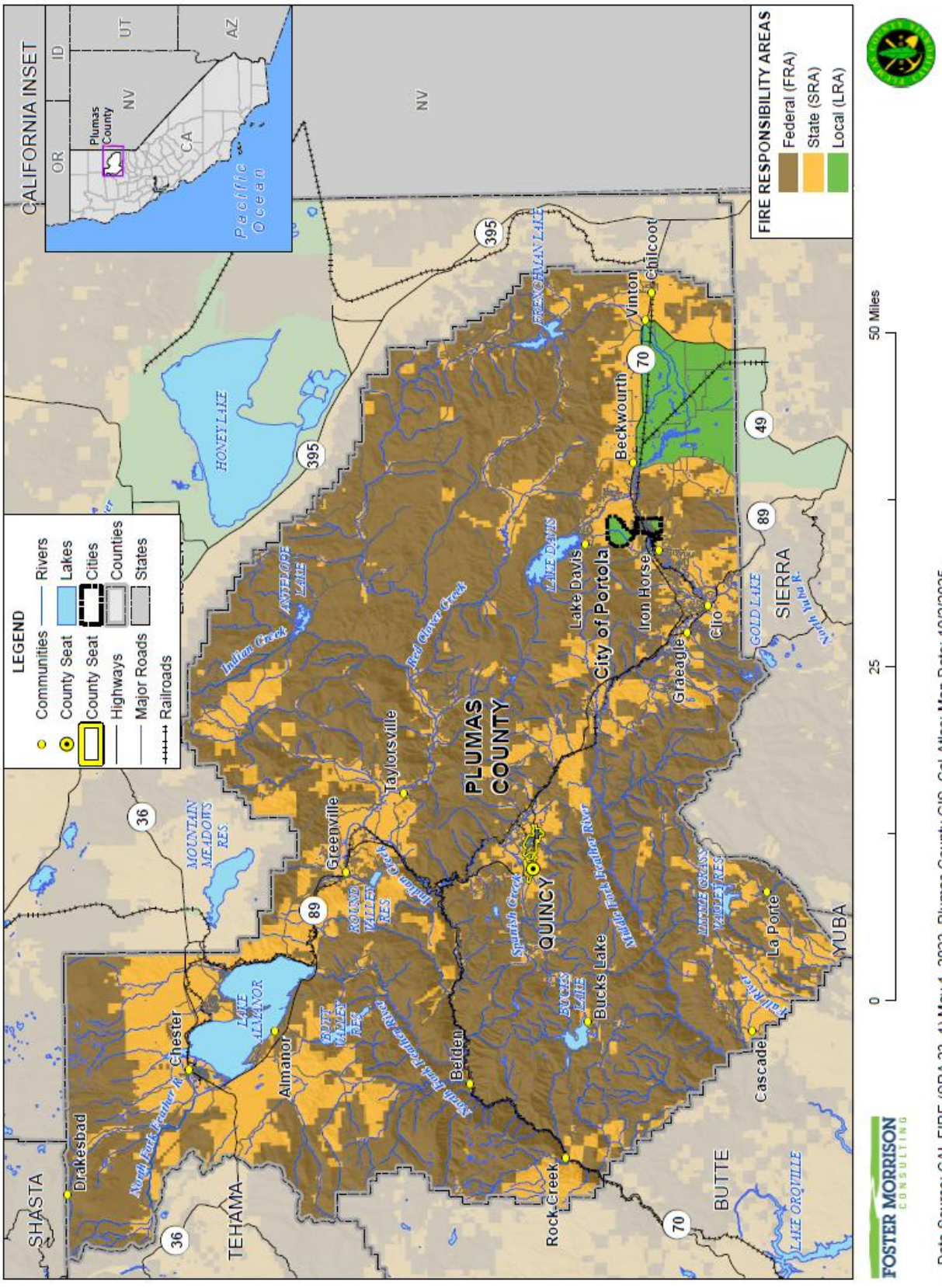
CAL FIRE mapping of Fire Responsibility Areas and Fire Hazard Severity Zone Mapping is shown below for the Plumas County Planning Area.

CAL FIRE Fire Responsibility Areas

There are various wildland fire protection agencies that have responsibility within the California communities. There are also numerous fire departments and fire protection districts that serve local areas, many of whom have mutual aid agreements with each other as well as federal and state agencies for fire suppression and protection. Fire Responsibility areas are generally categorized by FRA, SRA and LRA.

The CAL FIRE data, detailing Fire Responsibility Areas within the City Planning Area, was utilized to determine the locations of the County falling within each Fire Responsibility Area. CAL FIRE has a legal responsibility to provide fire protection on all SRA lands, which are defined based on land ownership, population density and land use. CAL FIRE's LRA lands show where the local jurisdictions have primary responsibility for fire protection. CAL FIRE's FRA areas detail where the federal government has responsibility. Using the 2023 FRA mapping layer, Fire Responsibility Areas are shown below.

Figure 4-188 Plumas County Planning Area – SRA/FRA/LRA Areas



CAL FIRE Fire Hazard Severity Zone Mapping

As part of the Fire and Resource Assessment Program (FRAP), the State Fire Marshall was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors, including areas where winds have been identified as a major cause of wildfire spread. These zones, referred to as Fire Hazard Severity Zones (FHSZs), include non-wildland/non-urban, moderate, high, and very high FHSZs. The FHSZ map evaluates hazard, not risk. Hazard is based on the physical conditions that create a likelihood and expected fire behavior over a 30-50 year period without considering mitigation measures such as home hardening, recent wildfire, or fuel reduction efforts. Risk is the potential damage a fire can do to an area under existing conditions, accounting for any modification such as fuel reduction projects, defensible space, and ignition resistant building construction.

CAL FIRE's FHSZ mapping for California, including Plumas County, has recently been updated as detailed below. The new FHSZ mapping will create more accurate zone designations that can direct the implementation of mitigation strategies in areas where hazards warrant these investments.

Effective April 1, 2024, CAL FIRE updated its Fire Hazard Severity Zone (FHSZ) maps for the State Responsibility Area (SRA) to provide updated map zones based on new science in local climate data and improved fire assessment modeling. The FHSZ model for wildland fire has two key elements: probability of an area burning and expected fire behavior under extreme fuel and weather conditions. The factors considered in determining fire hazard within wildland areas are fire history, flame length, terrain, local weather, and the potential fuel over a 50-year period. Outside of wildlands, the model considers factors that might lead to buildings being threatened, including terrain, weather, urban vegetation cover, blowing embers, proximity to wildland, fire history and fire hazard in nearby wildlands. FHSZs are not a structure loss model, as key information regarding structure ignition (such as roof type, etc.) is not included.

The FHSZ data for the Federal Responsibility Area has not been updated since 2007.

Effective February 10, 2025, CAL FIRE also updated its Fire Hazard Severity Zone (FHSZ) maps for the Local Responsibility Areas (LRA) to provide updated map zones based on new science in local climate data and improved fire assessment modeling.

New FHSZ mapping for Plumas County is utilized for this LHMP using two separate analyses: The SRA/FRA FHSZ mapping has been combined into one map and analysis and the LRA FHSZ mapping is included in a separate analysis and described below:

- Figure 4-189 shows the FHSZ map for the SRA/FRA in the Plumas County Planning Area. Geographic extents of wildfire FHSZs in the FRA and SRA for the Plumas County Planning Area is detailed in Table 4-120.
- Figure 4-190 shows the FHSZ map for the LRA in the Plumas County Planning Area. This map has three inset areas. These inset maps are shown on Figure 4-191, Figure 4-192, and Figure 4-193. Geographic extents of wildfire FHSZs in the LRA for the Plumas County Planning Area is detailed in Table 4-121.

Details on each jurisdiction's Fire Hazard Severity Zone extents (for both SRA/FRA and LRA) can be found in their respective annexes to this LHMP Update.

Figure 4-189 Plumas County Planning Area – CAL FIRE SRA/FRA Fire Hazard Severity Zones

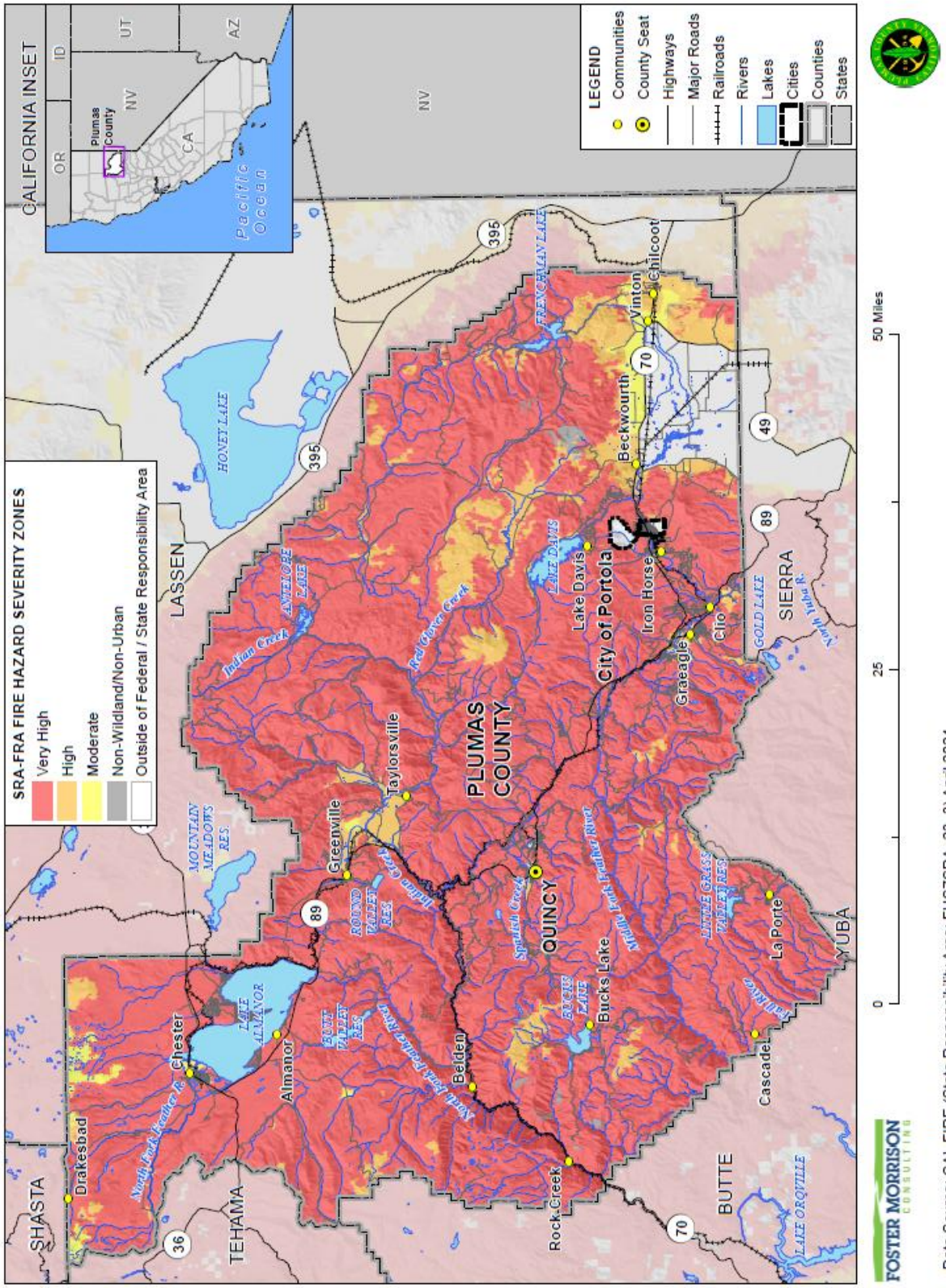


Table 4-120 Plumas County Planning Area – Geographical Extent of CAL FIRE SRA/FRA Fire Hazard Severity Zones

SRA/FRA Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
Very High	5	0.2%	3	0.1%	2	0.2%
High	5	0.1%	0.0001	0.000004%	5	0.4%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland/Non-Urban	0	0.0%	0	0.0%	0	0.0%
Outside of Federal / State Responsibility Area	3,481	99.7%	2,234	99.9%	1,246	99.4%
Grand Total	**3,491**	**100.0%**	**2,237**	**100.0%**	**1,254**	**100.0%**
Unincorporated Plumas County						
Very High	1,454,532	87.2%	40,739	44.9%	1,413,793	89.6%
High	116,705	7.0%	19,400	21.4%	97,305	6.2%
Moderate	39,004	2.3%	6,405	7.1%	32,599	2.1%
Non-Wildland/Non-Urban	13,602	0.8%	0.01	0.00001%	13,602	0.9%
Outside of Federal / State Responsibility Area	44,775	2.7%	24,214	26.7%	20,560	1.3%
Grand Total	**1,668,618**	**100.0%**	**90,759**	**100.0%**	**1,577,859**	**100.0%**

Source: CAL FIRE (FHSZ SRA 2024, FHSZ FRA 2007)

Figure 4-190 Plumas County Planning Area – CAL FIRE LRA Fire Hazard Severity Zones (Overview and Map Insets)

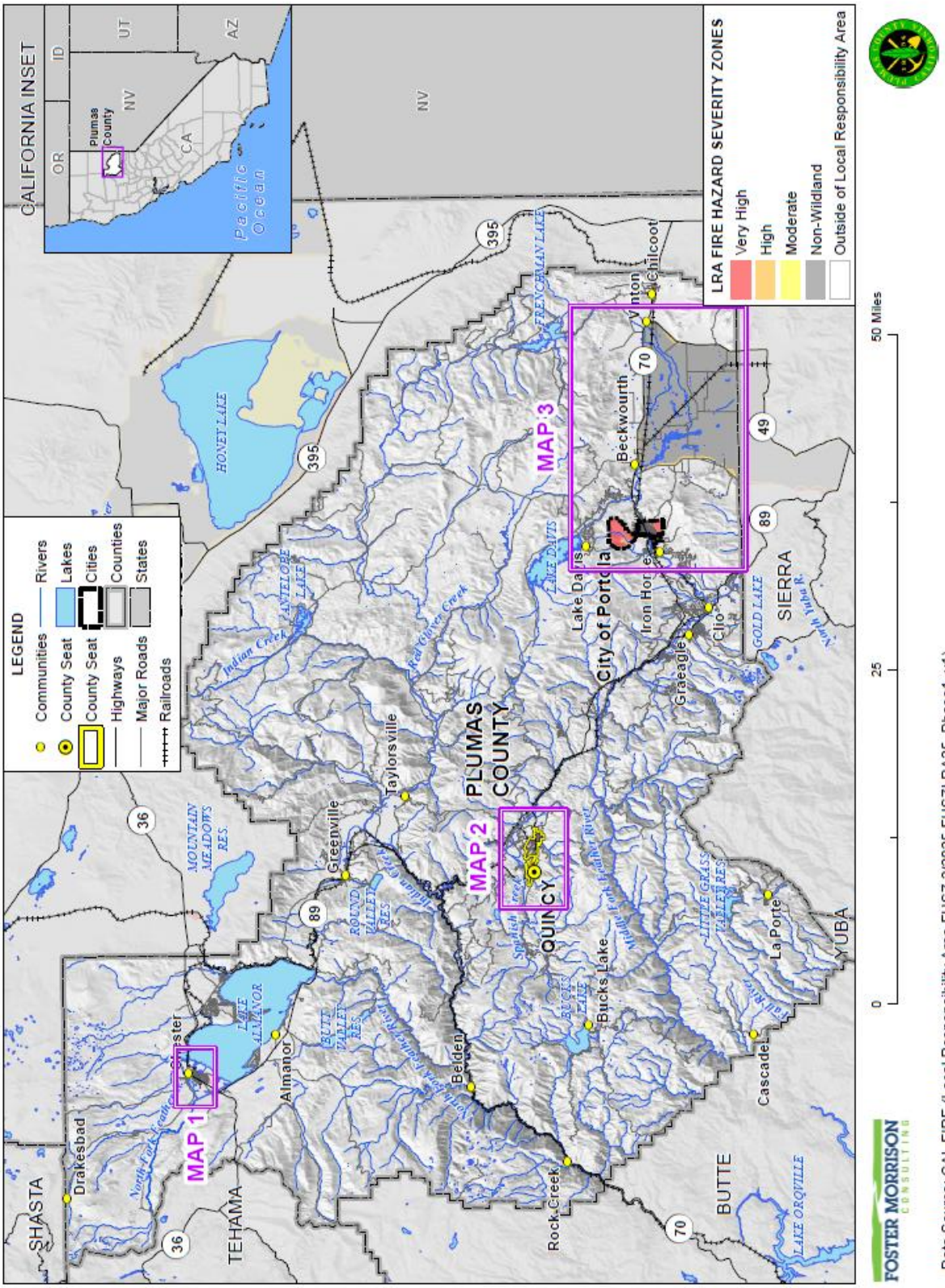


Figure 4-191 Plumas County Planning Area –CAL FIRE LRA Fire Hazard Severity Zones (Map Inset 1)

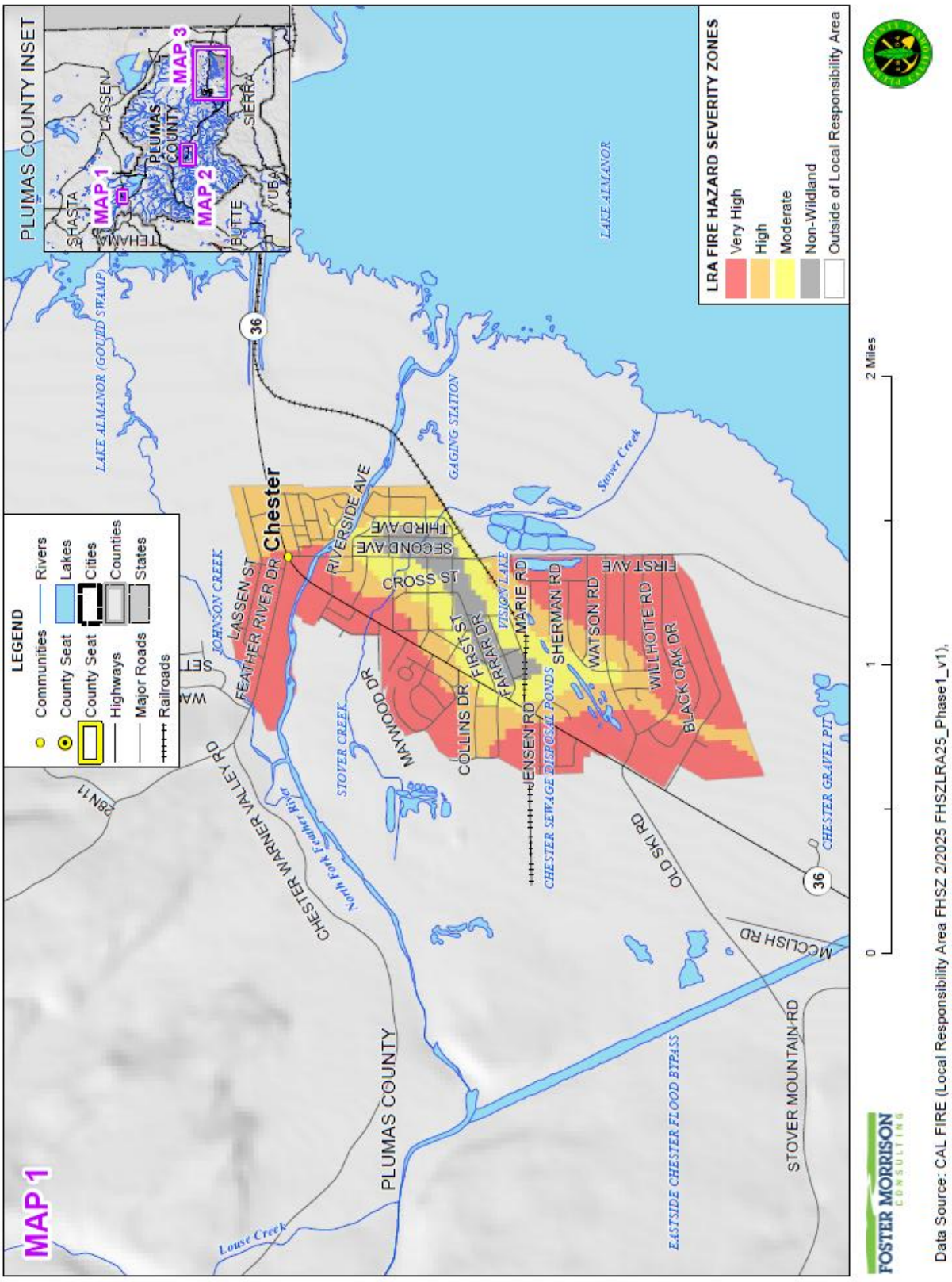


Figure 4-192 Plumas County Planning Area –CAL FIRE LRA Fire Hazard Severity Zones (Map Inset 2)

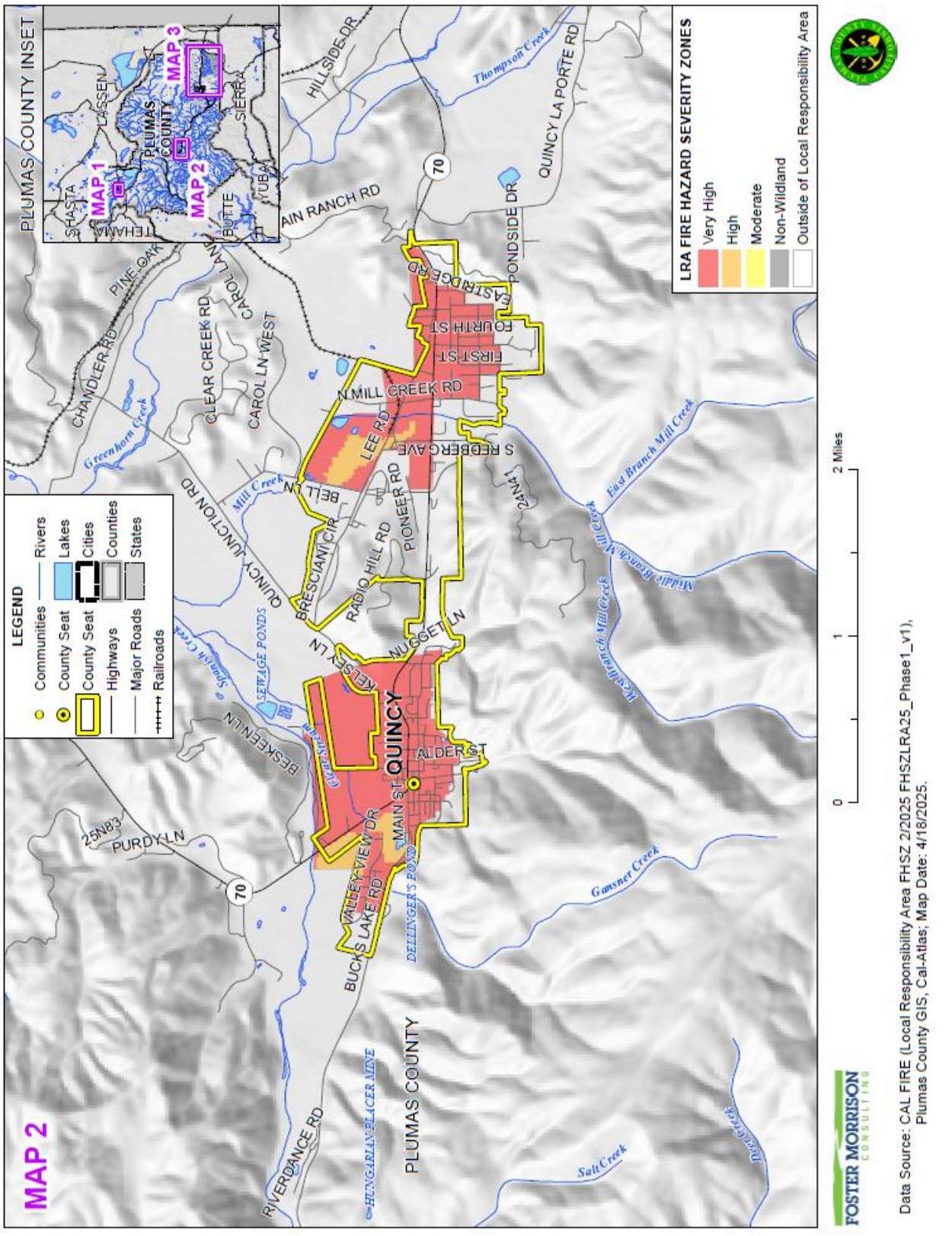


Figure 4-193 Plumas County Planning Area –CAL FIRE LRA Fire Hazard Severity Zones (Map Inset 3)

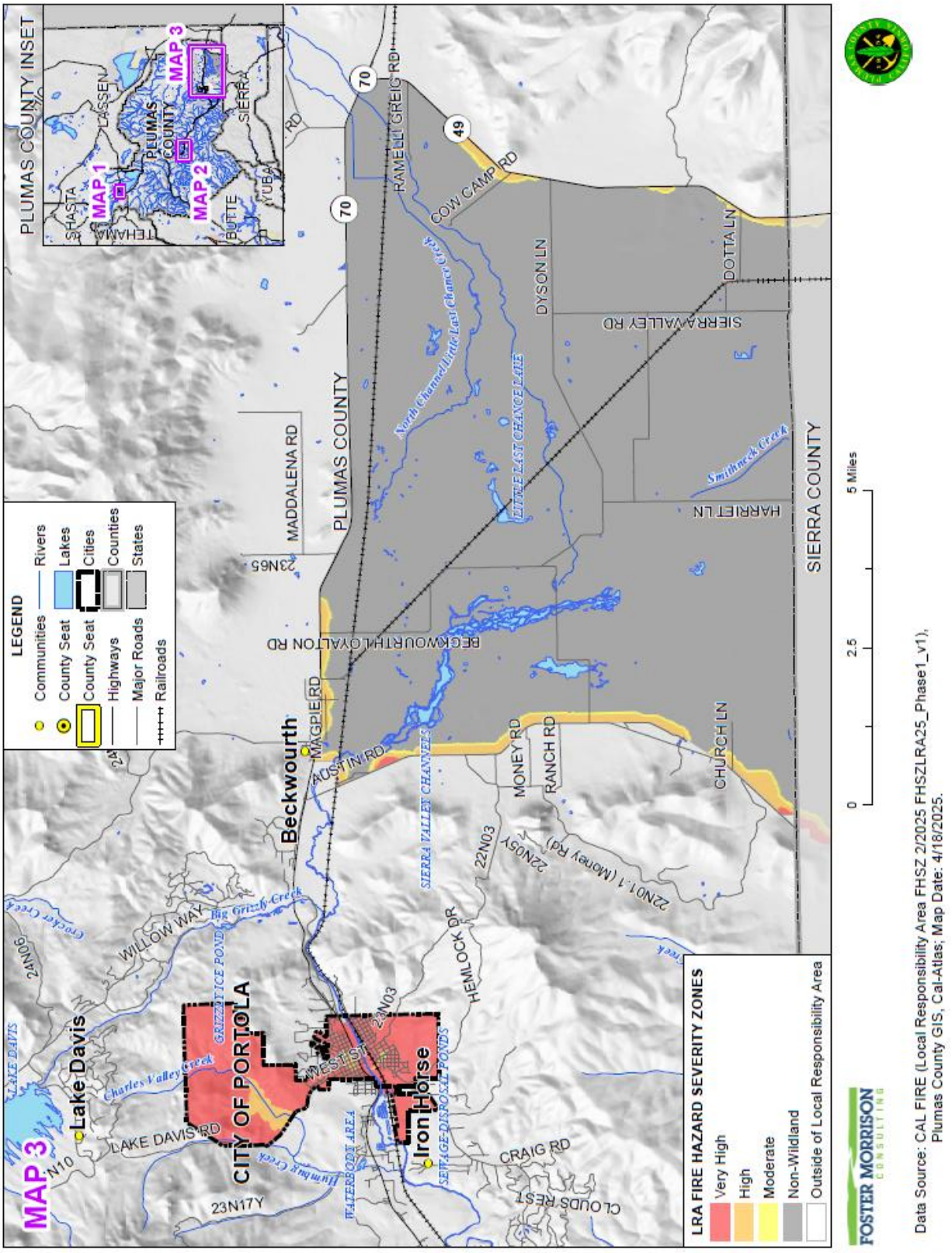


Table 4-121 Plumas County Planning Area – Geographical Extent of CAL FIRE LRA Fire Hazard Severity Zones

LRA Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
Very High	3,235	92.7%	2,016	90.1%	1,219	97.2%
High	250	7.2%	221	9.9%	28	2.26%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland	0	0.0%	0	0.0%	0	0.0%
Outside of Local Responsibility Area	6	0.2%	0	0.0%	6	0.5%
Grand Total	**3,491**	**100.0%**	**2,237**	**100.0%**	**1,254**	**100.0%**
Unincorporated Plumas County						
Very High	1,400	0.1%	742	0.8%	658	0.04%
High	1,279	0.1%	588	0.6%	690	0.04%
Moderate	488	0.03%	258	0.3%	230	0.01%
Non-Wildland	41,625	2.5%	22,641	24.9%	18,984	1.2%
Outside of Local Responsibility Area	1,623,211	97.3%	66,542	73.3%	1,556,670	98.7%
Grand Total	**1,668,003**	**100.0%**	**90,771**	**100.0%**	**1,577,231**	**100.0%**

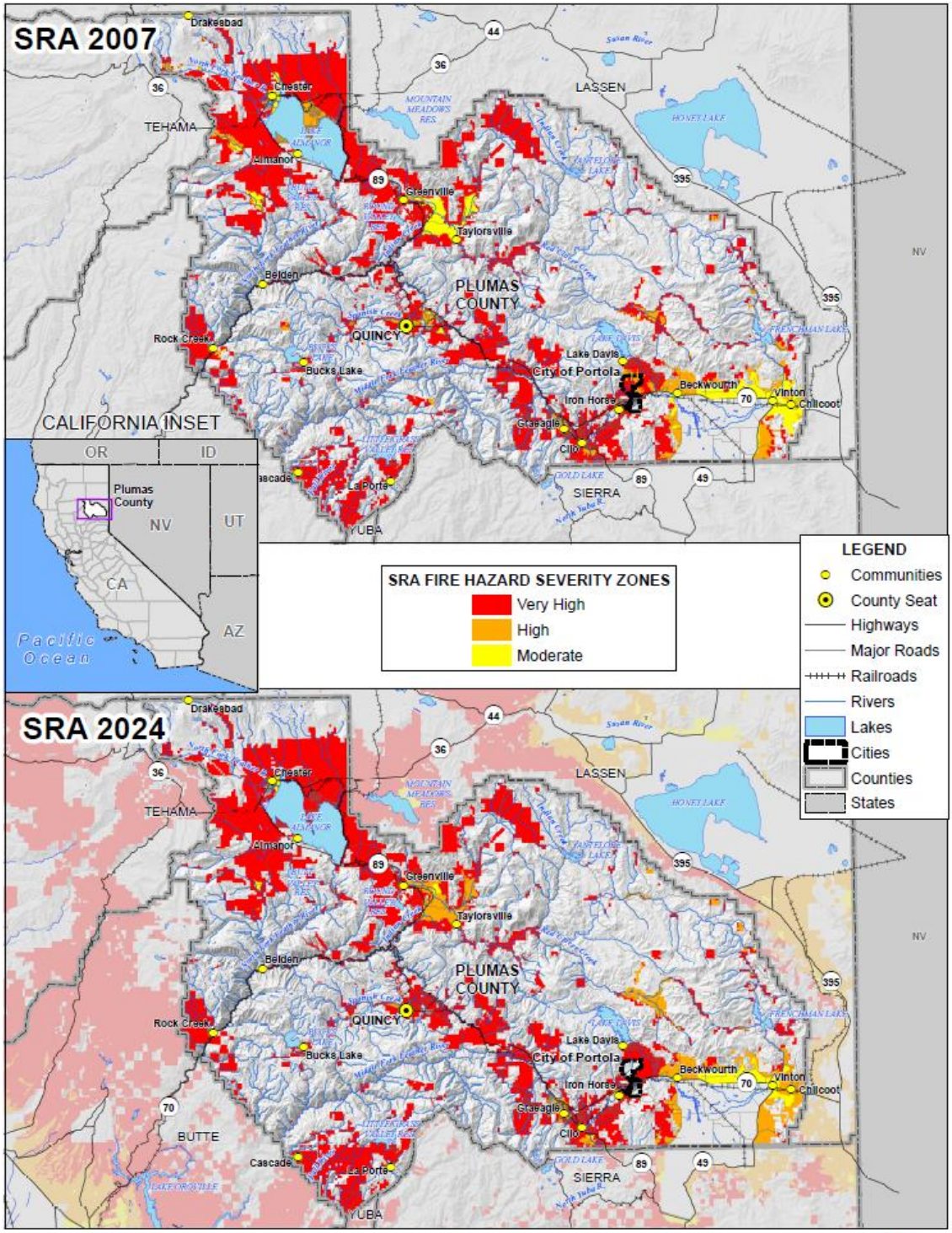
Source: CAL FIRE (LRA 2025)

CAL FIRE Fire Hazard Severity Zone Comparison

Given the new CAL FIRE Fire Hazard Severity Zone mapping for the SRA (2024) and the LRA (2025), a comparison of the previous CAL FIRE FHSZ mapping from 2007 was conducted. Figure 4-194 and Table 4-122 shows the 2007 FHSZ data compared to the 2024 FHSZ data for the SRA within the Plumas County Planning Area and Figure 4-195 and Table 4-123 shows the FHSZ data comparison for the LRA datasets.

Based on this comparative analysis, while many of the FHSZs have changed within the two (SRA and LRA) analyses, much of the change can be contributed to mapped areas being reallocated to new State and Local Fire Responsibility Areas. As such, the risk and vulnerability of the County Planning Area to wildfire remains significant. Further given the topography and fuels located throughout the Planning Areas, and the history of devastating wildfires in and around Plumas County, wildfire continues to be one of the County's most significant hazard of concern.

Figure 4-194 Plumas County Planning Area – SRA FHSZ Comparison



FOSTER MORRISON CONSULTING

2007 Data Source: CAL FIRE (State Responsibility Area: fhszs06_3_32) November 2007, Plumas County GIS, Cal-Atlas; Map Date: 03/01/2020.

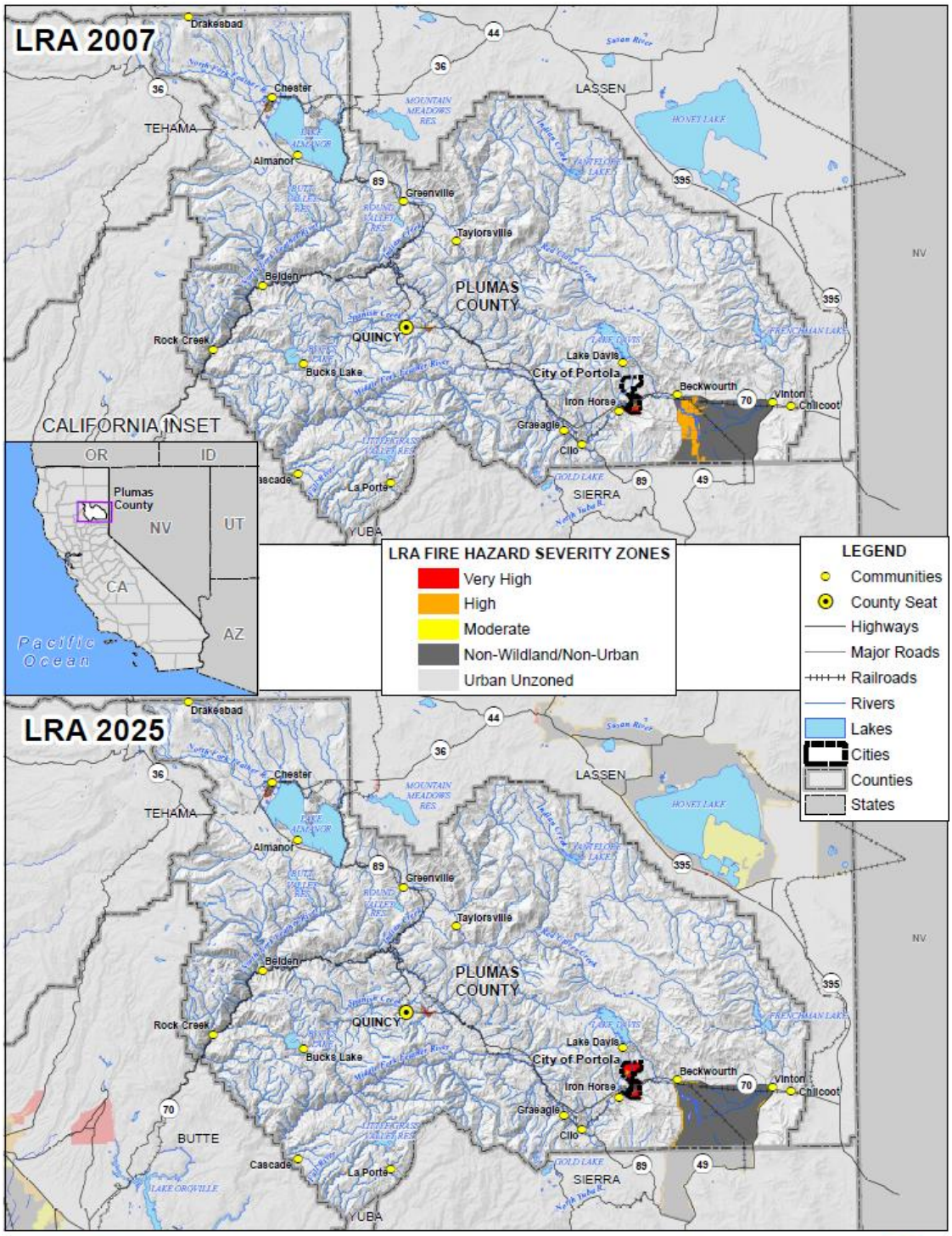
2024 Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024, Plumas County GIS, Cal-Atlas; Map Date: 9/30/2025.

Table 4-122 Plumas County Planning Area – SRA/FRA FHSZ Comparisons by Jurisdiction

Jurisdictions / Fire Hazard Severity Zones	Overall Acre Change			% Acre Change		
	Total Acres Plumas 2007	Total Acres Plumas 2024	Overall Change in Total Acres	% of Total Acres Plumas 2007	% of Total Acres Plumas 2024	Overall Change in % Total Acres
City of Portola						
Very High	1,265	0.02	-1,265	0.3%	0.000004%	-0.3%
High	777	0.0001	-777	0.2%	0.00000002%	-0.2%
Moderate	0.001	0	-0.001	0.0000002%	0%	-0.0000002%
City of Portola Total	**2,043**	**0.0201**	**-2,043**	**0.5%**	**0.000004%**	**-0.5%**
Unincorporated Plumas County						
Very High	342,434	354,154	11,720	77%	81%	3.5%
High	35,436	52,768	17,332	8%	12%	4.1%
Moderate	62,329	30,500	-31,829	14%	7%	-7.1%
Unincorporated Plumas County Total	**440,199**	**437,422**	**-2,778**	**99.5%**	**100.0%**	**0.5%**

Source: CAL FIRE

Figure 4-195 Plumas County Planning Area – LRA FHSZ Comparison



2007 Data Source: CAL FIRE (Local Responsibility Area: c32fhszl06_3) September 2007, Plumas County GIS, Cal-Atlas; Map Date: 03/01/2020.

2025 Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase1_v1) February 2025, Plumas County GIS, Cal-Atlas; Map Date: 9/30/2025.

Table 4-123 Plumas County Planning Area – LRA FHSZ Comparisons by Jurisdiction

Jurisdictions / Fire Hazard Severity Zones	Overall Acre Change			% Acre Change		
	Total Acres Plumas 2007	Total Acres Plumas 2025	Overall Change in Total Acres	% of Total Acres Plumas 2007	% of Total Acres Plumas 2025	Overall Change in % Total Acres
City of Portola						
Very High	812	3,235	2,423	2%	6.7%	5.0%
High	468	250	-218	1%	0.5%	-0.5%
Moderate	205	0	-205	0.4%	0%	-0.4%
Non-Wildland/Non-Urban	0	0	0	0%	0%	0%
Urban Unzoned	0	0	0	0%	0%	0%
City of Portola Total	**1,485**	**3,485**	**2,000**	**3%**	**7%**	**4%**
Unincorporated Plumas County						
Very High	772	1,400	628	2%	3%	1%
High	8,098	1,279	-6,819	17%	3%	-15%
Moderate	361	488	127	1%	1%	0.2%
Non-Wildland/Non-Urban	35,815	41,625	5,810	77%	86%	9%
Urban Unzoned	106	0	-106	0.2%	0%	-0.2%
Unincorporated Plumas County Total	**45,152**	**44,792**	**-360**	**97%**	**93%**	**-4%**

Source: CAL FIRE

Post-Wildfire Landslides and Debris Flows

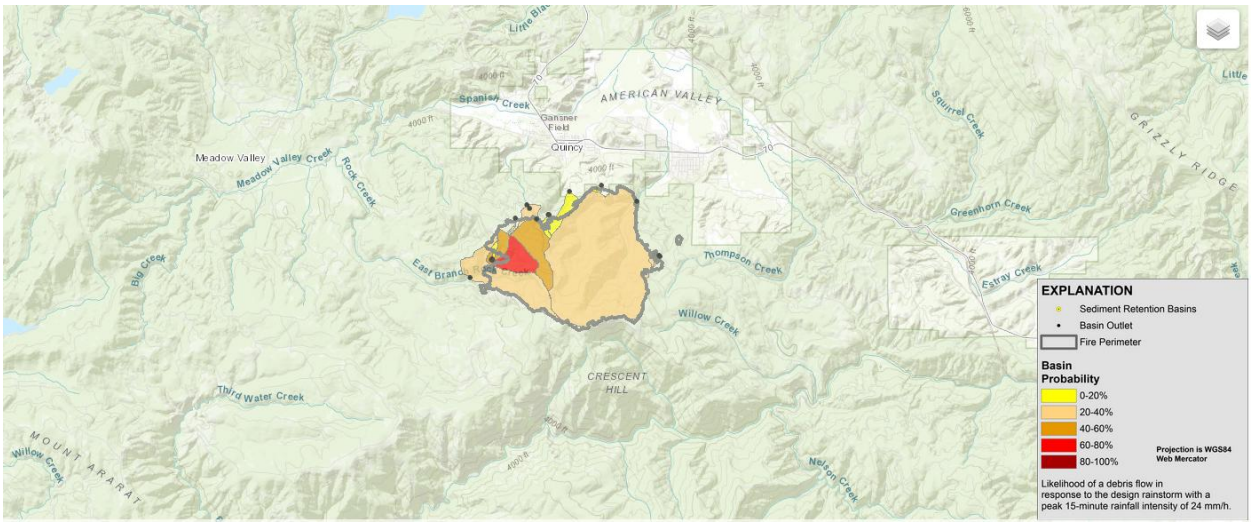
Post-wildfire landslides and debris flows are a concern in Plumas County. Fires that burn in sloped areas remove vegetation that holds hillsides together during rainstorms. Once that vegetation is removed, the hillside may be compromised, resulting in landslides and debris flows. USGS has been developing maps of these areas post fire.

Post-fire debris flow hazard assessments for each fire below were performed by the USGS. These assessments are prepared at the request of land and emergency management agencies responsible for managing wildfires impacts. The assessments are presented as a series of maps and geospatial data showing the probability of debris flows and their expected volume for burned drainage basins. Other landslide hazard assessments produced by the USGS are performed at the request of government agencies or sometimes as demonstration products from research to improve methods of hazard and risk assessment.

2017 Minerva 5 Wildfire

Figure 4-196 estimates of the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard from the Minerva 5 Fire. These predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h).

Figure 4-196 Minerva 5 Fire Landslide and Debris Flow Probabilities

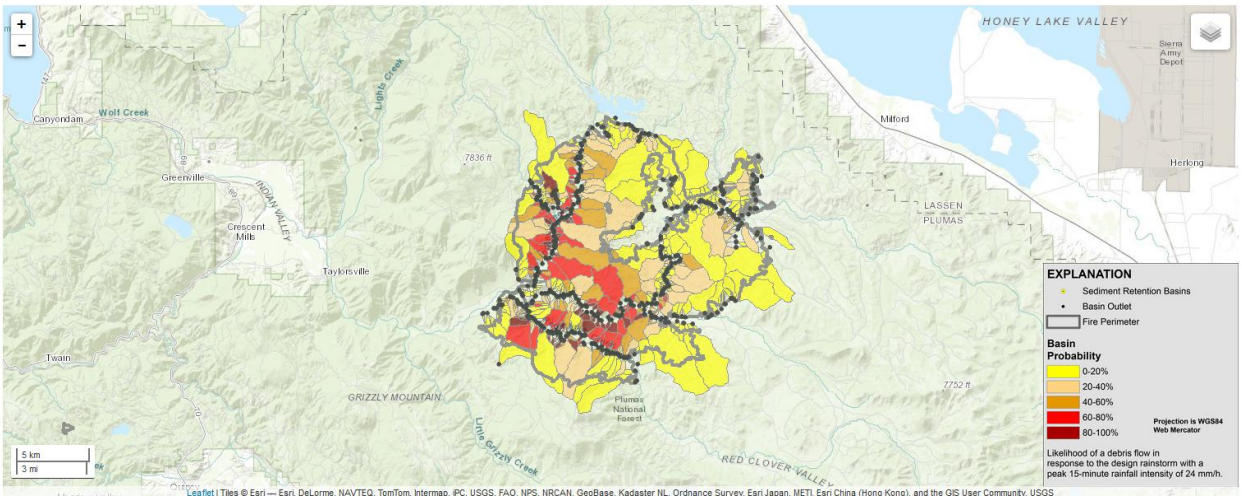


Source: USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=105). Retrieved 5/5/2025.

2019 Walker Fire Landslide and Debris Flow Mapping

Figure 4-197 estimates of the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard from the Walker Fire. These predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h).

Figure 4-197 Walker Fire Landslide and Debris Flow Probabilities

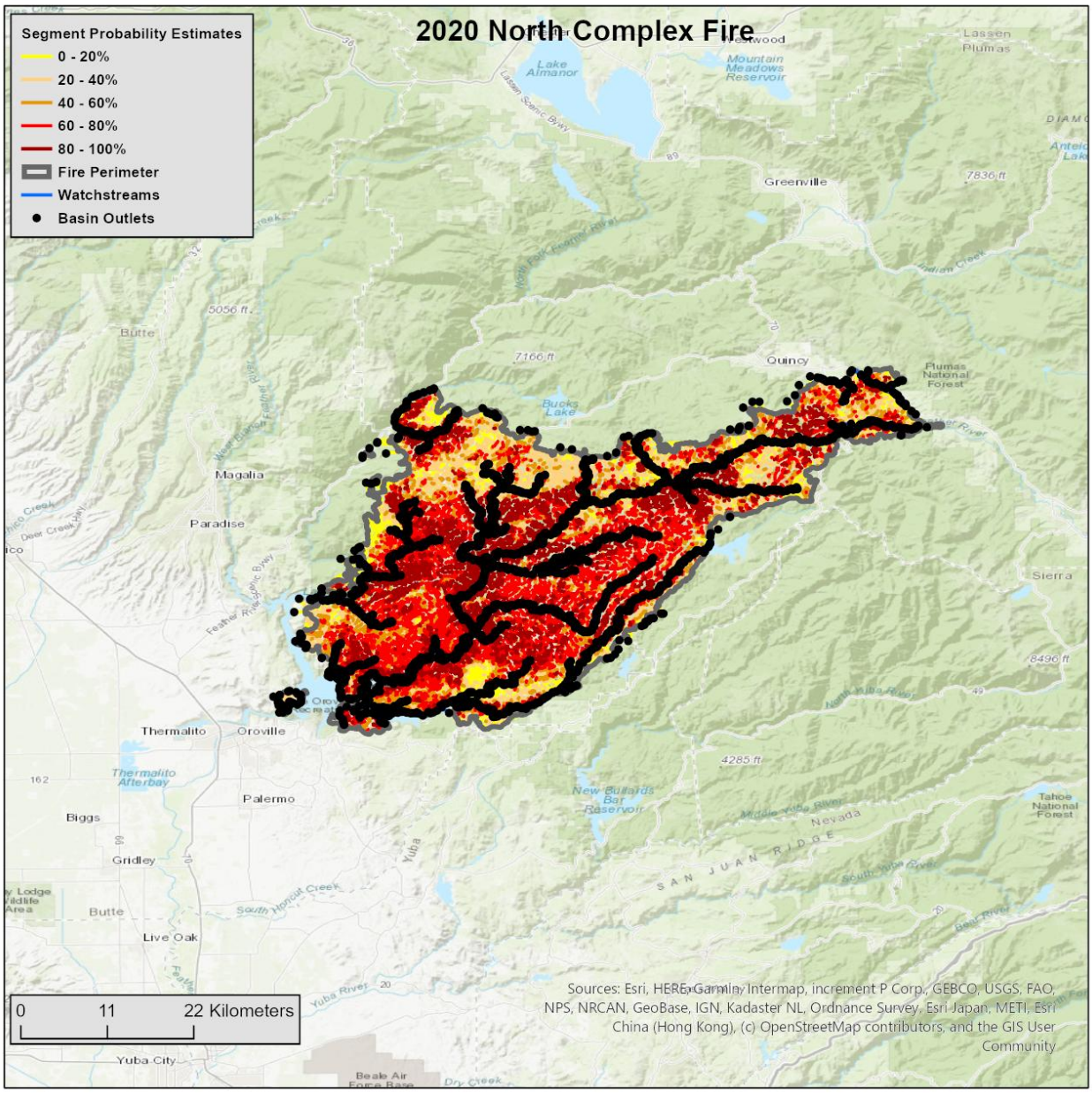


Source: USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=261). Retrieved 5/5/2025.

2020 North Complex Fire

Figure 4-198 estimates of the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard from the Walker Fire. These predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h).

Figure 4-198 North Complex Fire Landslide and Debris Flow Probabilities

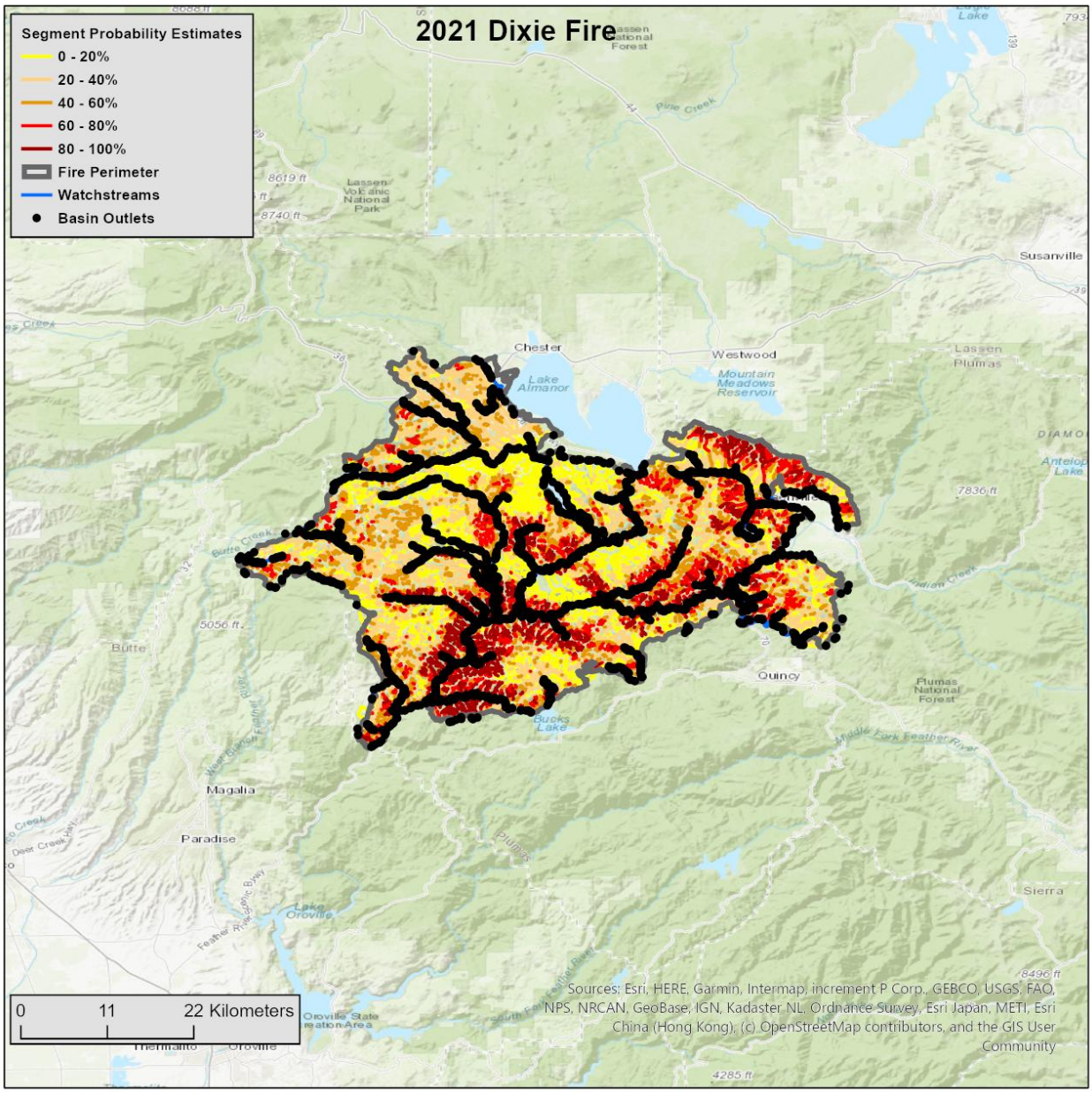


Source: USGS (https://usgs.maps.arcgis.com/apps/dashboards/c09fa874362e48a9afe79432f2efe6fe#fire_id=nrt2020). Retrieved 5/5/2025.

2021 Dixie Fire Landslide and Debris Flow Mapping

Figure 4-199 estimates of the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard from the Walker Fire. These predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h).

Figure 4-199 Dixie Fire Landslide and Debris Flow Probabilities



Source: USGS (https://usgs.maps.arcgis.com/apps/dashboards/c09fa874362e48a9afe79432f2efe6fe#fire_id=dix2021). Retrieved 5/5/2025.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations shows eight state and six federal disaster declarations. These are shown in Table 4-124.

Table 4-124 Plumas County – Federal and State Disaster Declaration from Wildfire 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987 (Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. The 15 events in Plumas County in the database are shown in Table 4-125. Many more fires have occurred but were not reported to the NCDC database.

*Table 4-125 NCDC Wildfire Events in Plumas County 1993 to 7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Dense Smoke	1	0	0	0	0	$0	$0
Wildfire	14	1	0	3	0	$22,775,000	$0
Total	**15**	**1**	**0**	**3**	**0**	**$22,775,000**	**$ 0**

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

CAL FIRE Events

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Plumas County were extracted and are listed in Table 4-126, sorted by the highest wildfire acres affecting each jurisdiction to the lowest acreage. There are 276 total fires recorded in this database for Plumas County. Of these, 186 burn areas in each jurisdiction exceeded 50 acres in size which are included in both the map and table below. Many more small fires likely have occurred but were not included in the CAL FIRE dataset.

Figure 4-200 shows fire history for the Plumas County Planning Area, colored by the size of the acreage burned and includes those fires exceeding 50 acres. This map contains fires from 1950 to 2024, while the detailed tables of wildfire shown in Table 4-126 contain fires from 1910 to 2024 and also includes those fires exceeding 50 acres.

Figure 4-200 Plumas County Wildfire History – CAL FIRE 1910 to 2024

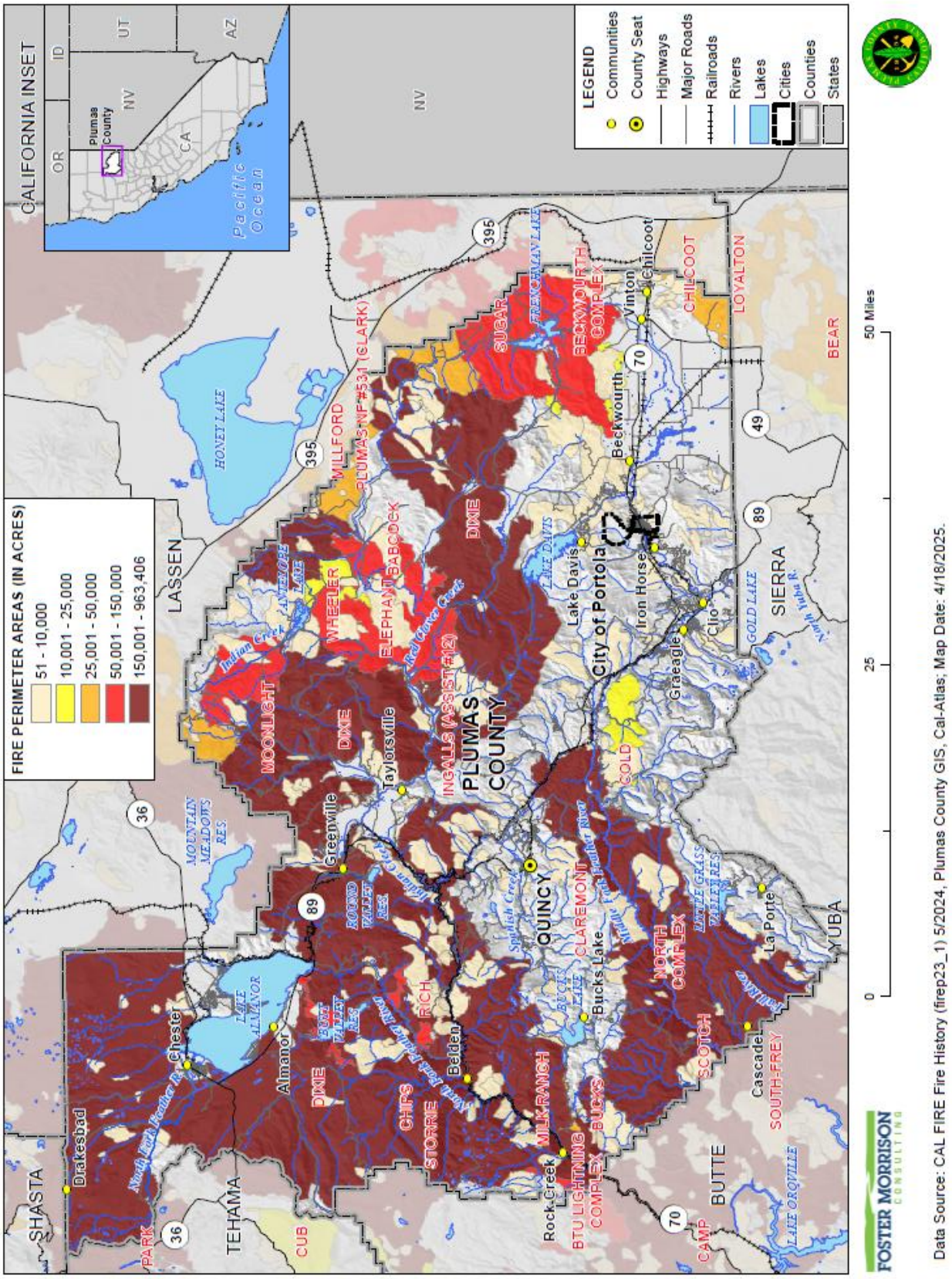


Table 4-126 Plumas County – CAL FIRE Wildfire History Summary 1910-2024s by Jurisdiction

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
City of Portola					
(Unnamed)	1988	8/29/1988	Lightning	528	224
(Unnamed)	1949	(blank)	Unknown / Unidentified	312	77
Unincorporated Plumas County					
Dixie	2021	7/14/2021	Powerline	963,405	699,689
North Complex	2020	8/17/2020	Lightning	318,797	166,617
Chips	2012	7/28/2012	Campfire	76,350	76,346
Beckwourth Complex (Sugar)	2021	7/2/2021	Unknown / Unidentified	105,004	67,828
Moonlight	2007	9/3/2007	Equipment Use	64,960	64,512
Storrie	2000	8/17/2000	Railroad	56,076	55,729
Walker	2019	9/4/2019	Miscellaneous	54,615	54,613
Bucks	1999	8/23/1999	Lightning	34,236	27,888
(Unnamed)	1931	(blank)	Unknown / Unidentified	32,336	27,215
(Unnamed)	1936	(blank)	Unknown / Unidentified	34,113	23,573
Wheeler	2007	7/5/2007	Lightning	22,332	22,330
Plumas NF #531 (Clark)	1987	8/30/1987	Miscellaneous	39,921	19,391
(Unnamed)			Unknown / Unidentified	17,156	17,127
(Unnamed)	1929	(blank)	Unknown / Unidentified	13,346	16,980
BTU Lightning Complex	2008	7/2/2008	Lightning	53,699	16,476
Milk Ranch	1951	9/11/1951	Miscellaneous	21,979	14,505
(Unnamed)	1927	(blank)	Unknown / Unidentified	36,663	12,250
(Unnamed)	1934	(blank)	Unknown / Unidentified	12,180	12,181
(Unnamed)			Unknown / Unidentified	12,385	10,810
(Unnamed)	1959	(blank)	Miscellaneous	10,362	10,362
Scotch	2008	6/21/2008	Lightning	13,008	9,799
(Unnamed)	1926	(blank)	Unknown / Unidentified	9,476	9,476
Sheep	2020	8/17/2020	Lightning	29,541	7,700

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
(Unnamed)			Unknown / Unidentified	7,593	7,593
Elephant	1981	9/17/1981	Lightning	6,852	6,852
Ingalls (Assist #12)	1981	9/17/1981	Unknown / Unidentified	6,697	6,697
Beckwourth Complex (Loyalton)	2020	8/14/2020	Lightning	46,721	6,415
Rich	2008	7/29/2008	Railroad	6,111	6,111
Cold	2008	6/21/2008	Lightning	5,599	5,600
(Unnamed)	1960	(blank)	Lightning	5,064	5,064
Babcock	1977	8/2/1977	Lightning	5,057	5,056
Horton 2	1999	8/24/1999	Equipment Use	4,941	4,942
(Unnamed)			Miscellaneous	7,949	4,889
Pidgeon	1999	8/23/1999	Lightning	4,713	4,714
Layman	1989	9/6/1989	Miscellaneous	4,449	4,450
Minerva 5	2017	7/29/2017	Arson	4,339	4,340
Maddalena	1996	7/25/1996	Equipment Use	3,975	3,976
(Unnamed)			Miscellaneous	3,918	3,918
(Unnamed)			Unknown / Unidentified	3,745	3,745
Stream	2001	7/25/2001	Lightning	3,526	3,526
(Unnamed)	1921	(blank)	Unknown / Unidentified	3,355	3,355
Ferris	1974	6/25/1974	Miscellaneous	3,289	3,289
Boulder	2006	6/25/2006	Lightning	2,919	2,919
(Unnamed)			Unknown / Unidentified	2,697	2,697
(Unnamed)	1966	(blank)	Lightning	2,681	2,681
Lookout	1999	8/23/1999	Lightning	2,615	2,615
(Unnamed)	1978	10/30/1978	Railroad	2,596	2,596
(Unnamed)	1945	(blank)	Miscellaneous	6,358	2,527
(Unnamed)	1946	(blank)	Lightning	2,448	2,448
(Unnamed)			Miscellaneous	73	2,416
Will	1979	9/18/1979	Miscellaneous	3,128	2,396
(Unnamed)	1937	(blank)	Unknown / Unidentified	2,361	2,361
(Unnamed)			Miscellaneous	2,844	2,213

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
Ramelli	1950	8/31/1950	Unknown / Unidentified	2,178	2,178
(Unnamed)	1942	(blank)	Unknown / Unidentified	7,916	2,162
(Unnamed)	1947	(blank)	Miscellaneous	2,036	2,036
(Unnamed)			Miscellaneous	3,864	1,837
Carman #2	1972	8/9/1972	Lightning	1,790	1,790
Chilcoot	2003	7/20/2003	Lightning	5,642	1,770
(Unnamed)			Unknown / Unidentified	1,737	1,737
(Unnamed)			Miscellaneous	2,692	1,693
(Unnamed)		7/5/1972	Miscellaneous	1,676	1,676
(Unnamed)	1930	(blank)	Unknown / Unidentified	1,828	1,658
Cashman	1977	7/30/1977	Smoking	1,556	1,556
Walker	1990	8/6/1990	Lightning	1,496	1,496
Devils Gap	1999	8/22/1999	Lightning	1,480	1,480
(Unnamed)	1943	(blank)	Unknown / Unidentified	1,425	1,425
Plumas N.F. #2	1959	8/4/1959	Miscellaneous	1,409	1,409
Rack	1989	7/8/1989	Miscellaneous	1,399	1,399
Little	2008	6/22/2008	Lightning	1,399	1,291
(Unnamed)	1928	(blank)	Miscellaneous	1,242	1,242
(Unnamed)			Miscellaneous	1,198	1,198
COOKS	1996	8/9/1996	Equipment Use	1,138	1,138
(Unnamed)	1951	(blank)	Miscellaneous	1,106	1,106
BELL	1970	8/25/1970	Miscellaneous	1,082	1,082
(Unnamed)			Miscellaneous	2,035	1,063
Assist P.N.F.	1987	8/31/1987	Unknown / Unidentified	1,047	1,047
Bar	2010	7/31/2010	Arson	1,039	1,039
Chilcoot	2017	8/6/2017	Lightning	1,020	1,020
Garnier	1950	8/8/1950	Miscellaneous	4,097	1,009
Sloat	1981	7/21/1981	Miscellaneous	907	907
(Unnamed)	1922	(blank)	Miscellaneous	865	865
(Unnamed)	1933	(blank)	Unknown / Unidentified	914	857

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
(Unnamed)			Unknown / Unidentified	619	855
Hot Springs	1980	8/14/1980	Arson	838	838
(Unnamed)		8/2/1973	Equipment Use	775	775
(Unnamed)	1938	(blank)	Unknown / Unidentified	721	721
Peak	2012	7/28/2012	Debris	712	712
Junction	1974	9/26/1974	Miscellaneous	1,136	678
(Unnamed)	1939	(blank)	Lightning	668	668
(Unnamed)	1917	(blank)	Lightning	614	614
Reno	1969	9/1/1969	Unknown / Unidentified	641	610
(Unnamed)	1924	(blank)	Unknown / Unidentified	596	596
Cottonwood	2004	5/4/2004	Debris	567	567
(Unnamed)	1941	(blank)	Unknown / Unidentified	564	564
Dotta	2021	6/30/2021	Unknown / Unidentified	532	532
(Unnamed)	1918	(blank)	Lightning	531	530
Hungry	2006	6/25/2006	Lightning	512	512
Cooks	1964	7/24/1964	Miscellaneous	501	501
Greenhorn	1990	6/29/1990	Playing With Fire	497	497
Ross	1977	8/8/1977	Arson	475	475
(Unnamed)			Unknown / Unidentified	1,386	475
(Unnamed)	1999	(blank)	Unknown / Unidentified	3,625	469
Stag	1999	8/23/1999	Lightning	467	467
Cabin W.P.R.R. #2	1976	6/28/1976	Unknown / Unidentified	632	452
Eureka	2017	9/5/2017	Lightning	446	446
Chambers Creek	1957	9/6/1957	Miscellaneous	432	432
(Unnamed)	1900	(blank)	Unknown / Unidentified	419	419
(Unnamed)		8/18/1987	Equipment Use	409	409
(Unnamed)	1955	(blank)	Miscellaneous	408	408
Babcock Peak	2007	7/5/2007	Lightning	407	407
Hay	1952	9/3/1952	Miscellaneous	401	401

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
(Unnamed)	1932	(blank)	Miscellaneous	395	395
(Unnamed)			Unknown / Unidentified	387	387
GREASE	2006	7/16/2006	Arson	366	366
(Unnamed)			Unknown / Unidentified	348	348
Beckwith (Tahoe NF)	1984	7/30/1984	Unknown / Unidentified	344	344
(Unnamed)		10/24/1972	Miscellaneous	344	344
(Unnamed)	1935	(blank)	Unknown / Unidentified	340	340
Ridge/Heights	2013	8/18/2013	Lightning	336	336
Hartman	2008	6/21/2008	Lightning	331	331
Martineck	1996	8/12/1996	Lightning	661	331
(Unnamed)	1923	(blank)	Unknown / Unidentified	323	323
Coyote	1973	9/9/1973	Miscellaneous	319	319
Silver	2009	9/19/2009	Miscellaneous	311	311
Camp	2018	11/8/2018	Powerline	153,336	306
(Unnamed)		8/29/1988	Lightning	-	304
Millford	1950	9/2/1950	Miscellaneous	9,185	301
(Unnamed)		6/13/1979	Miscellaneous	297	297
Lone Rock Valley	1950	8/7/1950	Lightning	293	293
Milford Grade	2009	4/22/2009	Lightning	284	284
Point	1980	8/14/1980	Unknown / Unidentified	284	284
Elephant	2009	8/16/2009	Miscellaneous	274	270
Tobin	2016	9/26/2016	Miscellaneous	248	248
(Unnamed)	1919	(blank)	Lightning	247	247
(Unnamed)	1920	(blank)	Lightning	219	219
(Unnamed)			Miscellaneous	217	217
(Unnamed)	1911	(blank)	Unknown / Unidentified	201	201
Cub	2008	6/21/2008	Lightning	14,729	190
Wilson	2018	9/28/2018	Miscellaneous	261	187
(Unnamed)	1949	(blank)	Lightning	185	185
Eagle	1989	7/7/1989	Lightning	4,665	179
Claremont	1999	8/23/1999	Lightning	178	178

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
South-Frey	2008	6/21/2008	Lightning	12,402	171
(Unnamed)	1964	(blank)	Lightning	170	170
Carman #1	1972	8/8/1972	Lightning	158	158
(Unnamed)	1971	11/6/1971	Debris	140	140
Chrome	1999	8/23/1999	Miscellaneous	135	135
Martin	2004	11/2/2004	Debris	131	131
(Unnamed)	1984	5/29/1984	Arson	130	130
Ward	2015	6/2/2015	Unknown / Unidentified	129	129
(Unnamed)	1916	(blank)	Lightning	127	127
5-6 Cascade Creek	2020	8/17/2020	Lightning	260	119
(Unnamed)	1983	7/5/1983	Arson	119	119
(Unnamed)	1986	8/14/1986	Smoking	118	118
Murphy	2018	8/7/2018	Miscellaneous	117	117
Squirrel	2017	9/27/2017	Arson	113	113
Gulch	2010	7/25/2010	Lightning	103	103
(Unnamed)	1972	8/11/1972	Miscellaneous	102	102
Cateyes	1996	5/2/1996	Debris	96	96
Johnson	2013	8/18/2013	Lightning	91	91
Stony	2004	4/27/2004	Debris	91	91
Crocker	2018	7/24/2018	Lightning	87	87
Ranch	2017	9/6/2017	Lightning	84	84
West	2019	9/17/2019	Lightning	89	84
(Unnamed)	1981	9/17/1981	Lightning	79	79
Keddie	2008	6/21/2008	Illegal Alien Campfire	78	78
Lone Rock	2021	8/6/2021	Unknown / Unidentified	78	78
Clifton	2007	5/10/2007	Debris	77	77
Mills	2017	9/3/2017	Miscellaneous	75	75
Big	2008	6/21/2008	Lightning	74	74
Creek	2019	11/21/2019	Lightning	74	74
(Unnamed)	1987	8/30/1987	Lightning	73	73
(Unnamed)		5/6/1974	Railroad	72	72
(Unnamed)		8/26/1984	Lightning	71	71
(Unnamed)		8/19/1984	Miscellaneous	68	68
(Unnamed)		8/9/1988	Lightning	63	63

Jurisdiction / Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within Jurisdiction
Rock	2010	8/13/2010	Arson	62	62
(Unnamed)		9/1/1981	Equipment Use	62	62
Toll	2017	8/20/2017	Arson	58	58
Copper	2020	8/18/2020	Lightning	55	55
Hartman	2021	6/29/2021	Unknown / Unidentified	54	54
Crescent	2017	6/30/2017	Arson	53	53
Correco	2003	7/27/2003	Lightning	52	52

Source: CAL FIRE (May 2024)

Hazard Mitigation Planning Committee Events

These sections separate events since the 2019/2020 LHMPs and those before 2019.

Events since 2019/2020 LHMP

The HMPC noted the following fires to affect the County:

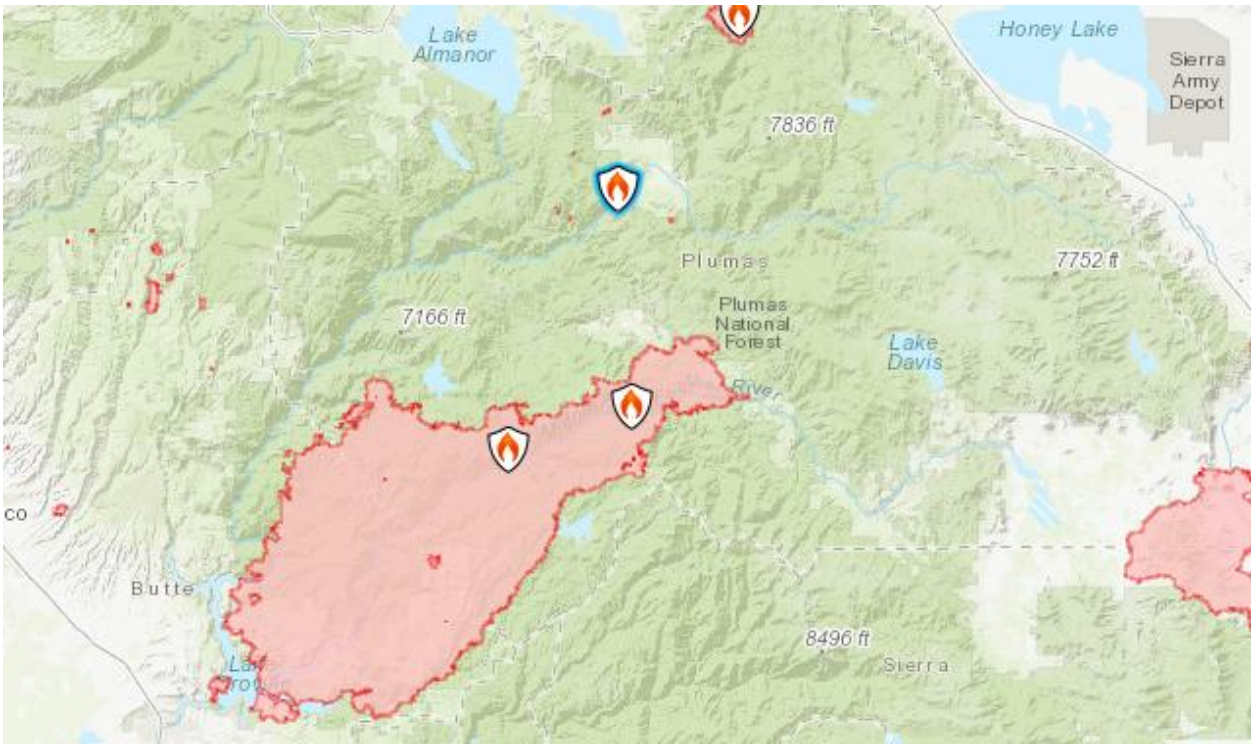
2019 Walker Fire – The Walker Fire was a wildfire that was burning in Genesee Valley in the Plumas National Forest approximately 11 miles east of the community of Taylorsville in Plumas County, California. The blaze was reported on Wednesday, September 4, 2019, and immediately expanded in size over its several days of burning. The fire actively threatened homes from Genesee Valley to Antelope Road. Communities along Highway 395 from Thunder Mountain Road (Wales Canyon) to the Laufman Grade (Old Highway 59), including the communities of Murdock Crossing, Stoney, Milford and Brockman Canyon, were under mandatory evacuation. On September 10, the Walker Fire had grown to 47,340 acres and was 12 percent contained. The Lassen County Fairground evacuation center was closed that morning. The majority of residential evacuation orders were lifted, except the Murdock Crossing and Stoney areas. The next evening, the fire continued to grow, but was 28 percent contained. Crews extended dozer lines and handlines to expand the containment. Structural defense was put in place for buildings at Murdock Crossing and mop up continued at Antelope Lake, Round Mountain and the eastern side of the fire. However, by the morning of September 14, the fire had expanded to 54,612 acres and was 97 percent contained. By the time the fire was extinguished, 9 structures had been destroyed. 55,000 acres of grazing land were burned, with livestock water troughs and fencing burned. Damages to livestock grazing were in excess of $1.2 million. The Agriculture Commissioner noted that the loss of grazing lands affected both current year and potential future loss for up to 3 years based on government regulations and weather.

It is important to note that in addition to the Plumas County fire history detailed above, there are numerous smaller fires that occur in the area year after year. These smaller fires have the ability to quickly get out of hand and become significant fires. Also, depending on the area, small fires in acreage can result in large losses. The HMPC provided the following details on fire history in Plumas County.

July 2020 Hog Fire – The 2020 Hog Fire affected nearby Lassen County. Though it did not burn areas in Plumas County, there were impacts to Plumas County. The Hog Fire, in Lassen County near Susanville, destroyed the one cable bringing Internet into the Lake Almanor Basin, Greenville and beyond. Sheriff Todd Johns said that Frontier Communications replaced the damaged lines, only to have them destroyed again. Officials say an essential fiber optic cable was damaged by the fire on the morning of the 21st and impacted communications and connectivity for Susanville and neighboring Plumas County.

August and September 2020 North Complex Fire – The North Complex Fire was a massive wildfire currently burning in Northern California in the counties of Plumas and Butte. The fires were started by lightning on August 17, 2020; by September 5, all the individual fires had been put out with the exception of the Claremont and Bear Fires, which merged on that date. Starting on September 8, strong winds caused the Bear Fire to explode in size to the southwest. Frequent ashfall occurred in Quincy through 9/17. The North Complex fire had burned an estimated 291,200 acres. Smoke from the fire has created extremely unhealthy air conditions in Quincy and nearby communities for several weeks. Major destruction was reported in the Greenville, Canyon Dam, and surrounding area. There is a worry that the post-wildfire burn scar will pose landslide, debris flow, and flooding issues.

Figure 4-201 North Complex Fire Burn Area



Source: Cal Fire Inciweb. Retrieved 9/28/2020

2021 Beckwourth Complex Fire - Beckwourth Fire Comprised of two separate fires. Dotta Fire started on 03/30/2021 and Sugar Fire started on 07/02/2021. They combined on 07/03/2021 Cause was dry lightning combined with red flag warnings. Total acres burned were 105,670. 106 residences and 42 outbuildings were destroyed in Plumas County. The fire was on USFS property and burned through 4 campgrounds owned by the federal government. All 4 campgrounds had to be evacuated as well as all the homes in the

Frenchman Lake Area. All USFS roads and two highways were closed and all USFS trails were closed (see detailed list). There are approximately 250 homes within the Beckwourth Fire footprint, but because most of the homes in the footprint of the were second homes or recreation, no sheltering of people was needed. The full-time homes below the fire in Chilcoot, CA were also under mandatory and warning status evacuations, but still, no one needed sheltering.

2021 Dixie Fire – The Dixie Fire began Tuesday, July 13, 2021, and burned nearly 1 million acres of land across five counties: Plumas, Butte, Lassen, Shasta, and Tehama, before it was considered contained October 25, 2021, 103 days later. It is the second largest wildfire in California history after the August Complex Fire. In total there were 95 structures damaged, and 1,329 structures destroyed by the fire and one fatality. During the Dixie Fire, the Seneca Health staff at the Chester facility were evacuated and the facility was temporarily shuttered. The facility was shuttered from August 4th to the 21st.

Evacuation centers for livestock opened on the 18th of July. In October, the evacuation center for livestock closed on the 2nd and the fire was 100% contained on the 24th. In addition, the fire tore through the town of Greenville and decimated most of what was in its path. The Greenville Rancheria lost their medical and dental facilities, the tribal office, the environmental office, as well as two fire trucks and other vehicles in the fire. The Dixie Fire impacted every person in Plumas County – whether directly or indirectly, including the social safety net providers. While the lack of housing was a strong concern pre-fire, the Dixie Fire significantly worsened an already tight housing market in Plumas County. Air quality in the County suffered from wildfire smoke during this event.

Figure 4-202 Dixie Fire billowing smoke as seen from nearby Deer Creek

Source: Plumas County

The magnitude of the Dixie Fire would have overburdened any region's social safety net and has been especially detrimental to the less vibrant system of care in rural Plumas County.

July 24, 2024, Wildfire Smoke – Seneca Healthcare noted that the Park Fire in nearby Butte County caused air quality issues in the County. Seneca prepares Skilled Nursing Unit for Evacuation due to possible Air Quality and/or Wildfire Threat. Highway 32 and 36 impacted making transfer difficult. This continued until August 12, 2024.

2024 Gold Complex Fire – On July 22, 2024, a thunderstorm in eastern Plumas County resulted in four dry lightning strikes that became wildfires on the Plumas National Forest Beckwourth Ranger District. The first fire was reported around 2:45 p.m. The Mill, Mill 2 and Mill 3 fires burned near the community of Clio and Whitehawk Ranch. The Smith Fire burned north of California State Highway 70 between Smith Peak and Maybe, California. All four fires grew rapidly due to winds, slope, and dry fuels. Structures were threatened by all four fires, including the communities of Whitehawk Ranch, Clio, Gold Mountain, Delleker, Maybe, Lake Davis Area, and the south and west sides of Portola. These four fires were combined into the Gold Complex.

Events before 2019

The HMPC noted the following fires to affect the County:

An unnamed fire occurred in **1960** which caused a state declaration (along with other California wildfires that summer).

1979 – A member of the HMPC from Viera Ranch noted there was a forest fire in Indian Valley.

1984 - A member of the HMPC from Viera Ranch noted there were multiple fires caused by dry lightning in the area. These wildfires caused air quality issues in Quincy.

1987 – The Plumas National Forest Fire #531 (known as the Clarks Fire) cause a state declaration in 1987 (along with other California wildfires that summer).

1999 – The Bucks Fire caused a federal and state disaster declaration in 1999. Dry lightning caused 25 fires in the forest in the County. The Quincy area was very smokey, with ash falling like now. Winds increased and Meadow Valley was placed on standby for evacuation. Tobin was surrounded by fire.

2000 Storrie Fire – The Forest Service had about 2,600 federal, state and local firefighters, air tankers and helicopter crews to battle the fire that burned 52,000 acres over three weeks. The federal government estimates the cost of the fire at $22 million. The fire caused extensive damage to trees and destroyed 21,000 acres of wildlife habitat. The remaining $80 million of the settlement is earmarked for damages to natural resources, with the money used for the remediation of Lassen and Plumas national forests. Union Pacific Railroad Co. has agreed to a $102 million settlement for damages from the Storrie forest fire in Lassen and Plumas national forests in 2000, the largest-ever federal settlement for a forest fire. Federal authorities allege Union Pacific employees failed to clear the area when they were using grinders and rail saws during repair work, sparking the fire on Aug. 17, 2000.

The **2007** Moonlight Fire was one of the most destructive fires in Plumas County history with a burn perimeter of 64,997 acres. Seven structures were destroyed, 2 residences and 5 outbuildings, and 1 outbuilding was damaged. An additional 25 residences and 10 outbuildings were threatened due to their

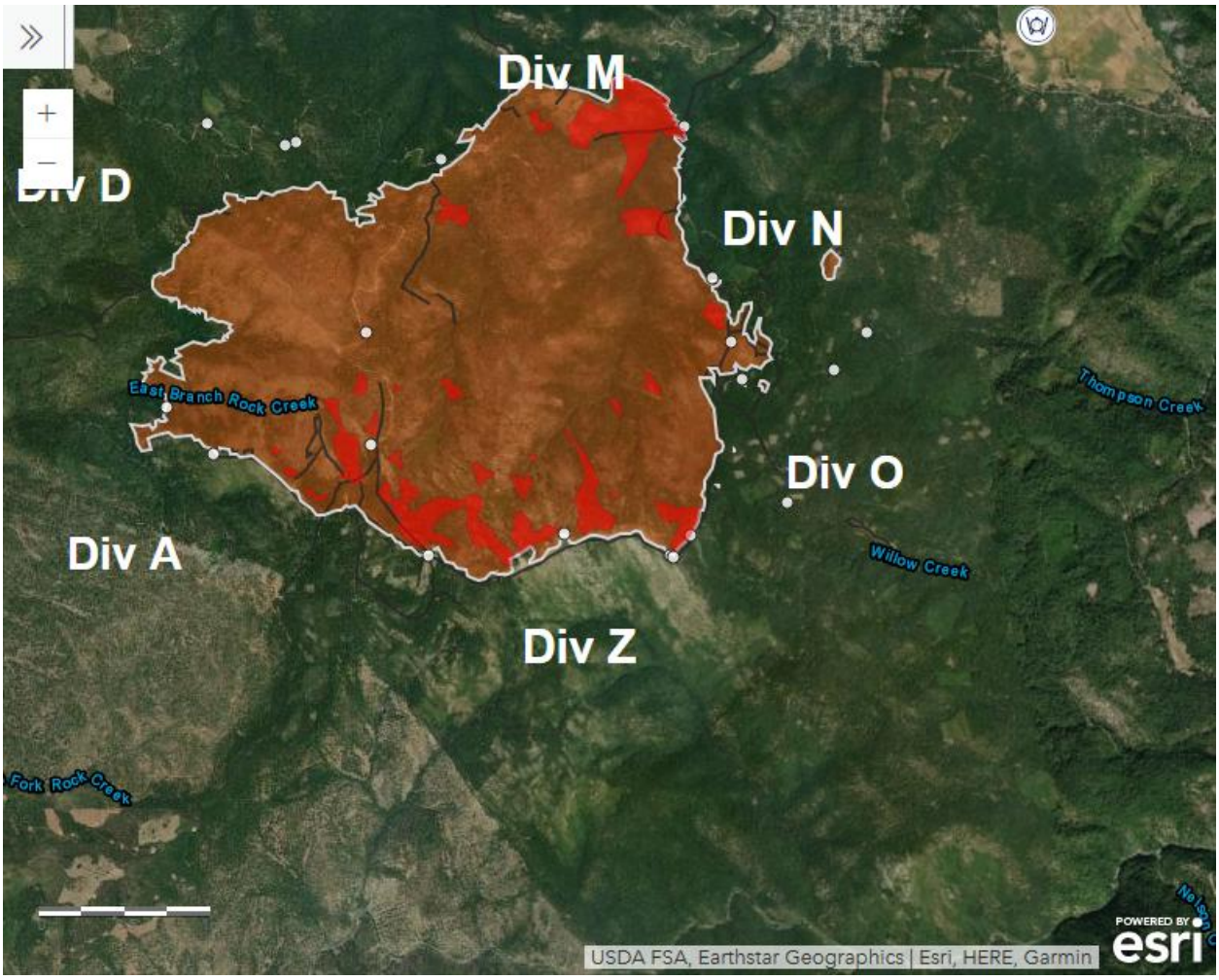
location within the interior of the fire containment lines. 34 injuries and zero deaths were reported. The total cost of fighting the fire was $31.5 million, utilizing 42 engines, one helicopter, 11 dozers, 34 water tenders, 11 fire crews, and 707 total fire personnel. The blaze was caused by employees of Sierra Pacific Industries and a contractor who struck a rock with a dozer, causing sparks to ignite the dry ground in the area. The federal government was able to successfully sue the logging company for $122.5 million in damages resulting from the fire that killed 15 million trees.

The **2008** BTU Lightning Complex Fire caused the federal disaster in 2008 (along with other California wildfires that summer).

2012 Chips Fire – The Chips Fire burned in the Plumas National Forest. The fire started on July 28, causing damage estimated by the US Forest Service of $53.3 million. The Plumas County Sheriff's Office issued a mandatory evacuation for Butt Reservoir, Ohio Valley, Humbug, Humboldt Area, and Yellow Creek. An evacuation advisory was issued to all Canyon Dam, Big Meadows, Rocky Point Campground, Prattville, Almanor, and West Almanor residents and visitors. The distribution lines powering Quincy and the Eastern Feather River were damaged by fire. PG&E crews were working to restore damaged distribution lines. A mandatory evacuation was ordered for Seneca and Ohio Valley, with voluntary evacuations for Rush Creek, Canyon Dam, Big Meadow, and Rocky Point. A Sheriff's advisory was in effect for West Almanor, Almanor, and Prattville.

2017 Minerva Fire – The Minerva Fire burned in July and August of 2017. The Minerva Fire almost burned into Quincy. On July 29th, the Plumas County Sherriff and OES stated "Residents of Quincy are strongly encouraged to start making emergency plans for the possibility of evacuation. Residents are encouraged to shut all windows, collect all personal documents, photos, avoid use of air conditioning, and locate your pets and keep them nearby." Air quality was poor in the County, especially near Quincy. The Oakland Camp area needed to be evacuated. The HMPC noted that they had school buses pick up evacuees from a fire near Oakland Camp and drop at fairgrounds/Red Cross. More than 1,800 firefighters were brought in to fight the blaze. The fire burned more than 4,300 acres. Authorities in Plumas County arrested a 36-year-old Quincy resident on suspicion of starting several fires in the surrounding forest, including the Minerva Fire. The burn area from the fire is shown on Figure 4-203.

Figure 4-203 Minerva Fire Burn Area



Source: https://yubanet.com/containedlocal16/minerva/

2018 Camp Fire – During the 2018 Camp Fire, there was a small area of Plumas County that was burned. High amounts of smoke caused air quality issues throughout the County. The EOC was mobilized for 4 to 5 days. Evacuees from Butte County were housed for a period of approximately 5 days. Mobilization costs were borne by the County and reimbursed by FEMA.

Likelihood of Future Occurrence

Highly Likely—Plumas County faces a serious wildland fire threat every year. While often limited to the sparsely populated, forested areas in the western portion of the County, fires will continue to occur on an annual basis throughout the Plumas County Planning Area. The threat of wildfire and potential losses are constantly increasing as human development and population increase, and the wildland urban interface areas expand. Due to its high fuel load and long, dry summers, portions of Plumas County continue to be at risk from wildfire.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and wildfire can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Wildfire

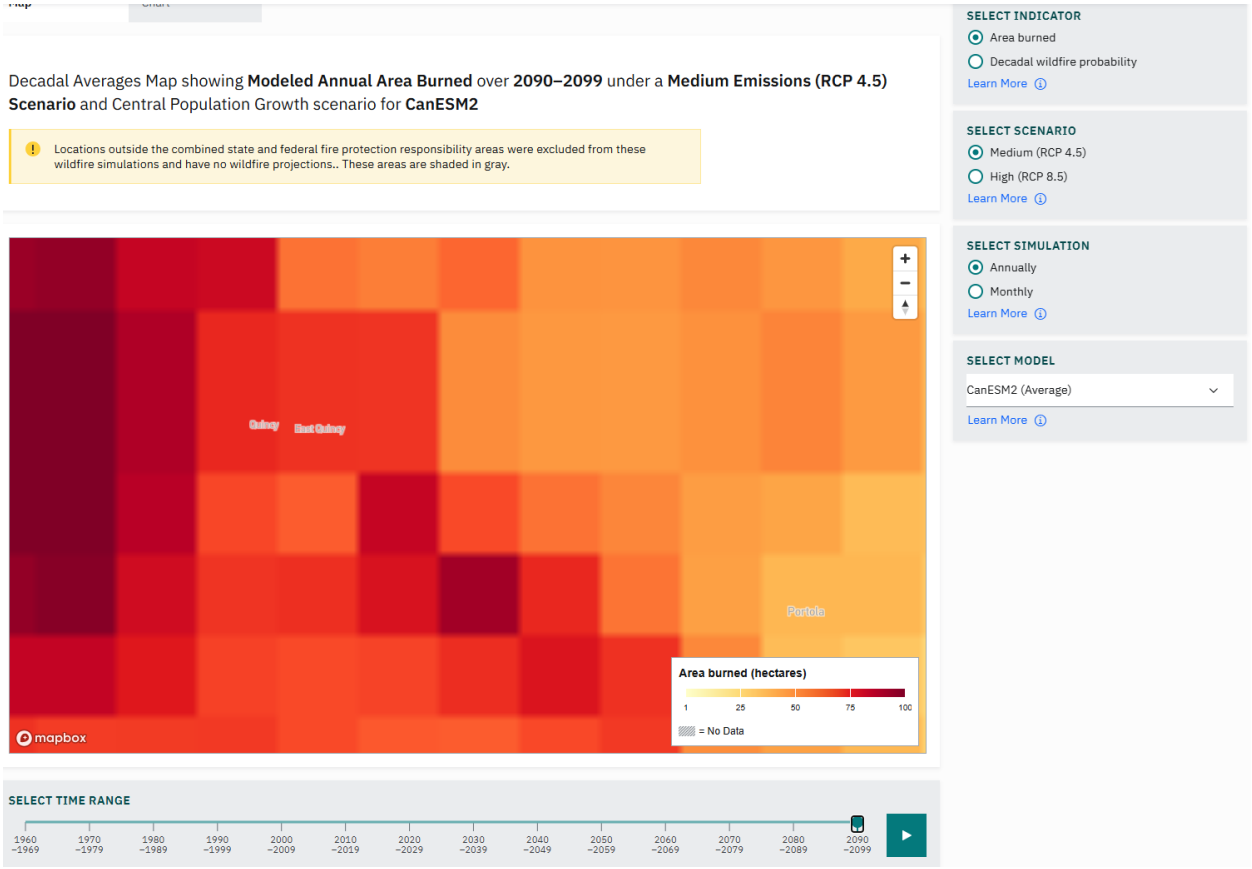
Climate change and its effects on wildfire come from two sources:

- Cal-Adapt
- 2019 Plumas County CWPP

Cal-Adapt

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2 090-2099, as compared to recent (2010) conditions. This is shown in Figure 4-204. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately by the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

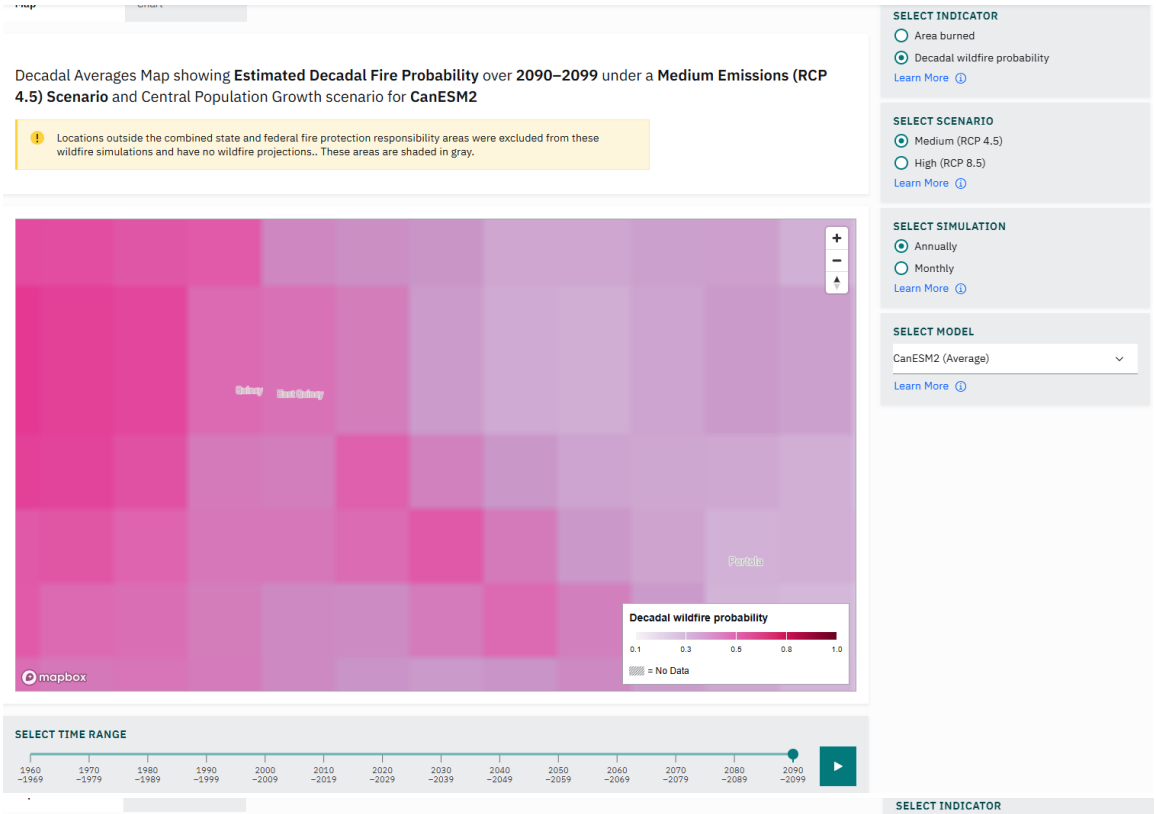
Figure 4-204 Plumas County Planning Area – Projected Increase in Wildfire Burn Areas

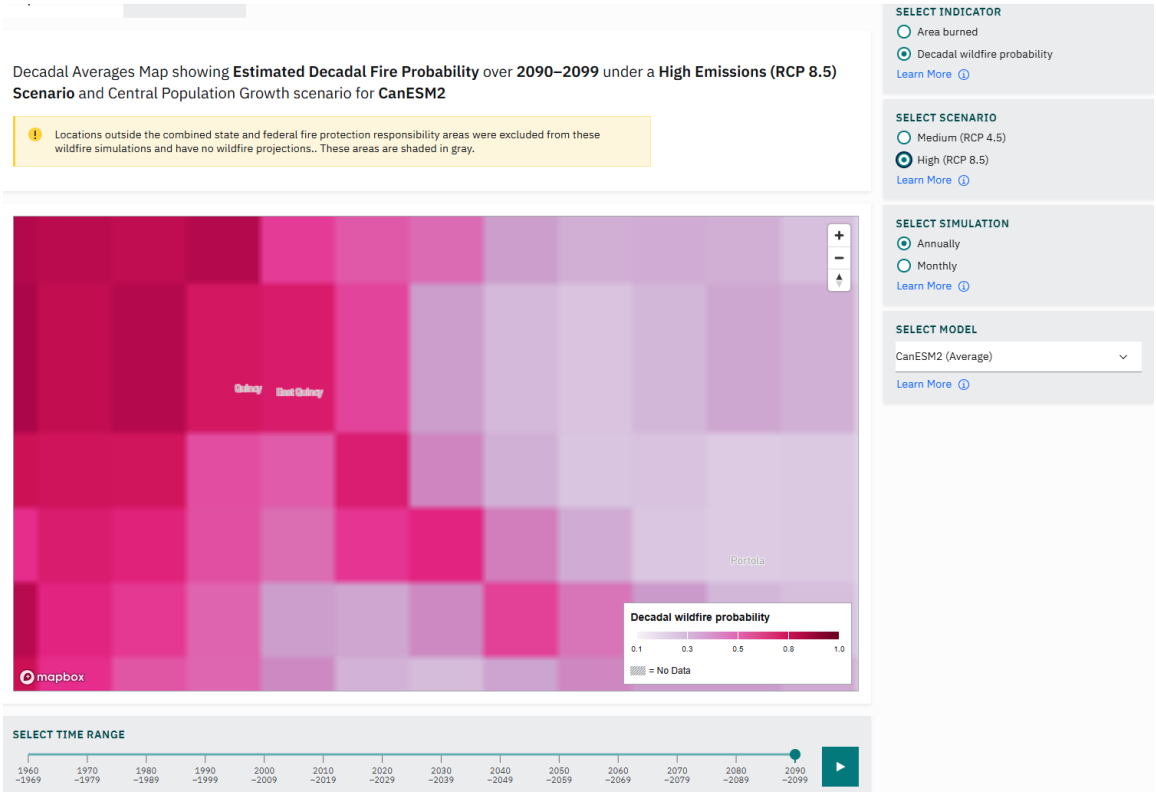


Source: Cal-Adapt. Retrieved 2/6/2025.

Wildfire scenario projections were done by Cal-Adapt, based on statistical modeling from historical data of climate, vegetation, population density, and fire history. The fire modeling ran simulations on five variables on a monthly time step - Large fire presence/absence, Number of fires given presence, Area burned in a grid cell given a fire, High severity burned area given a fire and emissions. These are shown on Figure 4-205. The upper chart shows modeled annual averages of area burned for the Planning Area under the RCP 4.5 scenario, while the lower chart shows modeled annual averages of area burned for the Planning Area under the RCP 8.5 scenario.

Figure 4-205 Plumas County Planning area – Future Annual Averages of Acres Burned under RCP 4.5 and 8.5 Scenarios





Source: Cal-Adapt. Retrieved 2/6/2025.

2019 Plumas County CWPP

The 2019 Plumas County CWPP noted that the majority of scientific research concerning climate trends indicates that climate has been changing since the mid-twentieth century. Trends suggest that the northern Sierra Nevada may become generally warmer and wetter, with longer periods of prolonged summer drought. While warmer and wetter weather patterns may increase forest growth and carbon sequestration, warmer temperatures – in combination with longer periods of prolonged summer drought – will likely increase forest insect and disease outbreaks and the occurrence of high severity fire – disturbances which may result in increased carbon losses. Such high severity disturbances could result in type-conversion to shrublands in forested ecosystems that are not adapted to such disturbance patterns – which could drastically alter carbon cycles in the short and long term. High-intensity wildfires, drought, and declining forest health are some effects of climate change that are worsening the threats to forests and reducing forest productivity.

Hotter and drier weather alter forest hydrology and water balance available to forest communities. Increased temperatures alter the timing of snowmelt, affecting the seasonal availability of water with earlier dry conditions which then provides fuel to earlier and hotter fires from stressed trees and shrubs. Drought also reduces trees' ability to produce sap, which protects them from destructive insects and diseases. Research has found that large trees may be most susceptible to climate driven mortality – which the authors suggested can also be compounded by high stand densities of small trees due to fire suppression. Others suggest that "regional warming and consequent increases in water deficits are likely contributors to the increase in mortality rates," and suggest that exogenous warming trends may be more of a driver of mortality, particularly in large diameter trees, than increasing stand density. Nonetheless, research indicates that warming climate is driving changes in forest structure.

Vulnerability Assessment

Vulnerability—Extremely High

Risk and vulnerability to the County from wildfire is of significant concern. Wildfires that occur in the County occur from a variety of both natural and manmade causes. The County can be affected both by fires that start on or near County lands as well as those that start elsewhere and move into the County. In addition to burning large areas of land, air quality can be affected in the County by fires occurring inside the County as well as those from many miles away. As growth continues and populations increase in the County, the potential for catastrophic wildfires will also increase.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Plumas County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Plumas County Planning Area as well as the unincorporated portions of Plumas County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development can be affected by this hazard.

Local Concerns (unincorporated Plumas County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

According to the County and HMPC, the areas with the highest risk of wildfire are spread throughout the County and are generally located in areas with greater fuel loads resulting from denser forestation. The area that has seen the highest number of fires is the Feather River Canyon along the CA-70 corridor due to the high volume of auto and rail traffic. The Canyon's accessibility to the population areas, also increases its risk for human-triggered fires. Areas of lower fire hazard, which include the larger valleys such as Indian, American, and Sierra areas of the County, and also the high elevation peaks that receive the most precipitation.

Wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may actually be beneficial to the landscape. Century old policies of fire exclusion and aggressive suppression have given way to better understanding of the importance fire plays in the natural cycle of certain forest types.

In Plumas County, past wildfires have caused damages to the County. The County has suffered loss of structures, loss of tax revenue, high costs to battle fires, and loss of lives. The County has noted that both developed and undeveloped areas are at risk. Loss of industrial timberlands, grazing lands, agricultural crops may occur as a result of wildfire. Localized road and school closures have been reported during wildfires. Roads, bridges, utility infrastructure, telecommunications and high voltage transmission lines are also at risk to wildfire. Past wildfires have resulted in loss of timber and recreational lands, which have caused economic issues. This was the case after the Gold Complex Fire.

The County noted that increasingly frequent and severe wildfires throughout California pose a major threat. Limited road networks and dispersed rural communities mean that the vulnerable populations mentioned below may struggle to evacuate quickly and safely.

Additionally, a concern from a fuels mitigation and post fire cleanup perspective, the County is limited with only one mill taking lumber. There is a finite mill capacity. A temporary mill is needed to process waste. The County is looking for more of a biomass project instead of a new mill. However, the County did indicate that there are several constraints to a biomass project; haul routes and distances are two primary issues related to a viable biomass project.

After wildfires, it was noted that there is a sensitive time period to reforest before next fire occurs. There is also a need to help private landowners with reforestation efforts after a fire and before the next fire.

The County and HMPC further noted that in the WUI areas, there has been increased difficulty in obtaining home insurance and the cost of insurance premiums. Some residents have experienced cancellations of their policies due to catastrophic and recent wildfires occurring throughout California which has reduced the risk tolerance of many insurance companies. This increases costs to those who live in the WUI, and in some circumstances limits where people choose to live.

Local concerns for Portola and the Special Districts can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Plumas County Planning Area and unincorporated Plumas County.

Additionally, for each hazard in the FEMA National Risk Index in Plumas County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Plumas County Planning Area as a whole.

Methodology (Parcels and Structures)

Utilizing the current FHSZ mapping for the Plumas County Planning Area, two separate analyses were performed: one for the combined SRA/FRA datasets and one for the LRA dataset. Specifically, the following datasets were utilized for the analysis and contained all FHSZ hazard classes from Very High to Non-Wildland: CAL FIRE State Responsibility Area (FHSZSRA_23_3) April 2024 and CAL FIRE Federal Responsibility Area: (Adopted FRA FHSZ 11/2007 - fhszs06_3_6). The following LRA dataset was used for the LRA FHSZ analysis: CAL FIRE Local Responsibility Area (FHSZLRA25_Phase3_v1) released in March 2025. Since it is possible for any given parcel to intersect with multiple categories for purposes of this analysis, the most conservative (or highest risk) FHSZ that intersected each parcel was used to determine which FHSZ to assign to each parcel. Once completed, the FHSZ parcel layer was joined to the assessor data to determine the number of parcels and values falling within each FHSZ. Based on this approach, the FHSZs for the Planning Area and unincorporated Plumas County were determined and further broken out by property use and included information on land and improved values, personal property values and estimated contents values.

This methodology is used below for the FHSZ analysis of people and populations, structures, and critical facilities at risk as well as with respect to future development areas. This FHSZ analysis can be misleading since multiple classes may fall within one polygon, and there are many large polygons throughout the County.

People and Populations

All populations are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment

- Individuals who exercise or recreate outdoors
- Individuals who work outdoors
- Individuals with impaired mobility

Plumas County Planning Area residents that live in CAL FIRE FHSZs are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the residential population within the Planning Area, CAL FIRE's wildfire hazard layers were overlayed on the parcel layer and linked to the Assessor data. Those residential parcel polygons that intersect the mapped FRA and SRA layers were counted and multiplied by the 2023 Census Bureau American Community Survey average household factors for each jurisdiction. These are shown by jurisdiction in Table 4-127. Those residential parcel polygons that intersect the mapped LRA layers were counted and multiplied by the 2023 Census Bureau American Community Survey average household factors for each jurisdiction. These are shown by jurisdiction in Table 4-128.

Table 4-127 Plumas County Planning Area – Residential Populations in Moderate or Higher CAL FIRE SRA/FRA Fire Hazard Severity Zones

SRA/FRA Fire Hazard Severity Zone/Jurisdiction	Improved Residential Parcels	Population at Risk
Moderate		
City of Portola	0	0
Unincorporated County	98	234
High		
City of Portola	0	0
Unincorporated County	1,415	3,382
Very High		
City of Portola	29	66
Unincorporated County	9,275	22,167

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor's Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29); Unincorporated Plumas County (2.39).

Table 4-128 Plumas County Planning Area – Residential Populations in Moderate or Higher CAL FIRE LRA Fire Hazard Severity Zones

LRA Fire Hazard Severity Zone/Jurisdiction	Improved Residential Parcels	Population at Risk
Moderate		
City of Portola	0	0
Unincorporated County	184	440
High		
City of Portola	125	286

LRA Fire Hazard Severity Zone/Jurisdiction	Improved Residential Parcels	Population at Risk
Unincorporated County	282	674
Very High		
City of Portola	781	1,788
Unincorporated County	1,494	3,571

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor's Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29); Unincorporated Plumas County (2.39).

Structures

This section is presented in two sections: SRA/FRA Fire Hazard Severity Zone Analysis and LRA Fire Hazard Severity Zone Analysis.

For the following analysis, the SRA/FRA and LRA FHSZ layer was overlaid with the parcel data as described above and further broken out by property use and included information on both land and improved values.

It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total County values at risk. However, it is highly unlikely the whole County will ever be on fire at once.

SRA/FRA Fire Hazard Severity Zone Analysis

All structures in the Plumas County Planning Area have some risk to wildfire. The Plumas County Planning Area parcel inventory and associated values by FRA and SRA are provided in Table 4-129. This is broken down further for the unincorporated County in Table 4-129. Table 4-129 shows FRA and SRA parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), personal property values, estimated content replacement values, and total values in the unincorporated County. Note: while most SRA/FRA mapped areas fall within the unincorporated County areas, due to differing boundaries in mapped datasets, a few SRA/FRA mapped areas are found in the incorporated communities as shown below. Details on each jurisdiction's SRA/FRA Fire Hazard Severity Zones can be found in their respective annexes to this LHMP Update.

Table 4-129 Plumas County Planning Area – Count and Value of Parcels and Structures in CAL FIRE SRA/FRA FHSZ by Jurisdiction

Jurisdiction / SRA/FRA Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
Very High	92	31	$4,749,530	$10,547,742	$12,605	$6,035,035	$21,344,912
High	2	0	$76,842	$0	$0	$0	$76,842
Moderate	0	0	$0	$0	$0	$0	

Jurisdiction / SRA/FRA Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Non-Wildland/Non-Urban	0	0	$0	$0	$0	$0	$0
Outside of State/ Federal Responsibility Area	1,549	990	$33,123,999	$140,703,292	$1,902,467	$88,607,174	$264,336,932
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**
Unincorporated Plumas County							
Very High	19,315	9,693	$1,383,692,274	$2,467,545,493	$41,465,180	$1,302,647,402	$5,195,350,349
High	2,252	1,542	$143,214,394	$357,339,463	$5,071,453	$194,104,091	$699,729,401
Moderate	159	108	$11,808,219	$16,685,606	$318,296	$9,002,272	$37,814,393
Non-Wildland/Non-Urban	1	0	$91,800	$0	$0	$0	$91,800
Outside of State/ Federal Responsibility Area	2,507	2,084	$126,188,041	$361,374,716	$94,672,634	$228,404,857	$810,640,248
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**
Grand Total	**25,877**	**14,448**	**$1,702,945,099**	**$3,354,196,312**	**$143,442,635**	**$1,828,800,830**	**$7,029,384,876**

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor's Data

Table 4-130 Unincorporated Plumas County – Count and Value of Parcels and Structures in CAL FIRE SRA/FRA FHSZ by Property Use

SRA/FRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Very High							
Agricultural	1,149	65	$46,154,317	$15,340,446	$986,996	$15,340,446	$77,822,205
Commercial	458	242	$42,543,301	$75,736,553	$26,524,529	$75,736,553	$220,540,936
Federal Lands	212	0	$0	$0	$0	$0	$0
Government	509	0	$124,956	$0	$0	$0	$124,956
Industrial	72	40	$5,519,454	$7,103,600	$10,600	$10,655,400	$23,289,054
Institutional	43	19	$1,512,925	$10,149,108	$26,990	$10,149,108	$21,838,131
Miscellaneous	25	0	$9,591	$0	$0	$0	$9,591

SRA/FRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Recreational	471	52	$16,440,859	$22,316,004	$1,773,985	$22,316,004	$62,846,852
Residential	15,474	9,275	$1,271,386,871	$2,336,899,782	$12,142,080	$1,168,449,891	$4,788,878,624
ROW/Utilities	902	0	$0	$0	$0	$0	$0
Very High Total	**19,315**	**9,693**	**$1,383,692,274**	**$2,467,545,493**	**$41,465,180**	**$1,302,647,402**	**$5,195,350,349**
High							
Agricultural	79	26	$10,317,552	$5,546,971	$225,254	$5,546,971	$21,636,748
Commercial	65	47	$4,611,970	$14,771,694	$3,919,965	$14,771,694	$38,075,323
Federal Lands	5	0	$0	$0	$0	$0	$0
Government	53	0	$0	$0	$0	$0	$0
Industrial	26	15	$1,341,184	$3,809,343	$0	$5,714,015	$10,864,542
Institutional	8	1	$49,910	$300,000	$0	$300,000	$649,910
Recreational	47	38	$1,696,229	$2,631,367	$40,139	$2,631,367	$6,999,102
Residential	1,875	1,415	$125,197,549	$330,280,088	$886,095	$165,140,044	$621,503,776
ROW/Utilities	94	0	$0	$0	$0	$0	$0
High Total	**2,252**	**1,542**	**$143,214,394**	**$357,339,463**	**$5,071,453**	**$194,104,091**	**$699,729,401**
Moderate							
Agricultural	16	5	$2,458,399	$695,338	$131,260	$695,338	$3,980,335
Commercial	5	5	$210,304	$623,600	$550	$623,600	$1,458,054
Institutional	1	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0	$0
Residential	131	98	$9,139,516	$15,366,668	$186,486	$7,683,334	$32,376,004
ROW/Utilities	5	0	$0	$0	$0	$0	$0
Moderate Total	**159**	**108**	**$11,808,219**	**$16,685,606**	**$318,296**	**$9,002,272**	**$37,814,393**
Non-Wildland/Non-Urban							
Residential	1	0	$91,800	$0	$0	$0	$91,800
Non-Wildland/Non-Urban Total	**1**	**0**	**$91,800**	**$0**	**$0**	**$0**	**$91,800**
Outside of State/Federal Responsibility Area							
Agricultural	66	22	$11,352,549	$3,396,890	$1,423,017	$3,396,890	$19,569,346
Commercial	325	262	$31,234,305	$73,212,565	$1,830,841	$73,212,565	$179,490,276
Government	37	0	$0	$0	$0	$0	$0
Industrial	42	30	$3,872,983	$7,536,590	$33,539,608	$11,304,885	$56,254,066
Institutional	28	19	$582,281	$3,487,061	$169,390	$3,487,061	$7,725,793
Recreational	1	1	$53,060	$265,302	$0	$265,302	$583,664

SRA/FRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Residential	1,943	1,750	$79,092,863	$273,476,308	$57,709,778	$136,738,154	$547,017,103
ROW/Utilities	65	0	$0	$0	$0	$0	$0
Outside of State/ Federal Responsibility Area Total	**2,507**	**2,084**	**$126,188,041**	**$361,374,716**	**$94,672,634**	**$228,404,857**	**$810,640,248**
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor's Data

LRA Fire Hazard Severity Zone Analysis

All structures in the Plumas County Planning Area have some risk to wildfire. The Plumas County Planning Area parcel inventory and associated values by LRA are provided in Table 4-131. This is broken down further for the unincorporated County in Table 4-137. Table 4-137 shows LRA parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), personal property values, estimated content replacement values, and total values in the unincorporated County. Details on each jurisdiction's SRA/FRA Fire Hazard Severity Zones and property use types can be found in their respective annexes to this LHMP Update.

Table 4-131 Plumas County Planning Area – Count and Value of Parcels in CAL FIRE LRA FHSZ by Jurisdiction

Jurisdiction / LRA Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
Very High	1,488	891	$35,371,649	$139,031,606	$1,912,223	$88,048,386	$264,363,864
High	155	130	$2,578,722	$12,219,428	$2,849	$6,593,823	$21,394,822
Moderate	0	0	$0	$0	$0	$0	$0
Non-Wildland/Non-Urban	0	0	$0	$0	$0	$0	$0
Outside of Local Responsibility Area	0	0	$0	$0	$0	$0	$0
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Jurisdiction / LRA Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Unincorporated Plumas County							
Very High	2,212	1,775	$110,540,627	$345,315,982	$93,775,633	$219,780,962	$769,413,204
High	480	343	$29,466,872	$52,827,286	$2,723,330	$33,896,596	$118,914,084
Moderate	235	196	$7,886,778	$22,845,115	$137,783	$12,529,989	$43,399,665
Non-Wildland/Non-Urban	188	119	$15,785,356	$13,424,512	$1,611,613	$9,153,000	$39,974,481
Outside of Local Responsibility Area	21,119	10,994	$1,501,315,095	$2,768,532,383	$43,279,204	$1,458,798,076	$5,771,924,758
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**
Grand Total	**25,877**	**14,448**	**$1,702,945,099**	**$3,354,196,312**	**$143,442,635**	**$1,828,800,830**	**$7,029,384,876**

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor's Data

Figure 4-206 Unincorporated Plumas County – Count and Value of Parcels in CAL FIRE LRA FHSZ by Property Use

LRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Very High							
Agricultural	13	2	$1,018,633	$759,651	$0	$759,651	$2,537,935
Commercial	298	238	$30,845,467	$73,154,517	$1,765,945	$73,154,517	$178,920,446
Federal Lands	3	0	$0	$0	$0	$0	$0
Government	46	0	$0	$0	$0	$0	$0
Industrial	38	25	$3,326,859	$7,767,049	$33,540,558	$11,650,574	$56,285,040
Institutional	27	16	$542,169	$4,797,675	$160,890	$4,797,675	$10,298,409
Residential	1,668	1,494	$74,807,499	$258,837,090	$58,308,240	$129,418,545	$521,371,374
ROW/Utilities	119	0	$0	$0	$0	$0	$0
Very High Total	**2,212**	**1,775**	**$110,540,627**	**$345,315,982**	**$93,775,633**	**$219,780,962**	**$769,413,204**
High							
Agricultural	18	7	$6,275,715	$1,674,393	$103,680	$1,674,393	$9,728,181
Commercial	56	41	$4,555,339	$9,216,431	$2,565,851	$9,216,431	$25,554,052
Government	6	0	$0	$0	$0	$0	$0

LRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Industrial	8	7	$920,532	$1,414,350	$0	$2,121,525	$4,456,407
Institutional	8	5	$249,084	$981,080	$11,550	$981,080	$2,222,794
Recreational	1	1	$53,060	$265,302	$0	$265,302	$583,664
Residential	362	282	$17,413,142	$39,275,730	$42,249	$19,637,865	$76,368,986
ROW/Utilities	21	0	$0	$0	$0	$0	$0
High Total	**480**	**343**	**$29,466,872**	**$52,827,286**	**$2,723,330**	**$33,896,596**	**$118,914,084**
Moderate							
Commercial	13	12	$690,326	$2,214,862	$97,460	$2,214,862	$5,217,510
Government	2	0	$0	$0	$0	$0	$0
Residential	214	184	$7,196,452	$20,630,253	$40,323	$10,315,127	$38,182,155
ROW/Utilities	6	0	$0	$0	$0	$0	$0
Moderate Total	**235**	**196**	**$7,886,778**	**$22,845,115**	**$137,783**	**$12,529,989**	**$43,399,665**
Non-Wildland							
Agricultural	67	24	$9,247,840	$3,715,159	$1,554,277	$3,715,159	$18,232,435
Commercial	1	1	$35,700	$117,300	$0	$117,300	$270,300
Industrial	8	4	$704,368	$524,514	$0	$786,771	$2,015,653
Residential	105	90	$5,797,448	$9,067,539	$57,336	$4,533,770	$19,456,093
ROW/Utilities	7	0	$0	$0	$0	$0	$0
Non-Wildland Total	**188**	**119**	**$15,785,356**	**$13,424,512**	**$1,611,613**	**$9,153,000**	**$39,974,481**
Outside of Local Responsibility Area							
Agricultural	1,212	85	$53,740,629	$18,830,442	$1,108,570	$18,830,442	$92,510,083
Commercial	485	264	$42,473,048	$79,641,302	$27,846,629	$79,641,302	$229,602,281
Federal Lands	214	0	$0	$0	$0	$0	$0
Government	545	0	$124,956	$0	$0	$0	$124,956
Industrial	86	49	$5,781,862	$8,743,620	$9,650	$13,115,430	$27,650,562
Institutional	45	18	$1,353,863	$8,157,414	$23,940	$8,157,414	$17,692,631
Miscellaneous	26	0	$9,591	$0	$0	$0	$9,591
Recreational	518	90	$18,137,088	$24,947,371	$1,814,124	$24,947,371	$69,845,954
Residential	17,075	10,488	$1,379,694,058	$2,628,212,234	$12,476,291	$1,314,106,117	$5,334,488,700
ROW/Utilities	913	0	$0	$0	$0	$0	$0
Outside of Local Responsibility Area Total	**21,119**	**10,994**	**$1,501,315,095**	**$2,768,532,383**	**$43,279,204**	**$1,458,798,076**	**$5,771,924,758**

LRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Unincorporated Plumas County Total	**24,234**	**13,427**	**$1,664,994,728**	**$3,202,945,278**	**$141,527,563**	**$1,734,158,622**	**$6,743,626,191**

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor's Data

Critical Facilities and Infrastructure

Wildfire presents a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Plumas County Planning Area to determine critical facilities in fire hazard severity zones. This was done for both SRA/FRA and LRA fire hazard severity zones.

Using GIS, the SRA/FRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Figure 4-207 shows critical facilities, as well as the SRA/FRA fire hazard severity zones. Table 4-132 details critical facilities by SRA/FRA fire hazard severity zone by facility category and count for the Planning Area.

Figure 4-207 is an overview map (with insets) that shows critical facilities, as well as the LRA fire hazard severity zones. Figure 4-208 through Figure 4-211 show the zoomed inset maps from Figure 4-207. Table 4-133 details critical facilities by LRA fire hazard severity zone by facility category and count for the Planning Area.

Details of critical facility category, type, name and address by SRA/FRA and LRA fire hazard severity zones are listed in Appendix G.

Figure 4-207 Plumas County Planning Area – Critical Facilities in SRA/FRA Fire Hazard Severity Zones

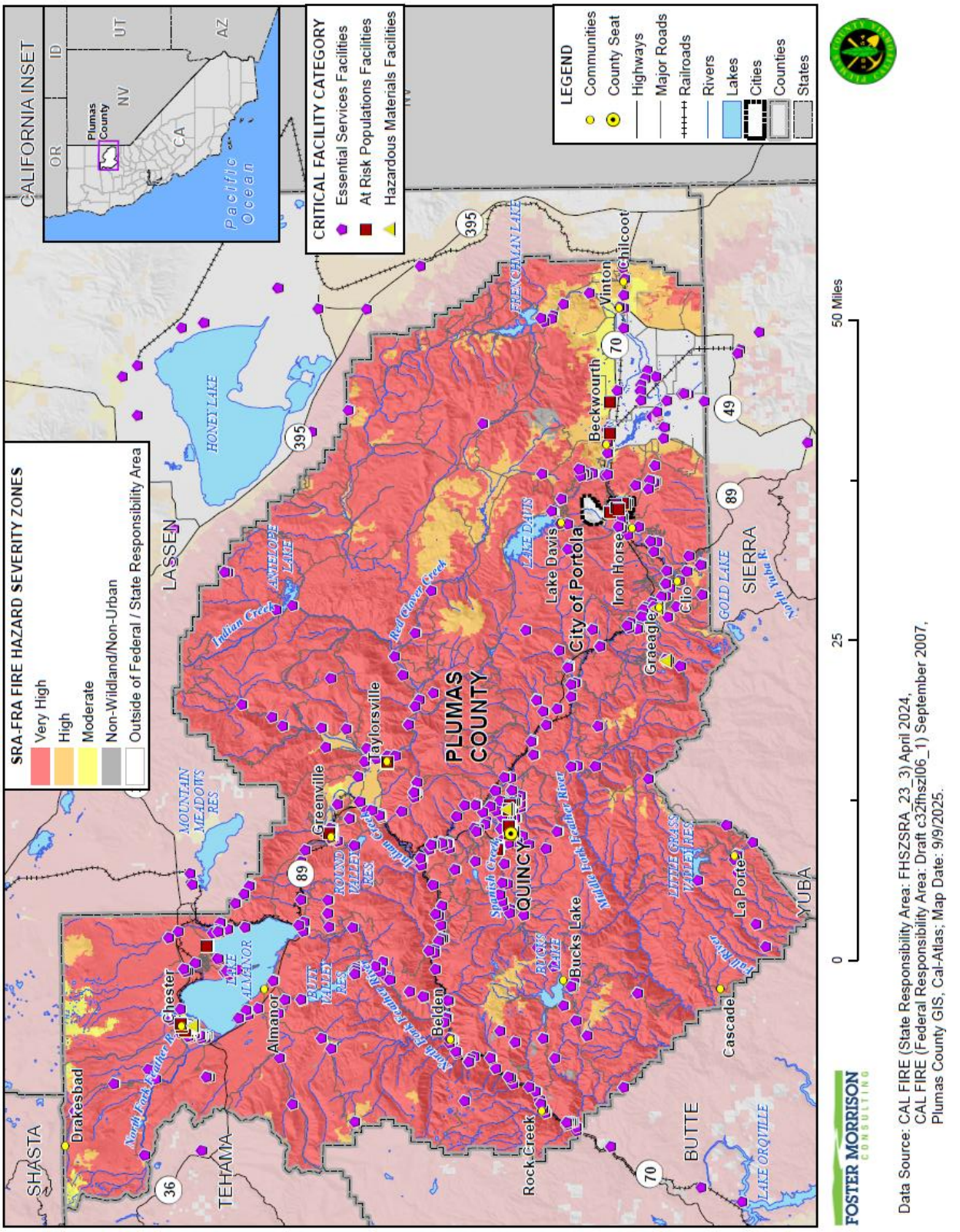


Table 4-132 Plumas County Planning Area – Critical Facilities in SRA/FRA Fire Hazard Severity Zones by Jurisdiction and Critical Facility Category

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category	Facility Count
Portola		
Outside of Federal / State Responsibility Area	Essential Services Facilities	16
	At Risk Populations Facilities	8
	Hazardous Materials Facilities	0
	Outside of Federal / State Responsibility Area Total	**24**
Portola Total		**24**
Unincorporated Plumas County		
Very High	Essential Services Facilities	619
	At Risk Populations Facilities	9
	Hazardous Materials Facilities	2
	Very High Total	**630**
High	Essential Services Facilities	70
	At Risk Populations Facilities	3
	Hazardous Materials Facilities	1
	High Total	**74**
Moderate	Essential Services Facilities	4
	At Risk Populations Facilities	1
	Hazardous Materials Facilities	0
	Moderate Total	**5**
Non-Wildland/Non-Urban	Essential Services Facilities	6
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Non-Wildland/Non-Urban Total	**6**
Outside of Federal / State Responsibility Area	Essential Services Facilities	130
	At Risk Populations Facilities	20
	Hazardous Materials Facilities	1
	Outside of Federal / State Responsibility Area Total	**151**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
Very High	Essential Services Facilities	3
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Very High Total	**3**
No Data Available	Essential Services Facilities	1

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category	Facility Count
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	No Data Available Total	**1**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
Very High	Essential Services Facilities	9
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Very High Total	**9**
High	Essential Services Facilities	5
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	High Total	**5**
Moderate	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Moderate Total	**2**
Outside of Federal / State Responsibility Area	Essential Services Facilities	16
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Federal / State Responsibility Area Total	**16**
No Data Available	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	No Data Available Total	**2**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
High	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	High Total	**2**
Outside of Federal / State Responsibility Area	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Federal / State Responsibility Area Total	**2**
Unincorporated Sierra County Total		**4**

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category	Facility Count
Unincorporated Tehama County		
Very High	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Very High Total	**2**
Unincorporated Tehama County Total		**2**
Grand Total		**934**

Source: CAL FIRE, Plumas County GIS

Figure 4-208 Plumas County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones (Overview Map with Insets)

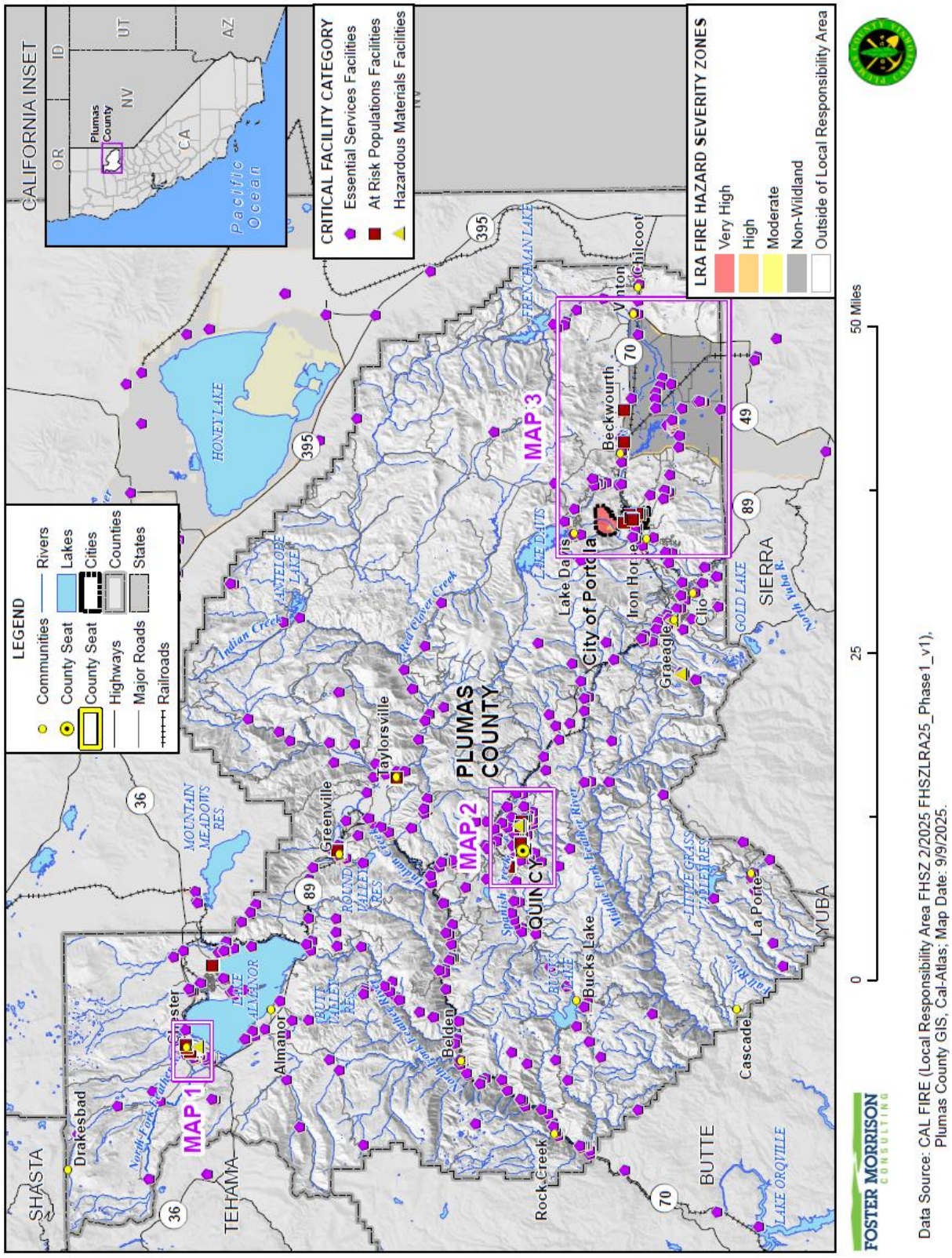


Figure 4-209 Plumas County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones (Map Inset 1)

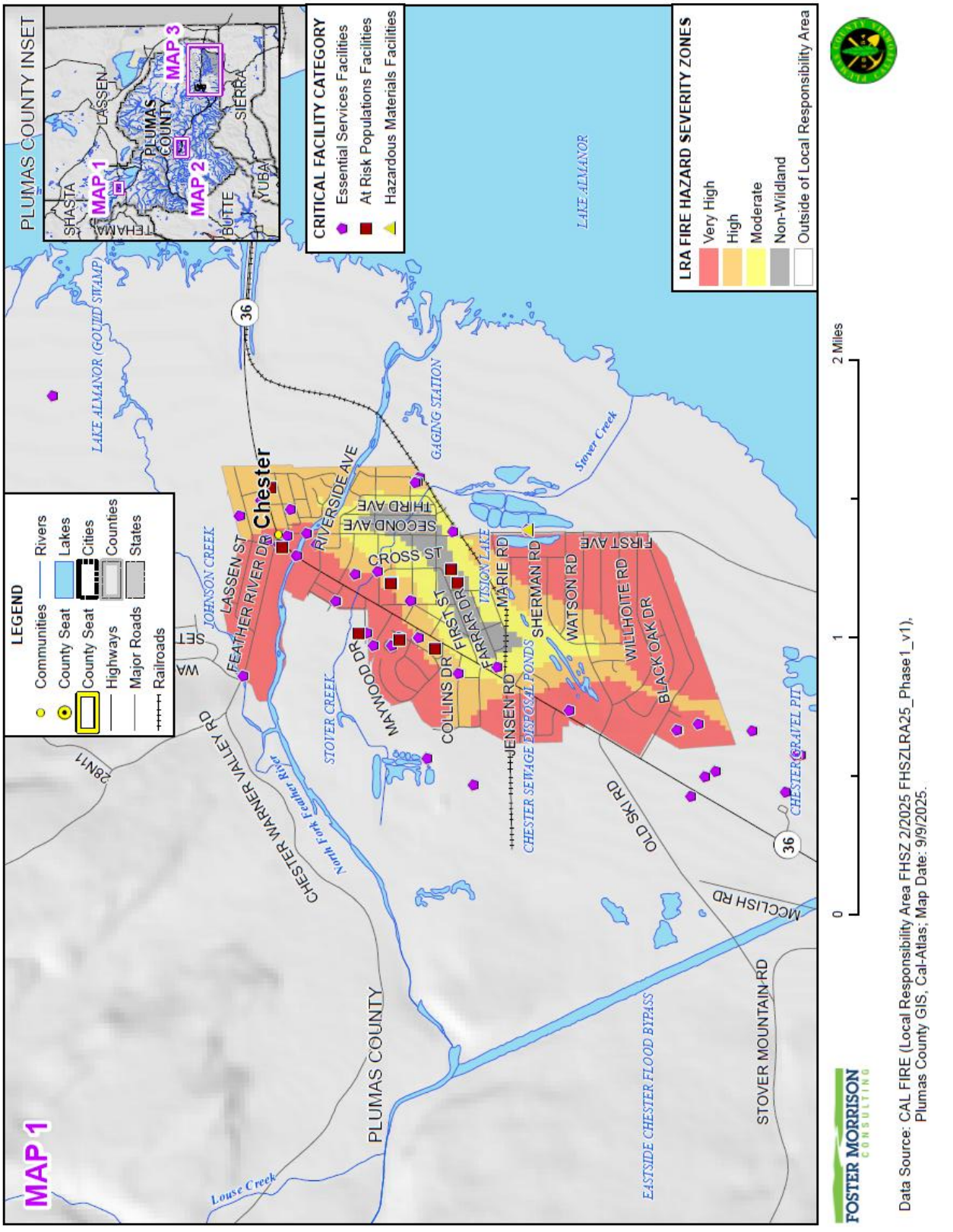


Figure 4-210 Plumas County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones (Map Inset 2)

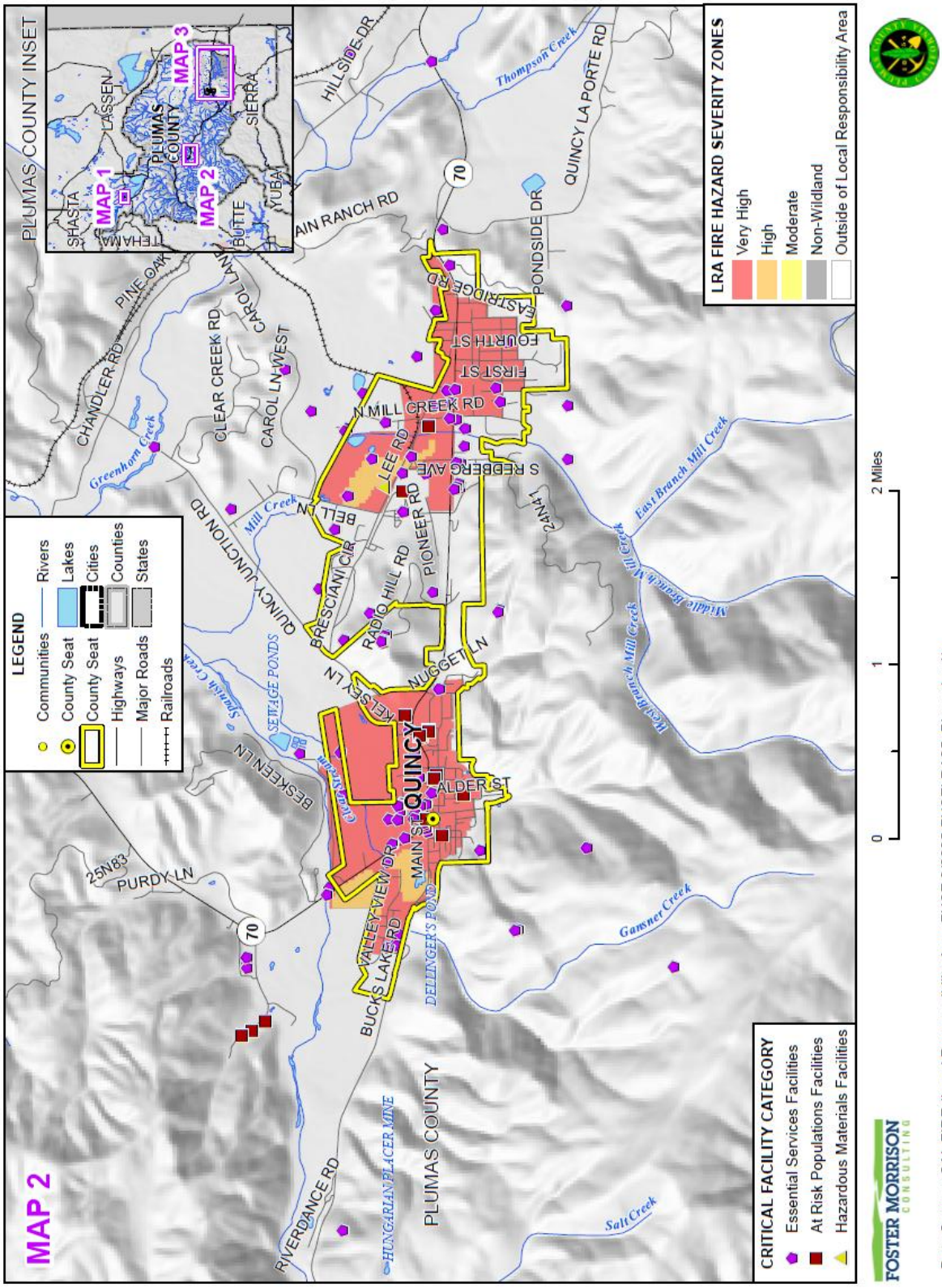


Figure 4-211 Plumas County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones (Map Inset 3)

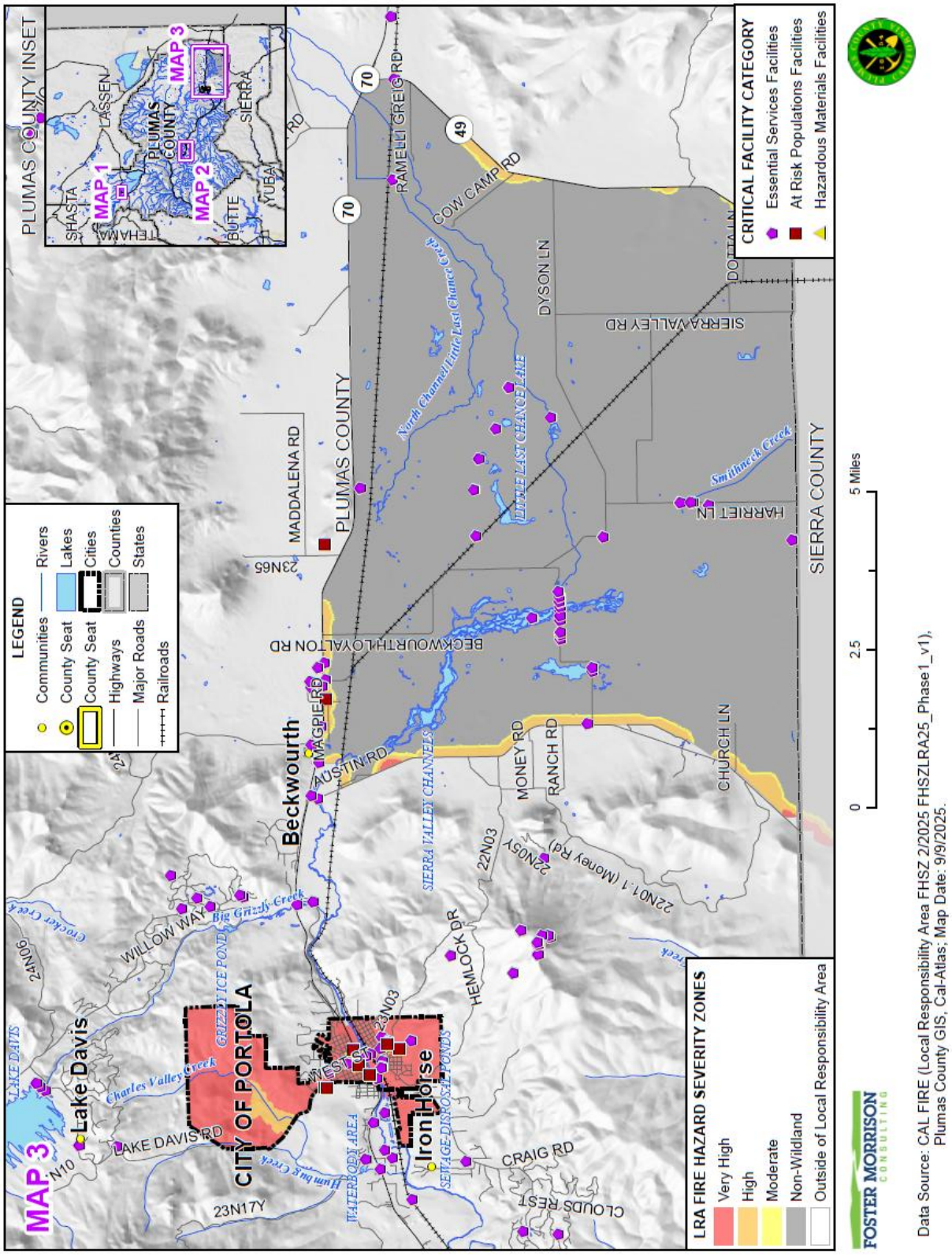


Table 4-133 Plumas County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones by Jurisdiction and Critical Facility Category

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category	Facility Count
Portola		
Very High	Essential Services Facilities	11
	At Risk Populations Facilities	7
	Hazardous Materials Facilities	0
	Very High Total	**18**
High	Essential Services Facilities	5
	At Risk Populations Facilities	1
	Hazardous Materials Facilities	0
	High Total	**6**
Portola Total		**24**
Unincorporated Plumas County		
Very High	Essential Services Facilities	79
	At Risk Populations Facilities	12
	Hazardous Materials Facilities	1
	Very High Total	**92**
High	Essential Services Facilities	19
	At Risk Populations Facilities	6
	Hazardous Materials Facilities	0
	High Total	**25**
Moderate	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Moderate Total	**2**
Non-Wildland	Essential Services Facilities	30
	At Risk Populations Facilities	2
	Hazardous Materials Facilities	
	Non-Wildland Total	**32**
Outside of Local Responsibility Area	Essential Services Facilities	699
	At Risk Populations Facilities	13
	Hazardous Materials Facilities	3
	Outside of Local Responsibility Area Total	**715**
Unincorporated Plumas County Total		**866**
Unincorporated Butte County		
Outside of Local Responsibility Area	Essential Services Facilities	4
	At Risk Populations Facilities	0

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category	Facility Count
	Hazardous Materials Facilities	0
	Outside of Local Responsibility Area Total	**4**
Unincorporated Butte County Total		**4**
Unincorporated Lassen County		
Very High	Essential Services Facilities	3
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Very High Total	**3**
Moderate	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Moderate Total	**1**
Non-Wildland	Essential Services Facilities	12
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Non-Wildland Total	**12**
Outside of Local Responsibility Area	Essential Services Facilities	18
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Local Responsibility Area Total	**18**
Unincorporated Lassen County Total		**34**
Unincorporated Sierra County		
High	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	High Total	**1**
Non-Wildland	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Non-Wildland Total	**1**
Outside of Local Responsibility Area	Essential Services Facilities	2
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Local Responsibility Area Total	**2**
Unincorporated Sierra County Total		**4**
Unincorporated Tehama County		
Outside of Local Responsibility Area	Essential Services Facilities	2

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category	Facility Count
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0
	Outside of Local Responsibility Area Total	**2**
Unincorporated Tehama County Total		**2**
Grand Total		**934**

Source: CAL FIRE, Plumas County GIS

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the Planning Area, the impacts to natural, historic, and cultural resources could be extensive and include loss of forested areas, air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be affected and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

FEMA NRI Hazard Vulnerability Assessment

The HMPC looked at the FEMA NRI for additional specific data on Plumas County's vulnerability to Wildfire. The NRI contains data and analysis for 18 separate natural hazards, including wildfire. As shown in Table 4-134, wildfires could cause a total of $7,840,595 in expected annual losses, with a historic loss rating of relatively high. Wildfire has a relatively low rating for social vulnerability and a relatively high community resilience, with a risk index score of 97.6 out of 100. According to the NRI, there have been 0 wildfire events during the 2021 data set with 0.80% annual chance per year.

Table 4-134 Plumas County Planning Area – Wildfire Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Wildfire	97.6	$7,840,595	$67,542,484,158	Relatively high

Source: FEMA NRI Report

*Hazard Risk Index is calculated using data for only a single hazard type, and reflects a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix H.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures (commercial, industrial, and residential) and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the Plumas County Planning Area. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the Planning Area by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the Planning Area; smoke and air pollution from wildfires can be a severe health hazard.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP Update have created significant air pollution affecting area residents. Planning Area residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

The Plumas County Air District noted that wildfire smoke impacts populations for days and weeks at a time. The County has no control on what wildfires burn or for how long. Poor air quality poses a health risk to all individuals. However, children, adolescents, pregnant women, the elderly, the immunocompromised and those with pre-existing chronic diseases and lung conditions are especially

vulnerable to the compounding detrimental health impacts of poor air quality events. Wildfire smoke creates and often exacerbates poor air quality situations. Of the many harmful components that exist in wildfire smoke, one of the most dangerous is particulate matter (PM), specifically fine PM (PM2.5). The microscopic particles of PM2.5 are so fine that they are inhaled deep into the lungs and cross the blood-air barrier to enter the bloodstream. Short-term exposure over hours or days can lead to increased asthma attacks, acute bronchitis, increased susceptibility to respiratory infections and can lead to an increased risk of heart attack for individuals with lung disease.

Ground-level ozone is another air pollutant of concern because it is a strong irritant that can cause constriction of the airways, forcing the respiratory system to work harder to provide oxygen. It can also cause other health problems including aggravated respiratory disease such as emphysema, bronchitis and asthma, lung damage, wheezing, chest pain, dry throat, headache, nausea, reduced resistance to infection, increased fatigue and weakened athletic performance. While ozone is typically seen at its highest levels during the summer, wildfire plumes can increase ozone formation. With an increased number of prolonged wildfire smoke events impacting populations near and far from fire epicenters, it has become imperative to understand the health impact from acute and extended exposure to wildfire smoke.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Plumas County include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the County to wildfire.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to decrease in Plumas County. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. However, County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

GIS Analysis

Plumas County provided 13 future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Figure 4-212 show the locations of the future development areas and SRA/FRA FHSZs. Table 4-135 shows the details of the future development areas that are located in each SRA/FRA FHSZ. Figure 4-213 shows the locations of the future development areas in the LRA FHSZ. Table 4-136 shows the details of the future development areas that are located in the LRA FHSZ. As shown, all future development areas in the County fall in the moderate or higher FHSZ.

Figure 4-212 Unincorporated Plumas County – Future Development in CAL FIRE SRA/FRA Fire Hazard Severity Zones

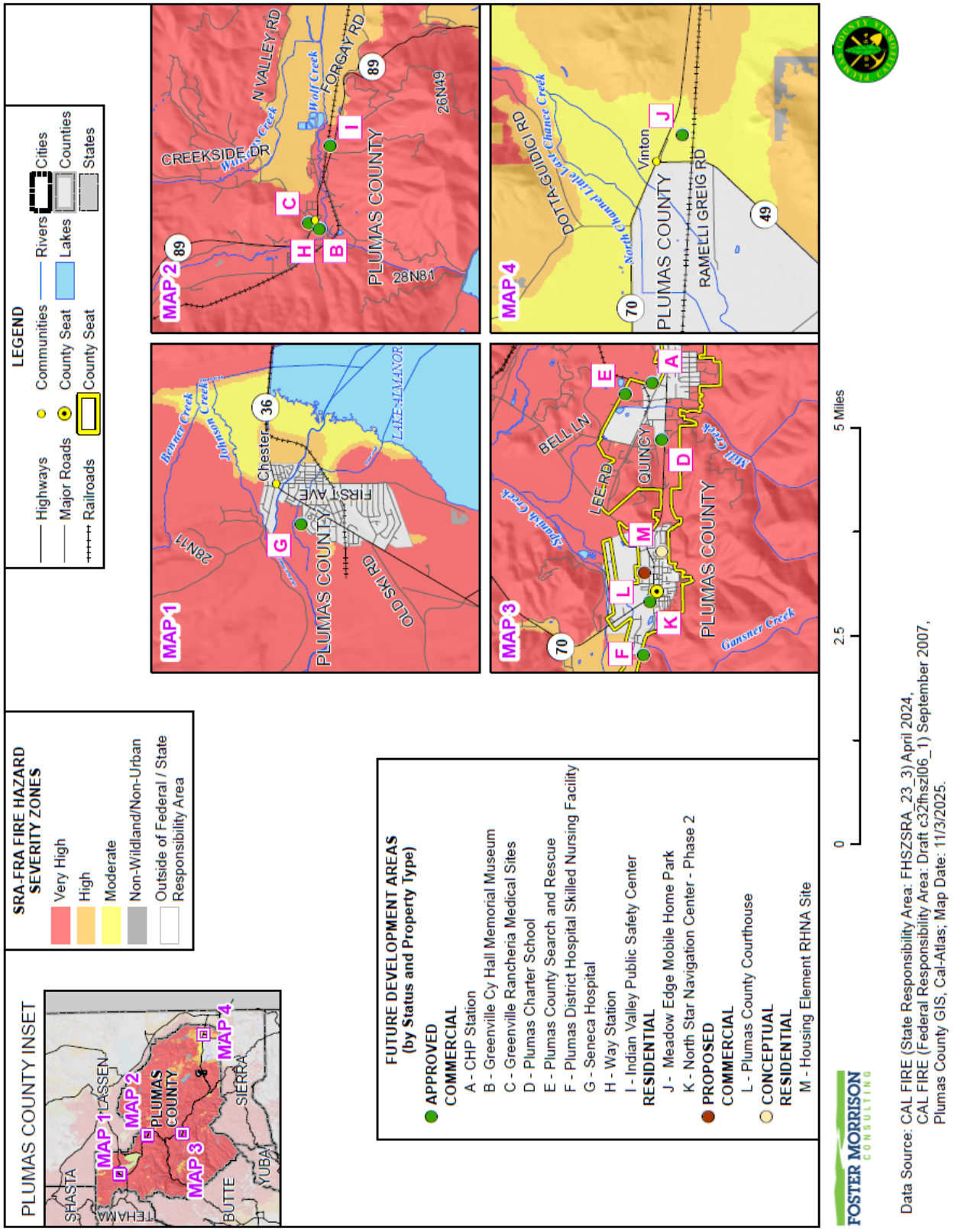


Table 4-135 Unincorporated Plumas County – Future Development in SRA/FRA FHSZs with Parcel Counts and Acreages

Fire Hazard Severity Zone / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High							
Approved							
Commercial	A - CHP Station	1	0	1	5.00	0.00	5.00
	B - Greenville Cy Hall Memorial Museum	1	0	1	0.11	0.00	0.11
	C - Greenville Rancheria Medical, Dental Clinic, and Pharmacy	1	0	1	1.58	0.00	1.58
	E - Plumas County Search and Rescue	1	1	0	4.50	4.50	0.00
	F - Plumas District Hospital Skilled Nursing Facility	1	0	1	4.12	0.00	4.12
	G - Seneca Hospital	1	0	1	11.80	0.00	11.80
	H - Way Station	1	0	1	0.28	0.00	0.28
	I - Indian Valley Public Safety Center	1	0	1	5.00	0.00	5.00
	Commercial Total	**8**	**1**	**7**	**32.39**	**4.50**	**27.89**
Approved Total		**8**	**1**	**7**	**32.39**	**4.50**	**27.89**
Conceptual							
Residential	M - Housing Element RHNA Site	1	1	0	3.64	3.64	0.00
	Residential Total	**1**	**1**	**0**	**3.64**	**3.64**	**0.00**

Fire Hazard Severity Zone / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Conceptual Total		**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Very High Total		**9**	**2**	**7**	**36.03**	**8.14**	**27.89**
Moderate							
Approved							
Residential	J - Meadow Edge Mobile Home Park	1	1	0	42.74	42.74	0.00
	Residential Total	**1**	**1**	**0**	**42.74**	**42.74**	**0.00**
Approved Total		**1**	**1**	**0**	**42.74**	**42.74**	**0.00**
Moderate Total		**1**	**1**	**0**	**42.74**	**42.74**	**0.00**
Grand Total		**10**	**3**	**7**	**78.77**	**50.88**	**27.89**

Source: CAL FIRE, Plumas County GIS

Figure 4-213 Unincorporated Plumas County – Future Development in CAL FIRE LRA Fire Hazard Severity Zones

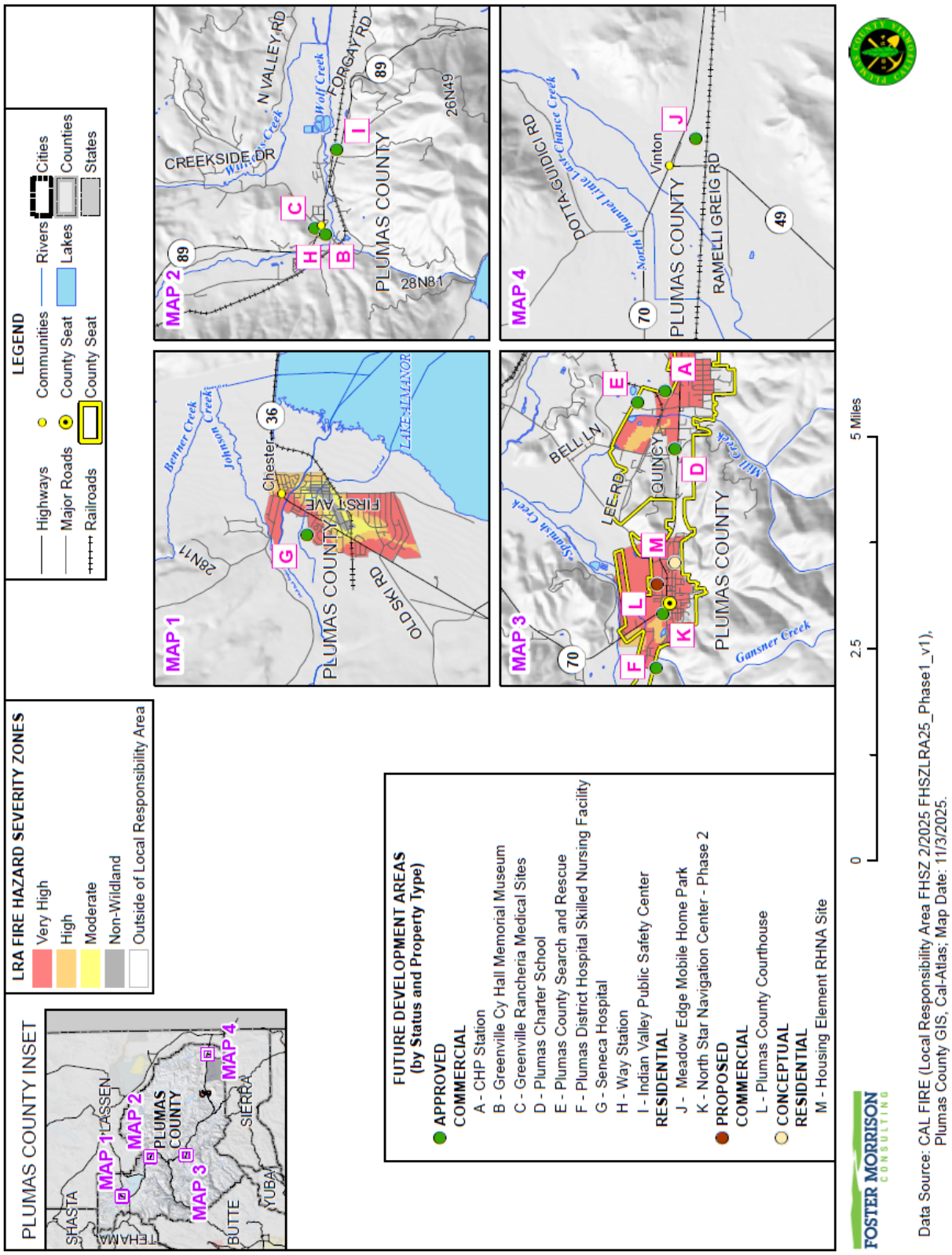


Table 4-136 Unincorporated Plumas County – Future Development in LRA FHSZs with Parcel Counts and Acreages

Fire Hazard Severity Zone / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High							
Approved							
Commercial	A - CHP Station	1	0	1	5.00	0.00	5.00
	D - Plumas Charter School	1	0	1	0.89	0.00	0.89
	F - Plumas District Hospital Skilled Nursing Facility	1	0	1	4.12	0.00	4.12
	G - Seneca Hospital	1	0	1	11.80	0.00	11.80
	Commercial Total	**4**	**0**	**4**	**21.81**	**0.00**	**21.81**
Residential	K - North Star Navigation Center - Phase 2	1	1	0	1.00	1.00	0.00
	Residential Total	**1**	**1**	**0**	**1.00**	**1.00**	**0.00**
Approved Total		**5**	**1**	**4**	**22.81**	**1.00**	**21.81**
Proposed							
Commercial	L - Plumas County Courthouse	1	1	0	2.86	2.86	0.00
	Commercial Total	**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
Proposed Total		**1**	**1**	**0**	**2.86**	**2.86**	**0.00**
Conceptual							
Residential	M - Housing Element RHNA Site	1	1	0	3.64	3.64	0.00
	Residential Total	**1**	**1**	**0**	**3.64**	**3.64**	**0.00**

Fire Hazard Severity Zone / Future Development Status and Type	Site / Map ID and Future Development Name	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Conceptual Total		**1**	**1**	**0**	**3.64**	**3.64**	**0.00**
Very High Total		**7**	**3**	**4**	**29.31**	**7.50**	**21.81**
Grand Total		**7**	**3**	**4**	**29.31**	**7.50**	**21.81**

Source: CAL FIRE, Plumas County GIS

4.4 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the Plumas County Planning Area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the capability assessment. Combining the risk assessment with the capability assessment provides an overview of the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this Plan.

A two-step approach is used to conduct the Capability Assessment for each participating jurisdiction to this LHMP Update. First, an inventory of common mitigation activities was made through the use of matrixes. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, an inventory and review of existing policies, regulations, plans, and programs was conducted to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This section presents the County's mitigation capabilities that are applicable to the unincorporated County. These are in addition to, and supplement, the many plans, reports, and technical information reviewed and used for this LHMP Update as identified in Chapter 3 and in Chapter 4.

This assessment is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.3; fiscal mitigation capabilities are discussed in Section 4.4.3; and mitigation education, outreach, and partnerships are discussed in Section 4.4.4.

4.4.1. Plumas County's Regulatory Mitigation Capabilities

Table 4-137 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in unincorporated Plumas County. Excerpts from applicable policies, regulations, plans and program descriptions follow to provide more detail on existing mitigation capabilities. ***The table has been prefilled with what was in the previous plan. Please***

update, and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.

Table 4-137 Plumas County Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Draft is still being edited but the RTP contains most of what is in the CIP
Climate Change Adaptation Plan		
Community Wildfire Protection Plan	Y	See link: https://www.plumasfiresafe.org/wildfire-planning-documents.html
Comprehensive/Master Plan	Y	Yes – see Element 6 "Public Health & Safety" Section 6.1: General Health and Safety Policies Section 6.2: Geologic and Seismic Hazards Section 6.3: Wildland Fire Hazards and Fire Protection Section 6.4: Flood and Dam Inundation Section 6.5: Hazardous Wastes Section 6.6: Airport Hazards Section 6.7: Emergency Operations Section 6.8: Healthy Communities See page 148 for implementation measures re: potential projects Plan goals, policies, and implementation measures can be used to implement mitigation actions. 2013
Continuity of Operations Plan	Y	See EOP "Basic Plan" "Continuity of Government" plan starting on page 23
Economic Development Plan	N	See General Plan Economics Element for economic development goals, policies, and implementation measures
Land Use Plan		
Local Emergency Operations Plan	Y	See link to County website: https://www.plumascounty.us/1941/Emergency-Operations-Plan
Stormwater Management Plan	N	No master plan as far storm water goes, very few actual storm water systems, mostly surface run-off
Transportation Plan	Y	Plumas County Transportation Commission https://www.plumascounty.us/1900/Regional-Transportation-Plan
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	Y	Yes (2019 CA Building Code and Title 24)

Flood insurance rate maps	Y	However, most of the County is not FEMA mapped, so there's a lot of Zone "A" (100-year) areas generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no BFE or flood depths are known.
Floodplain ordinance	Y	Chapter 2, Zoning; Article 35 – Floodplain combining zone (FP) But the original comprehensive flood plain ordinance was adopted in 1998 and was based on the Model Flood Plain ordinance produced by the Department of Water Resources (CA DWR). At the last audit conducted by CA DWR and the Federal Emergency Management Agency (FEMA), it was recommended that the ordinance be updated to the latest state/federal Model Flood Plain ordinance. Update Title 8 (Building Regulations), Chapter 17 (Flood) of the Plumas County Code re: Flood Plain Ordinance and applicable Title 9 (Planning and Zoning) sections. Issue identified during 2011 audit by CA DWR and FEMA. Update Flood Plain Ordinance to the latest December 2006 CA DWR CA Model Flood Plain Ordinance. Coordinate with Public Works. Related General Plan policies: PHS 6.4.1 Coordination with Federal Emergency Management Agency, United States Army Corps of Engineers and Department of Water Resources Division of Flood Management PHS 6.4.2 Development in Floodways and Dam Inundation Areas PHS 6.4.4 Floodplain Development Restrictions PHS 6.4.7 Limit Surface Runoff PHS Implementation Measures 1, 10, 20 COS 7.2.4 Stream Corridor Development W 9.7.2 Downstream Peak Flows
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	Y	Implement State Responsibility Areas (SRAs) Fire Safe Regulations, various County Code sections

Subdivision ordinance	N	But look to develop an ordinance in 2020/2021 The Subdivision Ordinance should: Update the Plumas County Code to be in conformance with the California Subdivision Map Act, including language regarding procedures for processing Certificate of Compliance and Reversion to Acreage proposals. Clarify the responsibilities of the Planning Director, Zoning Administrator, County Engineer, Road Commissioner, and County Surveyor in processing tentative and final maps. Incorporate the application requirements as approved by the Board of Supervisors in previous resolutions. Provide for a streamlined process that leads to development of standard conditions of approval as delineated in the wording of the ordinance. Incorporate goals, policies and implementation measures from the 2035 Plumas County General Plan.
Zoning ordinance	Y	Title 4, Public Safety, Chapter 1 – Disaster Response and Emergency Organization; Chapter 2 – Fire Prevention; Title 9, Planning and Zoning, Chapter 2, Zoning; Section 9-2.407.5-Flood; Article 35 Flood Plain Combining Zone (FP); Chapter 3 Subdivisions; Section 9-3.309-Flood Hazards: Drainage; Chapter 9 – State Responsibility Area Fire Safe Regulations; and Title 8, Building Regulations, Chapter 17 – Flood
Other		
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP YOUR JURISDICTION. FROM PREVIOUS PLAN - Have a BCEGS Score Develop a climate action plan / climate resilience and adaptation plan Develop subdivision ordinance Develop grading and drainage ordinance FEMA needs to map more of the County, so property owners are not burdened with paying for a flood study to determine BFE to get an elevation cert		

BCEGS Scores by Fire Protection Agency

BCEGS scores vary by fire protection agency. This can be seen in Table 4-138. IS THIS STILL ACCURATE?

Table 4-138 Plumas County – Fire Protection Agency BCEGS Scores

ISO Rating	Department
4/9	Beckwourth Fire Protection District
10	C-Road Comm. Services District
4	Chester Public Utility District
9	Crescent Mills Fire Protection District
5/5X	Eastern Plumas Rural Fire District
4/8b	Graeagle Fire Protection District

ISO Rating	Department
5	Greenhorn Creek CSD
4/4Y	Hamilton Branch Fire Protection District
4/8	Indian Valley CSD
7/9	La Porte Fire Protection District
8B	Long Valley CSD
8	Meadow Valley Fire District
3	Peninsula Fire Protection District
4/4Y	Plumas Eureka CSD
5	Portola City Fire Department
10	Prattville-Almanor Fire District
3/3Y	Quincy Fire Protection District
8B	Sierra Valley Fire District
3	West Almanor CSD

Source: Plumas County OES

As indicated in the tables above, Plumas County has several plans and programs that guide the County's mitigation of development of hazard-prone areas. Starting with the Plumas County General Plan, which is the most comprehensive of the County's plans when it comes to mitigation, some of these are described in more detail below.

2035 Plumas County General Plan (Adopted December 2013)

A general plan is a legal document, required by state law, that serves as a community's "constitution" for land use and development. The plan must be a comprehensive, long-term document, detailing proposals for the "physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning" (Government Code §65300 et seq.). Time horizons vary, but the typical general plan looks 10 to 20 years into the future. The law specifically requires that the general plan address seven topics or "elements." These are land use, circulation (transportation), housing, conservation, open space, noise, and safety. The plan must analyze issues of importance to the community, set forth policies in text and diagrams for conservation and development, and outline specific programs for implementing these policies.

Goals and policies related to mitigation from the General Plan include the following:

Land Use Element

Goal LU-5	**To promote a development pattern that maximizes the use of existing infrastructure prior to the construction of new infrastructure. Develop a land use pattern to facilitate the delivery of community services in the most cost-effective manner possible for infrastructure construction and maintenance, fire protection, emergency medical and police.**
Policy 1.5.3	Provision for Fire and Life Safety Services – The County shall require development to be located adjacent to, or within, areas where fire and life safety services exist, or can be efficiently and economically provided.

Goal LU 1.11	To promote development patterns that recognize the need to conserve water resources, consistent with other stated goals.
Policy 1.11.1	Groundwater Management Plans – The County shall support the development and implementation of a regional groundwater management plan and shall work with water resources agencies, water users, and other affected parties to develop basin-specific plans for high priority groundwater basins to ensure a sustainable, adequate, safe and economically viable groundwater supply for existing and future uses within the County.

Public Health & Safety Element

Goal PHS 6.1	To protect local communities from injury and damage resulting from natural catastrophes and man-made hazardous conditions.
Policy 6.1.1	Development Constraints – The County shall limit the density and intensity of development in areas to the levels needed to reduce hazards to public health and safety.
Policy 6.1.2	Building and Code Updates – Except as otherwise noted by State law, the County shall ensure that all new structures intended for human habitation are designed in compliance with the latest adopted editions of the California Building Standards Code.
Policy 6.1.3	Hazard Awareness and Public Education – The County shall continue to promote awareness and education among residents regarding possible natural hazards, including soil conditions, landslides, earthquakes, flooding, wildfire hazards and emergency procedures.
Policy 6.1.4	Public Safety Programs – The County shall promote all applicable public safety programs, including neighborhood-watch programs, hazards materials disposal, public awareness and prevention of wildfire hazards, and other public-education efforts.

Goal PHS 6.2	To identify and prevent development in "areas of unstable geologic conditions," which include: active faults, landslides and areas of potential ground failure such as liquefaction, mudslides and subsidence.
Policy6.2.1	Maintenance of Updated Geologic and Seismic Hazard Information – The County shall maintain updated geologic, seismic and avalanche hazard maps and other hazard inventory information in cooperation with the State Office of Emergency Services, California Department of Conservation—Division of Mines and Geology, United States Forest Service, California Department of Transportation and other agencies as this information is made available.
Policy6.2.2	Design Measures – The County shall require earthquake resistant designs consistent with the requirements of the California Building Standards Code for all critical structures, such as fire stations, emergency communication centers, private schools, high occupancy buildings, and non-highway bridges.
Policy6.2.3	Seismic Retrofitting – The County shall support and encourage seismic upgrades to older buildings that may be structurally deficient. Upgrades shall consider any applicable historic building preservation requirements.
Policy6.2.4	Development on Slopes – The County shall not allow development on slopes 30 percent or greater, unless the applicant can sufficiently mitigate the inherent problems associated with developing on steep slopes.
Policy6.2.5	Avalanche, Landslide and Mudflow Hazards – The County shall prohibit new subdivisions in high risk areas of known avalanche, landslide or mudflow hazards.

Goal PHS 6.2	To identify and prevent development in "areas of unstable geologic conditions," which include: active faults, landslides and areas of potential ground failure such as liquefaction, mudslides and subsidence.
Policy6.2.6	Naturally Occurring Asbestos – The County shall work with the Northern Sierra Air Quality Management District to map locations of naturally occurring asbestos and to mitigate potential hazards from development.
Policy6.2.7	Development Requirements – The County shall continue to address seismic standards of dam safety as required by the State Division of Safety and Dams.

Goal PHS 6.3	To minimize the possibility of the loss of life, injury, damage to property, and loss of habitat and natural resources as a result of fire.
Policy 6.3.1	Defensible Space – The County shall review and update its Fire Safe ordinance to attain and maintain defensible space through conditioning of tentative maps and in new development at the final map and/or building-permit stage.
Policy 6.3.2	Limitations in Fire Hazard Areas – The County shall consult the current Fire Hazard Severity Zone Maps during the review of all projects so that standards and mitigation measures appropriate to each hazard classification can be applied. Land use densities and intensities shall be determined by mitigation measures in areas designated with a high or very high fire hazard rating. Intensive development in areas with high or very high fire hazard rating shall be discouraged.
Policy 6.3.3	Structural Fire Protection – All developments within the service boundaries of an entity which provides structural fire protection may be required to make contribution to the maintenance of the existing level of structural service proportionate to the increase in demand for service structural fire protection and Emergency Medical Services resulting from the development.
Policy 6.3.4	New Development Requirements – As a requirement for approving new development, the County must find (based on information provided by the applicant and the responsible fire protection district), that concurrent with development, adequate emergency water flow, fire access – Public Health & Safety Element| 140 – and fire-fighting personnel and equipment, will be available in accordance with applicable State, County, and local fire district standards.
Policy 6.3.5	Emergency Access – As a requirement of new development, the applicant must demonstrate that adequate emergency access exists or can be provided to ensure that emergency vehicles can access the site and that private vehicles can evacuate the area.
Policy 6.3.6	Fire Protection and Roadside Maintenance – As a condition of development, the County shall require the long-term maintenance of private roads, including roadside vegetation management, to the standards of original improvements.
Policy 6.3.7	Rural Fire Protection Water System – The County shall research the feasibility of a countywide rural fire protection water system that provides a cost-effective, adequate water supply.
Policy 6.3.8	Fire Protection Facility Upgrades – The County shall encourage upgrading facilities within existing fire protection districts and encourage expansion of existing districts where warranted by population density allowed under the General Plan.
Policy 6.3.9	Fuel Modification – The County shall require new development within high and very high fire hazard areas to designate fuel break zones that comply with defensible space requirements to benefit the new and, where possible, existing development.
Policy 6.3.10	Prescribed Burning – The County shall encourage the use of prescribed burning as a management tool for hazardous fuels reduction, timber management purposes, livestock production and enhancement of wildlife habitat. The County shall support removal of fuels and chipping and onsite distribution of chipped materials as an alternative to burning.

Goal PHS 6.3	To minimize the possibility of the loss of life, injury, damage to property, and loss of habitat and natural resources as a result of fire.
Policy 6.3.11	Regional Cooperation – The County shall cooperate with Federal, State, community fire safety groups and other fire protection entities in fire prevention programs and in identifying opportunities for hazardous fuel reduction projects in zones of high and very high fire hazard either prior to or as a component of project review.
Policy 6.3.12	Fire Prevention Education – The County, in cooperation with Federal and State agencies, community fire safety groups, and the local fire protection districts, shall educate the public about the hazards of wildfires, methods to reduce the potential for fires to occur, and mitigation measures, including reducing fuel loads, to lessen the impacts of wildfires.
Policy 6.3.13	Landscape-Scale Fuel Modification – The County shall support fuel modification across public and private forestlands to reduce the potential for catastrophic wildfires, with the highest priority directed toward reducing hazardous fuel levels in the wildland-urban interface.

Goal PHS 6.4	To minimize the loss of life, injury or damage to property as a result of floods in Plumas County.
Policy 6.4.1	Coordination with Federal Emergency Management Agency, United States Army Corps of Engineers and Department of Water Resources Division of Flood Management – The County shall continue participation in the Federal Emergency Management Agency's National Flood Insurance Program, utilizing the Flood Insurance Rate Maps and the County's floodplain ordinances that implement Federal and State flood management standards. The County shall continue to utilize floodplain management and flood control information provided by the Department of Water Resources Division of Flood Management and the United States Army Corps of Engineers and coordinate with these agencies when undertaking updates to the County's floodplain ordinances and policies.
Policy 6.4.2	Development in Floodways and Dam Inundation Areas – The County shall prohibit the development of new critical or high-occupancy structures within the floodway of any river, stream or other body of water. Similar structures should not be located within the inundation area resulting from failure of dams identified by the State Department of Water Resources Division of Safety of Dams.
Policy 6.4.3	New Parcels in Floodplain – The County shall strongly discourage the creation of new residential parcels which lie entirely within Special Flood Hazard Areas as identified on the most current version of the Flood Insurance Rate Maps provided by the Federal Emergency Management Agency. Proposals for new parcels that are partially located within designated Special Flood Hazard Areas must be evaluated to determine if sufficient land is available outside the Special Flood Hazard Area to support residential development and that potential flood impacts can be sufficiently mitigated.
Policy 6.4.4	Floodplain Development Restrictions – The County shall ensure that riparian areas and drainage areas within floodplains are free from development that may adversely affect floodway capacity or characteristics of natural/riparian areas or natural groundwater recharge areas.
Policy 6.4.5	Multi-Purpose Flood Control Measures – The County shall encourage multi-purpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat and scenic values of the County's waterways.
Policy 6.4.6	Flood Control Design – The County shall avoid flood control projects involving further channeling, straightening or lining of waterways until alternative multi-purpose modes of treatment, such as wider berms and landscaped areas in combination with recreation amenities, are studied.

Goal PHS 6.4	To minimize the loss of life, injury or damage to property as a result of floods in Plumas County.
Policy 6.4.7	Limit Surface Runoff – The County shall review development projects to determine that such development can be permitted without alteration of off-site historical flood patterns or contribution to flooding hazards for downstream users. Each project with the potential to create off-site drainage shall be required to submit a plan showing how the impacts of such drainage will be addressed, both on-site and off-site.
Policy 6.4.8	Storm Water Retention/Detention and Groundwater Infiltration – As appropriate, the County shall require development to incorporate storm-water retention/detention ponds to encourage groundwater recharge and to make efficient use of storm water.

Goal PHS 6.7	To provide effective emergency response to natural or human-made hazards and disasters.
Policy 6.7.1	Emergency Response Services Coordination with Government Agencies – The County shall coordinate emergency response with local, State and Federal governmental agencies, community organizations, volunteer agencies and other response partners during emergencies or disasters utilizing the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS).
Policy 6.7.2	Mutual Aid Agreement – The County shall participate in established local, State and Federal mutual aid systems. Where necessary and appropriate, the County shall enter into agreements to ensure the effective provision of emergency services, such as mass care, heavy rescue, hazardous materials or other specialized functions.
Policy 6.7.3	Maintenance of Emergency Evacuation Plans – The County shall continue to create, revise and maintain emergency plans for the broad range of natural and human-made disasters and response activities that could be foreseen to impact Plumas County. This shall include, but not be limited to, flooding, dam failure, extreme weather, evacuation/transportation, mass care and shelter, and animal evacuation and sheltering. Emergency Planning projects shall be in line with the County's Emergency Operations Plan and incorporate current guidance and initiatives from State and Federal Emergency Management Agencies.
Policy 6.7.4	Streets and Highways Upgrades – The County shall evaluate and strive to upgrade vital streets and highways to an acceptable level for emergency services and for public safety.
Policy 6.7.5	Search and Rescue – The County should continue to provide search and rescue operation capabilities through the Plumas County Sheriff's Department.
Policy 6.7.6	Joint Exercises – The County shall encourage fire, law enforcement, emergency medical services, resource management, public health and other governmental and non-governmental response partners to periodically conduct joint training exercises with the goal of developing the best possible coordinated action and effective response times in the event of a natural or human-made disaster across all local jurisdictions.

Conservation & Open Space Element

Goal COS 7.10	To address climate change and manage its effects by pursuing programs and strategies in order to meet or exceed state requirements for reductions in GHG emissions.
Policy 7.10.1	Inventory and Monitor GHG Emissions – The County shall inventory and monitor GHG emissions in County operations and in the community, consistent with Northern Sierra Air Quality Management District and/or State guidelines.

Goal COS 7.10	To address climate change and manage its effects by pursuing programs and strategies in order to meet or exceed state requirements for reductions in GHG emissions.
Policy 7.10.2	Climate Action Plan – The County shall establish a Climate Action Plan that identifies strategies for increasing energy efficiency, carbon sequestration, GHG emissions reductions, and land use and transportation strategies that are consistent with appropriate climate change regulations (i.e. State of California's Global Warming Solution Act).
Policy 7.10.3	Support Statewide Climate Change Solutions – The County shall monitor and support the efforts of CAL EPA, CARB, and the NSAQMB, under AB 32 (Health and Safety Code §38501 et seq.), to formulate mitigation strategies, if any, that may be implemented by local government, and further require the County to ultimately consider any such strategies once they become available and are appropriate for rural adaptation.
Policy 7.10.4	Forest Sequestration and Biomass Energy – The County shall investigate providing incentives for increased carbon sequestration on forest lands and encourage the use of forest biomass for sustainable energy generation.
Policy 7.10.5	Sustainable Business Practices – The County shall encourage all businesses to take the following actions as appropriate for each business: replace high mileage fleet vehicles with hybrid and/or alternative fuel vehicles, increase the energy efficiency of facilities, transition to the use of renewable energy instead of non-renewable energy sources, adopt purchasing practices that promote emissions reductions, and reusable materials and increased recycling.
Policy 7.10.6	Sustainable Agricultural Practices – The County shall promote GHG emission reductions by encouraging carbon efficient farming methods, such as no-till farming, crop rotation, cover cropping, installation of renewable energy technologies, protection of grasslands, open space, riparian, and forest lands from conversion to other uses, and development of energy-efficient structures.
Policy 7.10.7	Public Awareness and Education – The County shall work to increase public awareness regarding climate change and encourage County residents and businesses to become involved in activities and lifestyle changes that will aid in the reduction of GHG emissions.

Agriculture and Forestry Element

Goal AG/FOR 8.5	Protect the supply and quality of the County's water resources, by maintaining the proper ecological function of watersheds, including sediment transport groundwater recharge and filtration, biological processes, flood mitigations, and maintaining enough water for local and agricultural needs and uses.
Policy 8.5.1	Water for Agricultural Uses – Protect sustainable supplies of water for agricultural uses.

Goal AG/FOR 8.11	Promote the utilization of forested lands to address GHG emissions.
Policy 8.11.1	Forestlands as Locations for Carbon Sequestration - The County shall work through the CEQA process to comply with GHG reductions as set forth in AB 32 to create policies that encourage utilization of forestlands to serve as locations for carbon sequestration.
Policy 8.11.2	GHG Emissions Mitigation – The County shall determine impacts of development projects on GHG emissions and require enforceable mitigation measures. If, after analyzing and requiring all reasonable and feasible on-site mitigation measures for avoiding or reducing GHG-related impacts, the lead agency determines that additional mitigation is required, the agency shall consider additional off-site mitigation. Priority for off-site mitigation shall be given to agricultural and forested lands serving as locations for carbon sequestration.

Water Resources Element

Goal W 9.1	To manage groundwater as a valuable and limited resource and to ensure its sustainability as a reliable water supply sufficient to meet the existing and future needs of Plumas County.
Policy 9.1.1	Groundwater Management – The County shall support the development and implementation of a regional groundwater management plan and shall work with water resource agencies, such as the Sierra Valley Groundwater Management District, water users and other affected parties to develop basin-specific plans for high priority groundwater basins to ensure a sustainable, adequate, safe and economically viable groundwater supply for existing and future uses within the County.
Policy 9.1.2	Groundwater Recharge Area Protection – The County shall require that all projects be designed to maintain or increase the site's pre-development absorption of rainfall (minimize runoff), and to recharge groundwater where appropriate. Implementation would include standards that could regulate impervious surfaces, provide for water impoundments (retention/detention structures), protecting and planting vegetation, use of permeable paving materials, bioswales, water gardens, and cisterns, and other measures to increase runoff retention, protect water quality, and enhance groundwater recharge.
Policy 9.1.3	Groundwater Demand Reductions – The County shall encourage the use of alternate sources of water supply as appropriate and to the maximum extent feasible in an effort to reduce demand on key groundwater resources in the county.

Goal W 9.2	To protect, restore and enhance the quality of surface and groundwater resources to meet the needs of all reasonable beneficial uses.
Policy 9.2.1	Participation in Water Quality Objectives – The County shall support and assist in the development of reasonable and prudent Total Maximum Daily Loads for the impaired water bodies and pollutants of concern identified by the Central Valley Regional Water Quality Control Board to achieve compliance with adopted Total Maximum Daily Loads. Work with the Central Valley Regional Water Quality Control Board to develop and implement measures consistent with the adopted Total Maximum Daily Loads. The County shall also work closely with the Central Valley Regional Water Quality Control Board, the City of Portola, public water supply purveyors and other interested parties in the development and implementation of water quality plans and measures.
Policy 9.2.2	Background Water Quality – The County shall encourage the use of water management strategies, biological remediation and the best available technology to address naturally occurring water quality problems.
Policy 9.2.3	County Facilities – The County shall design, construct and maintain County buildings, roads, bridges, drainage and other facilities to minimize sediment and other pollutants in stormwater flows.
Policy 9.2.4	Wildfire and Water Quality Controls The County shall, in cooperation with wildfire management agencies, such as Cal Fire, United States Forest Service and local fire protection agencies, develop a variety of land-use planning, site design and vegetation management techniques to reduce the risk of wildfires. This risk reduction shall also include post-fire erosion, sedimentation and water-quality conditions.
Policy 9.2.5	Wastewater Standards and National Pollutant Discharge Elimination System (NPDES) The County shall support wastewater agencies' efforts to meet applicable NPDES permit requirements and waste discharge requirements in compliance with the Federal Water Pollution Control Act and California's Porter-Cologne Water Quality Control Act.
Policy 9.2.6	Erosion and Sediment Control Measures The County shall ensure that Best Management Practices to control erosion and sediment will be incorporated into development design and improvements.

Goal W 9.2	To protect, restore and enhance the quality of surface and groundwater resources to meet the needs of all reasonable beneficial uses.
Policy 9.2.7	Wastewater Application Management The County shall approach all wastewater applications, both individual on-site and community systems, in a manner that supports Federal, State and local wastewater regulations to ensure the protection of public health and the environment.

Goal W 9.3	To ensure that the County proactively develops and supports programs and policies for forest and watershed management to counteract trends in declining snowpack storage, accelerated Spring runoff, and declining overall runoff that threaten both larger flood events and diminished late-season water supplies.
Policy 9.3.1	Water Resource Adaptation – The County shall encourage water purveyors to develop plans for responding to potential changes in weather patterns resulting from climate change effects, the sharing of water resources to improve water supply reliability and the allocation of water supply to priority users. Climate patterns will also be monitored for their ability to affect existing drainage patterns and their resultant effects to flood-prone areas.
Policy 9.3.2	Forest Management – The County shall support plans and projects to improve the conditions of overstocked forestlands, especially around communities-at-risk, to reduce the potential adverse impacts from wildfires, to protect watersheds, habitats and reduce excessive evapotranspiration losses.

Goal W 9.4	To maintain sound management of the water resources in Plumas County's diverse watersheds and assure that any proposals for surface and groundwater exports are stringently reviewed to ensure that they do not undermine the County's ability to sustain an adequate supply of high-quality water for all its water users and dependent natural resources.
Policy 9.4.1	Watershed Protection – The County shall require new development projects to mitigate potential impacts on surface water, recreation areas, agriculture and wildlife habitat areas.
Policy 9.4.2	In-stream Flow Rate Management – The County shall support reasonable in-stream flow standards to protect aquatic habitat and fisheries while balancing water supply needs and protecting water rights within the Feather River watershed.
Policy 9.4.3	Watershed and Community-Based Efforts – The County shall support the efforts of local community-based watershed groups to protect water resources and work with local groups to ensure decisions and programs take into account local opinions, priorities and needs.
Policy 9.4.4	Regional Water Management – The County shall support regional efforts through the Upper Feather River Integrated Regional Water Management Plan (UFRIRWMP) to ensure coordination and adaptive management between statewide water resource planning efforts, regional priorities and local needs. The goals and objectives of the UFRIRWMP shall be considered in establishing County water resource priorities and policies.
Policy 9.4.5	Watershed Program Funding – The County shall support efforts to obtain grant funding for locally sponsored watershed programs and planning efforts and projects that enhance and protect the Feather River Watershed.
Policy 9.4.6	Water Export Projects on Plumas County Watercourses – The County, prior to giving its approval and support to export projects on county watercourses, will require the following information to demonstrate the export project's adherence to the requirements of California Water Code Section 10505 protecting development rights and Section 11460 protecting beneficial needs of the watersheds.

Goal W 9.4	**To maintain sound management of the water resources in Plumas County's diverse watersheds and assure that any proposals for surface and groundwater exports are stringently reviewed to ensure that they do not undermine the County's ability to sustain an adequate supply of high-quality water for all its water users and dependent natural resources.**
Policy 9.4.7	Minimizing the Effects of Water Exports – The County shall require that exports not damage the County's environmental and economic setting by ensuring that "no unreasonable effect" occurs in the transfer and withdrawal of water resources pursuant to Section 1810 of the State Water Code.
Policy 9.4.8	Hydroelectric Project Relicensing – The County shall encourage that dam relicensing projects effectively balance development values, such as electric power, flood control and water supply, with non-developmental values, such as environmental resource protection, recreation, habitat restoration and water quality, and other values that best reflect the public interest. Efforts to mitigate project impacts should not impose redirected impacts on other public or private resources.

Goal W 9.5	**To encourage public water systems and their sources to provide an adequate supply to meet long-term needs and that is provided in a manner that maintains water resources for other water users while protecting the natural environment.**
Policy 9.5.1	Adequate Water Supply Facilities and Services – The County shall support water purveyors' plans to develop new reliable future sources of supply, while promoting water conservation and water recycling/reuse. Additionally, through the development review process, the County shall ensure that public water facilities and services will be adequate and operational to serve new development and meet capacity demands when needed. Such needs shall include capacities necessary to comply with public safety.
Policy 9.5.2	Cooperative Planning for Water Supply – The County shall work with public water supply purveyors to disseminate and discuss information on the limits of available water supplies, how the supplies can be used efficiently, the possible effects of drought conditions, acceptable levels of risk of shortage for various water users, priorities for allocation of the available water supply, conditions for use of limited supplies, and limits of alternate sources that could be used or developed.
Policy 9.5.3	Urban Water Management Plans – The County shall encourage and assist in the preparation of master facilities plans, and urban water management plans where required by State law, for all public water suppliers, to design and construct all facilities in accordance with sustainable yields and the planning documents of applicable jurisdictions.
Policy 9.5.4	Water Supply for New Development – The County shall ensure a sufficient water supply for all new residential/non-residential development. To do this, the County shall comply with Water Code Section 10910 (Senate Bill 610) and Government Code Section 66473.7 (Senate Bill 221), or more current state code requirements. Where these codes do not apply (i.e., because the "projects" at issue do not meet the minimum size requirements for triggering duties under Senate Bill 610 or Senate Bill 221), the County shall impose conditions similar to those required by Water Code Section 10910 (Senate Bill 610) and Government Code Section 66473.7 (Senate Bill 221), or more current state code requirements, and suitable for the size and scale of the development. For projects requiring discretionary approvals from the County, the County shall identify the resultant significant environmental impacts associated with these projects, if any, along with available and feasible means to address these impacts.
Policy 9.5.5	Water Rights Protection – The County shall support public agencies and private entities within Plumas County in their efforts to protect their water rights and water supply contracts.
Policy 9.5.6	Consistent Fire Protection Standards – The County, in coordination with local water service purveyors, wildfire protection agencies and local fire protection agencies, shall ensure consistent and adequate standards for fire flows and fire protection for new development, with the protection of human life and property as the primary objectives.

Goal W 9.5	To encourage public water systems and their sources to provide an adequate supply to meet long-term needs and that is provided in a manner that maintains water resources for other water users while protecting the natural environment.
Policy 9.5.7	Community Water Systems – The County shall require any new community water system, in the unincorporated area of the county, serving residential, industrial or commercial development to be owned and operated by a public or private entity that can demonstrate to the County adequate financial, managerial and operational resources.
Policy 9.5.8	Level of Service Impacts – The County shall ensure that any new development projects do not create significant adverse impacts on existing water and wastewater infrastructure.
Policy 9.5.9	Funding for Water Supply Improvements – The County shall support water/wastewater purveyors use of all appropriate and equitable financing methods (e.g., grant funding, assessment districts and development fees) to finance public facility design, construction, operation and maintenance.

Goal W 9.7	To manage stormwater from existing and future development in an efficient manner through methods that maintain natural water quality, enhance percolation for groundwater recharge, reduce potential flooding, support natural wetlands and provide opportunities for reuse.
Policy 9.7.1	Natural Stormwater Drainage Courses – The County shall require that natural drainage courses, including ephemeral streams, be retained and protected from development impacts which would alter the natural drainage courses, increase erosion or sedimentation or have a significant adverse effect on flow rates or water quality. Natural vegetation within riparian and wetland protection zones shall be maintained to preserve natural drainage characteristics consistent with the policies provided in the Conservation Element. Storm-water discharges from outfalls, culverts, gutters and other drainage control facilities that discharge into natural drainage courses shall be dissipated so that they make no contribution to additional erosion and, where feasible, are filtered and cleaned of pollutants.
Policy 9.7.2	Downstream Peak Flows – For new development, the County shall require that peak stormwater discharge not exceed the capacity limits of off-site drainage systems or cause downstream erosion, flooding, habitat destruction or impacts to wetlands and riparian areas.
Policy 9.7.3	Maintenance of Stormwater Runoff Systems – The County shall maintain its existing stormwater runoff systems to the extent possible, to assure that these systems do not fall into a state of disrepair such that they are causing water quality degradation inconsistent with their original design function.
Policy 9.7.4	Runoff Quality – The County shall require all drainage systems in new development and redevelopment to comply with applicable state and federal non-point source pollutant discharge requirements.
Policy 9.7.5	Best Management Practices – The County shall require best management practices in new development and redevelopment to reduce pollutants from entering natural water bodies while allowing stormwater reuse.
Policy 9.7.6	Interagency Cooperation – The County shall work with the Central Valley Regional Water Quality Control Board and local, state, and Federal flood control and water resources management agencies to adopt effective stormwater management measures.

Goal W 9.8	To increase the role of conservation and water-use efficiency to help meet domestic or municipal water supply needs.
Policy 9.8.1	Water Conservation – The County shall work with local water purveyors and managers to implement a variety of water conservation measures appropriate for existing and future needs that comply with state and federal legislation and the California Urban Water Conservation Council.

Goal W 9.8	To increase the role of conservation and water-use efficiency to help meet domestic or municipal water supply needs.
Policy 9.8.2	Recycled Water Use – The County shall encourage new development, redevelopment, and landscape and agricultural irrigators to use recycled water wherever practical and available; this includes striving for the highest possible quality of wastewater treatment to increase the potential use of recycled water for existing and future needs of the county.
Policy 9.8.3	Compact Development – The County shall support and encourage compact forms of development and shall focus new growth within existing community plan areas to help reduce water demands, reduce landscape areas and reduce the costs of water and wastewater infrastructure.
Policy 9.8.4	Existing Development – The County shall promote programs for retrofitting plumbing, providing cost rebates, identifying leaks, changing landscaping, irrigating efficiently and other methods of reducing water consumption by existing users. As appropriate, the County will assist existing users seeking grants or other funding opportunities for such water conservation projects.
Policy 9.8.5	County Buildings – The County shall assess its water use in County buildings and facilities and reduce water consumption to the maximum extent possible.
Policy 9.8.6	Agricultural Water Use – The County shall encourage and support water conservation for agricultural activities that increase the efficiency of water use for crop irrigation and livestock maintenance.
Policy 9.8.7	Sustainable Water Practices – The County shall encourage the use of sustainable, affordable water management practices that meet state and local standards, such as greywater reuse, rainwater capture/harvest, watershed management and stormwater infiltration to reduce demands on potable supply.
Policy 9.8.8	County Codes – The County shall establish a program to revise County Codes to increase, as appropriate, the use of recycled water for new commercial, residential, industrial and agricultural development.

Other Plumas County Plans/Studies/Programs

Plumas County Drought Resilience Plan (In Process in 2025)

Plumas County is developing a Drought Resilience Plan (County DRP) to facilitate drought and water shortage preparedness for state small water systems (SSWS) and domestic wells within the County's jurisdiction. The County DRP will include a water shortage risk assessment, a range of short-term responses, long-term mitigation strategies and actions, and other supporting capacity building that the County should consider and adapt, as appropriate, to achieve meaningful, long-term water resilience improvements for their residents.

Plumas County Climate Change and Health Profile Report (2017)

The Climate Change and Health Profile Report seeks to provide a county-level summary of information on current and projected risks from climate change and potential health impacts. This report represents a synthesis of information on climate change and health for California communities based on recently published reports of state agencies and other public data.

The content of this report was guided by a cooperative agreement between CDPH and the CDC Climate-Ready States and Cities Initiative's program Building Resilience Against Climate Effects (BRACE). The goals of BRACE are to assist state health departments to build capacity for climate and health adaptation

planning. This includes using the best available climate science to project likely climate impacts, identifying climate-related health risks and populations vulnerable to these impacts, assessing the added burden of disease and injury that climate change may cause, identifying appropriate interventions, planning more resilient communities, and evaluating to improve the planning effort. Communities with economic, environmental, and social disadvantages are likely to bear disproportionate health impacts of climate change.

This Climate Change and Health Profile Report is intended to inform, empower, and nurture collaboration that seeks to protect and enhance the health and well-being of all California residents. This report is part of a suite of tools that is being developed by the California Department of Public Health to support local, regional, and statewide efforts of the public health sector to build healthy, equitable, resilient, and adaptive communities ready to meet the challenges of climate change. Along with a county-level climate change and health vulnerability assessment and state guidance documents, such as Preparing California for Extreme Heat: Guidance and Recommendations, the profile provides a knowledge base for taking informed action to address climate change.

Plumas County Communities Wildfire Protection Plan (2019)

The purpose of this plan is to outline the risks and hazards associated with a wildland fire threat to Plumas County communities and to identify potential mitigation measures. The Plumas County Communities Wildfire Protection Plan (CWPP) is intended to provide documentation of implementing actions designed to reduce risk to homes and communities from wildfire through education and outreach programs, the development of partnerships, and implementation of preventative activities such as hazardous fuel reduction, defensible space, land use, or building codes. The emphasis of this plan is to work from the home outward into the Wildland Urban Interface, so that man-made and natural resources survive the eventual intrusion of a wildfire.

This plan is intended to: 1) meet the requirements of the Healthy Forest Restoration Act (HFRA) of 2003, 2) make the County eligible for National Fire Plan (NFP) funding assistance from the Departments of Agriculture and Interior (by meeting the requirements of HFRA), 3) provide information to assist communities in developing fuel reduction projects on private and public lands, 4) continue to serve as the Wildfire Hazard Mitigation portion of Plumas County's Multi-Hazard Mitigation Plan, which is required after November 1, 2004, for counties to be eligible to receive FEMA disaster assistance funding, and 5) provide direction in implementing the Plumas County Fire Safe Council's Mission: To reduce the loss of natural and human made resources caused by wildfire through Firewise community programs and pre-fire activities."

Lassen-Modoc Unit Strategic Fire Plan (2025)

Plumas County is served by the Lassen-Modoc Unit of CAL FIRE. The Lassen-Modoc Unit Fire Management Plan documents the assessment of the fire situation in the Unit. It includes stakeholder contributions and priorities which identify strategic targets for proactive approaches and project-based solutions. While the Unit Fire Management Plan addresses local needs, the State Board of Forestry and Fire Protection also has legislative mandates dating back to 1945 requiring it to determine the "intensity" or appropriate level of fire protection for all state responsibility areas in California (Public Resources Code

§4130). The Unit Fire Management Plan is the means of focusing efforts on local needs while working within the framework of the California Fire Plan as adopted by the Board of Forestry and Fire Protection.

It is intended to be an ever-evolving working document which can be used to identify potentially hazardous areas or communities at risk, provide guidelines for fire prevention and protection projects and to assist the Fire Safe Councils and community groups with useful information in making their communities fire safe. This document should be used as a guide that can be amended over the years as necessary and as the basic framework for fire prevention projects within the Lassen-Modoc Unit. The California Fire Plan is outlined within this document. It is the goal of the Unit to apply the California Fire Plan to accomplish a systematic assessment of the fire problem. Through this assessment, the Unit strives to develop "fire safe" communities and reduce the potential occurrence of devastating wildfires. In an effort to implement the California Fire Plan, the Lassen-Modoc Unit utilizes computer-based data and Geographic Information System (GIS) to comprehensively analyze fire hazards, assets at risk and the level of service, all of which are included in the Unit Fire Management Plan. The Unit Fire Management Plan systematically assesses the existing levels of wild/and protection services, identifies high-risk and high value areas that are potential locations for costly and damaging wildfires, ranks the areas in terms of priority needs, and prescribes actions that can be taken to reduce future losses.

Plumas County Fire Chiefs Association – Local Fire Service Mutual Aid & Rescue Plan (2023)

The purpose of this Plan is to:

- To provide for rapid, systematic, and safe mobilization, organization, and operation of necessary local government fire and rescue resources to mitigate the effects of extraordinary events;
- To provide an annually updated fire and rescue inventory of all personnel, apparatus, and equipment;
- To promote recommended, standardized training and/or exercises for and between plan participants.

The plan is intended to provide a common mutual aid operating system for all incidents, which will require a minimum of transition from day-to-day operations. Basic ICS positions are included as a beginning point in which to build an organizational structure and manage the incident. Agencies requiring an enhanced ICS structure should refer to ICS Field Operations guide 420-1.

The effectiveness of mutual aid resources is determined by the application of a predetermined system familiar to all agencies, thus basic systems have been included to provide an integrated approach known to all involved agencies.

This plan is not intended to deplete any department of apparatus beyond that to which it has agreed and committed. Companies that are already provided to the requesting agency by automatic aid or day-to-day mutual aid agreements are considered part of the maximum commitment under this plan.

Participating Agencies include the following as shown on Figure 4-214:

Figure 4-214 Participating Agencies and Signatories

Dam Failure Plan (Draft in 2023)

The County has a draft dam failure plan that would be instituted if a dam failure were to occur. This document is still in draft state but could be used during an actual dam failure event.

Dixie/Beckwourth Fire Burn Area Debris Flow/Flash Flood Emergency Operations Plan (2021)

This document establishes a uniform plan for a joint response by local governments, special districts, and allied agencies in Plumas County to the threat of or actual soil movement (debris flow) and/or flash flooding in the areas recently burned in the Dixie and Beckwourth Fires

Extreme Weather Response Plan (Draft in September 2024)

The Extreme Weather Response plan aims to identify actions needed during extreme weather events in Plumas County. Through pre-planning and resource sharing, the goal is to mitigate damage and minimize extreme weather-related health impacts within the county.

This plan is designed to identify and address the health risks of Plumas County residents during extreme weather events. This plan should also be considered during prolonged utility outages that may result during extreme weather emergencies and the potential health related issues that may arise.

The plan describes local operations during periods of extreme weather and guides local government(s) and supporting agencies.

Plumas County Hazardous Materials Response Plan (2023)

The Plumas County Hazardous Materials Response Plan ensures a coordinated response to emergency situations involving a hazardous materials release. It provides operational concepts, management structure, resources, and roles and responsibilities of all agencies charged with responding to and mitigating an incident. Following this plan will help protect human health, public and private property, and the environment.

The plan provides specific statutory authorities for local, state, and federal agencies, and the private sector. It also identifies sources of outside support which might be provided through service contracts or mutual aid. The plan should be considered as a preparedness document, intended to be read and understood before a hazmat incident occurs. It should always be used in conjunction with the Plumas County Emergency Operations Plan prepared by the Plumas County Office of Emergencies Services.

Integrated Regional Water Management Plan (2016)

This IRWM Plan articulates a coherent and durable vision for the management of water resources in the Upper Feather River (UFR) Region that highlights important actions needed to accomplish that vision through the year 2035--the planning horizon. This document is intended to be an ongoing adaptive planning tool that can evolve with a dynamic water future. It does not authorize or provide discretionary approval for any given project, nor does it establish new prescriptive compliance requirements. Rather, it provides a locally developed framework for improving understanding and undertaking the coordinated actions that will be needed to address the major water-related challenges/needs and conflicts facing the Region through the planning horizon.

The focus and direction described within this IRWM Plan provides participating entities and individuals with an opportunity to envision the integration of water management across the Region and thereby accomplish more to benefit the needs of the Region. The integrated array of goals and objectives, resource management strategies (RMS), implementation projects, and the Plan's implementation framework demonstrate the potential for further strengthening and broadening the collaborative working relationships for integrated water and watershed management that have been fostered throughout the 24-month plan development process.

Plumas County Ordinances

The Plumas County General Plan provides policy direction for land use, development, open space protection, and environmental quality; however, this policy direction must be carried out through numerous ordinances, programs, and agreements. The following ordinances are among the most important tools for implementing the General Plan and/or are critical to the mitigation of hazards identified in this plan.

Disaster Response and Emergency Organization (Title 4, Chapter 1)

The Plumas County Board of Supervisors acknowledges the serious responsibility of protecting the citizens of Plumas County. The Board of Supervisors understands that citizens will rely on County government to make decisions that will directly affect their lives during a disaster. The purpose of this chapter is to provide for the preparation, maintenance, exercise and implementation of plans for the protection of persons and property within this County in the event of an emergency. This chapter also authorizes the Plumas County Office of Emergency Services and Disaster Council. (§ 1, Ord. 92-790, eff. September 3, 1992)

As used in this chapter, "emergency" means the actual or threatened existence of an event bringing great damage and possible loss of life. The words emergency and disaster are interchangeable. Some of the hazards which could cause disasters in Plumas County are hazardous materials, wild land fire, severe winter storm, landslide, flood, earthquake, volcanic eruption, multi-casualty accident and nuclear, biochemical or conventional attack.

Fire Prevention Ordinance (Title 4, Chapter 2)

Every person owning, controlling, renting, occupying with or without permission of the owner thereof, or operating any cabin, tent, store, residence, hotel, or other structure in any unincorporated territory in the County, except all territory located within the boundaries of townsites and additions to townsites as the same are laid out and designated on the official plats of maps on file of record in the office of the County Recorder, shall maintain a firebreak or clearing free from all inflammable material for thirty (30') feet from any portion of such cabin, tent, residence, store, hotel, or other occupied structure and shall keep the roofs of all such buildings or other structures free from needles, leaves, or other debris during the period from April 1 to October 31 of each year; provided, however, where a natural firebreak is declared to exist by Federal or State forestry officers, no further clearing of inflammable materials shall be required. (§ 51300, P.C.O.C.)

Building Regulations (Title 8)

The current California Building Standards Code Part 1, Part 2 [including Appendix Chapter 1, Appendix C and Appendix J (formerly Appendix 33)], Part 3 [including Annex A], Part 4 [including appendix chapters thereto, except chapter 1], Part 5 [including Appendix I], Part 6 [including appendix chapters thereto], Part 8 [with appendices], Part 9 [including Appendix Chapter 4 and Appendix H, Part 10 [including appendix thereto], Part 12 [including appendix thereto] of Title 24 of the California Code of Regulations and the Uniform Swimming Pool, Spa and Hot Tub Code, 2006 edition, as published by IAPMO are hereby adopted as the Building Standards Code of the County of Plumas. For purposes of this section, "current" means the most recent edition and any subsequent triennial edition of the California Building Standards Code. The

County's Building Standards Code also shall include by operation of law any subsequent revisions, recompilations, or supplements of the California Building Standards Code or the Uniform Swimming Pool, Spa and Hot Tub Code, which shall be deemed effective and operative in Plumas County when they become effective and operative in the State of California. A copy shall be available for public inspection in the Office of the County Building Official. (§ 1, Ord. 82-487, eff. March 11, 1982, as amended by § 1, Ord. 85-609, eff. June 20, 1985, § 1, Ord. 89-708, eff. April 20, 1989, § 1, Ord. 90-726, eff. April 12, 1990, Ord. 91-754, eff. May 16, 1991, § 1, Ord. 92-785, eff. July 16, 1992, § 1, Ord. 96-857, eff. April 5, 1996, § 2, Ord. 99-922, eff. September 16, 1999, § 1, Ord. 01-958, eff. November 22, 2001, and § 2, Ord. 02-984, adopted November 12, 2002, § 1, Ord. 04-1017, adopted September 14, 2004, § 2, Ord. 05-1023, § 2, adopted March 1, 2005; § 1, Ord. No. 06-1043, adopted January 24, 2006; and § 1, Ord. No. 08-1067, adopted September 23, 2008)

Floodplain Ordinance (Title 8, Chapter 17)

The areas of special flood hazard identified by the Federal Insurance Administration of the Federal Emergency Management Agency on the Flood Insurance Rate Maps dated September 24, 1984, and all subsequent amendments and revisions and any subsequent Flood Insurance Study, are hereby adopted by reference and made a part of this chapter as though set forth in this chapter in full. The areas of special flood hazard are the minimum area to which the provisions of this chapter shall apply. The County shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a federal, state, or other source as criteria for requiring that new construction, substantial improvements, or other man-made changes in areas of special flood hazard meet the standards of this chapter.

The County Engineer, the Building Official, the Director of Environmental Health and the Planning Director may make interpretations where needed, as to the exact location of the boundaries of the areas of special flood hazard, including where there appears to be a conflict between a mapped boundary and actual field conditions. (§ 1 (Exh. A), Ord. 98-902, eff. September 10, 1998, and § 1 (Exh. A), Ord. 01-961, eff. December 20, 2001)

Note: there are also floodplain regulations in the Zoning Ordinance (Title 9) below.

Zoning Ordinance (Title 9, Chapter 2)

The provisions of this chapter are adopted to implement the General Plan by providing a precise delineation of permitted land uses, precluding land use conflicts, and by establishing general site development standards. This chapter shall specify the uses of land in a manner which conveys full knowledge of potential uses. The application of the provisions of this chapter shall be held to be only the minimum requirements for the promotion of the public health, safety, and general welfare and to protect property owners' rights to develop consistently with the General Plan. The provisions of this chapter are not intended to repeal or in any way interfere with other existing laws, ordinances, regulations, or permits. The County is hereby divided into the following zones:

- Single-Family Residential (2-R, 3-R, 7-R);
- Multiple-Family Residential (M-R);
- Suburban (S-1);

- Secondary Suburban (S-3);
- Rural (R-10);
- Rural (R-20);
- Core Commercial (C-1);
- Periphery Commercial (C-2);
- Convenience Commercial (C-3);
- Recreation Commercial (R-C);
- Recreation (Rec-P, Rec-1, Rec-3, Rec-10, Rec-20);
- Recreation-Open Space (Res-OS);
- Heavy Industrial (I-1);
- Light Industrial (I-2);
- Limited Combining (Ltd);
- Open Space (OS);
- Lake (L);
- Agricultural Preserve (AP);
- General Agriculture (GA);
- Timberland Production (TPZ);
- General Forest (GF);
- Mining (M);
- Flood Plain Combining (FP);
- Special Plan Combining (SP) (DRA, ScA, ScR, HA, HB);
- Manufactured Home Combining (MH);
- Business Exclusion Combining (BX); and
- Farm Animal Combining (F).

The Planning and Development Agency shall maintain a County-wide set of Zoning Plan Maps which shall show the zones which apply to all property in the County. Any change in the zones shown on the Zoning Plan Maps shall be made pursuant to the provisions of Sections 65500 et seq. and 65853 of the Government Code of the State. The Planning and Development Agency shall establish and show on the Zoning Plan Maps street addresses for parcels or buildings, as necessary, and shall maintain a file of street addresses. (§ 3, Ord. 84-593, eff. January 3, 1985, as amended by § 13, Ord. 99-924, eff. November 11, 1999)

Subdivisions (Title 9, Chapter 3)

The provisions of this chapter are adopted for the purpose of adopting subdivision regulations in accordance with the provisions of the Subdivision Map Act of the State, set forth in Division 2 of Title 7 of the Government Code of the State. The provisions of this chapter are adopted to regulate the subdivision of land within the County for the purposes of sale, lease, or financing in all instances except those which are exempt under the provisions of Sections 66411, 66412, 66424, and 66428 of the Government Code of the State. The general policy governing the subdivision of land in the County shall be to permit orderly, reasonable, and beneficial growth, to discourage overdevelopment and ill-conceived subdivisions, to protect and enhance in every way possible the public health, safety, and general welfare of the citizens, and to conserve the outstanding resources of land, water, air, timber, and scenic beauty.

The Board shall have the overall legislative and governing authority regarding land subdivisions in the County, and the rulings and decisions of the Board shall be final except as an appeal or recourse to law is

provided in the Map Act, or as otherwise provided by law. The various County officers designated by the Map Act or by the provisions of Chapter 4 of Title 2 of this Code shall perform such functions and make such recommendations as are provided for in the Map Act or as are more specifically provided for in this chapter and in the various County departmental subdivision regulations approved by the Board. (§ 61202, P.C.O.C., as amended by Ord. 664 § 2, Ord. 74-64, eff. September 19, 1974, § 1, Ord. 75-99, eff. May 8, 1975, § 1, Ord. 77-211, eff. August 4, 1977, § 1, Ord. 89-714, eff. August 31, 1989, § 1, Ord. 91-762, eff. October 3, 1991, § 8(Exh. A), Ord. 98-902, eff. September 10, 1998, and § 5, Ord. 05-1026, adopted March 29, 2005)

Development Standards (Title 9, Chapter 4)

The provisions of this chapter are adopted to implement the General Plan by providing a precise delineation of its development standards and to provide for the control and design of improvements for development in accord with the Subdivision Map Act and Chapters 2 and 3 of this title. The application of the provisions of this chapter shall be held to be only the minimum requirements for the promotion of the public health, safety, and general welfare and to protect owners' rights to develop consistent with the General Plan, the Subdivision Map Act, and Chapters 2 and 3 of this title. It shall be the duty of the Department of Planning and Building Services and the Department of Public Works to administer the provisions of this chapter. The headquarters of the Ranger Units of the California Department of Forestry and Fire Protection which administer State Responsibility Area Fire protection in Plumas County shall be given reports of violations of those sections of this chapter which implement the SRA Fire Safe Regulations. Those sections are enumerated in Section 9-9.103 of Chapter 9 of Title 9 of this Code. (§ 1, Ord. 91-762, eff. October 3, 1991; § 1, Ord. No. 05-1036, § 1, adopted August 16, 2005)

SRA Fire Safe Regulations (Title 9, Chapter 9)

The provisions of this chapter are to complete integration of the SRA Fire Safe Regulations into this Code and to specify those portions of this Code which implement those regulations. The application of the provisions of this chapter and those portions of this Code which implement the SRA Fire Safe Regulations shall be held to be only the minimum requirements for the promotion of the public health, safety and general welfare. The purpose of this article is to provide for exceptions from the provisions of this Code which implement the SRA Fire Safe Regulations in a manner consistent with the General Plan and public health, safety, and welfare, where the exceptions provide the same overall practical effect as these regulations towards providing defensible space. This ordinance is certified by the Board of Forestry in lieu of SRA regulations in the County. (§ 1, Ord. 91-762, eff. October 3, 1991)

4.4.2. Plumas County's Administrative/Technical Mitigation Capabilities

Table 4-139 identifies the County personnel responsible for activities related to mitigation and loss prevention in the County. ***The table has been prefilled with what was in the previous plan. Please update, and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table 4-139 Plumas County Administrative/Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Chief Building Official is also Director of Building Services – Chuck White is trained on hazards and mitigation and is part of the County's rescue
Civil Engineer, including dam and levee safety	Y	Staff is trained on regulation enforcement with a hazard focus. Coordination is effective.
Community Planner	Y	Planning Director has experience with hazard mitigation.
Emergency Manager	Y	County Sheriff is the "Director of OES" County Administrator is also "Risk Management" All County employees are Disaster Service Workers: According to California Government Code Sections 3100-3109, all public employees are designated as Disaster Service Workers. In Plumas County, all county employees take an oath of affirmation to ensure the county has the resources and readiness to help protect public health and safety and to protect lives and property during disasters or emergencies.
Floodplain Administrator	Y	Staffing is adequate and trained. Coordination is being worked on to increase effectiveness.
GIS Coordinator	Y	GIS capabilities are strong, and the GIS Department serves all County departments with mapping needs; GIS County portal: https://mangomap.com/plumasgis/maps Maps on the portal include: -fire district query -Firewise communities map -snow load and fire hazard -Sheriff Evacuation Area Maps Static PDF Maps: https://plumascounty.us/2206/Static-PDF-Maps -State Responsibility Areas (SRA) lands for fire protection -various maps created for Fire Safe Council Link for FEMA FIRM Maps: https://plumascounty.us/2295/FEMA-Flood-Insurance-Rate-Maps-Informati

Planning Commission	Y	Coordination is effective with Commission, although only recommendation authority to Board of Supervisors on: Periodically review and recommend action on the general plan for the County; Periodically review and recommend action on any specific plans for the County; Periodically review and recommend action on the zoning ordinances of the County; and Initiate amendments to boundaries of zones and provisions of Chapter 2 of Title 9 of this Code pursuant to Section 9-2.902 of Article 9 of Chapter 2 of Title 9 of this Code.
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	OES, Planning, and Public Works (maybe others)
Hazard data and information	Y	OES
GIS analysis	Y	County GIS provides hazard analysis support as needed
Mutual aid agreements	Y	--Mutual Aid Radio Systems --Plumas County Fire Chiefs Association Local Fire Service Mutual Aid & Rescue Plan (updated 2016)
Other		
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP YOUR JURISDICTION. FROM PREVIOUS PLAN - The County could expand capabilities by hiring a Fire Warden. Wildfire is the biggest hazard faced by the County, but there is no overarching entity in the County to coordinate fire response among all the fire protection districts.		

4.4.3. Plumas County's Fiscal Mitigation Capabilities

Table 4-140 identifies financial tools or resources that the County could potentially use to help fund mitigation activities. ***The table has been prefilled with what was in the previous plan. Please update, and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table 4-140 Plumas County Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Community Development Block Grant	Y	For housing (not hazard mitigation) in the past via Plumas County Community Development Commission (housing authority)

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Federal funding programs (non-FEMA)	Y	--Homeland Security Grant --EMPG – Emergency Management Performance Grant --Title III Funding-Federal funding to County of Plumas
Fees for water, sewer, gas, or electric services	Y	Various community and public utility districts (see website for more information), along with Environmental Health (just did a fee study and raised fees) – see County department websites for fee schedules
Impact fees for new development	N	
State funding programs	Y	Cal Fire, Cal Trans, Cal EPA, Cal DWR, Cal OES, and others
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP YOUR JURISDICTION. FROM PREVIOUS PLAN - The County is seeking to integrate Capital Improvement Funding with hazard mitigation project funding. There is currently a push to assess project fees.		

4.4.4. Plumas County Mitigation Education, Outreach, and Partnerships

Table 4-141 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. ***The table has been prefilled with what was in the previous plan. Please update, and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table 4-141 Plumas County Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters		
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Firewise communities, as of 3/30/2020 – there are 21 certified communities, with 4 others in process. Fire Safe council.
Local news		
Organizations that interact with underserved and vulnerable communities	Y	County works closed with the new County VOAD group

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Social media	Y	The County uses social media platforms to community hazard and preparedness information and information related to hazard events and disaster declarations including information on evacuation routes and process
How can these capabilities be expanded and improved to reduce risk?		
PROVIDE SPECIFIC DETAILS OF AREAS FOR IMPROVEMENT OF THESE TYPES OF CAPABILITIES AND HOW/WHY IT WILL HELP YOUR JURISDICTION. FROM PREVIOUS PLAN - The County is seeking to expand knowledge of evacuation routes and plans. There is a desire to put publications, mailings, and other education outreach ideas into place. There will be continued efforts to expand FireWise communities.		

4.4.5. Other Mitigation Efforts

The County has pursued and previously implemented other mitigation efforts not already captured in the capability assessment above. These include: UPDATE THESE BELOW

- The County noted a document completed titled Evaluating Treatment Longevity and Maintenance Needs for Fuel Reduction Projects Implemented in the Wildland Urban Interface of Plumas County, CA" was completed in 2021. This project assessed the current maintenance needs for projects implemented, funded, or otherwise supported by the PCFSC. This assessment will allow critical questions described in the Effectiveness Monitoring Committee (EMC) Strategic Plan (Husari and Henly 2018) to be answered spatially and quantitatively over all PCFSC treated lands in Plumas County. In addition, the project assessed treatment utilization by fire fighters and post fire severity resulting from both the North Complex (2019) and Dixie Fire (2021).
- Plumas County supports the U.S.D.A. Farm Service Agency County Emergency Board that provides technical assistance and assessment of local disasters. The team can quantify forage losses, analyzes grazing infrastructure losses, certify livestock death and other associated impacted to livestock grazing operations from drought and wildfires. The Emergency Board includes representation from the US Forest Service (Rangeland Team), University of California Cooperative Extension local livestock and natural resources advisors (Plumas-Sierra), and the Natural Resources Conservation Services (Quincy), under the leadership of the Farm Service Agency. The County Emergency Board also works with the "County Committee" that is a board of local livestock and agricultural producers that advise the local Farm Service Agency (based in Susanville).
- Evacuation maps have been created for several communities in case of wildfire. These maps show suggested primary and secondary evacuation routes out of each community. Depending on the type of emergency, there may be more than one route out of the area. Residents are asked to familiarize themselves with their surrounding neighborhood and listen for instructions from emergency personnel when asked to evacuate.
- Plumas County OES, in coordination with County GIS and Fire Safe Council, have put together a FIREWISE Program for many of the communities in the County. An interactive map of FireWise community boundaries has been put together online. This map (one of the first of its kind) can be found at https://mangomap.com/plumasgis/maps/104226/firewise-communities-#.
- Plumas County has EAPs on file for many of the dams in the County.

- In 2019, the County participated in a large, multi-agency wildfire exercise. There were hundreds of participants included: OES, Sheriff's Department, Cal-Fire, USFS, CHP, Peninsula Fire, PG&E, County Search/Rescue, local fire departments, community members. The County has functional exercises
- Public Works also participated with the wildfire exercise at Almanor and a couple of years prior all players also held one in the Meadow Valley area.
- Plumas County's newly updated (2020) Living with Fire publication is available online. It includes evacuation information that could be handy for many folks right now. Hard copies are available from business racks where citizens would usually find the Plumas County Visitors Guide, post offices, fire departments, the Feather Publishing office in Quincy, or at the Fire Safe Council office.
- Plumas County Fire Save Council (PCFSC) has provided 698.1 acres of Hazardous Fuel Reduction on private lands with state and federal dollars
- PCFSC has treated 8,028.5 acres of public land (Plumas National Forest) for fuel reduction and forest health using state dollars
- PCFSC has provided annual Senior/Disabled Defensible Space services, providing treatment for hundreds of participants
- Starting in 2017, PCFSC has provided annual chipping services across Plumas County. In 2019 alone the program chipped 4,720 linear feet of material across 326 locations.
- Since 2014 PCFSC has secured $13 million in grant funds to support wildfire risk reduction activities.
- PCFSC has regularly produced Living with Fire publications for public outreach and education
- PCFSC has held multiple public showings of the documentary Wilder than Wild, as well as other public events
- 16 of Plumas County's 21 Firewise communities have been certified since 2014
- Plumas County OES hosted a Fire Preparedness Virtual Town Hall
- In 2019, inundation maps and an Emergency Action Plan were completed related to the Chester Diversion Dam.
- The County has an annual FireWise community event
- The County has put together home hardening workshops to mitigate against hazards like wildfire.
- The County has put together wildfire preparedness town hall events. These have been on Zoom recently due to the Covid outbreak.

4.5 Natural Hazards Summary

As detailed in the hazard identification section, those hazards identified as a high or medium significance in Table 4-142 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the Plumas County Planning Area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance in the Plumas County Planning Area, enabling the County and participating jurisdictions to focus resources where they are most needed.

Table 4-142 Hazard Identification and Initial Determination of Priority Hazards

Hazard	Likelihood of Future Occurrence	Vulnerability	Priority Hazard
Ag Hazard: Severe Weather/ Pests/Weeds	Highly Likely	Medium	Y
Climate Change	Likely	High	Y
Dam Failure	Unlikely	High	Y
Drought & Water Shortage (w/tree mortality)	Likely	High	Y
Earthquake	Unlikely/Occasional	High	Y
Flood: 1%/0.2% annual chance (w/levee failure)	Occasional/Unlikely	High	Y
Flood: Localized Stormwater	Highly Likely	Medium	Y
Haz Mat Transportation	Occasional	Medium	Y
Landslide, Mudslide, and Debris Flow	Likely	Medium	Y
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Highly Likely	Medium	Y
Severe Weather: Extreme Heat	Highly Likely	Medium	Y
Severe Weather: Heavy Rains and Storms	Highly Likely	Medium	Y
Severe Weather: High Winds and Tornadoes	Highly Likely	Medium	Y
Volcano	Unlikely	Low	N
Wildfire (w/smoke and air quality)	Highly Likely	Extremely High	Y

Chapter 5 Mitigation Strategy

44 CFR §201.6(c)(3) and §201.7(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for this 2026 Plumas County LHMP Update. It describes how all the participating jurisdictions met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the HMPC led to the mitigation strategy and mitigation action plan for this LHMP Update. As part of the LHMP Update process, a comprehensive review and update of the mitigation strategy portions of the 2020 Plumas County and 2019 City of Portola LHMPs was conducted. Some of the initial goals and objectives from the previous LHMPs were refined and reaffirmed, some goals and objectives were deleted, and others were added. The end result is a new set of goals and objectives, to reflect the completion of, or progress towards the 2020/2019 mitigation actions, the updated risk assessment, and the new priorities of the County and all participating jurisdictions and this 2026 LHMP Update.

To support the updated mitigation strategy including updated goals, the mitigation actions from the 2020/2019 LHMPs were reviewed and assessed for their value in reducing risk and vulnerability to the Plumas County Planning Area from identified hazards and further evaluated for their inclusion in this LHMP Update (See Chapter 2 What's New). Section 5.2 below identifies the new goals and objectives of this 2026 LHMP Update and Section 5.4 details the new mitigation action plan.

Taking all of the above into consideration, the participating jurisdictions and HMPC developed the following umbrella mitigation strategy for this LHMP Update:

- Communicate the hazard information collected and analyzed through this planning process as well as mitigation success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the mitigation action plan recommendations of this Plan.
- Use existing rules, regulations, policies, and procedures already in place.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged, and broader constituent support may be garnered.

5.1.1. Continued Compliance with the NFIP

Given the nature and extent of the flood hazard in the Plumas County Planning Area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP) by all communities. This Chapter 5 of the Base Plan for Plumas County and the jurisdictional annex for the City of Portola, as the two eligible NFIP communities, provides an overview of their flood management programs and continued compliance with the NFIP. Although the participating districts to this LHMP Update are not eligible NFIP communities, many of their mitigation actions and projects contain measures to promote effective floodplain management throughout the Plumas County Planning Area.

To participate in the NFIP a community must adopt and enforce floodplain management regulations that meet or exceed the minimum requirements of the Program. These requirements are intended to prevent loss of life and property and to reduce taxpayer's costs for disaster relief as well as to minimize economic and social hardships that result from flooding. Participation in the NFIP provides a community with access to flood insurance.

Detailed below is a description of the County's flood management program to ensure continued compliance with the NFIP. Also to be considered are the flood mitigation actions contained in this LHMP that support the ongoing efforts by the County to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program.

Plumas County's Flood Management Program

Plumas County has participated in the Regular Phase of the NFIP since September 24, 1984. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The Community Rating System (CRS), a voluntary program under the NFIP, was created in 1990. It is designed to recognize floodplain management activities that go above and beyond the NFIP's minimum requirements. If a community implements public information, mapping, regulatory, loss reduction and/or flood preparedness activities and submits the appropriate documentation to FEMA, then its residents can qualify for a flood insurance premium rate reduction. The County does not currently participate in the CRS program.

Presently, the County manages its floodplains in compliance with NFIP requirements and implements a floodplain management program designed to protect the people and property of the County. Floodplain regulations are a critical element in local floodplain management and are a primary component in the County's participation in the NFIP.

The County will continue to manage their floodplains in continued compliance with the NFIP. An overview of the County's NFIP status and floodplain management program is discussed on Table 5-1. FILL OUT REMAINDER OF TABLE. THOSE AREAS WE COULD BRING IN FROM LAST PLAN HAVE BEEN PREFILLED BUT NEED TO BE VERIFIED.

Table 5-1 Plumas County NFIP Status

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	No
Is floodplain management an auxiliary function?	Auxiliary
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	
What are the barriers to running an effective NFIP program in the community, if any?	
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	93 policies $159,286 in annual premiums $61,661,100 of insurance in force
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	59 paid losses $1,099,373.04 in paid claims. 9 substantial damage claims
How many structures (residential and non-residential) are exposed to flood risk within the community?	1,714 in 1% annual chance flood zone 787 in 0.2% annual chance flood zone
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	4 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	No known places of limited coverage
How does the community teach property owners or other stakeholders about the importance flood insurance?	
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	9/29/2011CAV
Is a CAV or CAC scheduled or needed?	No

NFIP Topic	Comments
Regulation	
When did the community enter the NFIP?	9/24/1984
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	
Has the community adopted the latest effective FIRM? Date adopted?	
How does the community enforce local floodplain regulations and monitor compliance?	
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet minimum requirements.
How are Letters of Map Change (LOMCs) tracked and compiled?	New DFIRMs are downloaded regularly which include the latest LOMCs, LOMRs, and CLOMRs
Provide an explanation of the permitting process.	Permit review is done
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: FEMA CIS, FEMA PIVOT, Plumas County

*FEMA CIS and PIVOT databases record this data differently; thus results utilized differ depending on the source.

5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard mitigation actions are essential to weaving long-term resiliency into all community recovery efforts so that at-risk infrastructure, development, and other community assets are stronger and more resilient for the next severe storm or hazard event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps communities become more resilient and sustainable. It is often most efficient to fund eligible infrastructure mitigation through FEMA's Public Assistance mitigation program if the asset was damaged in a storm event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial.

Integration of mitigation into post disaster recovery efforts should be considered by all communities as part of their post disaster redevelopment and mitigation policies and procedures. Post-disaster redevelopment and mitigation policies and procedures are evaluated and updated as part of the Emergency Operations Plan (EOP) updates and other emergency management plans for each community.

These EOP's and other emergency management documents, through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the community to their normal state of affairs. Mitigation is emphasized as a major component of recovery efforts.

Mitigation Strategy Funding Opportunities

An understanding of the various funding streams and opportunities enable the communities to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant funding opportunities available pre- and post- disaster include the following.

FEMA HMA Grants

Cal OES administers four main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, (3) Flood Mitigation Assistance Program, and (4) Building Resilient Infrastructure and Communities. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant.

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Community Development Block Grants

The California Department of Housing and Community Development administers the State's Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight, or meet an urgent need. Grant funds can generally be used in federally declared disaster areas for CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

Small Business Loans

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent

of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

Increased Cost of Compliance

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to $30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under NFIP.

5.2 Goals and Objectives

44 CFR §201.6(c)(3)(i) and §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the participating jurisdictions, along with the HMPC, have organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goals development and the identification and prioritization of mitigation alternatives by the HMPC and participating jurisdictions.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Plumas County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2020 and 2019 LHMPs as well as a list of other sample goals to consider. The team was told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was asked to provide three goal statements. Goal statements were collected and grouped into similar themes and provided to the

HMPC. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal. Edits and refinements to these new goals and resulting objectives were provided by the HMPC until the team came to consensus on the final goals and objectives for this 2026 LHMP Update.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals, which provide the direction for reducing future hazard-related losses within the Plumas County Planning Area.

Goal #1: Minimize loss of life and injuries and protect public health, property, and the environment from natural hazards

- Minimize impact to all populations, including vulnerable and underserved populations
- Minimize impact to existing and future development, both public and private
- Minimize economic and natural resource impact
- Promote resiliency strategies

Goal #2: Minimize losses and damages, and provide protection for critical facilities, infrastructure, and services from hazard impacts

- Implement critical facility upgrades and mitigation measures to current standards and codes to better withstand future hazard events and to ensure reliability of critical services (e.g., communications, power, water)
- Update and maintain a GIS database of critical facilities to include: Essential Services, At-Risk Populations, and Hazardous Materials Facilities

Goal #3: Increase community and public awareness, education, preparedness, and self-reliance to natural hazards

- Enhance public and stakeholder outreach, education, and preparedness programs to include all hazards of concern
- Increase public and stakeholder knowledge about the risk and vulnerability to identified hazards and how to be more self-reliant in mitigating risks from natural hazards
- Provide viable local resources and information (i.e., training, technical assistance, education) to promote implementation of self-reliant mitigation actions and to support informed decision-making before, during, and after a disaster
- Provide public and stakeholder education and outreach specific to evacuation routes, available emergency communication modes, and roles and responsibilities

Goal #4: Strengthen and improve communities' capabilities, capacity, and effectiveness to mitigate hazards, reduce losses, and be prepared for, respond to, and recover from a disaster event in Plumas County

- Improve coordination of local, state, and federal resources and community partners
- Enhance emergency communication capabilities (e.g., cell phones, radios, sirens, reverse 911)
- Ensure continuity of government operations

- Increase use of shared resources, enhance resource availability, and build local resources in a meaningful way to support all mitigation partners (i.e., government, community, individuals)
- Establish and maintain mutual aid agreements for all phases of emergency management

Goal #5: Build capacity and capabilities to increase disaster resilience among historically underserved populations, individuals with access and functional needs, and communities disproportionately impacted by disasters and climate change

- Identify vulnerable and underserved populations and communities within the County
- Incorporate equity metrics, tools, and strategies into all mitigation planning, policy, funding, outreach, and implementation efforts

Goal #6: Minimize life safety issues, property loss and damage, environmental and natural resource impacts, and economic impacts associated with wildfires, the #1 natural hazard of concern in Plumas County

- Reduce the threat of catastrophic wildfire to lives, structures, and the environment through proactive management
- Reduce the wildfire risk and vulnerability and promote wildfire resilient communities
- Follow best available science to reduce the potential for catastrophic wildfire
- Implement a fire-adapted community concept approach at broader county-wide geographic and policy scales
- Develop a Countywide fuels management implementation strategy to reduce fuel loading and catastrophic wildfire in and surrounding Plumas communities
- Promote a wholistic approach to mitigating wildfire through restoration of the beneficial functions of natural resources and fire ecology
- Coordinate comprehensive fire protection strategies among all federal, state, and local agencies and across all property boundaries
- Increase community education and outreach of wildfire mitigation strategies (e.g., fuels management, defensible space, home hardening) including those to be undertaken by private property owners
- Promote and enhance fire-fighting capabilities (e.g., access roads, water supply, etc.)
- Improve community infrastructure for wildfire prevention, preparedness and response including locating safety zones, augmenting community water supplies, and reducing fire hazard along transportation, power, water, and other critical infrastructure
- Enhance and update the county wildfire hazard codes including enforcement capabilities to address new LRA and SRA mapping of fire hazard severity zones
- Continue land use planning efforts to ensure increased fire protection in new developments
- Update, maintain, and implement Community Wildfire Protection Plans

Goal #7: Minimize the loss of agricultural and natural resource productivity (foundation of rural economy) from natural hazards

- Promote local research, education, and technical assistance on sustainable agriculture and forestry practices
- Support education and training of public and private land managers on hazard mitigation and disaster resilience
- Foster agricultural and natural resource resilience to natural hazards through implementation of best management practices and restoration activities

Goal #8: Apply best available science and authoritative data to design, implement, and prioritize projects that enhance resilience to natural hazards and climate change impacts

- Make better use of technology (e.g., GIS, public notification, alert and warning, communications)
- Identify and implement opportunities to build resilience to changing climate conditions
- Implement climate adaptation measures including enhanced standards to reduce the influence and consequences of climate change (e.g., increasing temperatures, changing hydrology) on natural hazards

Goal #9: Maximize funding opportunities for natural hazard mitigation, preparedness, response, and recovery

- Collaborate with all levels of local, state, and federal mitigation partners
- Identify and track mitigation grant funding opportunities and maintain eligibility for grant programs
- Identify, consolidate, and pursue eligible mitigation projects for multi-benefit (rather than competing against each other for similar projects and limited grant funding)
- Establish and implement a countywide multi-agency committee to promote, coordinate, and track mitigation action development and project implementation
- Improve community's ability to be competitive/successful with grant funding opportunities from application development to project delivery

5.3 Identification and Analysis of Mitigation Actions

44 CFR §201.6(c)(3)(ii) and §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated at the completion of the risk assessment as part of the second prioritization process to determine which hazards were priorities for mitigation strategy planning. Only those hazards that were determined to be a priority hazard for each participating jurisdiction were considered further in the development of hazard-specific mitigation actions. Those hazards not considered a priority for mitigation strategy development were eliminated from further consideration because the risk of a hazard event to the participating jurisdiction is unlikely, the vulnerability of the participating jurisdiction is low, or capabilities are already in place to mitigate adverse impacts. Further, the resulting mitigation strategy presented in this Chapter focuses on those mitigation actions that each jurisdiction has the authority, resources, and capacity to consider for implementation over the next 5-years covered by this LHMP Update. Table 5-2 and Table 5-3 provide a listing of priority hazards by jurisdiction to be addressed in the mitigation strategy portion of this Plan.

Table 5-2 Plumas County Planning Area: Mitigation Action Priority Hazards by Jurisdiction

Hazard	Plumas County	City of Portola	Chester PUD	Feather River RCD	Gold Mountain CSD	Indian Valley CSD
Ag Hazard: Severe Weather/ Pests/Weeds	X					
Climate Change	X	X		X		
Dam Failure	X	X				X
Drought & Water Shortage (w/tree mortality)	X	X	X		X	X
Earthquake	X	X			X	X
Flood: 1%/0.2% annual chance (w/levee failure)	X	X	X			X
Flood: Localized Stormwater	X	X	X	X	X	X
Hazardous Materials Transportation	X	X				
Landslide, Mudslide, and Debris Flow	X	X		X	X	X
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	X	X	X		X	
Severe Weather: Extreme Heat	X				X	
Severe Weather: Heavy Rains and Storms	X	X	X		X	
Severe Weather: High Winds and Tornadoes	X	X			X	X
Volcano						
Wildfire (w/smoke and air quality)	X	X	X	X	X	X

Table 5-3 Plumas County Planning Area: Mitigation Action Priority Hazards by Jurisdiction

Hazard	Plumas Corp/Plumas Fire Safe Council	Plumas Eureka Community Services District	South Feather Water & Power Agency
Ag Hazard: Severe Weather/ Pests/Weeds	X		
Climate Change	X	X	X
Dam Failure			X
Drought & Water Shortage (w/tree mortality)	X	X	
Earthquake		X	X
Flood: 1%/0.2% annual chance (w/levee failure)	X		
Flood: Localized Stormwater	X	X	
Hazardous Materials Transportation			
Landslide, Mudslide, and Debris Flow		X	X
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)		X	X
Severe Weather: Extreme Heat	X	X	
Severe Weather: Heavy Rains and Storms	X	X	X

Hazard	Plumas Corp/Plumas Fire Safe Council	Plumas Eureka Community Services District	South Feather Water & Power Agency
Severe Weather: High Winds and Tornadoes	X		X
Volcano			
Wildfire (w/smoke and air quality)	X	X	X

It is important to note, however, that all the Hazards addressed in this LHMP are included in the multi-hazard public awareness mitigation actions as well as in other multi-hazard, emergency management actions, and other hazard-specific actions, providing benefits to all participating jurisdictions to this 2026 LHMP Update.

Once it was determined which hazards warranted the development of specific mitigation actions, the participating jurisdictions and HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

- Prevention
- Property protection
- Structural projects
- Natural resource protection
- Emergency services
- Public information

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both the existing built environment and future development in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a detailed review and discussion of the six mitigation categories to assist in the review and identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?

- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

The initial list of mitigation actions from the 2020 and 2019 LHMPs and new actions identified during this planning process were reviewed and prioritized using the criteria (alternatives and selection criteria) in Appendix C.

With these criteria in mind, the HMPC were each given a set of 18 colored dots, six each of red, blue, and green. The dots were assigned red for high priority (worth five points), blue for medium priority (worth three points), and green for low priority (worth one point). The HMPC was asked to use the dots to prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in the development of the Mitigation Action Plan detailed below in Section 5.4. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this 2026 LHMP Update.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the participating jurisdictions and HMPC decided to pursue actions that contribute to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized mitigation action plan for the Plumas County Planning Area.

5.4 Mitigation Action Plan

44 CFR §201.6(c)(3)(iii) and §201.7(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This mitigation action plan was developed to present the recommendations developed by the HMPC for how the Plumas County Planning Area can reduce the risk and vulnerability of people, property, critical facilities and infrastructure, natural and cultural resources, and the economy to future disaster losses. Emphasis was placed on both future and existing development. This mitigation action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-4 identifies all mitigation actions for participating jurisdictions to this LHMP Update. For each mitigation action item included in Table 5-4, a detailed mitigation implementation strategy has been developed. The detailed descriptions for each mitigation action are included below for the unincorporated County and within each respective jurisdictional annex to this LHMP.

The mitigation action plan summarized below contains both new action items developed for this 2026 LHMP Update as well as old actions that were yet to be completed from the 2020 and 2019 LHMPs. Table 5-4 indicates whether the action is new or from the 2020 or 2019 LHMP and Chapter 2 contains the details for each 2020 and 2019 mitigation action item indicating whether a given action item has been completed, deleted, or deferred.

As described throughout this 2026 LHMP Update, the Plumas County Planning Area has many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this LHMP focuses only on those mitigation actions that are both reasonable and realistic for the communities to consider for implementation over the next 5-years covered by this 2026 Update. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-4. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this LHMP Update came down to the actual priorities of jurisdictions, individuals and departments based in part on department direction, staffing, and potential funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this LHMP Update during annual plan reviews and the formal 5-year update process.

It is also important to note that the participating jurisdictions have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as flood and water management plans, fire plans, climate plans, and capital improvement budgets and reports. These actions are considered to be part of this LHMP, and the details, to avoid duplication, should be referenced in their

original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this LHMP Update.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The participating jurisdictions are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the jurisdictions to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach actions, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this 2026 LHMP Update.

NEED ACTIONS FOR COUNTY (HAZ MAT, AND EXTREME COLD FREEZE AND SNOW)

Table 5-4 Plumas County Planning Area Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Plumas County					
Multi-Hazard Actions					
Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 3. Back Up Power Redundancy Project – Resilient and Continued Outpatient Medical Services at Lake Almanor Clinic, and Continued Operation of a Cooling/Warming Station for the General Public during Electrical Power Disruptions as Needed.	New Action	X	X		Property Protection Emergency Services
Action 4. Resilient Community Systems Initiative	New Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection Emergency Services Public Information
Action 5. Designation of Minor County Roads and Forest Service Roads to be used as Alternate Routes around Road Closures during Wildfire and other Hazard Events. Plumas and Lassen National Forests have funding for new Road Connections to Form Alternate Routes.	New Action	X	X		Property Protection Emergency Services
Action 6. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access.	Previous Action	X	X	X	Property Protection Structural Projects Emergency Services
Action 7. Continue to Reach out to the Community Countywide to Sign Up for Emergency Alerts through the Genasys Program	New Action	X	X		Emergency Services
Action 8. Plumas County General Plan Public Health & Safety Element update to incorporate Senate Bill (SB) 379 requirements	Previous Action	X	X		Prevention

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Agricultural Hazard Actions					
Action 9. Wildlife Conflict Mitigation Tools and Equipment	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Invasive Weed Control and Eradication	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Wildlife Conflict Mitigation Tools	New Action	X	X		Prevention Property Protection Natural Resource Protection
Climate Change Actions					
Action 12. Develop a Climate Action Plan	Previous Action	X	X		Prevention
Dam Failure Actions					
Action 13. Evaluate Options for Obtaining 100-year Level of Certification for the Diversion Dam (East and West Chester Levees)	Previous Action	X	X		Property Protection Structural Projects Natural Resource Protection
Drought and Water Shortage Actions					
Action 14. County Wide Drought Resilience Plan	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Earthquake Actions					
Action 15. Hospital Seismic Compliance (SB-1953)	Previous Action	X	X		Structural Property Protection
Floods: 1%/0.2% Annual Chance, Floods: Localized Flooding, Landslide, Mudslide and Debris Flow, Severe Weather Heavy Rains and Storms Actions					
Action 16. Evaluate and implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 17. Identify and Implement Bank Stabilization Projects.	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 18. Develop a Countywide Drainage Master Plan	Previous Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 19. FEMA Mapping Update	Previous Action	X	X	X	Prevention

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 20. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)	Previous Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 21. County Wide Stormwater Drainage and Grading Ordinance.	Previous Action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 22. Ongoing Implementation of Stream Clearing and Culvert Maintenance Programs	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 23. Review and Update, as Needed, Title 8 (Building Regulations), Chapter 17 (Flood) of the Plumas County Code re: Floodplain Ordinance and Applicable Title 9 (Planning and Zoning) Sections					
Hazardous Materials Transportation Actions					
Action 24. NEED					
Landslide Actions					
Action 25. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad	Previous Action	X	X		Property Protection Structural Projects Natural Resource Protection
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche) Cold Actions					
Action 26. NEED					
Wildfire, Drought, Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornadoes Actions					
Action 27. Promote and Implement Compliant Street/Address Reflective Signage for Public and Private Roads and Structures	Previous Action	X	X		Property Protection Structural Projects Emergency Services
Action 28. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access	Previous Action	X	X		Property Protection Structural Projects Emergency Services
Action 29. Air Quality Impacts During Wildfire Events	New Action	X	X		Property Protection Structural Projects Emergency Services
Action 30. Plumas County Agriculture, Forestry, and Natural Resources Resilience	Previous Action	X	X		Property Protection Structural Projects
Action 31. Livestock and Companion Animal Trailer	Previous Action	X	X		Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 32. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects	Previous Action	X	X		Property Protection Structural Projects Emergency Services
Action 33. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.	Previous Action	X	X		Property Protection Structural Projects Emergency Services
Action 34. Plumas County General Plan Public Health & Safety Element update to address state law requirements for land classified as State Responsibility Areas (SRAs) and within Very High Fire Hazard Severity Zones (VHFHSZs)	Previous Action	X	X		Property Protection Structural Projects Emergency Services
City of Portola					
Action 1. Public Education on Hazards in the City of Portola	Previous Action	X	X	X	Public Education
Action 2. Essential Facilities Retrofit and Redundant Power Sources	Previous Action	X	X	X	Property Protection Structural Projects Emergency Services
Action 3. Wildfire Risk and Impact Reduction	Previous Action	X	X		Prevention Property Protection Natural Resource Protection Public Information
Action 4. Gulling Street Bridge Structural Rehabilitation	New Action	X	X	X	Structural Project Emergency Services
Action 5. Fire Suppression Enhancements	New Action	X	X		Property Protection Natural Resource Protection Emergency Services
Chester Public Utility District					
Action 1. Asbestos Water Line Natural Disaster Hazard	New Action	X	X		Property Protection Structural Projects
Action 2. Backup Power	New Action	X	X		Property Protection Emergency Services
Action 3. Public Outreach Program	New Action	X	X	X	Public Information
Action 4. Tree and Brush Removal	New Action	X	X		Property Protection Natural Resource Protection
Action 5. Wastewater Infrastructure	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 6. Wireless Radio Meters	New Action	X	X		Emergency Services Property Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Feather River Resource Conservation District*					
Action 1. Ecological Restoration	New Action	X	X		Natural Resource Protection
Action 2. Plumas Public Emergency Outreach Program	New Action	X	X	X	Public Information
Action 3. Fuels and Vegetation Management	New Action	X	X		Property Protection Natural Resource Protection
Action 4. Plumas Backup Generator and Air Purifier Loan Program	New Action	X	X		Property Protection Emergency Services
Action 5. Tree Mortality Tracking and Removal	New Action	X	X		Property Protection Natural Resource Protection
Gold Mountain Community Services District					
Action 1. Drought Impact on CSD Service	New Action	X	X		Property Protection Structural Project Natural Resource Protection
Action 2. Flood/Landslide/High Wind Mitigation	New Action	X	X	X	Property Protection Structural Project Natural Resource Protection
Action 3. Fire Prevention Hazard and Impact on CSD Services	New Action	X	X		Property Protection Natural Resource Protection
Action 4. ADDITIONAL ACTIONS					
Indian Valley Community Services District					
Action 1. Public Outreach Project	New Action	X	X	X	Public Information
Action 2. Dam Failure Mitigation and/or Replacement	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. IVCSD Secondary Water Source Project and Storage	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 4. Earthquake Mitigation	New Action	X	X		Property Protection Structural Projects
Action 5. Landslide, Mudslide, and Debris Flow Mitigation	New Action	X	X	X	Property Protection Structural Projects
Action 6. Severe Weather Mitigation	New Action	X	X	X	Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 7. Wildfire Mitigation	New Action	X	X		Prevention Property Protection Natural Resource Protection
Plumas Corp/Plumas County Fire Safe Council*					
Action 1. Update the Plumas County Communities Wildfire Protection Plan	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 2. Firewise Program Promotion and Public Education	Previous Action	X	X		Prevention Public Education
Action 3. WUI Map Project: Implementation of Fire Hazard Severity Zone, Insurance Rating, and Other Classification Systems for Wildfire Risk Management and Identification of Wildland Urban Interface Areas	New Action	X	X		Prevention
Action 4. Biomass Management and Utilization Program	New Action	X	X		Property Protection Natural Resource Protection
Action 5. Community Encompassing Firelines and Shaded Fuel Breaks	New Action	X	X		Property Protection Natural Resource Protection
Action 6. Continue and Promote Defensible Space (PRC 4291) Projects including Assistance Efforts for Senior and Disabled Residents.	New Action	X	X		Property Protection Natural Resource Protection Public Information
Action 7. Improve Local Plumas County Fire Department Capacity and Response Capabilities	New Action	X	X		Emergency Services Property Protection Natural Resource Protection
Action 8. Countywide Green Waste Disposal and Utilization Program	New Action	X	X		Property Protection Natural Resource Protection
Action 9. Hazardous Fuels Reduction – Implementation, Monitoring, and Maintenance	New Action	X	X		Property Protection Natural Resource Protection
Action 10. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.	New Action	X	X		Property Protection Natural Resource Protection Public Information
Action 11. Last Chance Creek Watershed Floodplain Restoration Project	New Action	X	X	X	Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 12. Mountain Meadows Watershed Floodplain Restoration Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 13. Upper Feather River Watershed Post-Fire Water Quality Monitoring Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 14. Red Clover Creek Watershed Floodplain Restoration Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 15. Tree Mortality Action Plan – Monitoring, Prevention, and Mitigation	New Action	X	X		Property Protection Natural Resource Protection
Action 16. Tributaries Forest Recovery Project	New Action	X	X	X	Property Protection Natural Resource Protection
Action 17. Prescribed Burning Project and Plumas Under burn Cooperative Programs	New Action	X	X		Property Protection Natural Resource Protection
Plumas Eureka Community Services District					
Action 1. Establishment of Evacuation Routes and Resident Notification System	New Action	X	X		Emergency Services
Action 2. Flood Risk Reduction for Wastewater Treatment Plant 6 (WWTP6)	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 3. Recycled Water Use	New Action	X	X		Property Protection Natural Resource Protection
Action 4. Water Storage Tank Retrofit or Replacement	New Action	X	X		Property Protection Structural Projects Natural Resource Protection
South Feather Water and Power Agency					
Action 1. Little Grass Valley Dam Spillway Northern Slope Stabilization and Rockfall Protection Project	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection

*Since these District's have the same boundaries as the County, these actions augment the County's actions.

Plumas County Mitigation Actions

Multi-Hazard Actions

Action 1. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Ag Hazard: Severe Weather/ Pests/Weeds, Climate Change, Dam Failure, Drought & Water Shortage (w/tree mortality), Earthquake, Flood: 1%/0.2% annual chance (w/levee failure), Flood: Localized Stormwater, Hazardous Materials Transportation, Landslide, Mudslide, and Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche), Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Plumas County plays a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The County will work with other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 3 of this LHMP Update, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: Plumas County, incorporated communities, and other jurisdictions

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets (general fund, special revenue funds, CIP funding), grant funds from Cal OES (mitigation grants), FEMA (HMGP, PDM, FMA), CA DWR, or other entities.

Timeline: Ongoing/Annual public education and awareness campaign over the next 5 years.

Project Priority (High, Medium, Low): High

Action 2. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Ag Hazard: Severe Weather/ Pests/Weeds, Climate Change, Dam Failure, Drought & Water Shortage (w/tree mortality), Earthquake, Flood: 1%/0.2% annual chance (w/levee failure), Flood: Localized Stormwater, Hazardous Materials Transportation, Landslide, Mudslide, and Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche), Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (Assembly Bill (AB) 2140).

Project Description: Specifically, this section requires that each applicable jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: Plumas County Planning Department

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding: Local budgets (general fund)

Timeline: Within 1 year; upon approval by FEMA of the 2026 LHMP

Project Priority (High, Medium, Low): High

Action 3. Back Up Power Redundancy Project – Resilient and Continued Outpatient Medical Services at Lake Almanor Clinic, and Continued Operation of a Cooling/Warming Station for the General Public during Electrical Power Disruptions as Needed.

Hazards Addressed: Earthquake, Flood: 1% and 0.2% Annual Chance, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Electrical Power Outage resulting in a loss of operation of the Lake Almanor Clinic Services and Building at 199 Reynolds Road, Chester CA 96020. Electrical outages may be caused by caused by electrical generation and distribution equipment failure, natural disasters such as a blizzard, floods, earthquake, wildfire, Public Safety Power Shut offs, etc., or civil unrest. . The current 200 KW emergency generator and associated equipment providing standby emergency power to the Lake Almanor Clinic building are now 19 years old, installed in November of 2006, and have a few thousand hours of use. Although the equipment is still operating as it should, and regular maintenance and testing is being completed the age of the equipment is becoming concerning, and the risk of failure of the equipment during a power outage is rising. It is the intention of Seneca Healthcare District to minimize the risk of losing the ability to operate the Lake Almanor Clinic in the event of an electrical power failure.

Project Description: Remove and replace the 200KW standby emergency generator with weather enclosure and attached diesel fuel belly tank and remove and replace the Automatic Transfer Switches that allow the transfer from Normal electric power to emergency generator power.

Other Alternatives: Leave current equipment in place and wait till failure occurs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Seneca Healthcare District Strategic Planning Committee, Emergency Management Planning, Seneca Healthcare Board of Directors and Administration.

Responsible Office/Partners: Brady Haynes, COO Seneca Healthcare District and Jerri Nielsen, President of Seneca Board of Directors; in coordination with PCOES.

Benefits (Losses Avoided): Benefits – Continued uninterrupted ou5tpatient healthcare for the community, operation of a cooling or warming shelter as needed, and provides the hospital a secondary site to conduct patient care in the event of a Disaster, Pandemic, or Mass Casualty Incident. The ability to access medical care is priceless and the financial losses to Seneca Healthcare District have a large impact on an already struggling rural healthcare facility.

Potential Funding: Seneca Healthcare, future Capital Equipment Budgets, Philanthropy. No grants have been investigated for this expense at this time.

Timeline: 2 – 3 years in the future. 2027-2029

Project Priority (High, Medium, Low): Project Priority is Medium to Low at this time as current construction of the Lake Almanor Community Hospital is in progress and takes priority.

Action 4. Resilient Community Systems Initiative

Hazards Addressed: Drought and Water Shortage, Earthquake, Flood: 1% and 0.2% Annual Chance, Severe Weather: Extreme Cold, Freeze, and Snow, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County faces growing threats from natural hazards—including wildfires, severe storms, flooding, drought, and public health emergencies—that jeopardize the safety and functionality of its critical infrastructure, special districts, and community-serving foundations. These entities provide essential services such as water, sanitation, fire protection, education, and social support, yet many lack the resources, planning capacity, and physical resilience needed to withstand and recover from disasters. Without a coordinated mitigation strategy that includes these sectors, the county risks prolonged service disruptions, increased recovery costs, and greater harm to vulnerable populations. Integrating foundations, infrastructure operators, and special districts into the Local Hazard Mitigation Plan is vital to building a more resilient, prepared, and connected community.

Project Description: The RCSI is a countywide effort to enhance the disaster resilience of foundations, critical infrastructure, and special districts (e.g., water, fire, school, and utility districts). The initiative will support hazard mitigation planning, facility upgrades, and inter-agency coordination to reduce vulnerability to wildfire, flooding, severe storms, drought, and public health emergencies.

Other Alternatives:

- Goal 1: Protect life, property, and critical facilities from natural hazards.
- Goal 2: Increase community resilience through education, outreach, and partnerships.
- Goal 3: Strengthen coordination among jurisdictions and service providers.
- Goal 4: Promote hazard mitigation planning and implementation across all sectors.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This mitigation action will be implemented through existing planning mechanisms including individual hazard mitigation plans developed by special districts, strategic plans and operational protocols maintained by foundations, and findings from countywide community needs assessments. These mechanisms provide a coordinated framework for integrating mitigation actions into infrastructure upgrades, service continuity planning, and community-based resilience efforts.

Mitigation Actions:

1. Facility Resilience Audits
   - Conduct hazard vulnerability assessments for buildings and infrastructure operated by foundations and special districts.
   - Identify and prioritize retrofit needs (e.g., seismic upgrades, floodproofing, defensible space, backup power).

2. Continuity and Emergency Operations Planning
   - Support development or updates of Continuity of Operations Plans (COOPs) and Emergency Operations Plans (EOPs) for special districts and nonprofits.

- Facilitate joint training and tabletop exercises with county OES and emergency responders.

3. Infrastructure Hardening Projects - Implement physical mitigation projects such as:
- Backup generators for water and wastewater facilities
- Resilience Hubs for communities
- Fire-resistant upgrades for community centers and schools
- Stormwater management improvements for flood-prone areas

4. Community Resilience Microgrants
- Provide funding to foundations and special districts for small-scale mitigation projects (e.g., emergency supply caches, air filtration systems, fire-safe landscaping).

5. Resilience Coordination Network
- Establish a countywide network of foundations, special districts, and emergency managers to share resources, coordinate during disasters, and advocate for mitigation funding.

6. Public Education and Outreach
- Partner with foundations and districts to deliver hazard awareness and preparedness education to residents, especially vulnerable populations.

Responsible Office/Partners: Plumas County Office of Emergency Services (OES)/Plumas County Public Health/Special Districts/Local foundations and Nonprofits/ Tribal organizations/Utility providers, Plumas County Disaster Recovery Coordinator

Benefits (Losses Avoided):

- Reduced service disruption during disasters
- Enhanced safety and resilience of critical infrastructure
- Stronger coordination between public, nonprofit, and special district sectors
- Increased eligibility for FEMA and state mitigation funding
- Improved community preparedness and recovery capacity

Potential Funding: FEMA Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC), Cal OES, USDA Rural Development, Private philanthropic contributions, State Water Resources Control Board (for water-related projects)

Timeline: 2026–2030 (5-year implementation window)

Project Priority (H, M, L): High

Action 5. Designation of Minor County Roads and Forest Service Roads to be used as Alternate Routes around Road Closures during Wildfire and other Hazard Events. Plumas and Lassen National Forests have Funding for new Road Connections to Form Alternate Routes.

Hazards Addressed: Landslide, Mudslide, and Debris Flow, and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): During and after wildfires in Plumas County alternate routes are required around State Route closures during and after wildfires. Provides additional routes around wildfire road closures. Past forest fire State Route closures have necessitated long alternate routes outside the County through Susanville, down State Route 395 and through the Sierra Valley to get from Lake Almanor to Quincy.

Project Description: Intent is to connect minor Plumas County Roads to Forest Service Roads to function as alternate routes in the event of a forest fire road closure.

Other Alternatives: Maintenance or improvements to Forest Service Roads

Existing Planning Mechanism(s) through which Action Will Be Implemented: Discussions with Plumas and Lassen National Forest.

Responsible Office/Partners: Plumas and Lassen National Forest

Benefits (Losses Avoided): Benefit is potentially saving lives with additional evacuation routes. Also benefit of shorter alternate route around forest fire closed roads.

Potential Funding: Plumas and Lassen National Forest have stated that funding is possible through the National Forest.

Timeline: 2026 and ongoing during the length of this plan.

Project Priority (H, M, L): High

Action 6. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access.

Hazards Addressed: Floods: Localized Stormwater, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County owns and maintains 90 bridges with many very old and single lane bridges.

Project Description: Intent is to replace Plumas County bridges that qualify for federal funding. Bridges are required to be replaced with minimum two lane bridge.

Other Alternatives: Maintain existing bridges to ensure continued operation

Existing Planning Mechanism(s) through which Action Will Be Implemented: Bridges that qualify are replaced within the County with Federal funds. Bridges are listed in the Plumas County Capital Improvement Program.

Responsible Office/Partners: Federal Highway Administration (FHWA)

Benefits (Losses Avoided): Increased width for wildfire equipment and evacuation. Bridge replacement funding requires that the bridge be raised above the 100 year flood water elevation.

Potential Funding: Federal Funding through FHWA

Timeline: As soon as possible, within 1-5 years, dependent on Plumas County cash flow and funding.

Project Priority (H, M, L): High

Action 7. Continue to Reach out to the Community Countywide to Sign Up for Emergency Alerts through the Genasys Program

Hazards Addressed: Multi-Hazard (Avalanche, Climate Change, Dam Failure, Drought & Water shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Levee Failure, Pandemic, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Sever Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County currently uses the Genasys Platform for reverse 911 notifications. When the data from the previous platform was transferred to Genasys, the addresses did not transfer over. We need the community to login to the system to add their addresses. If a address is not tied to a phone number, they many not get the notification.

Project Description: Increase public education for sign up and editing emergency notification addresses and phone numbers. Publications, advertising, media outreach and in person meetings.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County CWPP, Plumas County EOP

Responsible Office/Partners: Plumas County OES, Sheriff's Department, Fire Departments, Fire Safe Communities

Benefits (Losses Avoided): Public education; faster notification of emergency; community enhances knowledge of being prepared

Potential Funding (Local Budgets, Grant Funds, etc.): EMPG, State 911

Timeline: Ongoing

Project Priority (High, Medium, Low): Medium

Action 8. Plumas County General Plan Public Health & Safety Element update to incorporate Senate Bill (SB) 379 requirements

Hazards Addressed: Wildfire, Flood, Severe Weather, and Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: The Plumas County General Plan Public Health & Safety Element update is necessary to address SB 379 state law requirements that will lead to improved countywide climate resilience.

Project Description: The County of Plumas General Plan Public Health & Safety Element update focuses on addressing climate resiliency for the unincorporated areas of the County to inform the General Plan and incorporate Senate Bill (SB) 379 requirements. A vulnerability assessment will be prepared and adaptation strategies will be developed. Adaptation goals, policies, and implementation measures will inform an update of the General Plan and reflect recommendations developed through the collaborative process. In particular, because of its environment Plumas County is particularly susceptible to the impacts of changes in climate including:

- Increased incidence of wildfires
- Impacts of localized and regional flooding
- Threats due to severe weather
- Water shortages and drought conditions

The project will address the identified problems and/or deficiencies by first cataloging them in a vulnerability assessment. This critical task will include identifying and evaluating vulnerabilities that exist for Plumas County and its planning areas. An investigation of exposure to climate change, as well as potential impacts and the current capacity for the community to adapt to potential impacts, will be studied. The vulnerability assessment will provide the baseline for current climate change risks that the community faces. Once the vulnerabilities are identified, adaptation strategies will be prepared. The strategies will be carefully evaluated and prioritized based on factors including impact, cost, benefits, and feasibility. An implementation plan will be prepared that includes appropriate updates to the General Plan pursuant to Senate Bill 379 while also providing a platform for local businesses and environmental groups to use recommendations to reduce climate change risks and improve adaptability.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County General Plan Public Health & Safety Element

Responsible Office/Partners: Plumas County Planning Department

Benefits (Losses Avoided): People and property

Potential Funding: Grant to be identified

Timeline: 2026/2027

Project Priority (High, Medium, Low): Medium

Agricultural Hazard Actions

Action 9. Wildlife Conflict Mitigation Tools and Equipment

Hazards Addressed: Human Wildlife conflicts

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Due to current policies and regulations, the predator population in Plumas County has increased dramatically in the last decade. This is resulting in many hazardous interactions with wildlife and economic loss.

Project Description: Provide residents with wildlife conflict mitigation equipment and nonlethal tools such as electric fencing, fladry, fox lights, drones, range riders, etc.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Sierra County Local Hazard Mitigation Plan, Plumas County Local Hazard Mitigation Plan

Responsible Office/Partners: Plumas-Sierra Department of Agriculture/ Weights and Measures, UC ANR Cooperative Extension, Resource Conservation Districts, and Agricultural Associations.

Benefits (Losses Avoided): Increased safety for wildlife, a lowering of agricultural predator losses in Plumas County, increase in public safety, and lower economic losses.

Potential Funding (Local Budgets, Grant Funds, etc.): Grant funding will be sought through non-government organizations, National Resource Conservation Districts, and government entities.

Timeline: Ongoing

Project Priority (High, Medium, Low): High

Action 10. Invasive Weed Control and Eradication

Hazards Addressed: Noxious/ invasive weeds, fire mitigation

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Due to the movement of livestock, people, vehicles and trains, Plumas County has a high potential for infestations of noxious/invasive weeds. The damage caused by wildfires and road contraction provides fertile, disturbed soil that is readily invaded by these pests. These pests crowd out native vegetation, damage crop land, and provide less forage for wildlife and livestock. Some invasive weeds such as Cheat Grass and Scotch Broom are known to raise the fire danger in areas where it occurs.

Project Description: To secure funding for biological, mechanical, and chemical removal of invasive/ noxious weeds.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Local Hazard Mitigation Plan, Plumas-Sierra Weed Management Area Group

Responsible Office/Partners: Plumas-Sierra Department of Agriculture/ Weights and Measures, UC ANR Cooperative Extension, Resource Conservation Districts, and United States Forest Service.

Benefits (Losses Avoided): Improvement in native plant populations, increase in forage and crop production, and lowering of wildfire risk.

Potential Funding (Local Budgets, Grant Funds, etc.): Grant funding will be sought through non-government organizations, National Resource Conservation Districts, and government entities.

Timeline: Ongoing

Project Priority (High, Medium, Low): High

Action 11. Wildlife Conflict Mitigation Tools

Hazards Addressed: Human Wildlife conflicts

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Due to current policies and regulations, the predator population in Plumas County has increased dramatically in the last decade. This is resulting in many hazardous interactions with wildlife and economic loss.

Project Description: Provide residents with wildlife conflict mitigation techniques and nonlethal tools such as electric fencing, fladry, fox lights, range riders, etc.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Sierra County Local Hazard Mitigation Plan, Plumas County Local Hazard Mitigation Plan

Responsible Office/Partners: Plumas-Sierra Department of Agriculture/ Weights and Measures, UC ANR Cooperative Extension, Resource Conservation Districts, and Agricultural Associations.

Benefits (Losses Avoided): Increased safety for wildlife, a lowering of agricultural predator losses in Plumas County, increase in public safety, and lower economic losses.

Potential Funding (Local Budgets, Grant Funds, etc.): Grant funding will be sought through non-government organizations, National Resource Conservation districts, and government entities.

Timeline: Ongoing

Project Priority (High, Medium, Low): High

Climate Change Actions

Action 12. Develop a Climate Action Plan

Hazards Addressed: Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Governor Schwarzenegger issued Executive Order S-3-05 in June 2005, setting GHG emission targets for the State to meet, starting with a reduction to 2000 GHG emission levels by 2010, 10% below 1990 levels by 2020 and concluding with a reduction to 80% below 1990 numbers by 2050. In 2006, Governor Schwarzenegger signed AB 32, which established the first set of limits on GHG emissions for the state of California and put into place the regulatory framework needed to reach those targets. AB 32 set the 10% below 1990 GHG emissions level as a target to be achieved by 2020. In order to meet this goal, the California Air Resources Board has developed GHG emissions reporting procedures. In 2008, Governor Schwarzenegger signed SB 375, which sets out planning concepts intended to reduce vehicle travel by promoting more compact development; ideas which are incorporated in this General Plan. A goal of SB 375 is to help curb GHG emissions. Taken together, both S-3-05 and AB 32 set the emission targets that Plumas County will eventually be required to attain. While explicit thresholds and requirements have yet to be developed, various state agencies have begun to examine proposed land use plans and specific projects for their potential GHG impacts. Three important steps in helping to reduce potential climate change impacts are the creation of an inventory of existing GHGs and a plan to reduce these emissions.

Project Description: Prepare a Climate Action Plan that identifies strategies for increasing energy efficiency, carbon sequestration, GHG emissions reductions, and land use and transportation strategies that are consistent with appropriate climate change regulations (i.e., State of California's Global Warming Solution Act). Step 1 – GHG inventory. Step 2 – GHG Reduction Plan. Step 3 – Develop a Strategy for Carbon Sequestration.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County General Plan Conservation and Open Space (COS) Element, 7.10.2 Climate Action Plan

Responsible Office/Partners: Plumas County Planning Department

Benefits (Losses Avoided): Reduced risk to people and property from climate change.

Potential Funding: Staff time

Timeline: 2028-2029

Project Priority (H, M, L): Medium

Dam Failure Actions

Action 13. Evaluate Options for Obtaining 100-year Level of Certification for the Diversion Dam (East and West Chester Levees)

Hazards Addressed: Flood

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: FEMA flood maps show the 100-year floodplain within the East and West Chester Levees.

Project Description: Research options for certifying levees to FEMA standards.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: No existing planning mechanism currently exists.

Responsible Office/Partners: Plumas County Planning Department and Public Works Department

Benefits (Losses Avoided): People and property protection

Potential Funding: Staff time

Timeline: 2028

Project Priority (H, M, L): Medium

Drought and Water Shortage Actions

Action 14. County Wide Drought Resilience Plan

Hazards Addressed: Drought

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Plumas County is in need of a County Wide Drought Resilience Plan.

Project Description: Develop County Wide Drought Resilience Plan.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This action creates a planning mechanism.

Responsible Office/Partners: Plumas County Flood Control, OES and Environmental Health

Cost Estimate: $125,000

Benefits (Losses Avoided): Drought resilience plan will be in place for potential short- or long-term drought. This plan will be implemented by the County Drought Task Force as needed.

Potential Funding: $125,000 from DWR for Direct Technical Assistance to comply with SB 552

Timeline: Currently being drafted for approval

Project Priority (H, M, L): High

Earthquake Actions

Action 15. Hospital Seismic Compliance (SB-1953)

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): California instituted a series of seismic compliance standards in 1994 following the catastrophic Northridge Earthquake. The state instituted a series of milestones over the years, ultimately leading up to the most stringent 2030 compliance standards.

Project Description: Retrofit existing hospital structure to improve its ability to withstand a major earthquake event. Standard requires all hospitals to maintain operations (uninterrupted) during a localized 8.0 earthquake by 2030. Work includes bracing of structure, equipment, and installation of independent utility systems (water/sewage/electricity).

Other Alternatives: N/A

Existing Planning Mechanism(s) through which Action Will Be Implemented: PDH is currently working with HCAI and its architects/engineers towards seismic compliance and is on track to adhere to the mandated milestones/timelines.

Responsible Office/Partners: HCAI

Benefits (Losses Avoided): Prevention of loss of acute care hospital services in a seismic event.

Potential Funding (Local Budgets, Grant Funds, etc.): Received a grant from HCAI's Small and Rural Hospital Relief program for approximately $2.8M to meet structural seismic compliance.

Timeline: Ongoing-January 1, 2030

Project Priority (High, Medium, Low): High

Floods: 1%/0.2% Annual Chance, Floods: Localized Flooding, Landslide, Mudslide and Debris Flow, Severe Weather Heavy Rains and Storms Actions

Action 16. Evaluate and implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas

Hazards Addressed: Severe Weather: Heavy Rains and Storms, Landslide, Mudslide, and Debris Flow

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Problems with channel bank stabilization over the years.

Project Description: Intent is to provide erosion protection by means of rip rap or other mitigation methods to prevent stream bank erosion and protect surrounding development.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas Corp has studies along with Plumas National Forest

Responsible Office/Partners: Plumas County Public Works

Benefits (Losses Avoided): Protection of Wolf Creek Channel protects the surrounding areas from flooding during high water flows.

Potential Funding: State and Federal Grants (HMA funding)

Timeline: As soon as possible depending on funding availability

Project Priority (H, M, L): High

Action 17. Identify and Implement Bank Stabilization Projects.

Hazards Addressed: Landslide, Mudslide, and Debris Flow, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County has bank stabilization problems near multiple bridges as follows: Chandler Road Bridge, North Valley Bridge, Mill Creek Erosion, Wapaunsie Creek Erosion, and Stampfli Lane Bridge Erosion. Gravel buildup on Smith Creek Erosion needs to be removed to prevent the creek from overflowing Johnsville-Graeagle bridge.

Project Description: Intent is to provide erosion protection by means of rip rap upstream and downstream of bridges to reduce turbidity of the stream from erosion and remove gravel buildup on Smith Creek.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Upper Feather River IRWM and included in the Capital Improvement Program

Responsible Office/Partners: Plumas County Public Works

Benefits (Losses Avoided): Prevent damage to bridge abutments during high water events.

Potential Funding: IRWM Grant Funding

Timeline: 1-5 years; As soon as funding becomes available

Project Priority (H, M, L): High

Action 18. Develop a Countywide Drainage Master Plan

Hazards Addressed: Floods: Localized Stormwater, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The drainages across Plumas County have been added and modified over the past 150 to 200 years without any overall plan for moving high flows through multiple developed towns.

Project Description: Intent is to complete a comprehensive drainage master plan for Plumas County. To better plan for future, record storm water events, as well as the accommodations of new, proposed site development, in the County requires a Drainage Hydraulic Study for drainage basins that exist. Drainage Master Plan should focus on higher population density towns within the County where drainage is more complex, particularly in Quincy/East Quincy, Chester, and Greenville.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Drainage Master Plan is listed in the Plumas County Capital Improvement Program.

Responsible Office/Partners: Public Works Department

Benefits (Losses Avoided): Increase efficiency of the Countywide drainage to prevent or minimize flooding during a record storm water event.

Potential Funding: HMA Grant Funding Local Budgets (general fund, special revenue funds, CIP funding)

Timeline: 2026-2031

Project Priority (H, M, L): High

Action 19. FEMA Mapping Update

Hazards Addressed: Floods: 1%/0.2% annual chance, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): FEMA Flood Insurance Rate Map (FIRM) maps have not been updated since March 2, 2005

Project Description: There are three primary methods by which a community's flood hazard maps are updated. The first is through a FEMA-initiated study/mapping project and subsequent revision of the effective National Flood Insurance Program (NFIP) flood maps. The second method is through a community-initiated revision under Part 65 of the NFIP regulations. The third is through a study/mapping project undertaken by a participant in the FEMA Cooperating Technical Partners (CTP) Program.

Other Alternatives: Letter of Map Revision (LOMR) is option for specific parcel revisions

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Public Works / Engineering

Benefits (Losses Avoided): FEMA mapping update would primarily revise maps for any changes that have occurred in the past 15 years, increasing accuracy for development.

Potential Funding: Federal Grants such as HMGP or BRIC; Local Budgets (general fund, special revenue funds, CIP funding)

Timeline: 2026-2031

Project Priority (H, M, L): High

Action 20. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)

Hazards Addressed: Floods: 1%/0.2% annual chance, Levee Failure

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County has many levee's that protect residences from flood waters and are owned by individual levee owners, CSD's and Central Valley Flood Control in the case of the Chester Diversion Dam. Plumas County Flood Control is tasked with maintenance responsibility for the Chester Diversion Dam and Levee system only. Other levee's within the County are privately owned and maintained.

Project Description: Intent is to evaluate options to repair and maintain levee's including emergency access vehicles, gates, crown repair and vegetation maintenance. Many levees are privately owned and maintained.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Flood Control and Water Conservation District

Benefits (Losses Avoided): Maintain levee's to provide access for emergency vehicle and remove vegetation to allow levee inspection and repair during high water flows.

Potential Funding: DWR Flood Maintenance Assistance Program

Timeline: As soon as possible once funding becomes available

Project Priority (H, M, L): High

Action 21. County Wide Stormwater Drainage and Grading Ordinance.

Hazards Addressed: Floods: Localized Stormwater

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County is in need of a County Wide Stormwater Drainage and Grading Ordinance.

Project Description: Develop County Wide Stormwater Drainage and Grading Ordinance to standardize development related to stormwater and grading issues.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Public Works, Building and Planning

Benefits (Losses Avoided): With standardized procedure for stormwater drainage and grading, Countywide drainage will be improved.

Potential Funding: Current funding in place; Local Budgets (general fund, special revenue funds, CIP funding)

Timeline: Within 1 year from the start of the plan

Project Priority (H, M, L): High

Action 22. Ongoing Implementation of Stream Clearing and Culvert Maintenance Programs

Hazards Addressed: Floods: Localized Stormwater

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County has many stream channels that require vegetation management and clearing. Public Works maintains storm drainage facilities and water crossing at County Roads extending out to the County right-of-way. Caltrans maintains State Highways in a similar manner. In most cases, responsibility of channel vegetation management beyond the roadway right-of-way falls on adjacent to stream property owners.

Project Description: Plumas County Public Works performs regular routine maintenance of storm drainage facilities and water crossings at approximately 168 locations through the County. Privately owned stream channels require property owner's permission to conduct vegetation management in addition to a funding source.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lake and Streambed Alteration Agreement for County-Wide Routine Maintenance Program for Plumas County was completed in 2022. This document streamlines the process of obtaining permits for routine maintenance of storm drainage facilities and water crossings.

Responsible Office/Partners: Public Works Engineering Department

Benefits (Losses Avoided): Regular vegetation management and stream clearing will reduce the risk of flooding by improving the efficiency of the streams to drain heavy flows.

Potential Funding: State and Federal grants, HMA funding; Local Budgets (general fund, special revenue funds, CIP funding)

Timeline: 1-5 years; As soon as possible, depending on funding availability

Project Priority (H, M, L): High

Action 23. Review and Update, as Needed, Title 8 (Building Regulations), Chapter 17 (Flood) of the Plumas County Code re: Floodplain Ordinance and Applicable Title 9 (Planning and Zoning) Sections

Hazards Addressed: Flood

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: The original comprehensive flood plain ordinance was adopted in 1998 and was based on the Model Flood Plain ordinance produced by the Department of Water Resources (DWR). At the last audit conducted by DWR and FEMA in 2011 it was recommended that the ordinance be updated to the latest state/federal Model Flood Plain ordinance.

Project Description: Update Flood Plain Ordinance to the latest December 2006 DWR CA Model Flood Plain Ordinance. Coordinate with Public Works. Conduct Planning Commission workshops. Refer to General Plan policies and implementation measures:

- PHS 6.4.1 Coordination with Federal Emergency Management Agency, United States Army Corps of Engineers and Department of Water Resources Division of Flood Management
- PHS 6.4.2 Development in Floodways and Dam Inundation Areas
- PHS 6.4.4 Floodplain Development Restrictions
- PHS 6.4.7 Limit Surface Runoff
- PHS Implementation Measures 1, 10, 20
- COS 7.2.4 Stream Corridor Development
- W 9.7.2 Downstream Peak Flows

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Code, Title 8 (Building Regulations), Chapter 17 (Flood) and Plumas County General Plan

Responsible Office/Partners: Plumas County Planning Department and Public Works Department

Benefits (Losses Avoided): People and property protection

Potential Funding: Staff time

Timeline: 2026/2027

Project Priority (H, M, L): Medium

Hazardous Materials Transport Actions

Action 24. DO YOU HAVE ONE? NOT REQUIRED BY FEMA.

Landslide, Mudslide, and Debris Flow Actions

Action 25. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad

Hazards Addressed: Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): During heavy rains, County Roadways have historically experienced landslides covering the roadways and slip outs, where the roadway is eroded and undermined on the downslope side. The typical problem for slope stability tends to be lack of extent of right-of-way. The problem of slip outs tends to be waterways shifting during heavy flows and eroding banks below the roadway.

Project Description: Potential areas of landslides can be identified from past problems, but other factors like changing stream location and forest fires affect slope stability. These areas will be identified and prioritized based on potential for damage. Locations that pose a high risk for slides can potentially be stabilized prior to landslides occurring.

Other Alternatives: For reoccurring slides, retaining walls provide another option

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Public Works Engineering Department

Benefits (Losses Avoided): Increase efficiency of the Countywide drainage to prevent or minimize flooding during a record storm water event.

Potential Funding: HMA Grant Funding; Local Budgets (general fund, special revenue funds, CIP funding)

Timeline: 2026-2031

Project Priority (H, M, L): High

Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche) Cold Actions

Action 26. NEED

Wildfire, Drought, Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornadoes Actions

Action 27. Promote and Implement Compliant Street/Address Reflective Signage for Public and Private Roads and Structures

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Compliant Street/Address reflective signage for public and private roads and structures is critical during wildfires for first responders, evacuation routes, and alternate evacuation routes. Public Resources Code (PRC) 4290 regulations require, "Standards for signs identifying streets, roads, and buildings."

Project Description: Plumas County Public Works has in house reflective sign making capability for street and address signage. Street signs for Plumas County Roads are updated on an as needed basis. Street signs for private roads and address signs can be purchased from Public Works at cost. Street signs can also be produced for Forest Service Roads for evacuation routes, but a funding source would need to be established.

Other Alternatives: Private companies can also produce reflective street and address signs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Public Works Engineering Department

Benefits (Losses Avoided): Proper reflective signage and street signs help first responders efficiently respond.

Potential Funding: HMGP grants, HMA funding

Timeline: 2026 and ongoing throughout the duration of this plan.

Project Priority (H, M, L): Medium

Action 28. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access

Hazards Addressed: Wildfires, Severe Weather: High Winds and Tornadoes

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): There are many County, Private and Forest Service Roads within Plums County that do not have a secondary evacuation route and are not wide enough for two-way traffic. This combination creates a hazard for emergency services access during wildfire evacuation and other evacuations, while residents are evacuating. This situation is compounded when a one-lane bridge must be crossed on the one lane road. This is also a problem on private and Forest Service Roads.

Project Description: Intent is to survey County Roads in Plumas County that have inadequate width for two-way traffic and only one evacuation route. Widen roads to two-way roads when funding source is determined. It would be beneficial for Private Roads and Forest Service Roads with insufficient width for two-way traffic to be surveyed by other agencies.

Other Alternatives: Develop second evacuation route

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Public Works Department, GIS Department.

Benefits (Losses Avoided): Efficient evacuation of residents while allowing emergency services access.

Potential Funding: CalFire Grants

Timeline: 1-5 years; As soon as possible, depending on funding

Project Priority (H, M, L): High

Action 29. Air Quality Impacts During Wildfire Events

Hazards Addressed: Air Quality - Smoke impacts from wildfires

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The growing impact from wildfires in California is undeniable. Historic forest management practices along with climate change have led to mega-fires and year-round fire seasons impacting communities statewide. Wildfire smoke impacts populations living hundreds of miles away and often lasts for days and weeks at a time. Poor air quality poses a health risk to all individuals. Children, adolescents, pregnant women, the elderly, the immunocompromised and those with pre-existing chronic diseases and lung conditions are especially vulnerable to the health impacts of poor air quality events. Wildfire smoke creates and often exacerbates poor air quality situations. One of the most dangerous components that exist in wildfire smoke is particulate matter (PM). PM particles are so fine that they are inhaled deep into the lungs and enter the bloodstream. Plumas County has been impacted by surrounding wildfires and even out of state ones in the last five years. The smoke lingers low to the ground for multiple days making it extremely unhealthy to conduct business, school and sport activities. Many of the homes, buildings, office spaces, schools, and shopping centers have very old HVAC systems leaving them vulnerable to smoke infiltrating indoors.

Project Description: Provide the community with clean air spaces during wildfire smoke. Mitigations will include:

- Increased public outreach on smoke impacts and how people can protect themselves during smoke events, including the issuing of health advisories, factsheets on staying indoors and keeping doors and windows closed, limiting the amount of time spent outdoors depending on the air quality and what time of day is best to go outside. Additional information is shared via our website and Facebook pages on the air quality and measures to protect against smoke impacts.

- What the air quality is in the area based on currently deployed monitoring equipment. Additional indoor monitors can be deployed in areas that act as clean air shelters.
- Air Purifiers: Vary in sizes that can easily be customized to the need of the person. For homes, small offices, and portable classrooms, these units are very quiet and highly efficient at circulating clean air.
- Filters: Filters can be expensive to swap out during wildfire smoke events because of how frequently it has to be done. This is problematic because consumers will tend to go with the cheapest available option, which in most cases doesn't really do much for their air. If assistance to purchase filters is available this would be extremely helpful and beneficial.
- Scrubbers: Although very loud, commercial scrubbers get the job done in a larger/high-capacity room. Provide schools and large-scale businesses/offices with an inventory of scrubbers that could be deployed when needed.
- There are many "Clean Air Centers" in Plumas County that have air purifiers and replacement filters ready for when there is a smoke event. The location of clean air shelters within Plumas County for the public to retreat to in order to not be in poor air quality conditions. Locations in Plumas County include, the libraries, Plumas Fairgrounds, and several churches. Depending on where the fire is and what communities are being impacted, these clean air shelter locations will be activated.
- Indoor Air Monitors: PurpleAir now offers indoor monitors that are easy to read just by looking at the color on the bottom rim. These use the Air Quality Index color guide. Indoor monitors will be provided when a clean air shelter is activated.
- Air Purifiers: Vary in sizes that can easily be customized to the need of the person. For homes, small offices
- Air quality information is continuously available on our website at myairdistrict.com
- Additional outdoor monitors will be deployed depending on conditions.

Other Alternatives: Brochures, handbooks, guides, and handouts.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Clean air shelters are established throughout Plumas county and are activated when air quality levels reach Unhealthy for Sensitive Groups.

- Health Advisories are issued with information on how to protect oneself from the impacts of wildfire smoke. Health Advisories are issued when air quality levels reach Unhealthy for Sensitive Groups.
- Public outreach during smoke events on air quality conditions and how the community can protect themselves.
- A mitigation effort to prevent wildfires is our Green Waste program through the Targeted Airshed Grant program in Portola through the Green Waste Vouchers and Neighborhood Bin Program. These programs provide residents the ability to dispose their green waste at our local transfer station or in bins given to residents based on approval of an application. Free green waste disposal occurs during the months of June and October.

Responsible Office/Partners: Northern Sierra Air Quality Management District along with the Office of Emergency Services and the Public Health Department

Benefits (Losses Avoided): Protect human health from adverse air quality.

Potential Funding (Local Budgets, Grant Funds, etc.): Limited grant funds for indoor monitors.

Timeline: Within 1 to 3 years

Project Priority (High, Medium, Low): High priority during wildfire season (typically June through October)

Action 30. Plumas County Agriculture, Forestry, and Natural Resources Resilience

Hazards Addressed: Climate Change, Drought, Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Well documented climate change trends and projections indicate that Plumas County communities and landscapes will continue to be impacted by climate driven disturbances such as drought, tree mortality and wildfire. Because Plumas county communities and economies are inherently linked to agriculture, forest health, and natural resources there is a need for awareness, capacity building, and technical assistance to promote and implement best management practices to be more resistant and resilient to these disturbances.

Plumas County experienced extreme drought conditions during the 2012-2016 statewide drought. This resulted in:

- Diminished water supply for domestic, agriculture, and forestry use: Agricultural wells were running dry; reduced water supply for surface water irrigation of pasture and hay, lack of sufficient water in the creeks limited water drafting sites for road maintenance and inhibited/delayed forest management activities
- Lack of rangeland forage for both wildlife and livestock production: this results in reductions of agricultural and livestock yields thereby affecting the local agricultural economy.
- Tree mortality events which threatened and damaged homes and road and power infrastructure resulting in large mitigation costs.
- Increased dependence on groundwater. Over pumping of groundwater resulted in cones of depression in the water table in Sierra Valley. This necessitated the deepening of ground water wells and the abandonment of certain wells due to sand intrusion.
- Negative effects on soil health and increased challenges with the management and control of invasive species.

While Plumas County experienced "extreme" drought conditions in the last drought, other parts of the State experienced "exceptional" drought conditions, indicating that the northern sierra could be vulnerable to even more catastrophic drought events. Education and technical assistance regarding best management practices, water conservation measures, and countywide mitigation strategies are needed to prepare for and mitigate impacts of future drought events.

Project Description: This project includes concerted and coordinated efforts to provide outreach, education, and technical assistance to Plumas County land owners and land managers to promote drought prevention and mitigation strategies. As evidenced above, climate change and drought driven disturbances are broad in nature and reach and include but are not limited to reduction in water storage, flow, and utilization, agricultural yields, forest health and tree mortality. Projects that fit within these programs include:

- Continued work with UC Davis to look at crop varieties to reduce dependence on water;

- Identification and implementation of projects to enhance soil health;
- Continue education and training of land managers;
- Develop Countywide drought mitigation strategies;
- Continue and expand tree morality detection, monitoring, prevention and mitigation strategies;
- Implement programs to increase sprinkler efficiency; and
- Manage, control, and eradicate invasive plant species and pests.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas-Sierra Agricultural Department and UC Cooperative Extension are skilled staff currently serving agricultural and livestock producers, and forest landowners and managers. The Plumas Fire Safe Council helps to host/Coordinate the County tree mortality group.

Responsible Office/Partners: Critical primary partners and stakeholders include:

- Plumas-Sierra County Department of Agriculture
- UC Cooperative Extension
- Plumas County Fire Safe Council
- Resource Conservation Districts
- Plumas County Public Works
- Feather River Watershed Group
- Feather River Integrated Regional Watershed Management (IRWM) plan

Benefits (Losses Avoided): Benefits of these programs include greater economic and community resilience of the county, improved forest health, reduced wildfire risk, and improved sustainability of agriculture and livestock production. Avoided Losses could easily be within the range of millions of dollars considering the dependence of Plumas County communities on natural resources and the contributions of the watershed to the state water project supply.

Potential Funding: A portion of the costs are currently funded by existing programs, however, this limits the capacity for prevention and mitigation measures. As a result, programs are more reactive to drought-driven issues and events rather than pro-active in terms of prevention and mitigation. Additional funds would be needed to increase existing program capacity to serve the county communities. Potential funding may be available through the Sierra Nevada Conservancy Watershed Improvement Program, Title II and III RAC grants, CDFA grants for Soil Health, SB1 grants through the IRWM process, and CALFIRE Forest Health grants.

Timeline: Ongoing

Project Priority (H, M, L): High

Action 31. Livestock and Companion Animal Trailer

Hazards Addressed: Wildfire, Flood, Evacuation

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Plumas County does not currently own a trailer suitable for the transport of livestock and/or companion animal crates. Plumas County currently owns a horse trailer that can be used for the transport of horses and/or the emergency equipment required to care for them.

Many people will refuse to evacuate if they cannot move their companion animals and/or livestock during a disaster. Others will try to walk their animals out or just turn them loose, which creates a major hazard for evacuees and first responders alike. In this area we also have the problem of people either not having transportation for their animals or insufficient transportation for their animals. Large producers with 50 or more animals are covered under the Ag Pass Program in Plumas County.

Project Description: To purchase a multi-species appropriate bumper pull livestock trailer.

Other Alternatives: A second combination horse trailer.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Emergency Operations Plan, Local Hazard Mitigation Plan,

Responsible Office/Partners: Plumas-Sierra Department of Agriculture, UC Cooperative Extension, and Plumas County Animal Services

Benefits (Losses Avoided): Efficient evacuation of people and their companion animals, horses and livestock results in lives saved.

Potential Funding: FEMA grants, Red Rover grant, Humane Society of the United States, International Fund for Animal Welfare grant, local donations and sponsorships.

Timeline: As soon as funding is available as this is urgent. Desire within a year, but will pursue it during the 5 year lifecycle of this LHMP.

Project Priority (H, M, L): High

Action 32. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects

Hazards Addressed: Wildfire, Tree Mortality

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Plumas County land base is primarily under federal ownership, which means that in addition to significant forested area there is limited tax-based income. As a result, Plumas County benefits from grant funds for local initiatives. Grant opportunities come from local, state, federal, and private sources. A publicly available clearinghouse for grant information would benefit local entities seeking funding for wildfire mitigation activities.

Project Description: The Plumas County Fire Safe Council will continue to compile forest health, hazardous fuel reduction, defensible space/home hardening, outreach, and fire department related grant opportunities monthly. The Fire Safe Council will continue to distribute the information via email list and will add the information to plumasfiresafe.org as well as promote the fact that this information is available.

Other Alternatives: There are currently many venues for interested parties to access regional information about grant opportunities. Regular email updates are available from the Sierra Nevada Conservancy, Sierra Business Council, CAL FIRE, California Office of Planning and Research, California Fire Safe Council, and the NFPA, among many others. The alternative is for interested parties to sign up directly for these listservs and to independently evaluate each funding opportunity for relevance.

Existing Planning Mechanism(s) through which Action Will Be Implemented: N/A

Responsible Office/Partners: Plumas County Fire Safe Council in coordination with partners

Benefits (Losses Avoided): Plumas County entities will be more likely to take advantage of local, state, federal, and private opportunities for grant funding.

Potential Funding: Existing budgets (County General Fund)

Timeline: Annually over the life cycle of this LHMP.

Project Priority (H, M, L): High

Action 33. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Plumas County has a longstanding history over the last three decades of community awareness of the wildfire threat and working to increase fuel reduction efforts around communities. While fuel reduction efforts mitigate fuels accumulations and fire behavior in the wildland urban interface and intermix (WUI), residential homes and adjacent structures may still be vulnerable to fire ignition and loss. Home ignition in the WUI may still be possible to do ember ignition or ignition from lower severity ground fire if fire resistant design and materials are not in place. This gap in a community wildfire protection strategy may not effectively reduce the risk of home loss unless we address both sides of the equation: fuel reduction and home vulnerability.

Findings from case studies such as the 2010 Fourmile Canyon fire and the 2012 Waldo Creek Fire suggest that homes may burn and be loss even where fuel reduction has mitigated fire behavior near homes, and the primary factor in home loss is structure design, materials, and maintenance – particularly when firefighting resources are not available or insufficient to provide individual home level structure protection and triage.

Many of the homes in Plumas County are in the Wildland urban intermix which poses challenges for wildfire suppression in terms of community fire protection and structure triage. In addition, many of these homes and subdivisions were built prior 2008 when current fire standards were enacted. As a consequence, a large majority of homes in Plumas County may not meet current fire code and may be in need of structure retrofits to improve resistance to fire.

Common home vulnerabilities in Plumas County communities include wood siding, attached wooden decks/structures, non-tempered glass windows, eave and soffit design/screening, lack of sufficient water resources, and outbuilding siting/maintenance/design. As a result, the Plumas County communities may continue to be vulnerable to large scale home and economic loss despite widespread defensible space efforts.

Project Description: The overall goal of this project is to outreach, educate, provide technical assistance, and ultimately support financial assistance through grants to help Plumas County residents with home hardening retrofits. FEMA has funded a variety of hazard mitigation activities including structure vulnerability retrofits for different natural hazards including wildfire as evidenced by the Big Bear Lake Shake Shingle Roof Replacement in 2010.

The Plumas County Fire Safe Council is well known throughout the county for its public outreach, support of NFPA Firewise USA Sites, and direct fuel reduction assistance programs to landowners – many of which focus on defensible space. This proposal intends to build on existing organizational strengths to add additional capacity to develop technical assistance for home ignition zone assessments and developing home hardening/retrofitting programs as envisioned in State assembly bill AB38. This project would include collaboration between, Plumas County Fire Safe Council, local fire departments, the planning department, and support from UC Cooperative Extension.

This Project proposes two phases of implementation.

The first phase is providing outreach, education, and technical assistance for home ignition zone assessment of homes, commercial structures, and community infrastructure. This includes developing outreach materials about wildfire and the built environment, providing workshops and educational offerings to educate residents about home hardening and preparedness, and developing programs to provide site specific home consultations on the home ignition zone to help residents identify, assess, and prioritize home hardening retrofits to make their home more resistant to wildfire. This outreach effort would be well paired with defensible space programs already being delivered to Plumas county residents

The second phase is to provide home retrofitting assistance program to improve structural resistance to wildfire, or to improve community infrastructure for wildfire preparedness as described in Calif. Assembly Bill AB38. This would include developing and implementing cost-share, grant funded, or incentive based projects and programs to help residents with projects that improve home resistance to fire and enhance community wildfire preparedness and protection. Home retrofit projects may include replacement of out of code structure vents, installing fire resistant roofing, siding or windows, and/or installing snow protectors on propane regulators. Community wildfire preparedness and protection project may include installation of secondary water supplies, developing community water supplies, developing community safety zones or temporary areas of last resort refuge, or improving fire safety of power, communications, and road infrastructure. These implementation efforts would likely need to implemented in a phased manner.

Other Alternatives: Currently, there are no other alternative programs such that the de facto alternative is not providing residents home hardening support.

Existing Planning Mechanism(s) through which Action Will Be Implemented: State Assembly Bill AB38 provides state level direction and guidance to develop programs to mitigate fire hazard and support communities by delivering programs that improve wildfire preparedness. Home hardening & retrofitting is included in these activities.

Responsible Office/Partners: County Agencies (OES, Building & Planning Departments); Plumas County Fire Safe Council, UC Cooperative Extension, CAL FIRE, Office of State Fire Marshall

Benefits (Losses Avoided): Reduction of the loss of homes in a wildfire event would be the largest benefit (loss avoided).

Potential Funding: AB38 opens potential avenues for funding which still remain to be seen and may be uncertain during current state and federal economy challenges.

Ideally Phase 1 could include: $150- $200K to develop the staffing, materials and outreach programs for a two to three year period. This would fund staffing for a Home ignition zone assessment consultation, preferably a candidate with professional forestry or wildland fire fighting skillset who can also assess defensible space as well as the home ignition zone.

Phase 2: First phase of implementation could be $500K-$1million as an annual program. This is within the same context and scale as the Big Bear Lake Shake Roof replacement program which was limited in scope and scale to a smaller community. A county wide program offered for 5 years could reach into a $5 million or greater program.

Timeline: This project should be ongoing considering the need; however for purposes of LHMP planning, a 5 year timeline would be utilized. Considering this, a two to three year timeline would be necessary for phase 1 outreach and development. Implementation of the initial stages of phase 2 (Home retrofitting) could occur in a phased approach anywhere in years 2 to 5 of the five year planning horizon.

Project Priority (H, M, L): High

Action 34. Plumas County General Plan Public Health & Safety Element update to address state law requirements for land classified as State Responsibility Areas (SRAs) and within Very High Fire Hazard Severity Zones (VHFHSZs)

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: The Plumas County General Plan Public Health & Safety Element update is necessary to address newly adopted state law requirements for land classified as State Responsibility Areas (SRAs) and within Very High Fire Hazard Severity Zones (VHFHSZs).

Project Description: The Plumas County General Plan Public Health & Safety Element Update includes amending the goals and policies of the Element to fully respond to and address state law requirements for land classified as SRAs and within VHFHSZs to reduce the risk and potential of wildfire in the

unincorporated areas of the County and particularly in the WUI. For example, the Public Health & Safety Element is required by state law to include, and will be reviewed and updated, as necessary, to contain the following:

- Fire hazard severity zone maps
- Historical data on wildfires
- Information about wildfire hazard areas
- General location and distribution of existing and planned uses of land in VHFHSZs and SRAs
- Local, state, and federal agencies with responsibility for fire protection, including special districts and local OES

Though the update process, implementation measures may also be developed, including but not limited to, avoiding or minimizing the wildfire hazards associated with new uses of land; locating, when feasible, new essential public facilities outside of high fire risk areas; working cooperatively with public agencies with responsibility for fire protection; and designing adequate infrastructure if new development is located in the SRA or VHFHSZ, including access for emergency response vehicles, visible street signage, and water supplies for fire structural suppression.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County General Plan Public Health & Safety Element

Responsible Office/Partners: Plumas County Planning Department

Benefits (Losses Avoided): The County's 2035 General Plan recognizes that growth has occurred in high fire hazard areas and the combination of population growth and climate change in these fire-prone areas is putting more people and homes at a greater risk from catastrophic wildfire. Public Health & Safety Element policies in Plumas County mitigate some of the risks by directing new development to be located within existing fire districts or adjacent to areas where fire protection can efficiently be extended. There is a continuing need to develop policies that both address fire safe patterns for new development and address solutions for improving fire safety for existing communities and rural places.

Potential Funding: Federal and State Grants

Timeline: 1-3 years.

Project Priority (H, M, L): Medium

Chapter 6 Plan Adoption

44 CFR §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this 2026 Plumas County LHMP Update is to secure buy-in from each participating jurisdiction, raise awareness of the Plan, and formalize the Plan's approval and implementation. The adoption of this LHMP Update completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. For unincorporated Plumas County and the City of Portola, this adoption resolution also addresses AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan. Two resolutions were created – one for the County and City and one for the special districts.

The governing board for each jurisdiction has adopted this 2026 Plumas County LHMP Update by passing a resolution. A copy of the generic resolutions is included in Appendix D: Adoption Resolution.

Chapter 7 Plan Implementation and Maintenance

44 CFR §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of this 2026 Plumas County LHMP Update is critical to the success of hazard mitigation in the Plumas County Planning Area. Plan implementation and maintenance is Planning Step 10 of the 10-step planning process. Accordingly, this chapter provides an overview of the overall strategy for Plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the Plan. The chapter also discusses incorporating the Plan into existing planning mechanisms and how to address continued public involvement in local hazard mitigation planning.

Chapter 3, Planning Process, includes information on the implementation and maintenance process since the adoption of the Plumas County 2020 and City of Portola 2019 LHMPs. This chapter includes information on the implementation and maintenance process for this Plan, the 2026 Plumas County LHMP Update.

7.1 Implementation

Once adopted, this 2026 Plumas County LHMP Update faces the truest test of its worth: implementation. While the Plan contains many worthwhile actions, the County and all participating jurisdictions will need to decide which action(s) to undertake first. Two factors should be considered when making that decision: the priority assigned to the mitigation actions in the Plan and funding availability. Low or no-cost actions most easily demonstrate progress toward successful Plan implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms such as local general plans, stormwater and flood plans, Emergency Operations Plans (EOPs), evacuation plans, and other hazard and emergency management planning efforts by the participating jurisdictions. These jurisdictions already implement policies and programs to reduce loss to life and property from hazards. This 2026 LHMP Update builds upon the momentum developed through prior, related planning and mitigation programs and recommends implementing actions, where possible, through these other programs.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation can be accomplished by adhering to the schedules identified for each action through sustained collaborative efforts, highlighting the mutual benefits of proposed mitigation actions, and the Plumas County jurisdictions, its stakeholders, and the public. This is achieved through the routine actions of monitoring agendas, attending meetings, and promoting mitigation initiatives to enhance the safety and sustainability of the community. Additional mitigation strategies may include consistent and ongoing enforcement of existing policies and the vigilant review of programs for coordination and multi-objective opportunities to enhance mitigation.

Simultaneously, it is important to continuously monitor potential funding opportunities to finance mitigation actions. This may include identifying funding sources to meet local matching funds requirements under FEMA pre- and post-disaster mitigation grant programs, and other sources. When funding does become available, the participating jurisdictions will be better positioned to capitalize on the opportunity.

Responsibility for Implementation of Goals and Activities

The elected officials, executive leadership teams, responsible staff and departments, and emergency management offices of the participating jurisdictions are charged with implementation of various activities in the 2026 LHMP Update. During annual reviews as described later in this section, each participating jurisdiction should conduct an assessment of progress toward meeting the goals and activities of the LHMP Update. At that time, recommendations may be made to modify timeframes for the completion of identified mitigation actions, identify funding sources, and work with responsible entities to implement the actions. On an annual basis, the priority of various mitigation actions may be adjusted. Some activities that are found not to be feasible may be removed from the Plan entirely, while other mitigation actions unforeseen during the Plan development process may be added.

7.1.1. Role of the LHMP Update Planning Committee in Implementation and Maintenance

With adoption of this Plan, each participating jurisdiction will be responsible for LHMP implementation and maintenance. The HMPC identified in Chapter 3 (or a similar committee) will reconvene annually to ensure mitigation strategies are being implemented, and the County and City continue to maintain compliance with the NFIP. The Plumas County, Office of Emergency Services (County OES), will continue in its role as project lead for LHMP implementation and maintenance. As such, County OES, as LHMP project lead, and all participating jurisdictions will continue their relationship, and will plan to convene the same or similar HMPC when preparing the subsequent LHMP Update. The County OES project lead, with support from participating jurisdictions and the LHMP Update HMPC will:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the Plan's recommended actions for which no current funding exists;
- Monitor and assist in the implementation and update of this Plan;
- Report on Plan progress and recommended changes to the governing boards for all participating jurisdictions; and
- Inform and solicit input from the public.

The primary duty of the County and all participating jurisdictions and the HMPC is to see the LHMP Update successfully carried out and to report to their governing boards and the public on the status of LHMP implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation

proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information about the LHMP on the websites of participating jurisdictions.

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate LHMP implementation and to update the Plan as progress, roadblocks, or changing circumstances are encountered.

7.2.1. Maintenance Schedule

Plumas County OES, as project lead, in conjunction with the LHMP leads for all participating jurisdictions, is responsible for initiating Plan reviews. In order to monitor progress and update the mitigation strategies identified in the mitigation action plan, County OES, LHMP leads from other participating jurisdictions, and the HMPC will revisit this Plan annually each year and following a hazard event to review and document progress on Plan implementation. Plumas County OES will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this 2026 LHMP Update anticipated to be fully approved and adopted in early 2026, the next required written update of the Plan must be completed by early 2031. Plumas County OES will initiate the Plan Update – which may include applying for grant funding to hire professional services to assist in preparing the 2031 LHMP Update. The 2031 LHMP Update development process should be initiated in 2028 to ensure the 2031 LHMP Update can be funded and completed by this 2026 Plumas County LHMP's expiration date.

7.2.2. Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the Plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions;
- Increased vulnerability as a result of new development (and/or annexation); and/or
- Increased vulnerability resulting from unforeseen or new circumstances.

Updates to this Plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Changes will be made to this Plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or

funding resources. All mitigation actions will be reviewed during the monitoring and update of this Plan to determine feasibility of future implementation. Updating of this LHMP will be by written changes and submissions, as the participating jurisdictions and HMPC deem appropriate and necessary, and as approved by the governing boards of each participating jurisdiction. In keeping with the five-year update process, the HMPC will convene public meetings to solicit public input on this LHMP Update and its routine maintenance, and the final product will be again adopted by the governing boards of each participating jurisdiction.

Annual Plan Review Process

For the LHMP Update review process, the County OES lead and the LHMP leads for each of the participating jurisdictions, will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the LHMP. ***The LHMP is intended to be a living document.*** The review of the 2026 LHMP Update will normally occur on an annual basis each year and will be conducted by the HMPC as follows:

- County OES will place an advertisement in the local newspaper and will utilize other public outreach mechanisms, such as e-newsletters, social media blasts, and others, advising the public of the date, time, and place for each annual review of the LHMP Update and will be responsible for leading the meeting to review the Plan.
- Notices will be mailed to the members of the HMPC: federal, state, and local agencies; non-profit groups; local planning agencies; representatives of business interests; neighboring communities; and others advising them of the date, time, and place for the review.
- County/City/District/Tribal officials will be noticed by email and telephone or personal visit and urged to participate.
- Members of any participating jurisdiction's planning commissions and other appointed commissions and groups will also be noticed by email and either by telephone or personal visit.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted, and a copy of the current LHMP will be available for public comment at Plumas County OES as project lead.
- After the review meeting, minutes of the meeting and an annual report will be prepared by the participating jurisdictions and the HMPC and will be placed on the County LHMP webpage.
- A copy of the 2026 LHMP Update will be continually posted on the LHMP website for the County and participating jurisdictions.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the 2026 LHMP Update. More specifically, the reviews should include the following information:

- Community growth or change in the past year.
- The number of substantially damaged or substantially improved structures by flood zone, wildfire zone, or other hazard zones.

- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center(s) (EOC) and whether or not the event resulted in a federal disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events and descriptions.
- Documented damages due to the events.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the next LHMP Update.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the 2026 LHMP Update recommendations and their underlying principles into other jurisdictional plans and mechanisms. Where possible, Plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this Plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this LHMP's capability assessment, the participating jurisdiction's already implement policies and programs to reduce losses to life and property from hazards. This Plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- General and master plans
- Emergency Operations Plans and other emergency management efforts
- Jurisdictional ordinances
- Flood/stormwater management/master plans
- Climate Plans
- Capital Improvement Plans and budgets
- Other plans and policies outlined in the capability assessment
- Other plans, regulations, and practices with a mitigation focus

Participating jurisdictions and HMPC members involved in these other planning and program mechanisms will be responsible for integrating the findings and recommendations of this LHMP with these other plans,

programs, etc., as appropriate. As described in Section 7.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the 2026 LHMP Update into existing planning mechanisms include:

1. As recommended by Assembly Bill 2140, the County and City should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plans. Evidence of such adoption (by formal, certified resolution and text within the body of the Safety Element) shall be provided to CAL OES and FEMA.
2. Integration of flood actions identified in this mitigation strategy with implementation priorities in existing flood and stormwater plans. Key people responsible for development and implementation of these plans participated on the HMPC.
3. Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing and new Community Wildfire Protection Plans and other fire plans. Key projects were identified and integrated specifically into this LHMP, while others currently of lessor priority should be referenced in their source document. Actual implementation of these projects will likely occur through the CWPP's and other Fire Plans' processes through the efforts of each responsible jurisdiction and department.
4. Integration of many of the infrastructure, roads, facility, and infrastructure improvement projects with the jurisdictional Capital Improvement Programs.
5. Use of risk assessment information to inform future updates of the hazard analysis in the Emergency Operations Plans and related emergency management efforts for all participating jurisdictions.

Each jurisdiction will consider incorporation of the LHMP into planning mechanisms listed on Table 7-1.

Table 7-1 LHMP Incorporation into other Planning Mechanisms

Jurisdiction	Safety Element/ Master Plans/ Strategic Plans	EOP / Emergency Plans/ Emergency Action Plans	CWPP / Fire Plans	CIP	Flood / Stormwater/ Watershed Plans	Drought & Water Resource Plans	Other Plans Related to Hazard Mitigation - Drought/ Water Management/ Climate Plans/ Other
Plumas County	X	X	X	X	X	X	X
City of Portola	X	X		X	X	X	X
Chester PUD	X			X		X	X

Jurisdiction	Safety Element/ Master Plans/ Strategic Plans	EOP / Emergency Plans/ Emergency Action Plans	CWPP / Fire Plans	CIP	Flood / Stormwater/ Watershed Plans	Drought & Water Resource Plans	Other Plans Related to Hazard Mitigation - Drought/ Water Management/ Climate Plans/ Other
Feather River RCD	X		X	X			X
Gold Mountain CSD	X			X		X	X
Indian Valley CSD	X	X		X		X	X
Plumas Corp/Plumas Fire Safe Council	X		X	X	X		X
Plumas Eureka CSD	X			X		X	X
South Feather Water & Power	X	X		X			X

In addition, the mitigation actions included within each jurisdictions' mitigation strategy contain a category identifying "Existing Planning Mechanism(s) through which Action will be Implemented" that contains how each mitigation action is related to other planning mechanisms and jurisdictional programs. Those can be found in Chapter 5 of the Base Plan for the County and within each jurisdictions' annex to this Base Plan.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this LHMP.

7.2.4. Continued Public Involvement

Continued public involvement is a crucial element of successful Plan implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the 2026 LHMP implementation and seek additional public comment. The Plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Annual Reviews

The public will be noticed by placing an advertisement in the newspaper and will utilize other public outreach mechanisms, such as e-newsletters, social media blasts, and others specifying the date and time for the review and inviting public participation. The HMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the participating jurisdictions and HMPC reconvenes for the next LHMP Update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the Plan. In reconvening, the HMPC will identify a public outreach subcommittee, which will be responsible for coordinating the activities necessary to involve the greater public. The subcommittee will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the LHMP update process. As part of this effort, public meetings will be held, and public comments will be solicited on the LHMP Update draft. In addition, continued public involvement and outreach efforts will place an emphasis on identifying and inviting representatives from underserved and vulnerable populations to be part of the next, 2031 Plumas County LHMP Update. As a starting point the underserved and vulnerable population groups identified for this 2026 LHMP Update will be contacted to invite them to the 2031 LHMP Update process with additional groups identified and added to meet the ongoing goal of mitigation planning for the whole community.

Prelude to Jurisdictional Annexes

For this 2026 Plumas County LHMP Update, the **Jurisdictional Annexes**, working in conjunction with the Base Plan, detail the hazard mitigation planning elements specific to participating jurisdictions, beyond the unincorporated County which is covered in the Base Plan. Each Annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan, as the umbrella document for this planning effort. As such, all Chapters 1-7 of the Base Plan and associated appendices, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction.

These Jurisdictional Annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy beyond that provided in the Base Plan.

Annex A City of Portola

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Portola, who completed a stand alone LHMP in 2019 before joining this County in this 2026 LHMP Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Portola, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

A.2 Planning Process

As described above, the City of Portola followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table A-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table A-1 City of Portola – Planning Team

Name	Position/Title	How Participated
Ryan Bonk	City Manager	Attended meetings, coordinated efforts and reviews with internal staff, provided feedback
Todd Roberts	Director of Public Works	Provided internal review throughout the process and feedback on mitigation plan overall
Karen Downs	Contracts Planner	Provided internal review throughout the process and feedback on mitigation plan overall.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2019 LHMP into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2019 LHMP through other plans and programs shown in Table A-2.

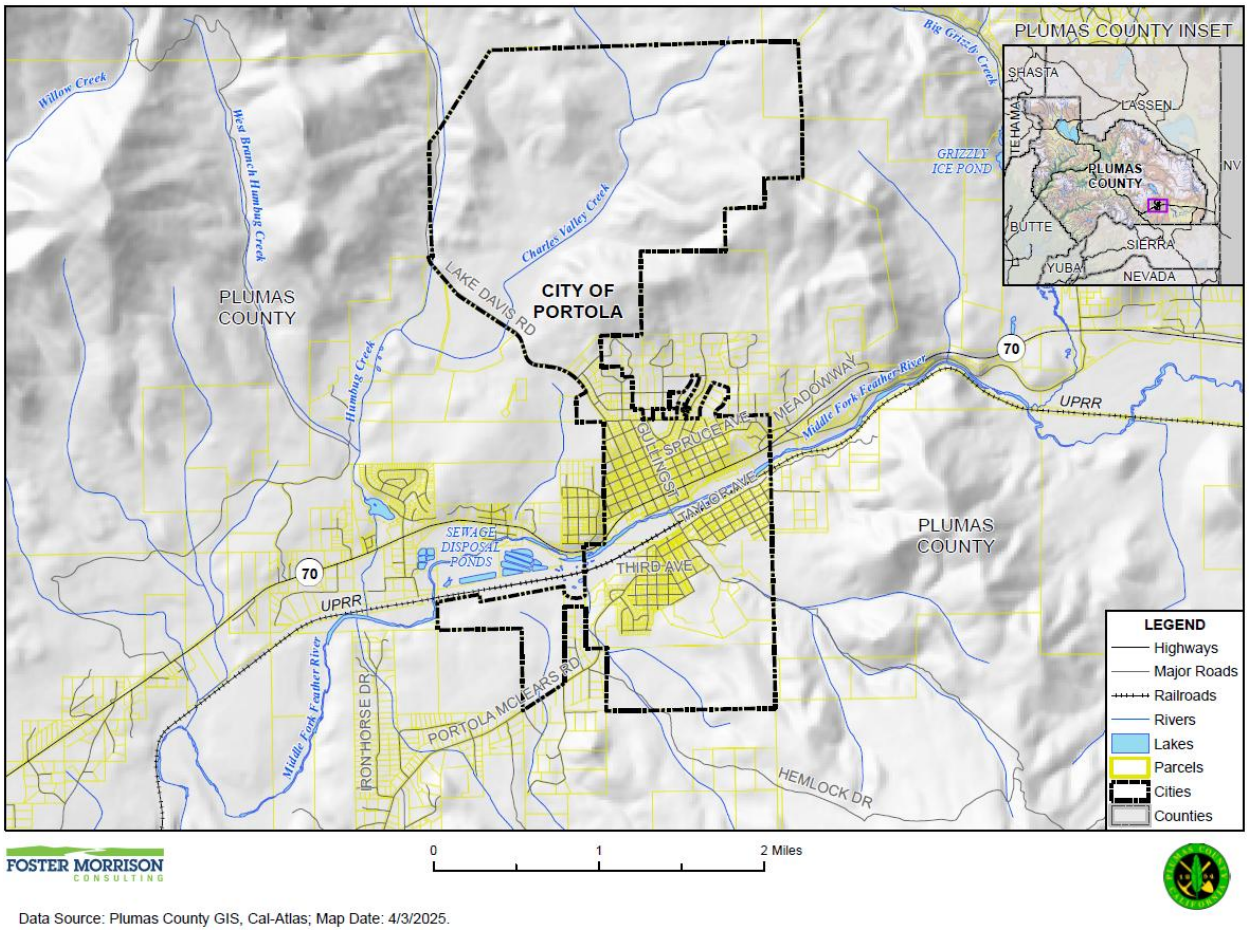
Table A-2 2019 LHMP Incorporation

Planning Mechanism 2019 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
State Hazard Mitigation Plan	The State Hazard Mitigation Plan was reviewed for recent updates on Statewide hazard events and hazard information for consistency.
General Plan Safety Element	(including incorporated documents)- Information from the recently-updated document was cross-referenced for inclusion as part of the overall profile. Additionally, any vulnerabilities identified were included as part of the vulnerability and risk assessment for wildfire, landslide, and flood.
Portola General Plan	Reviewed and included as part of the vulnerability assessment.
Plumas County Emergency Operations Plan	The EOP was reviewed to gather hazard information as it related to the assessed natural hazards.
Portola Emergency Operations Plan	Plan on file at City Hall. In addition, Plumas County has an Emergency Operations Plan that we also have at City Hall.

A.3 Community Profile

The community profile for the City of Portola is detailed in the following sections. Figure A-1 displays a City map and the location of City of Portola within Plumas County.

Figure A-1 City of Portola



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/3/2025.

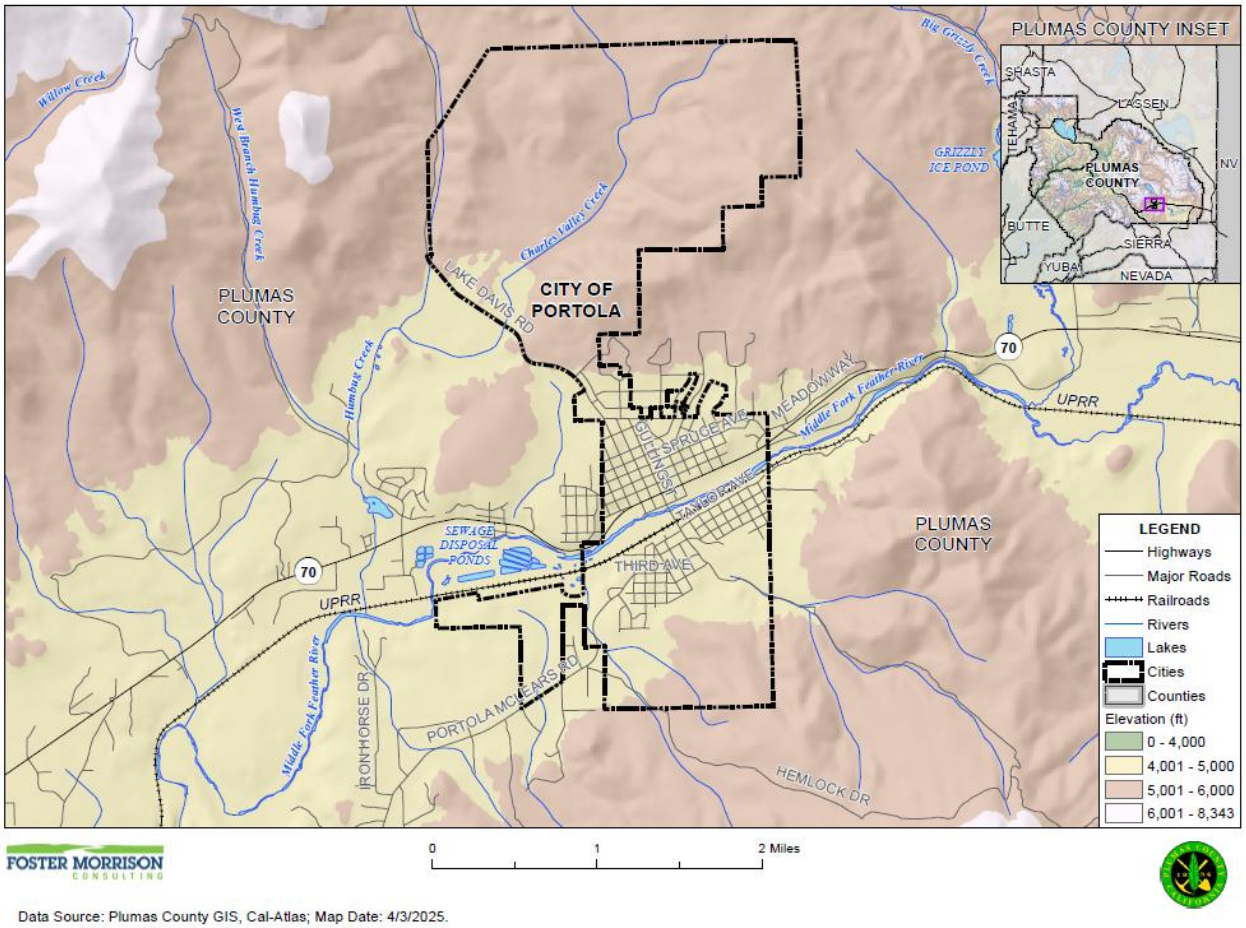
A.3.1. Geography and Climate

The City of Portola is located along the Middle Fork of the Feather River in the southeast portion of Plumas County, California. Nearby towns include Beckwourth to the east and Grazeable to the west. Reno, Nevada is approximately 50 miles to the southeast and Sacramento, California is approximately 150 miles to the southwest. The City of Portola is the only incorporated city in Plumas County.

Being on the eastern slopes of the Sierra Nevada, Portola has a continental Mediterranean climate with dry summers characterized by extreme diurnal temperature swings, and cold (though not severe) and snowy winters. Frosts occur on 218 mornings per year. Extreme cold is rare and temperatures below 0°F are observed on only 2.6 mornings per winter in an average year. During the summer, daytime temperatures of 100 °F are reached on average only once every two years.

Elevations in the City are shown on Figure A-2.

Figure A-2 City of Portola – Elevations



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/3/2025.

A.3.2. History

Portola, the only incorporated city in Plumas County, California, was established in the early 20th century as a key railroad hub along the Middle Fork of the Feather River in the Sierra Nevada. Named after Spanish explorer Gaspar de Portolá—despite him never exploring the area—Portola's origins are tied to the Western Pacific Railroad, now part of the Union Pacific, which shaped its identity as a "railroad town." The surrounding Sierra Valley, the largest valley in North America above 5,000 feet, was home to Maidu and Washoe Native American tribes before European settlement, with evidence of their presence in seed grinding holes and artifacts along the Feather River. In the 1850s, James P. Beckwourth, a mountain man of mixed African American and Native American descent, established a trading post in nearby Sierra Valley, facilitating travel during the California Gold Rush. Logging also played a significant role in Portola's founding, with companies like the Roberts Lumber Company and Reno Mill and Lumber harvesting pine and fir from the region's forests starting in 1905.

The city's development was driven by its strategic location along the Feather River drainage, fostering a small-town, bucolic character that persists today. Portola's economy and culture remained closely tied to the railroad, with the Western Pacific Railroad Museum becoming a major attraction, offering a "Run A Locomotive" program that draws visitors. The annual Railroad Days event celebrates this heritage with live

music, a farmer's market, and a 5K run. Despite its small population—2,100 as of the 2020 census—Portola has maintained its historical charm, with original buildings and sidewalks still present in the downtown area. However, economic and geographic constraints, along with the declining prominence of the railroad industry, have limited its growth compared to other California cities. Local newspapers and longtime residents preserve the town's history, which is further documented by the Portola Area Historical Society.

Portola's natural surroundings, including Lake Davis and the nearby Plumas-Eureka State Park, have made it a haven for outdoor enthusiasts, offering fishing, camping, and hiking opportunities. The city gained national attention in 1996–1997 and again in 2007 due to conflicts with the California Department of Fish and Game over the eradication of invasive northern pike in Lake Davis, highlighting tensions between environmental management and community interests. With a continental Mediterranean climate featuring dry summers and snowy winters, Portola's location on the eastern slopes of the Sierra Nevada adds to its appeal as a scenic, tranquil destination.

A.3.3. Economy and Tax Base

The economy of the City of Portola is historically based on logging; both as a logging camp and mill site. As the logging industry grew, railroads sprang up to help more efficiently transport the lumber in and out of the area. When the Western Pacific Railway through the Feather River Canyon was completed in 1910, the City of Portola provided the ideal location for a depot which has sustained the City to present day. Currently the City of Portola remains a railroad hub which helps support year round outdoor recreation, tourism, and a Railroad museum.

US Census estimates show economic characteristics for the City of Portola. These are shown in Table A-3 and Table A-4. Mean household income in the City was $47,497. Median household income in the City was $42,385.

Table A-3 City of Portola – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	27	3.4%
Construction	94	11.8%
Manufacturing	25	3.1%
Wholesale trade	0	0.0%
Retail trade	88	11.1%
Transportation and warehousing, and utilities	53	6.7%
Information	0	0.0%
Finance and insurance, and real estate and rental and leasing	45	5.7%
Professional, scientific, and management, and administrative and waste management services	19	2.4%
Educational services, and health care and social assistance	274	34.4%
Arts, entertainment, and recreation, and accommodation and food services	119	14.9%
Other services, except public administration	7	0.9%

Industry	Estimated Employment	Percent
Public administration	45	5.7%

Source: US Census Bureau American Community Survey 2023 Estimates

Table A-4 City of Portola – Income and Benefits

Income Bracket	Percent
<$10,000	7.5%
$10,000 – $14,999	7.9%
$15,000 - $24,9999	23.3%
$25,000 – $34,999	3.2%
$35,000 – $49,999	21.1%
$50,000 – $74,999	18.2%
$75,000 – $99,999	9.8%
$100,000 – $149,999	7.8%
$150,000 – $199,999	0.9%
$200,000 or more	0.2%

Source: US Census Bureau American Community Survey 2023 Estimates

As the service center for eastern Plumas County, future economic development depends on maintaining and expanding that role. Historically, the economy was based on natural resource extraction, but availability, environmental pressures, commodity value, and export difficulties have made these historic industries less viable. Current economic development has increased as workers seeking an active outdoor lifestyle relocate and are able to use technology to operate successful businesses free of traditional commuting and manufacturing restrictions. Additional resources are facilitating expanding tourism and visitor opportunities to help further develop this sector of the economy.

Major employers in the City include: C Roy Carmichael Elementary School and Walton's Grizzly Lodge.

A.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The City of Portola risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the City's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the City. This includes the following sections:

- A.4.1 Assets Inventory and Growth and Development Trends
- A.4.2 Hazard Identification
- A.4.3 Hazard Profiles and Vulnerability to Specific Hazards

A.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the City of Portola's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the City of Portola's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the City, potentially at risk to identified hazards as discussed in Section A.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the City, both current and future, is presented.

Assets Inventory

The City's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section A.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the City and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the City and potentially at risk to hazards. Information from the City, US Census Bureau, California Department of Finance, and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. The City of Portola has 2,098 residents, as of January 1, 2025. The City of Portola has seen growth rates as shown in Table A-5. As shown, the City has grown and shrunk periodically since 1950.

Table A-5 City of Portola– Population Changes Since 1950

Year	Population	% Change
1950	2,261	–
1960	1,874	-17.1%
1970	1,625	-13.3%
1980	1,885	16.0%
1990	2,193	16.3%
2000	2,227	1.6%
2010	2,104	-5.5%
2020	2,100	-0.2%
2025	2,098	-0.1%

Source: US Census Bureau, California Department of Finance (2025)

Underserved and Vulnerable Populations and Disadvantaged Communities

The City has a socially and economically diverse community, and many residents that are socially or economically disadvantaged or vulnerable due to varying reasons reside within the City. The City and surrounding County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Thus, it is important to consider the potential effects of hazard events and disasters on these more vulnerable populations. Socially vulnerable and disadvantaged communities in the City are discussed by the following sources:

- CDC Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- City Planning Team Input

CDC Social Vulnerability Index

Every community must prepare for and respond to a hazard event, including the range of natural hazards addressed in this Plan, from severe weather extremes to large potentially catastrophic events such as wildfires or earthquakes. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

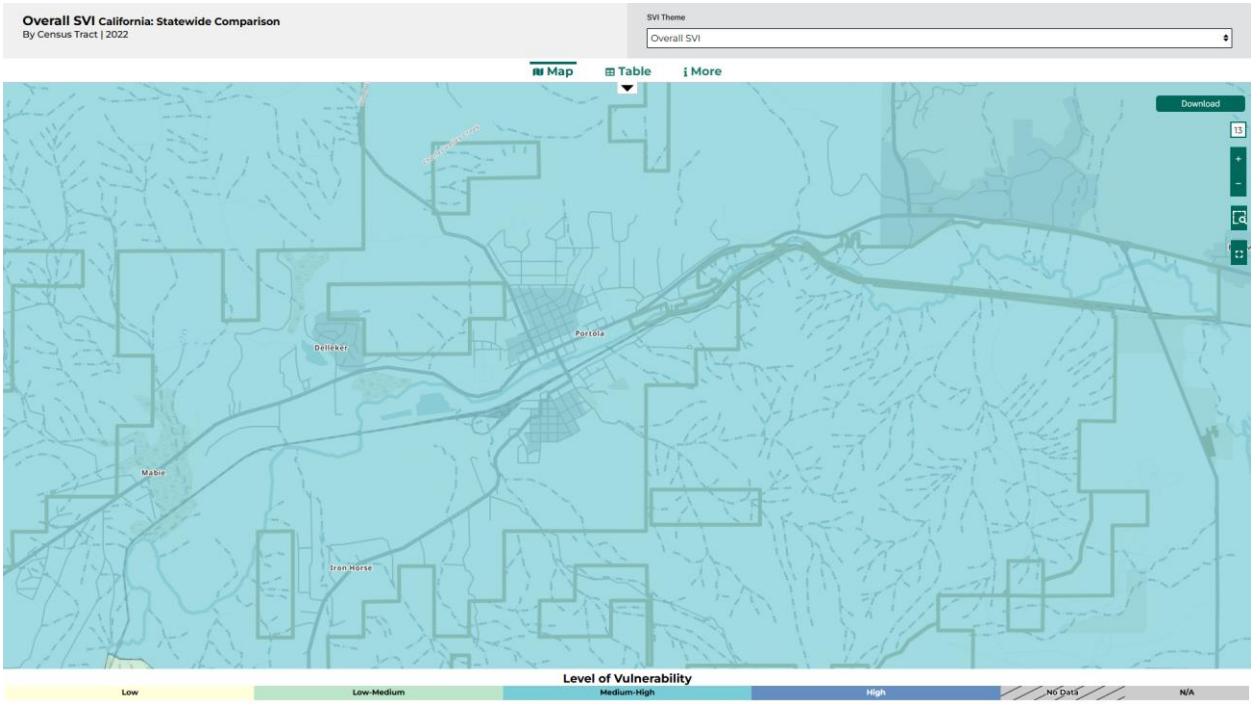
Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. The CDC used these databases to create the CDC Social Vulnerability Index (CDC SVI), which uses 15 U.S. census

variables to help local officials identify communities that may need additional support before, during, or after disasters.

CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes for the City are shown in the figures below.

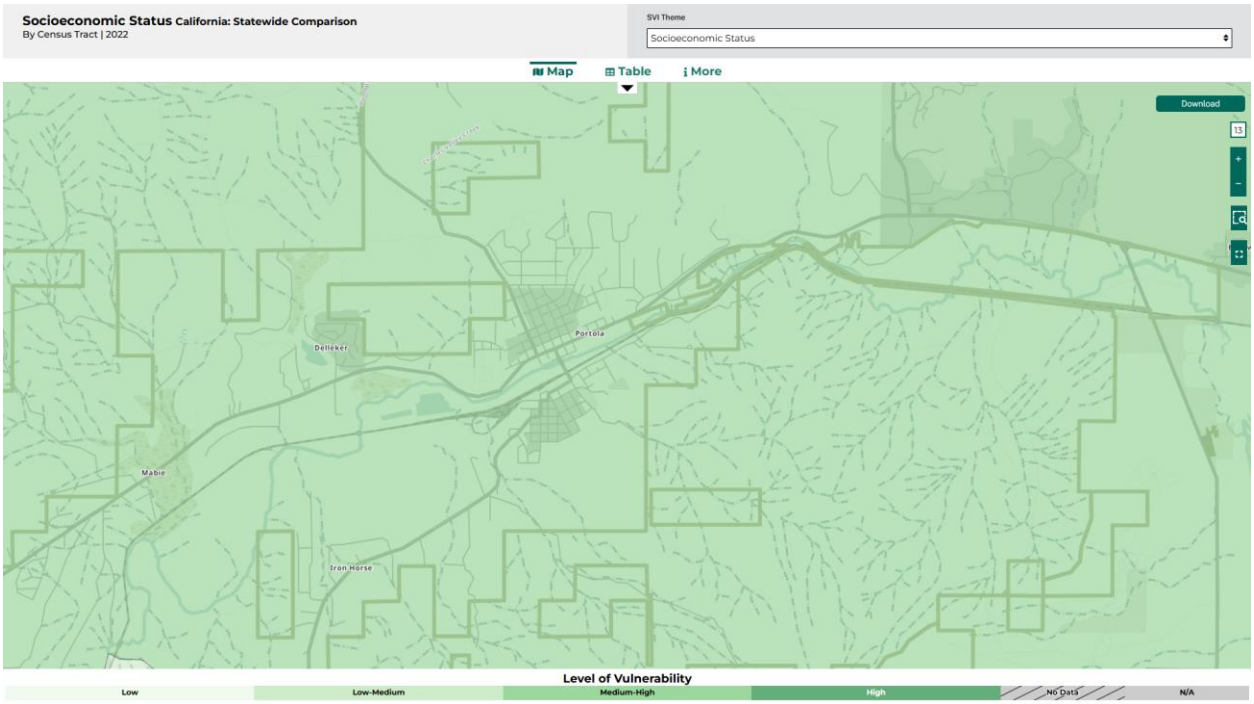
The overall SVI map is shown in Figure A-3; the socioeconomic SVI for the census tracts in and around the City are shown in Figure A-4; the household composition SVI is shown in Figure A-5; the minority and language SVI is shown in Figure A-6; and the housing and transportation SVI is shown in Figure A-7. Overall, the maps indicate that, in general, the City sees little change in social vulnerability regardless of location. As shown, there is very minimal change in each SVI across the City.

Figure A-3 City of Portola – Overall Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

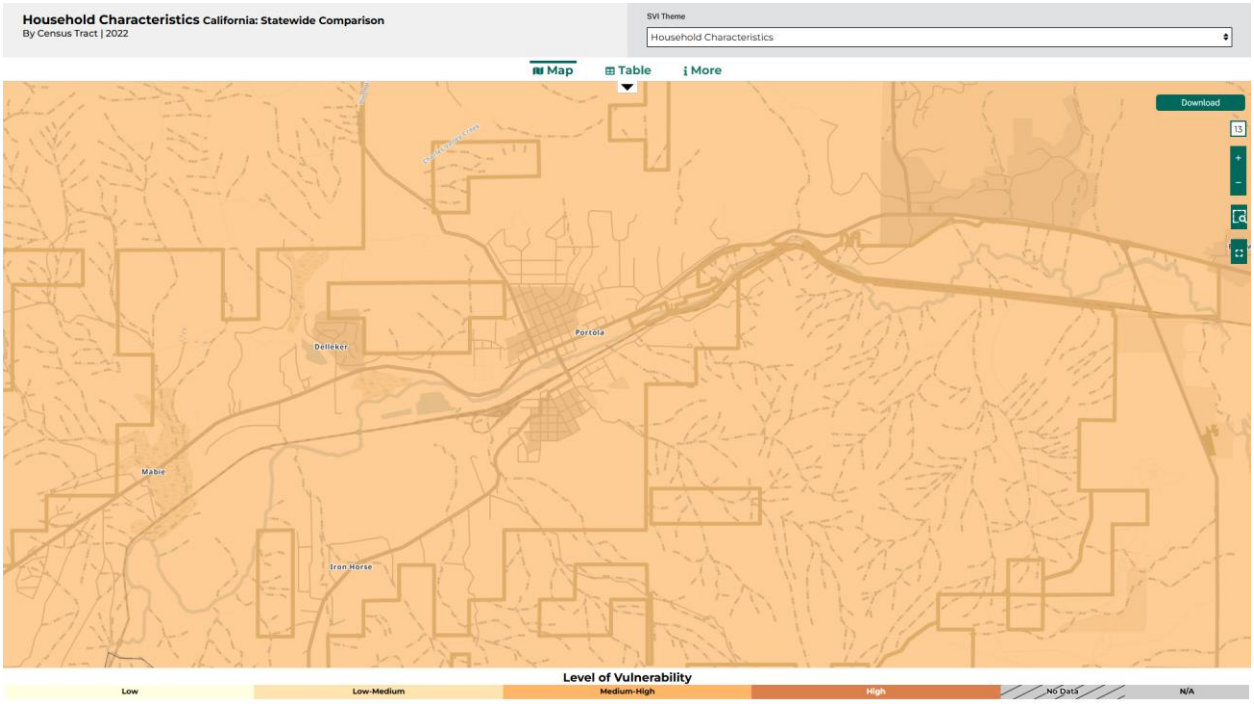
Figure A-4 City of Portola – Socioeconomic Status Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024

Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

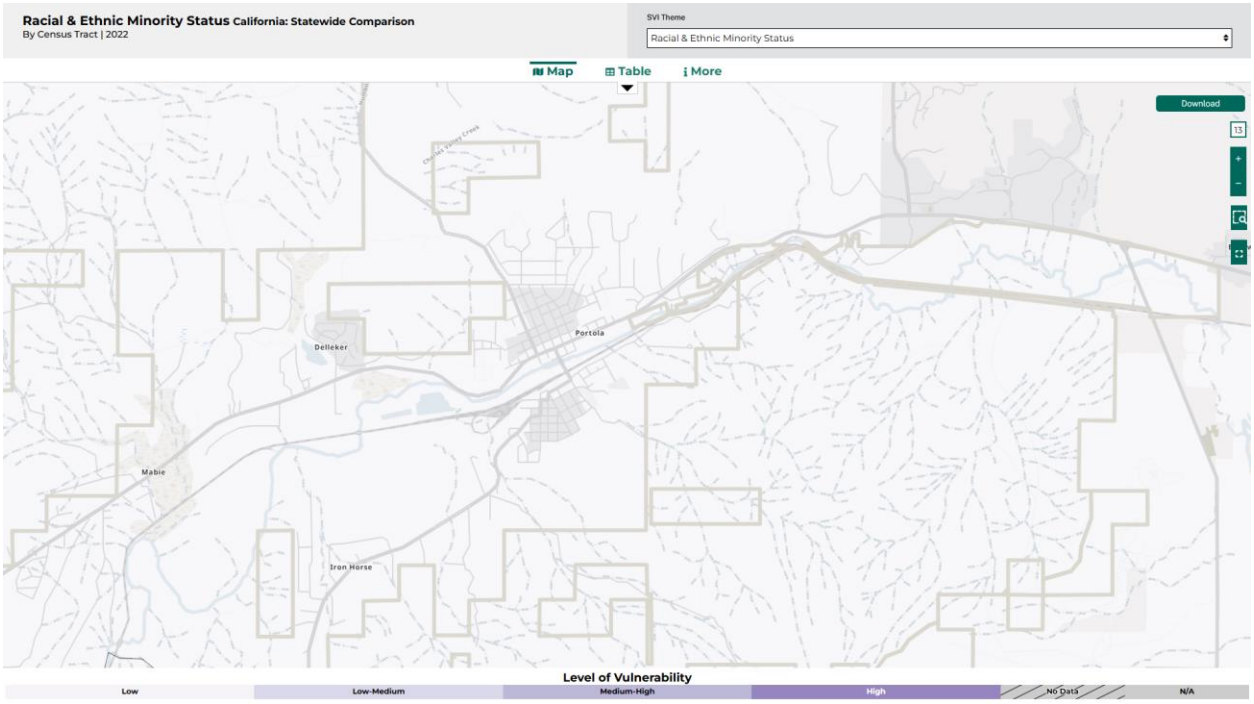
Figure A-5 City of Portola – Household Characteristics



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024

Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

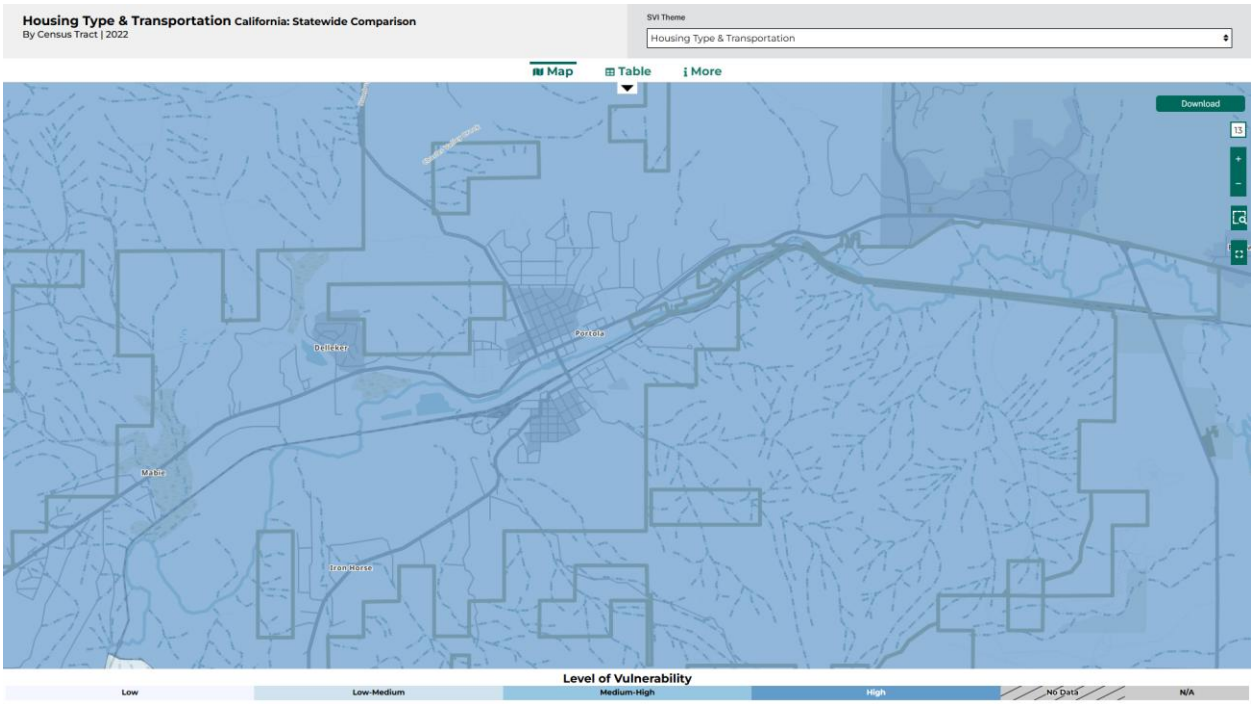
Figure A-6 City of Portola – Racial and Ethnic Minority Status



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024

Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure A-7 City of Portola – Housing Type and Transportation

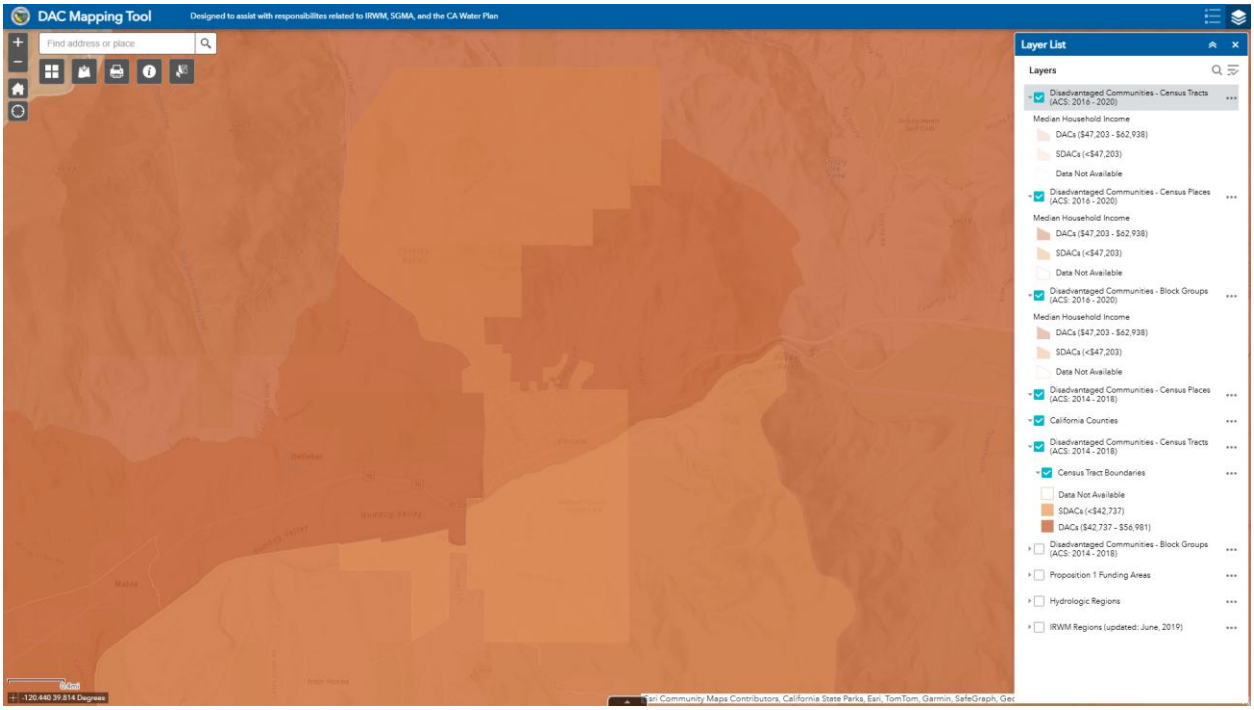


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the City considered disadvantaged are shown in Figure A-8. As shown, much of the City falls in these DAC areas.

Figure A-8 City of Portola – Disadvantaged Areas

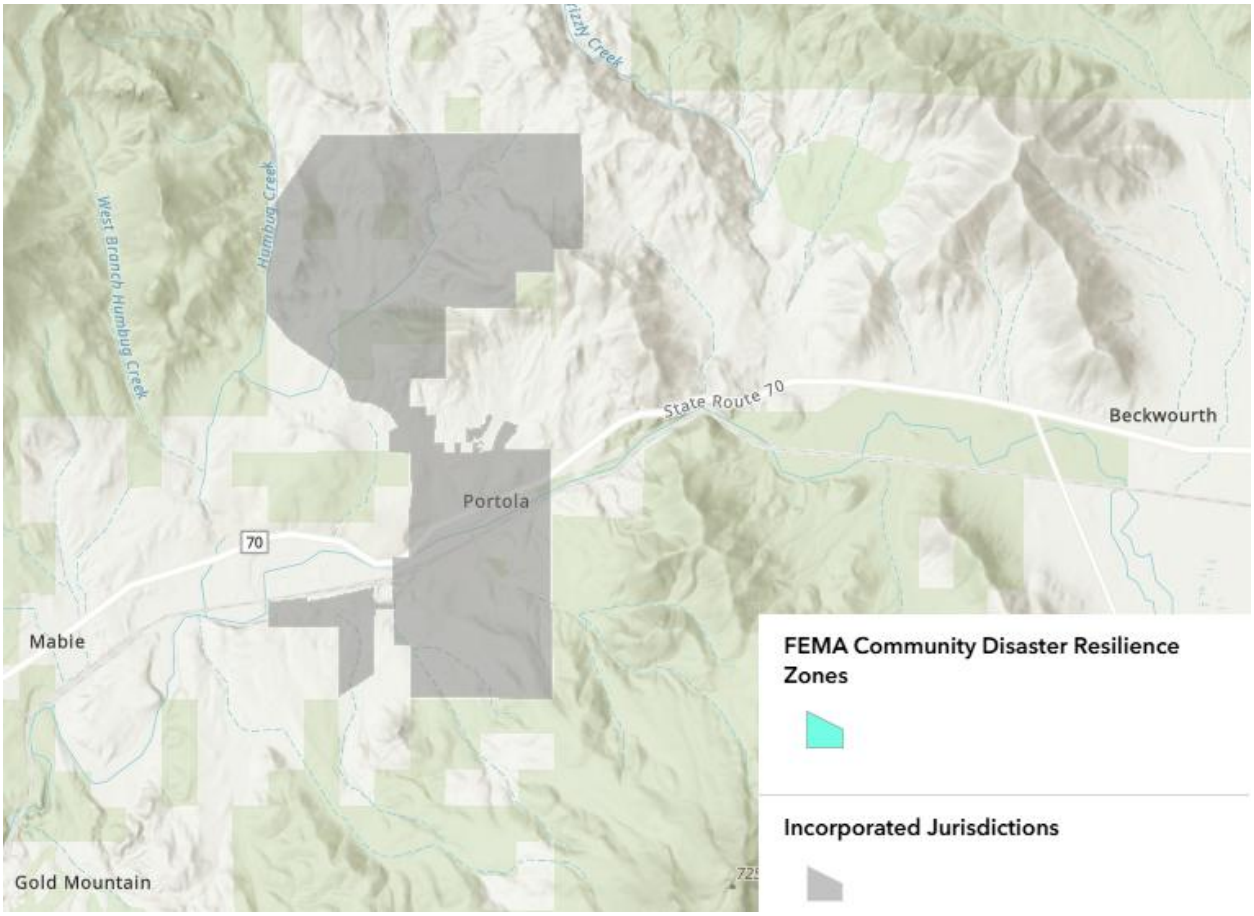


Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024

FEMA Community Disaster Resilience Zones

Community Disaster Resilience Zones aim to build and strengthen community resilience across the nation by driving federal, public, and private resources to the most at-risk and in-need communities. The Community Disaster Resilience Zones Act uses FEMA's National Risk Index to identify the most at-risk and in-need communities to identify resilience zones. Designated zones will be prioritized for targeted federal support, such as increased cost-share for resilience and mitigation projects, lessening the financial burden on communities to perform resilience-related activities. On September 6, 2023, FEMA announced the initial 483 designations in all 50 states and the District of Columbia. Figure A-9 shows these zones in teal green. As shown, none of these areas lie in or near the City.

Figure A-9 City of Portola – FEMA Community Disaster Resilience Zones



Source: FEMA. Map retrieved 12/16/2024

City Planning Team Input

Since 2017, the Tax Credit Allocation Committee (TCAC) and California Department of Housing and Community Development (HCD) have developed annual maps of access to resources such as high-paying job opportunities; proficient schools; safe and clean neighborhoods; and other healthy economic, social, and environmental indicators to provide evidence-based research for policy recommendations. This effort has been dubbed "opportunity mapping" and is available to all jurisdictions to assess access to opportunities within their community.

Portola is considered a low-resource community. The area along State Route 70 is also considered a low-resource area. All of Portola is within a low-resource area, based on a composite score of economic, educational, and environmental factors that can perpetuate poverty and segregation, such as school proficiency, median income, and median housing prices. "Low-resource" areas score in the bottom 30.0 percent of census tracts and indicate a lack of access to positive outcomes and opportunities.

Special needs populations have increased vulnerability and may face unique challenges during disasters, including mobility issues, communication difficulties, and reliance on specialized equipment or services.

such as providing accessible evacuation routes, alternative communication methods, and specialized support services. Portola has focused on:

- Building Codes: Enforcing building codes that ensure accessibility for people with disabilities.
- Shelter Planning: Ensuring that shelters are accessible and equipped to meet the needs of special populations.
- Community Outreach: Conducting outreach and education programs to inform special populations about hazards and mitigation measures.

The City noted the following tables that discuss special populations in the City.

Table A-6 City of Portola – Persons with Disability by Employment Status

	Plumas	Portola	Unincorporated Area
Age 5-64, Employed Persons with a Disability	340	47	293
Age 5-64, Not Employed Persons with a Disability	99	16	83
Persons Age 65 Plus with a Disability	950	190	760
Total Persons with a Disability	1,389	253	1,136

Source: https://data.census.gov/table/ACSDT5Y2021.C18120?q=C18120:%20EMPLOYMENT%20STATUS%20BY%20DISABILITY%20STATUS&g=160XX00US0658352

Table A-7 City of Portola – Persons with Disability by Disability Type

	Plumas County	Portola City	Unincorporated Area
Total Disabilities Tallied	3,218	408	2,810
Total Disabilities, Ages 5-64	1,389	253	1,136
Hearing Difficulty	211	20	191
Vision Difficulty	129	77	52
Cognitive Difficulty	648	149	499
Ambulatory Difficulty	611	81	530
Self-Care Difficulty	248	9	239
Independent Living Difficulty	442	102	340
Total Disabilities, Ages 65 & Over	1,700	129	1,571
Hearing Difficulty	619	42	577
Vision Difficulty	211	28	183
Cognitive Difficulty	396	64	332
Ambulatory Difficulty	1,150	79	1,071
Self-Care Difficulty	404	51	353

Source: ACS S1810 (2012-2016)

Table A-8 City of Portola – Homeless Needs

Facility Type	Homeless Needs		
	Households with children	Households without children	Current Bed #
Emergency Shelter	68	237	305
Transitional Housing	32	161	193

Source: https://files.hudexchange.info/reports/published/CoC_PopSub_CoC_CA-516-2022_CA_2022.pdf

*Note: Numbers are provided for the Redding/Shasta, Siskiyou, Lassen, Plumas, Del Norte, Modoc, Sierra Counties Continuum of Care for which Plumas County is a participating member. Numbers represent homeless needs for the total Continuum of Care area. Please supplement with local data sources for each jurisdiction in county.

Table A-9 City of Portola – Homeless Needs

Homeless Needs*	2011	2022	% Change
Total Homeless	403	1432	255.3%
Total Sheltered	255	498	95.3%
Total Unsheltered	148	934	531.1%
Total Chronically Homeless	62	317	411.3%
Total Chronically Sheltered	26	79	204.0%
Total Chronically Unsheltered	36	495	1,275.0%

Source: https://files.hudexchange.info/reports/published/CoC_PopSub_CoC_CA-516-2022_CA_2022.pdf

*Note: Numbers are provided for the Redding/Shasta, Siskiyou, Lassen, Plumas, Del Norte, Modoc, Sierra Counties Continuum of Care for which Plumas County is a participating member. Numbers represent homeless needs for the total Continuum of Care area. Please supplement with local data sources for each jurisdiction in county.

City of Portola 2019-2024 Housing Element

The City Planning Team noted that the City of Portola 2019-2024 Housing Element discusses special populations in the County. While the County Housing Element is discussed in the base plan and is very similar to Portola, the City has completed their own Housing Element with unique differences. Discussions for seniors, those with disabilities, developmental disabilities, people experiencing homelessness, large households, female headed households, and farmworkers were included. These are discussed below.

Seniors

According to the American Community Survey, of the City senior population (categorized as 65+ years), 165 individuals are owners of their homes while 82 individuals rent their residence.

Disabled Citizens

In the City of Portola, 238 persons, 11.01% of the total population (5 years and older) reports having a disability according to the American Community Survey (2012-2016). Of those with a disability between the ages of 6 and 65, 100% are employed. Seniors aged 65 and over comprise 76.89% of the people with disabilities.

Homeless Persons

Staff of the City and the Plumas County Sheriff Department's estimate the number of chronically homeless persons living in Portola to be two males. The number of homeless persons varies primarily due to weather.

Large Households

In the City of Portola, 4.7% of the owner households and 2.6% of the renter households are considered to be large households. In some circumstances, where the housing market does not meet large household housing needs, overcrowding can be a result of the lack of adequate housing. Overcrowding is not a significant problem in the City of Portola. A total of 2.38% of households in Portola are experiencing overcrowding; .84% of owners and 3.99% of renters.

Female Headed Households

According to the American Community Survey 2016, there were 93 female-headed households in the City of Portola; 55 with children and 38 without children. Of these households, 14 households (15.05%) are under the poverty level. Of the 85 families with incomes that are below the poverty level, 16.47% of them are female-headed households.

Structures

This section inventories the parcels (and associated structures) that make up the built environment of the City. The 2024 Plumas County Assessor's data and the associated parcel layer was used as the basis of this inventory. The methodology used to derive the number of total and improved parcels (i.e., those with an improved structure value) and land and improved property values (as well as content replacement values) follows the same methodology detailed in Section 4.2.1 of the Base Plan. This data should only be used as a guideline to overall values in the City, as the information has some limitations. The most significant limitations are created by Proposition 13. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the City. It is also important to note, in the event of a disaster, it is often the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table A-10 shows the Plumas County Parcel/Assessor Data land and structure values and content replacement values (e.g., the values at risk) broken down by property use for the City.

Table A-10 City of Portola – Total Value of Parcels and Structures by Property Use

Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola							
Agricultural	2	1	$536,231	$1,400,712	$0	$1,400,712	$3,337,655
Commercial	146	103	$7,583,297	$30,701,619	$1,484,240	$30,701,619	$70,470,775

Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	34	0	$0	$0	$0	$0	$0
Industrial	10	3	$325,236	$230,745	$0	$346,118	$902,099
Institutional	10	8	$224,898	$5,469,562	$147,200	$5,469,562	$11,311,222
Miscellaneous	2	0	$19	$0	$0	$0	$19
Recreational	1	0	$0	$0	$0	$0	$0
Residential	1,389	906	$29,280,690	$113,448,396	$283,632	$56,724,198	$199,736,916
ROW/Utilities	49	0	$0	$0	$0	$0	$0
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: 2024 Plumas County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just the buildings and structures that comprise the built environment, it is important to identify the critical facilities and infrastructure that are critical for life safety and property protection. This is done for the City of Portola below.

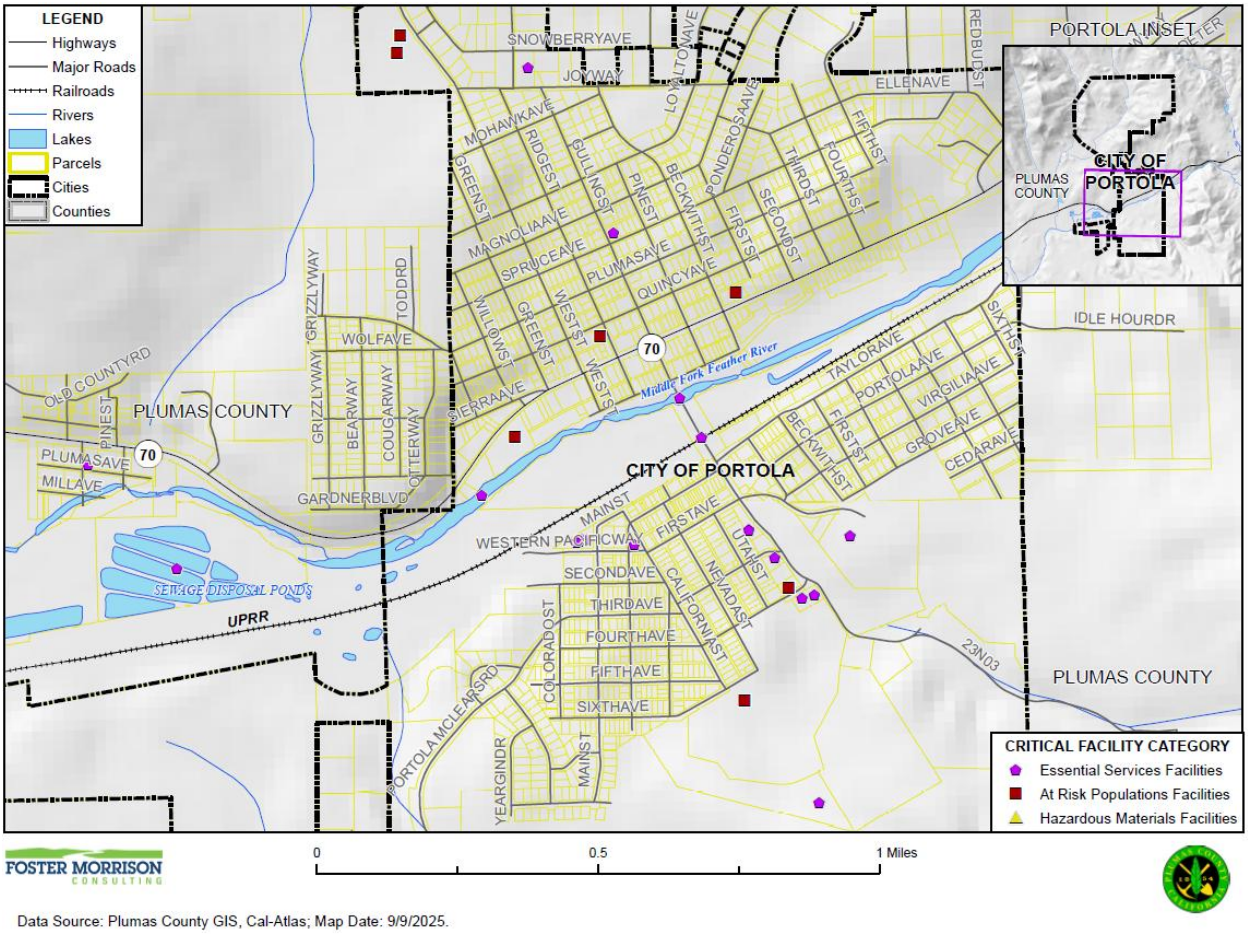
For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

An inventory of critical facilities in the City of Portola from Plumas County GIS is shown on Figure A-10. Table A-11 gives summary information about the critical facilities in the City. Table A-12 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure A-10 City of Portola – Critical Facilities



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table A-11 City of Portola – Critical Facilities by Category

Jurisdiction / Critical Facility Category	Facility Count
Portola	
Essential Services Facilities	16
At Risk Populations Facilities	8
Hazardous Materials Facilities	0
Portola Total	**24**

Source: Plumas County GIS

Table A-12 City of Portola – Critical Facilities by Category and Type

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
Portola		
Essential Services Facilities	Emergency Medical	1
	Essential Government Operations	3
	Public Safety	2

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
	Public Utility Plant and Substation Facilities	8
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	**16**
At Risk Populations Facilities	Designated Emergency Shelter	1
	Public Safety	1
	School	6
	At Risk Populations Facilities Total	**8**
Portola Total		**24**

Source: Plumas County GIS

Community Lifelines

Assessing the vulnerability of the City of Portola to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the cities,

local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the City's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP. As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the City of Portola to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City contains a variety of natural resources. Natural resources are unique to each area, often provide an important function, and are difficult to replace. Should a natural disaster occur, these species, resources, and locations are at risk.

The City of Portola 2045 General Plan Conservation and Open Space element discusses natural resources in the City. It noted that Portola is currently a compact, rural community surrounded by open space and divided by the Feather River, a major open space feature. One of the most notable visual characteristics of the community is the sense of open space within and around the City. Protection of these features is fundamental to maintain the quality of life enjoyed by current residents. New development will inherently change some aspects of the open space resource, but through planning for the location and character of new development, the existing open space can be protected.

Access to open space is also very important. Recreation along the river and in the surrounding forest is a major attraction for residents and visitors. The General Plan serves to enhance the potential for access to the open space resources in and around the City. In Portola, open space includes lands that serve the following purposes:

- Open space for the preservation of natural resources. Such areas are required for the preservation of plant and animal life, including habitat for fish and wildlife species (particularly rare, endangered or threatened plant and animal species), areas required for ecological and other scientific study purposes, rivers, streams, bank of rivers and streams, wetlands, and watershed lands. In Portola, the primary open space resource area is the Feather River and its major tributaries.
- Outdoor recreation. This includes areas of outstanding scenic, historic, and cultural value, areas particularly suited for park and recreation purposes including access to the river and streams, and areas that serve as links between major recreation and open space reserves, including utility easements, stream- and riverbanks, trails, and scenic highway corridors.
- Public health and safety. This refers to areas requiring special management or regulation due to hazardous or special conditions, such as earthquake fault zones, unstable soil areas, floodplains, watersheds, areas presenting high fire risks, and areas required for the protection and enhancement of air quality. In Portola, such areas include the flood plains and steep slope areas.
- Preservation of scenic areas and vistas. Settled in a narrow valley, Portola is surrounded by mountain peaks that visually define the community. Much of the surrounding mountain area is in public lands and is not likely to be developed in a manner that will affect the views from Portola. However, there are scenic areas within the General Plan study area and vicinity that have the potential to be developed in the future.

The Feather River is a special open space resource that significantly helps define the character of Portola. Not only is it a strong visual presence, but the river also provides unique opportunities for recreation in the center of the City. Few communities have the advantage of a beautiful river running through the center of town with very few structures abutting and screening out the river. The south side of the river abuts the Union Pacific Railroad, and the land is held by the railroad. Therefore, the land is not accessible, but is relatively undisturbed by development. The relative lack of development along portions of the north side of the river provide unparalleled opportunities to maintain the visual dominance of the river while also providing exceptional opportunities for public use and access.

The river was dredged and straightened through Portola about the middle of the 1900s. The effect is a somewhat deeper and straighter channel than would otherwise exist. Restoration of the river to a more natural configuration with naturally occurring bars, shallows, rock outcrops, and pools would enhance the visual quality and the fisheries quality of the river. The adjacent floodplain along the north side of the river is flanked by stands of pines and a riparian strand that extends along the foot of the steep bluff that provides a view from Sierra Street to the river.

The river and its immediate environment were designated a Wild and Scenic River by Congress in 1968. Thus, the river is under the jurisdiction of the Plumas National Forest. Public Law 90-542 (October 2, 1968) declares that "...certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." The Act continues, "...the appropriate Secretary shall issue guidelines, specifying standards for local zoning ordinances, which are consistent with the purposes of this Act.

The standards specified in such guidelines shall have the object of (A) prohibiting new commercial or industrial uses other than commercial or industrial uses which are consistent with the purposes of the Act,

and (B) the protection of the bank lands by means of acreage, frontage, and setback requirements on development." In its current state the river is not easily accessible for recreation, either on the river or along its banks. Although it is one of the dominant visual features in the area, it is only occasionally actively used by residents or visitors.

Much of the area surrounding Portola is part of the Plumas National Forest. National forests are under federal management of the United States Forest Service. The Forest Service operates under many policies and principles related to management of forest lands, including recreation and fuels and fire management. Both aspects are highly important to public safety, quality of life provided to residents, attraction of visitors and the health of Portola's economy.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

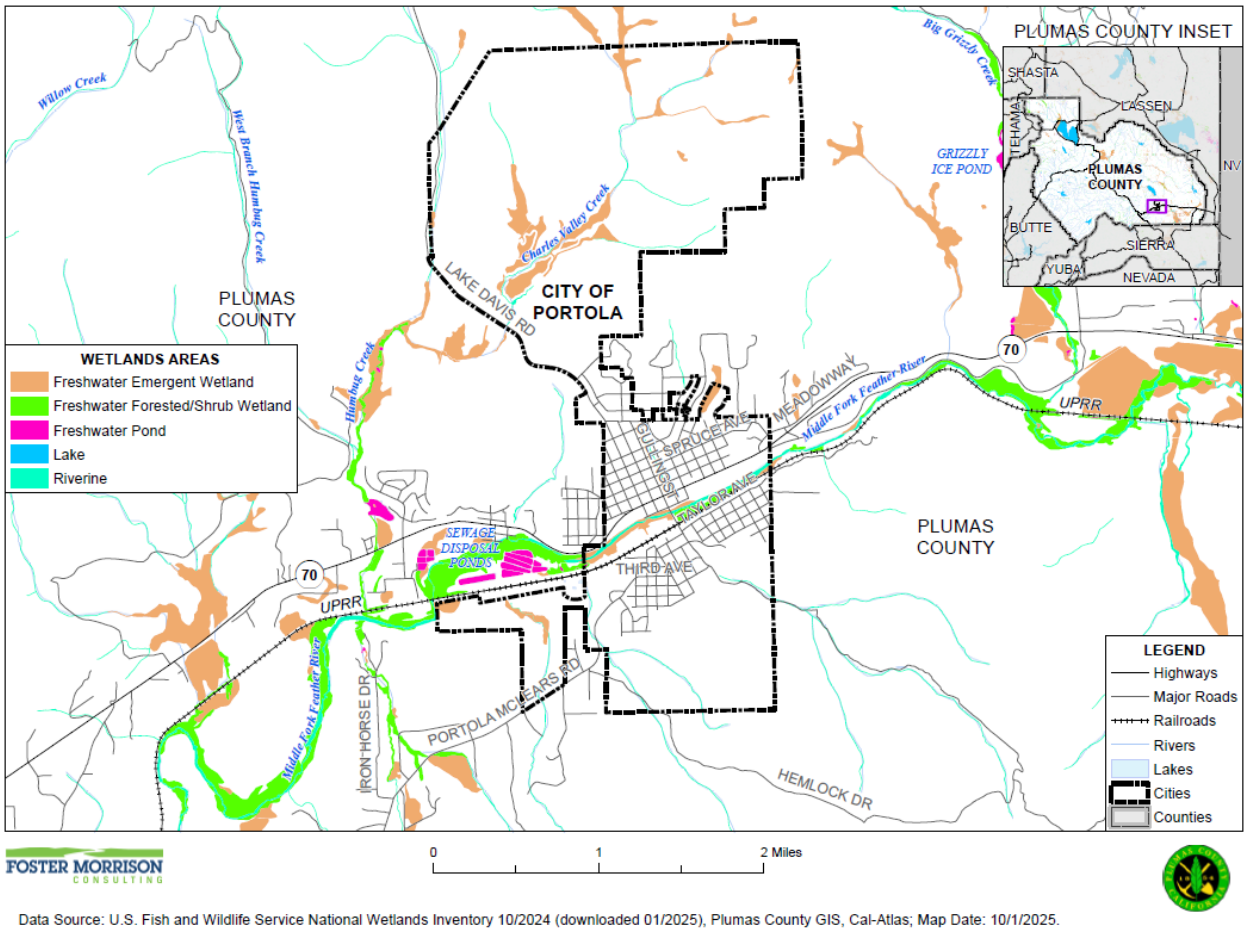
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Wetlands in the City are shown in Figure A-11 and detailed in Table A-13.

Figure A-11 City of Portola – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Plumas County GIS, Cal-Atlas; Map Date: 10/1/2025.

Table A-13 City of Portola – Wetland Types and Acreages

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Freshwater Emergent Wetland	54	126.35
Freshwater Forested/Shrub Wetland	9	9.67
Freshwater Pond	1	0.18
Lake	0	0.0
Riverine	56	30.91
Non-Wetland*	1,643	3,324.21
City of Portola Total	**1,763**	**3,491.32**

Source: US Fish and Wildlife Service
*This category is all other "blank/no data" areas

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. The City of Portola has a stock of historically significant homes, public buildings, and landmarks. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.2.1 of the Base Plan. As shown in the Base Plan, there are no historic buildings in the City in the OHP Database.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

It was noted in the City of Portola General Plan 2045 Conservation and Open Space Element that the Humbug Valley and surrounding area was home to the Miwok Indians and early settlers. Consequently, the area is rich in potential cultural sites. The specific locations of such sites are not addressed in the General Plan and do not directly affect the location or character of land use.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the City of Portola to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the City.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the City of Portola, this includes the following:

- Core business and economic centers of city could be affected by hazard events
  - ✓ Highway 70 corridor & businesses
  - ✓ Commercial Street businesses

Note: This inventory of economic assets is only included in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section A.4.3 below.

Community Activities of Value

Inventorying economic assets in the City and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities also provide economic benefits to the City. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism
- Local Pools
- Local Splash Pools

The City noted the following community activities of value:

- Sierra Buttes Trail Stewardship Lost & Found Gravel Grinder event
- City events/ Chamber of Commerce events
  - ✓ Music in the Park
  - ✓ Christmas in Old Town
  - ✓ Railroad Days
- Western Pacific Railroad Museum and events

Note: This inventory of community activities of value only occurs in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section A.4.3 below.

Growth and Development Trends

As part of the planning process, the City looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

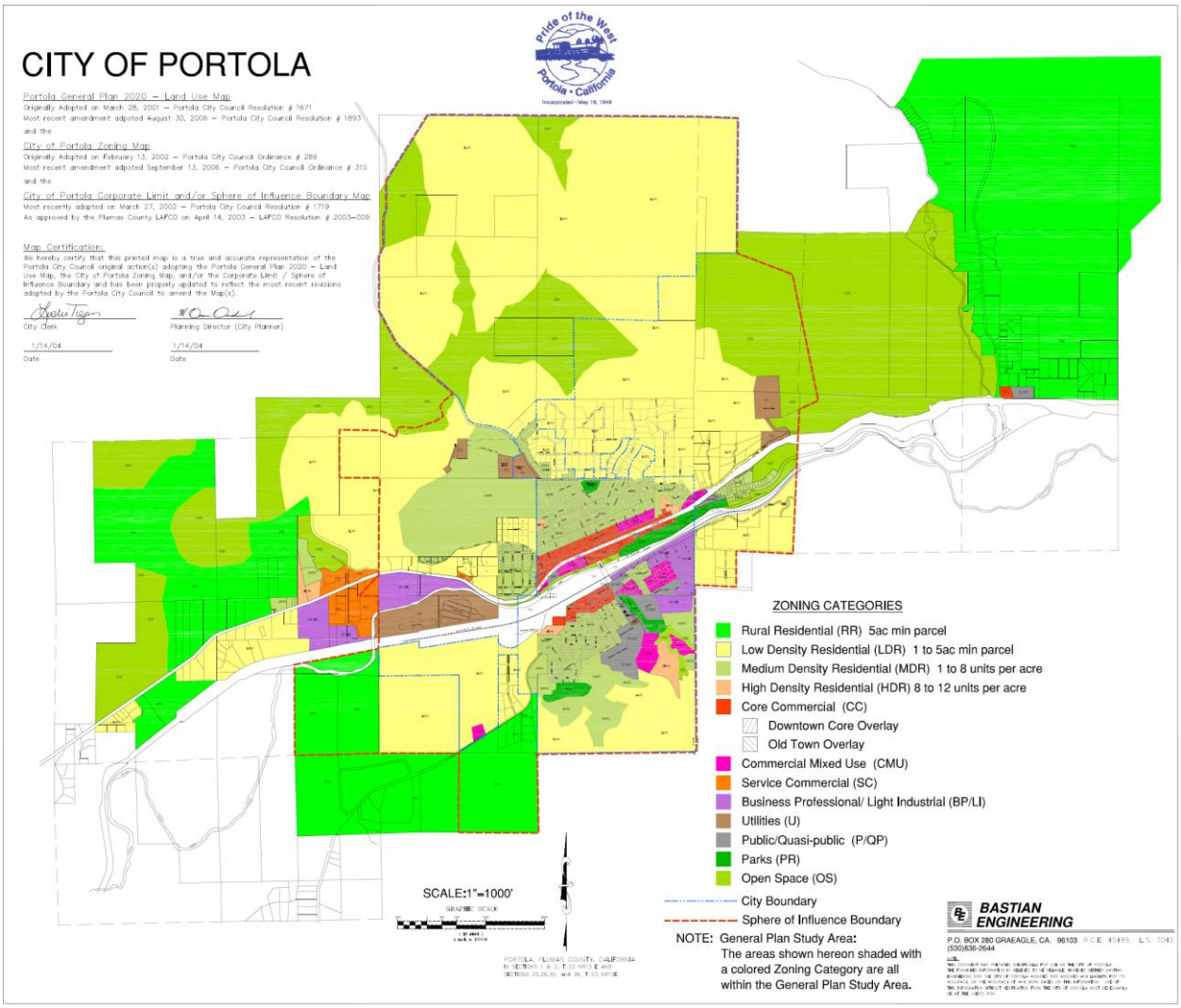
Land Use

State planning law requires that a land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City's land use designations are generally described below and mapped on the Land Use Diagram (Figure A-12). The City of Portola Municipal Code provides detailed land use and development standards for development.

The Municipal Code works hand in hand with the City's General Plan Land Use Element. The purpose of the Land Use Element is to provide goals, policies, actions diagrams and standards to guide future land use decisions in the City of Portola. While all elements of the General Plan have equal weight under California law, in some respects this Element is the most far-reaching. It informs all other elements of the General Plan, shaping the future transportation network and the location of future housing sites, and influencing public facility requirements and park and recreation needs. It defines the City's future open space system and responds to natural resource conservation issues and safety hazards. It establishes the basic pattern of development in the City for the next 20-25 years, including land uses and densities, and presents the policies and actions to ensure that future development will enhance the quality of life for all City of Portola residents.

Future land use for the City of Portola from the City of Portola General Plan 2045 Land Use Element is shown on Figure A-12.

Figure A-12 City of Portola – Land Use Diagram



Source: City of Portola General Plan 2045 Land Use Element

Population Trends and Projections

There are no future City population projections. Plumas County as a whole is expected (by the California Department of Finance) to slowly shrink in population. As such, it is assumed that the City may see negative population growth as well.

Development since 2019 Plan

Development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Planning Department tracked total building permits issued since 2019 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table A-14 and Table A-15.

Table A-14 City of Portola – Total Development Since 2019

Property Use	2020	2021	2022	2023	2024
Residential	0	0	0	0	0
Commercial	0	0	0	0	0
Industrial	0	0	0	0	0
Other	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

Source: City of Portola Planning Department

Table A-15 City of Portola – Development in Hazard Areas since 2019

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area[1]	Other
Total	0	0	0	0

Source: City of Portola Planning Department

[1]Moderate or higher wildfire risk area

No development has occurred in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas. As such, there should not be a significant change in vulnerability of the City to identified priority hazards.

Future Development Areas

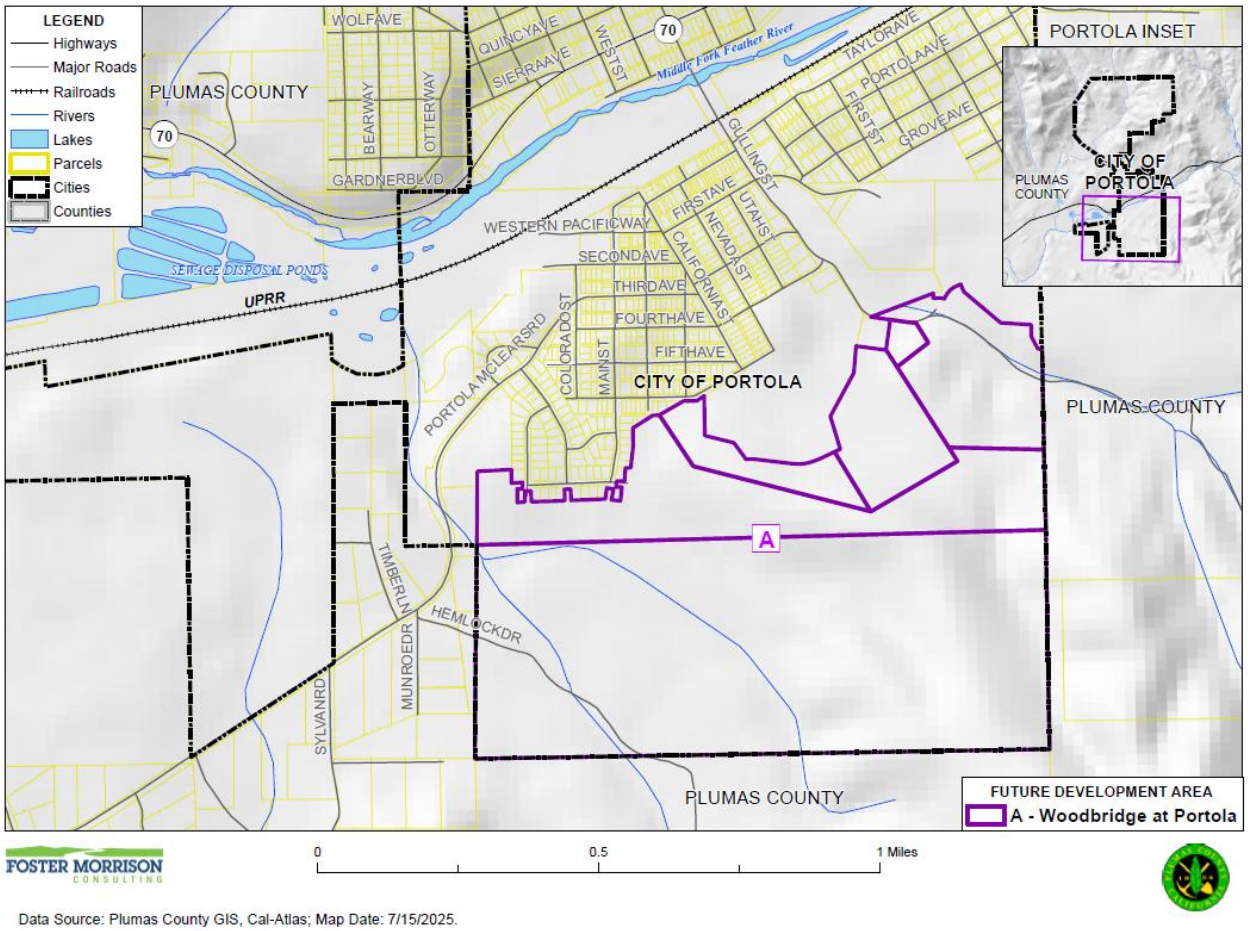
It is important to review future development plans for the City. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

GIS Analysis

The City noted that an area known as Woodbridge at Portola is the only future development under consideration in the City over the next 5 years. It is 251.5 acres with 1,005 units planned. The City noted that it is not 'shovel ready' and that a Development Agreement will term in 2027. The Developer presented

during a City Council meeting on 04/09/2025 and is primarily looking to divest interest. Council Approved it annual review. These areas were provided by the City of Portola in GIS. Using GIS, these areas were mapped. This area is shown on Figure A-13, and detailed by parcels and acres in Table A-16.

Figure A-13 City of Portola – Future Development Areas



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Table A-16 City of Portola – Future Development Areas by Acres and Parcels

Future Development / Property Use	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Woodbridge at Portola, Inc.						
Woodbridge at Portola, Inc. Total	6	398.52	6	398.52	0	398.52
Grand Total	**6**	**398.52**	**6**	**398.52**	**0**	**398.52**

Source: City of Portola

A.4.2. Hazard Identification

The City of Portola identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the City (see Table A-17). Those hazards identified as a high or medium significance in Table A-17 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed.

Table A-17 City of Portola—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather / Insects/Pests	Significant	Occasional	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Significant	Unlikely	Catastrophic	High	Medium
Drought & Water Shortage (w/tree mortality)	Significant	Likely	Limited	Medium	High
Earthquake	Significant	Likely	Critical	High	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Likely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Likely	Limited	Medium	Medium
Haz Mat Transportation	Significant	Likely	Critical	Medium	Low
Landslide, Mudslide, and Debris Flow	Limited	Occasional	Limited	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: Extreme Heat	Extensive	Occasional	Negligible	Low	Low
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Critical	High	Low
Volcano	NA	NA	NA	NA	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

A.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the City of Portola (as identified in the Significance column of Table A-17) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the City. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** - A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** - Location is the geographic area within the City that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** - Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the City follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change**—This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes City provided information on how the City is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section A.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure, and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section A.4.1 above.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the City and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will be affected by the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The City noted that there have been multiple instances of power outages with Liberty Utilities have been recorded due to severe weather events over the past couple of years. These events often lasted multiple days and vulnerable population have been affected greatly. This includes residents who need oxygen, medicine, etc.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The City falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City of Portola, the Plumas County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

City of Portola Events

The City Planning team noted that it seems to be getting hotter every year. There has been an increase of wildfire activity, and an increased potential for droughts.

Vulnerability to Climate Change

The whole of the City is at some measure of vulnerability to climate change. The City Planning Team has concerns that the vulnerability of the City to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the City's assets at risk, and impacts to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that the increase in temperatures increases risk for almost all other hazards identified in this LHMP. Drought, wildfire, flooding, mudslides are all increased potentially by climate change.

In the past, this region relied on industries such as mining, timber production, and agriculture. Population growth in recent decades has shifted the region's economy to be driven by the provision of services, tourism, and second home development (Sierra Business Council, 2007). Today, the region's economy is primarily tourism-based. Climate change has the potential to disrupt many features that characterize the region, including ecosystem health, snowpack, and the tourist economy.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature

extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section A.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, flood, or other areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. More information on how structures may be affected by climate change can be found in Section 4.3.7 of the Base Plan.

Critical Facilities and Infrastructure

As with structures, critical facilities and infrastructure in areas of increased wildfire, flood, or other areas due to the effects of climate change would be at increased risk. Climate change is expected to increase the vulnerability of critical facilities and infrastructure to many natural hazards.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the City supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the City are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the City may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the City is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7° F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.

- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- As climate change continues to accelerate over time, climate related impacts to the City will continue to increase.
- Climate change can influence population growth in the City over time. While the City is expected to see limited growth, the City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the City and larger Plumas County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. So while changes in population and population patterns are not expected to increase the impacts associated with this hazard, climate change may instead influence future population growth in the County.
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events and natural hazards due to the changing climate should be taken into account while considering land use planning for the City. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more disaster resilient community.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Extremely High

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

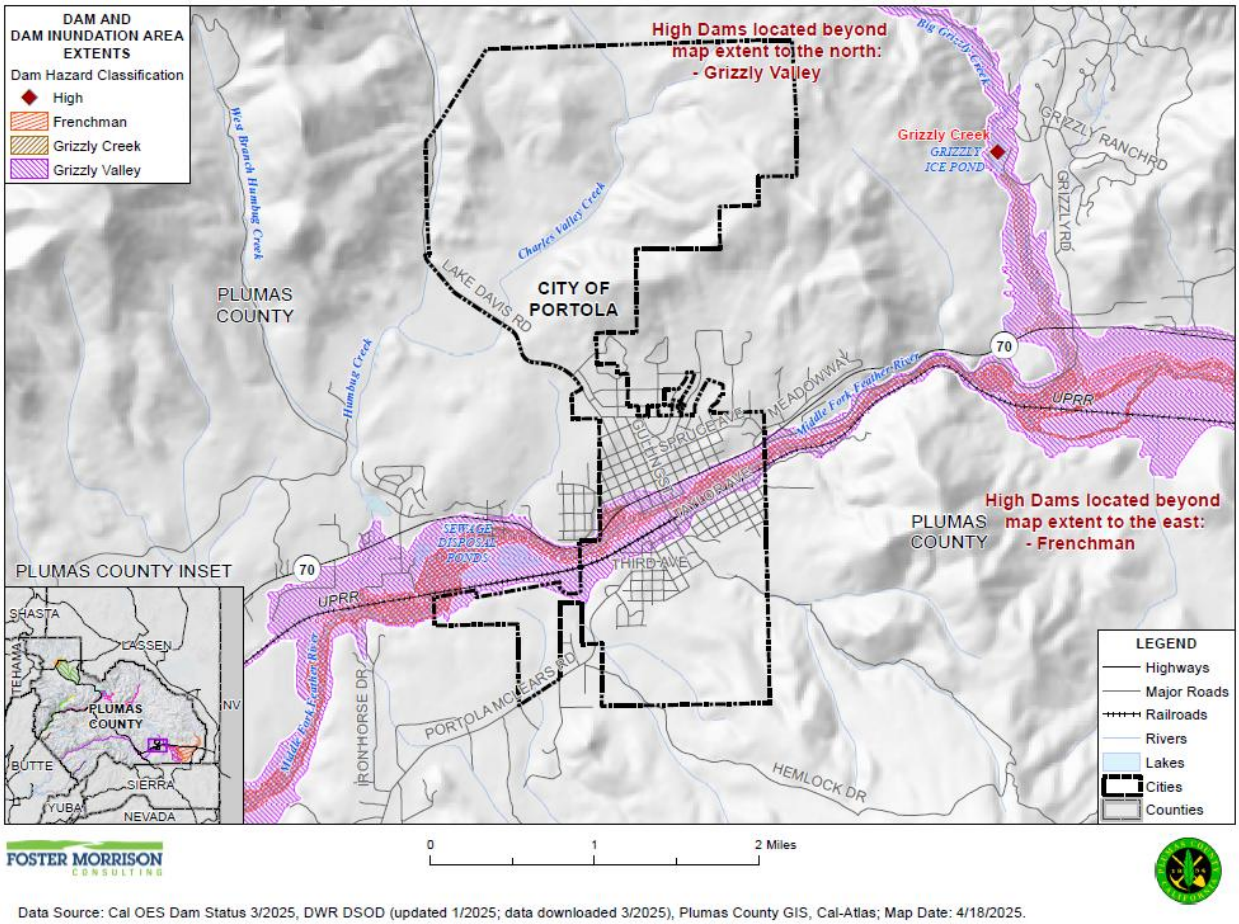
An inventory map of dams located within Plumas County was shown in Section 4.3.8 in the Base Plan. Dams with an inundation area within the City of Portola are shown on Figure A-14.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.8 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event in nearby Butte County). The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

No mapped extremely high hazard dam inundation areas intersect the City. As such, only the geographic flood extents from the DSOD high hazard dam inundation areas are shown on Figure A-14, as well as in Table A-18.

Figure A-14 City of Portola – High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 3/2025, DWR DSOD (updated 1/2025; data downloaded 3/2025), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Table A-18 City of Portola – Dam Inundation Areas Geographical Extents

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Frenchman	78	2.2%	5	0.2%	73	5.8%
Grizzly Creek	61	1.7%	4	0.2%	57	4.5%
Grizzly Valley	234	6.7%	33	1.5%	202	16.1%

Source: Cal OES, DSOD, Plumas County GIS

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Plumas County.

NCDC Events

The NCDC does not contain any dam failure events for Plumas County.

City of Portola Events

The City of Portola noted no past dam failure events.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the City can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snowmelt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Plumas County and the City.

Vulnerability to Dam Failure

The vulnerability of the City to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that its greatest concern is with Lake Davis, which is impounded by the Grizzley Valley Dam. The City of Portola lies approximately 8 miles downstream of Lake Davis and the Grizzly Valley Dam. Lake Davis was built to provide recreation, create a water supply to the City of Portola, and to improve fish habitat. The Grizzly Valley Dam was completed in 1915 and the maximum surface elevation is 5,744 ft with a maximum storage volume of 195,000 acre-feet. If the dam were to fail catastrophically the flood surge would travel south down the Grizzly Valley Creek channel and reach the Middle Fork of the Feather River approximately 2.25 miles east of Portola. Because the Feather River flows to the west, structures along the Feather River at the eastern boundary of the City of Portola would be the first structures to be affected by the flood surge.

Dam inundation areas, as mapped by the Cal OES and DSOD, show the potential flood extent, given a complete and sudden dam failure at full capacity. Given its physical setting and proximity to the Grizzly Valley Dam, the City of Portola could be affected both by the immediate impacts of a flood wave, and long-term impacts if roads, buildings and bridges are destroyed. The flood wave has the potential to impact the South Gulling Street Bridge, which is the only connection between the south and north sides of the City. If

the bridge were adversely impacted, those people on the south side of the Middle Fork of the Feather River would be required to travel over 25 miles to return to the north side of Portola; those on the north side would not be able to reach the hospital in the event of a medical emergency. Based on records presented by the National Bridge Inventory, the bridge is considered scour critical.

The main channel of the Middle Fork of the Feather River runs fairly central to the flood plain. The relatively broad flood plain will help mitigate potential damage and limit destruction as it allows for some spreading of the flood wave, while continuing to help channelize the flow. Depending on flood levels, the railroad, a City well, and the sewage treatment plant could all be impacted by the event. Because of confidentiality concerns on behalf of the Division of Safety of Dams, specific concerns will have to be reviewed by the City and cannot be represented herein.

The City noted that, as developments continue in the future, it will be ensured that development is properly planned and not within flood risk areas.

Assets at Risk

Assets at risk from dam failure include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in these dam inundation areas are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Portola's residential populations located in these hazard areas, a separate analysis was performed to determine residential populations in the dam inundation areas. The DSOD dam inundation areas were overlayed on the parcel layer. Those residential parcel polygons that intersect the dam inundation areas were counted and multiplied by the Census Bureau average household factors for the City of Portola – 2.29. This is shown in Table A-19. As shown, Frenchman, Grizzley Creek, and Grizzley Valley dams have inundation areas that intersect residential parcels in the City.

Table A-19 City of Portola – Improved Residential Parcels and Population by Dam Inundation Area

Dam Inundation Area	City of Portola	
	Improved Residential Parcels	Population
Extremely High Hazard Dams		
Lake Almanor	0	0

Dam Inundation Area	City of Portola	
	Improved Residential Parcels	Population
High Hazard Dams		
Antelope	0	0
Bidwell Lake	0	0
Bucks Diversion	0	0
Bucks Storage	0	0
Butt Valley	0	0
Caribou Afterbay	0	0
Chester Diversion	0	0
Cresta	0	0
Eureka	0	0
Frenchman	13	30
Grizzly Creek	12	27
Grizzly Forebay	0	0
Grizzly Valley	82	188
Indian Ole (Lassen County)	0	0
Little Grass Valley	0	0
Rock Creek	0	0
Silver Lake	0	0

Source: Cal OES, DSOD, Plumas County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Most structures in the City have some measure of risk to dam failure. Dam failure flooding can affect the built environment of the City. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated. Analysis by extremely high hazard and high hazard dam follows.

A GIS based analysis was used to determine the possible impacts of dam inundation flooding on parcels and structures within the City of Portola. The methodology described in Section 4.3.8 of the Base Plan was followed in determining City parcels and structures at risk to dam failure. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values that fall within dam inundation areas in the City are presented below by hazard classification and by dam. The results are presented in Table A-20 below for the dams that affect the City.

Table A-20 City of Portola – Count and Value of Parcels and Structures in Dam Inundation Area by Property Use

Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Frenchman							
Agricultural	15	8	$1,263,758	$3,012,093	$11,385	$3,012,093	$7,299,329
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	9	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	2	1	$6,510	$147,552	$0	$147,552	$301,614
Institutional	1	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	35	13	$1,141,203	$970,440	$5,280	$485,220	$2,602,143
Residential	7	0	$0	$0	$0	$0	$0
ROW/Utilities	69	22	$2,411,471	$4,130,085	$16,665	$3,644,865	$10,203,086
Total	**15**	**8**	**$1,263,758**	**$3,012,093**	**$11,385**	**$3,012,093**	**$7,299,329**
Grizzly Creek							
Agricultural	11	6	$929,543	$2,508,418	$11,385	$2,508,418	$5,957,764
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	9	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	2	1	$6,510	$147,552	$0	$147,552	$301,614
Institutional	1		$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	33	12	$1,118,586	$856,872	$5,280	$428,436	$2,409,174
Residential	7	0	$0	$0	$0	$0	$0
ROW/Utilities	63	19	$2,054,639	$3,512,842	$16,665	$3,084,406	$8,668,552
Total	**11**	**6**	**$929,543**	**$2,508,418**	**$11,385**	**$2,508,418**	**$5,957,764**
Grizzly Valley							
Agricultural	0	0	$0	$0	$0	$0	$0
Commercial	106	74	$5,108,031	$13,277,078	$99,195	$13,277,078	$31,761,382
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	12	0	$0	$0	$0	$0	$0
Industrial	9	3	$318,150	$230,745	$0	$346,118	$895,013
Institutional	5	4	$149,379	$3,698,377	$147,200	$3,698,377	$7,693,333
Miscellaneous	2	0	$19	$0	$0	$0	$19
Recreational	0	0	$0	$0	$0	$0	$0

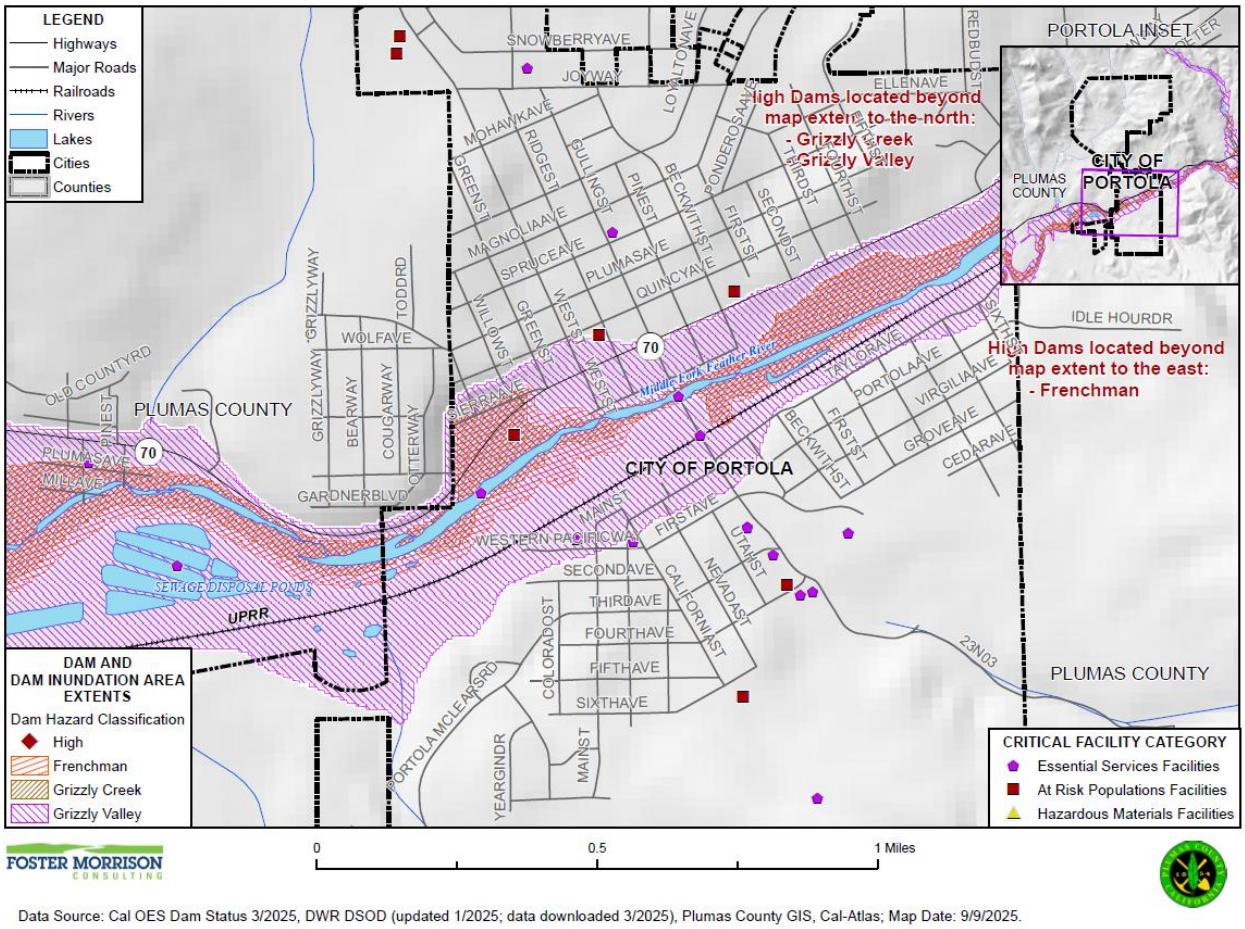
Dam Inundation Area/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Residential	137	82	$3,361,074	$9,268,058	$160,960	$4,634,029	$17,424,121
ROW/Utilities	17	0	$0	$0	$0	$0	$0
Total	**288**	**163**	**$8,936,653**	**$26,474,258**	**$407,355**	**$21,955,602**	**$57,773,868**

Source: DSOD, Plumas County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Dam failure flooding present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each Cal OES/DSOD dam inundation area. This was done separately for both extremely high hazard and high hazard dam inundation areas. Using GIS, the extremely high hazard dam inundation areas were overlayed on the critical facility GIS layer. There are no extremely high hazard dam inundation areas that intersect the City; as such, no maps or tabular analysis is shown. There are high hazard dams that affect the City. These is shown on Figure A-15. Table A-21 details which critical facilities fall in the high hazard dam inundation areas. Details of critical facility categories, type, name, and address by extremely high and high hazard dam inundation area are listed in Appendix F.

Figure A-15 City of Portola – Critical Facilities in High Hazard Dam Inundation Areas



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Data Source: Cal OES Dam Status 3/2025, DWR DSOD (updated 1/2025; data downloaded 3/2025), Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Extremely High dam inundations are not in proximity to the CFs; no map developed.

Table A-21 City of Portola – Critical Facilities by Category in High Hazard Dam Inundation Areas

Jurisdiction / High Hazard Dam Inundation Area	Critical Facility Category and Critical Facility Type	Facility Count
Portola		
High Hazard Dam Inundation Area	Essential Services Facilities	
	Essential Government Operations	1
	Public Utility Plant and Substation Facilities	4
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	7
	At Risk Populations Facilities	
	Public Safety	1
	At Risk Populations Facilities Total	1
	High Hazard Dam Inundation Area Total	**8**
Outside of High Hazard Dam Inundation Area	Essential Services Facilities	

Jurisdiction / High Hazard Dam Inundation Area	Critical Facility Category and Critical Facility Type	Facility Count
	Emergency Medical	1
	Essential Government Operations	2
	Public Safety	2
	Public Utility Plant and Substation Facilities	4
	Essential Services Facilities Total	9
	At Risk Populations Facilities	
	Designated Emergency Shelter	1
	School	6
	At Risk Populations Facilities Total	7
	Outside of High Hazard Dam Inundation Area Total	**16**
Portola Total		**24**

Source: Cal OES/DSOD, City of Portola

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the City. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the City from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Levees within the City and surrounding areas may also be damaged or destroyed contributing to the flood waters. Additionally, mass evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the City and Plumas County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable

water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the City to dam failure.
- Population in the City is expected to shrink along with the larger County; however, additional growth within the dam inundation areas of the City would place additional populations at risk to dam failure. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from a dam failure and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. However, City building codes are in effect to partially reduce this risk and should be updated as necessary to continue to address future dam failure conditions. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Future Development

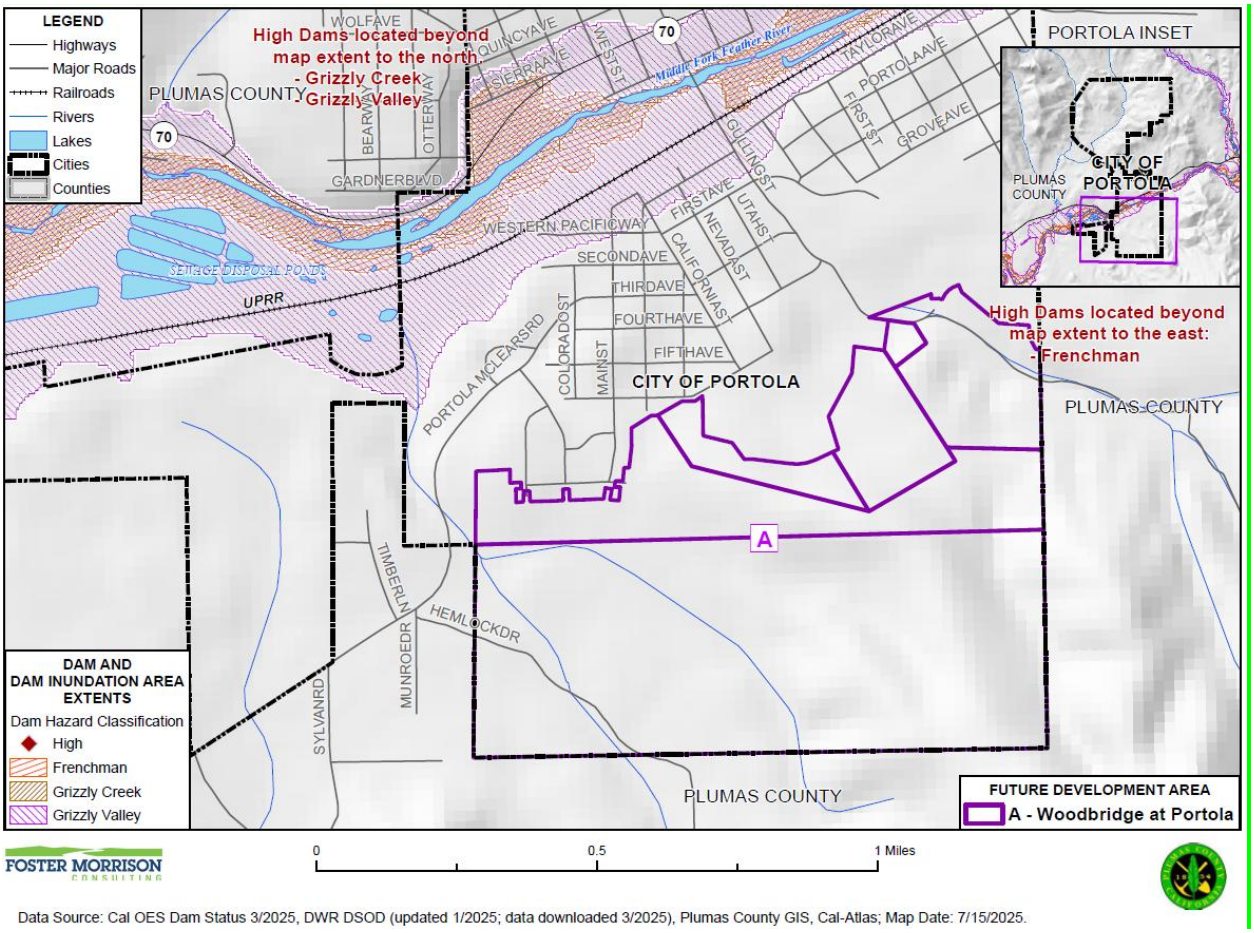
Future dam failure events may occur in the City. Given the high number of affected parcels and structures, future development in the City, could be affected by dam failures and associated flooding. Siting of future development areas should take dam failure flooding into account. As the City continues to develop, the population will continue to grow and become more diverse. Changing migration patterns will fluctuate the vulnerability of the City and the vulnerable populations such as AFN, unhoused, the elderly, and very young may feel the effects of this disaster disproportionately.

Future development areas and their vulnerability to dam failure are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each mapped dam inundation area. No facilities intersect extremely high hazard dam inundation areas; as such no maps or tabular analysis are presented. Figure A-16 shows the locations of the future development area overlayed on the high hazard dam inundation areas. These lie outside of the mapped dam inundation areas; as such, no tabular analysis is presented.

Figure A-16 City of Portola – Future Development Areas in High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 3/2025, DWR DSOD (updated 1/2025; data downloaded 3/2025), Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the City of Portola and the Plumas County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the City. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the City that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the City and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the City are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 1 state and 1 federal disaster declarations for Plumas County. This can be seen in Table A-22. Additionally, there have been 13 USDA Secretarial Disaster Declarations from drought in the County.

Table A-22 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1997

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the City.

City of Portola Events

Based on historical information, the occurrence of drought in California, including the City of Portola, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the City of Portola to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the City is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City of Portola is not likely to be highly affected by a drought due to its proximity to the headwaters of a major river (Middle Fork Feather River). The large, high elevation drainage area for the City of Portola historically receives abundant precipitation and, even in years of below average precipitation, snowpack, groundwater storage, and access to the Lake Davis Reservoir are sufficient to provide reliable sources of water for household use. Indirect impacts could include reduction in the limited agricultural productivity for surrounding areas and related economic impacts

The City is slightly concerned with reduced water supply from Willow Springs. Most of the City's water is supplied by Willow Springs, although there is a backup supply of water through Lake Davis. There have been minor impact to all recreational facilities in the City (parks, etc.). It is important to the City to ensure a reliable water supply through existing sources. In addition, drought hazards exacerbate the wildfire hazard. The highest priority is the protection of critical facilities (such as the water treatment plan) to mitigate effects of drought.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations of the City are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the City may be vulnerability to drought and water shortage issues.

Water quality can be impacted causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires threatening City residents. Water shortages can have an effect on all of the population in the City, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and infrastructure. Sufficient water supply for firefighting can also be an issue. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the City are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to City residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the City.

Impacts from Drought and Water Shortage

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire

suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the City.

Other qualitative impacts associated with drought in the City are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Portola include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the City to drought and water shortage.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population in the City and larger County is expected to shrink. According to the HMPC, the City has access to large quantities of water. However, any future population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. If the population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Potential population growth will be a challenge not only with regard to the City's water access for agricultural production, but state- and nation-wide with regard to food production. Should the City see a growth in population, it will increase the vulnerability and impacts to the City from this hazard.
- Land use planning should be proactive to address future hazard conditions. As the City continues to grow, more cropland may be taken out of production to provide housing to accommodate for population growth. As the areas adjacent to the City's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, more development will also require an increase in water supply and associated infrastructure. Changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard depending on where and how this future growth occurs.

Future development in the City is currently not expected. The mapped future development areas are not in process of being built. Should those go forward, the City and surrounding water agencies will need to plan for this additional growth.

Earthquake

Likelihood of Future Occurrence–Likely(minor)/ Unlikely (major)
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. The City of Portola, Plumas County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the City were shown in Section 4.3.10 of the Base Plan. These include the Almanor Fault, Butt Creek Fault Zone, and the Mohawk Valley Fault traverse the County. The Indian Valley Fault is also considered an active fault located within the County. Additionally, the Honey Lake and Fort Sage Faults are two active faults located east of the County. A significant seismic event on any of these major faults could cause damage in the City of Portola.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.10 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Plumas County and the City fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Plumas County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

City of Portola Events

The City noted the following events:

- There was an earthquake near the City of Portola that occurred **prior to 1931** (as could be recalled) and was estimated as a magnitude 4 earthquake.
- The nearest earthquake above magnitude 6.0 also occurred **prior to 1931** (as could be recalled) and was centered about 15 miles southeast of the City.
- **June 10, 2001** – a 5.5 earthquake was felt. It was centered in Portola. The County Courthouse was checked for cracks.
- **Since 2019** – The City noted that various small seismic events have occurred since 2019 that triggered alerts on cell phones.

There are no records of significant earthquakes (M > 6.5, caused loss of life, or caused more than $200,000) within close proximity to the City of Portola.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Plumas County Planning Area, seismic hazard mapping indicates that the City has low to moderate seismic hazard potential. There is the potential for the City and Plumas County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

The whole of the City is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Portola is within Zone 3.

In addition, there is concern around potential damage to infrastructure, specifically the already compromised Gulling Street Bridge. Rehabilitation of this bridge is of importance to the City. During a shake event, water and sewer infrastructure is at risk during events. There have been past reports of an increase in minor leaks after seismic events have occurred throughout the City. Secondary hazards, such as fire, can also present a significant risk to the community. Old heating systems, broken gas lines, old wooden structures can all become both a risk and a hazard if fire is triggered during a seismic event.

Assets at Risk

Many assets in the City are at risk to ground shaking. Assets at risk from earthquake include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations are at risk from earthquake shaking. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP (Great Valley Fault 6.53, Hat Creek/McArthur/Mayfield 7.29, Honey Lake 7.03, Warm Springs Valley 6.92). More information on the Hazus scenarios and how the County is affected is included in Section 4.3.10 of the Base Plan.

Structures

All structures in the City are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Plumas County Planning Area show how structures may be affected.

Critical Facilities and Infrastructure

Earthquake and its related hazards present risks to the City. Earthquakes can damage critical facilities and infrastructure that provide vital services to the City. Damage to critical facilities from the Hazus earthquake scenarios for the Plumas County Planning Area, including the City of Portola, are presented in the Hazus analysis in Section 4.3.10 of the Base Plan.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the City of Portola residents and visitors. Other impacts to the City could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs or behind levees might be subject to flooding, if the dams, reservoirs, or levees fail as a result of an earthquake. The City has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Portola include the following:

- Climate change is likely to have no effect on future earthquake conditions and associated impacts and vulnerability of the City.
- Population in the City of Portola is expected to shrink. If that were to reverse, any additional growth in the City would place additional populations at risk to earthquake. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from an earthquake and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. However, City building codes are in effect to reduce structure damage, including damage to critical facilities and infrastructure, and should be updated as necessary to continue to address future earthquake conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Although new growth and development corridors would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The City enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes and land use planning.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

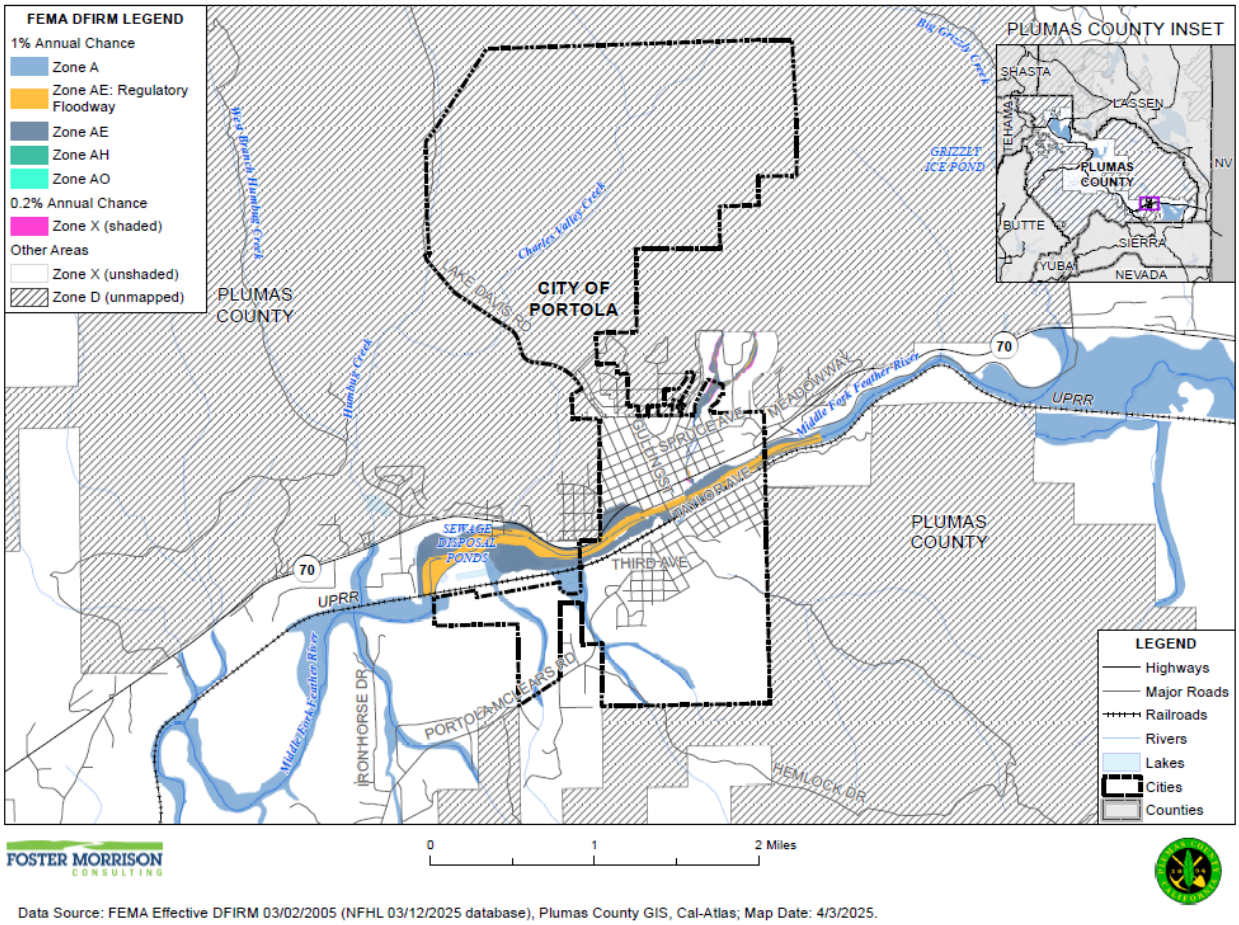
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the City and have caused damage in the past. Flooding can be a significant problem in the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the City swell with heavy rainfall and snowmelt runoff. The City has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Plumas County Planning Area and the City of Portola. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas in the City.

Location and Extent

The City of Portola has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure A-17.

Figure A-17 City of Portola – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 03/02/2005 (NFHL 03/12/2025 database), Plumas County GIS, Cal-Atlas; Map Date: 4/3/2025.

Table A-23 details the DFIRM mapped flood zones located within the City.

Table A-23 City of Portola– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in City of Portola
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	

Flood Zone	Description	Present in City of Portola
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X (unshaded)	No flood hazard	X

Source: FEMA DFIRM 03/02/2005

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table A-24.

Table A-24 City of Portola – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard	168	4.80%	10	0.47%	157	12.54%
0.2% Annual Chance Flood Hazard	1	0.02%	0.1	0.01%	1	0.06%
Other Areas	3,323	95.17%	2,226.8	99.53%	1,096	87.40%
Grand Total	**3,491**	**100.00%**	**2,237**	**100.00%**	**1,254**	**100.00%**

Source: FEMA DFIRM 03/02/2005

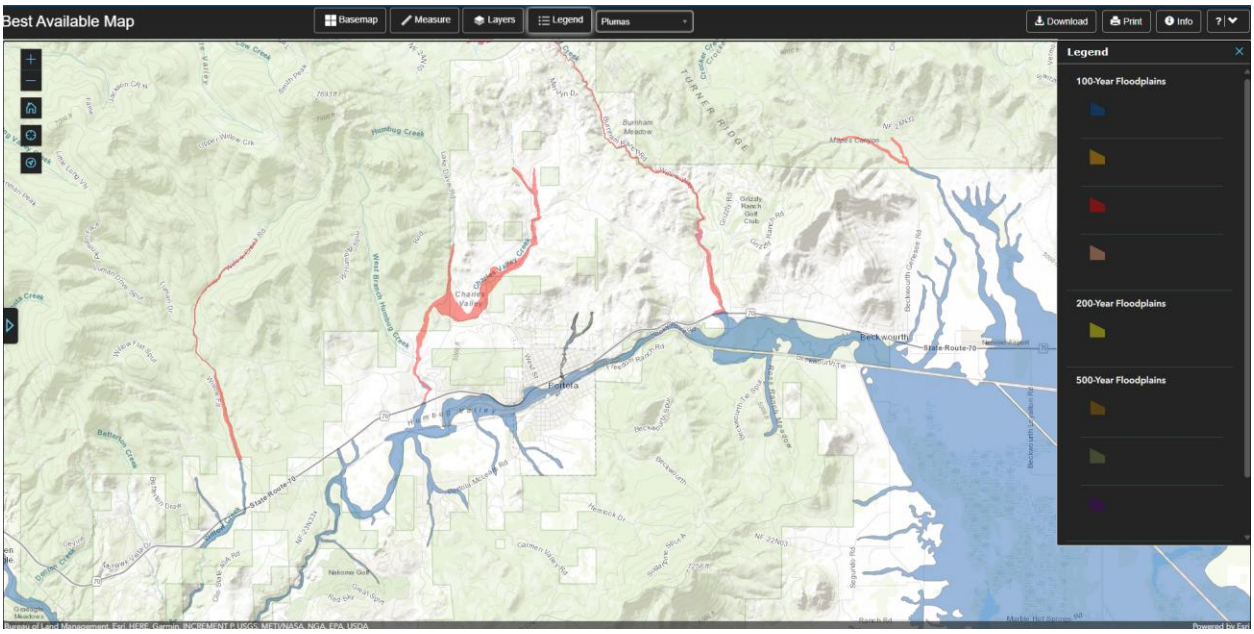
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in the City. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200- (as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements. The value in the BAMs is that they provide a bigger picture

view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for the City of Portola is shown in Figure A-18.

Figure A-18 City of Portola – Best Available Map



Source: California DWR

Legend explanation: **Blue** - FEMA 100-Year, **Orange** – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Plumas County from flooding is shown on Table A-25. These events also likely affected the City to some degree.

Table A-25 Plumas County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storm)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

*included a landslide component

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Plumas County has seen 15 events. These events most likely had some impact on the City.

City of Portola Events

The City noted that the following events had affects and damages to the City:

Records from NOAA's nearest gauging station on the Middle Fork of the Feather River indicate that the "action stage" of 7 feet has been exceeded regularly. Records also indicate that the "flood stage" of 8.5 feet was most recently reached on 3/17/2011 with a flood stage of 9.03 feet. Figure A-19 also indicates FEMA Flood Zones within and immediately around the City limits. Table 4 presents those historic flood events which have exceeded the "action stage" within the period of record. Inserted with these historical events are characterizations of what those flood levels mean to the community.

Figure A-19 City of Portola – Downstream from Gage Location with a Flood Stage of 9'

Source: City of Portola

Table A-26 City of Portola – Measured Flood Levels & Dates (Sorted by Height above Action Stage)

Event	Height Above Action Stage	Date
1	10.62 ft	01/21/1969
11' (8,400 cfs) Major Event - Record flooding of homes, businesses, structures, roads, railroads, and bridges from Beckwourth to Sloat California, including Portola. Before the gage record, this level was exceeded during the flood events of 2/21/1927, 3/26/1928, 4/6/1952, 12/23/1955, 2/1/1963, and 12/24/1964.		
2	10.07 ft	03/27/1971
10.5' (7,640 cfs) Major Event - Near record flooding with significant damage to roads, railroads, homes, businesses and structures along river with significant damage.		

Event	Height Above Action Stage	Date
3	9.56 ft	01/14/1980
10' (6,450 cfs) Moderate Event - Flooding of lowlands, structures, and roads from Beckwourth to Sloat, including Portola. Sleepy Pines Motel and other low structures along river in Portola flood. Evacuation of homes on south end of West Street likely to begin. Sewage ponds in Portola may exceed capacity and may need to release to river. River near foundation of Veterans Hall in Portola.		
4	9.11 ft	01/25/1980
9.5' (5,600 cfs) Moderate Event - Flooding of lowlands, roads, and low-lying structures in reach from Beckwourth to Sloat California, including Portola. In Portola, Sleepy Pines Motel on CA Hwy 70 begins to experience some minor flooding. Water near bottom of large propane tanks along Hwy 70. South end of West Street floods. River encroaches within about a foot of the Veterans' Hall foundation and some low homes along river.		
5	9.03 ft	3/17/2011
9' (4,800 cfs) Minor Event - Flooding of lowlands, rural roads, agricultural areas, and some low structures between Beckwourth and Sloat California, including Portola. In Portola water encroaches within CA Hwy 70 road surface. Water level is nearing the Sleepy Pines Motel and is just below the propane tanks on Hwy 70. The south end of West Street floods.		
6	8.17 ft	03/31/1974
8.5' (4,100 cfs) Flood Stage - Some minor lowland flooding in reach between Beckwourth and Sloat California, including Portola.		
7	7.74 ft	03/27/1975
8' (3,440 cfs) – Minor Event - Some areas of minor out of bank flow in reach between Beckwourth and Sloat California, including Portola.		
8	7.73 ft	01/17/1978
7.5' (2,850 cfs) Action Stage Event - Some areas of very minor out of bank flow in reach between Beckwourth and Sloat, California. No incidents reported for Portola		
9	7.32 ft	01/18/1973
7.5' (2,850 cfs) Action Stage Event - Some areas of very minor out of bank flow in reach between Beckwourth and Sloat, California. No incidents reported for Portola		

Source: http://water.weather.gov/ahps2/hydrograph.php?wfo=rev&gage=mftc1

The State of California issued the California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides Disaster Declaration (DR-4699-CA) on 04/03/2023 for incident period 02/21/2023 through 07/10/2023. The City of Portola issued a Proclamation proclaiming existence of a local emergency on 03/08/2023. The severely undermined condition was first documented in the 9/26/2023 Underwater Dive Inspection (UWI) Report, which occurred after the disaster. During the event period starting February 21st, 2023 through July 10th, 2023, the State of California experienced a series of atmospheric river events that brought heavy rains and high winds. The heavy rains saturated the ground, caused severe flooding throughout the State of California. Loss of topsoil, parking lot gravel, infield and batting cage surfaces occurred.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Plumas County Planning Area, and the City of Portola. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the City is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Due to its physical setting straddling the Middle Fork of the Feather River, and being confined in a river canyon, the City of Portola is at significant risk for flood damage, especially in low lying areas along the river. Historically floods have been a result of either "cloudburst storms" or general rainstorms. Cloudburst storms are unpredictable, high intensity storms of relatively short duration (<6 hours) which produce short duration peak flows and relatively small runoff volumes. General rainstorms are longer duration storms which produce large runoff volumes. The impacts of these storms can be exacerbated when the rainfall occurs over frozen ground or existing snowpack (Plumas County, California Flood Insurance Study). Burn areas can also exacerbate flooding conditions due to increased runoff and debris-laden flows.

Recent evaluations of the Gulling Street Bridge (2010, National Bridge Inventory, NBI Structure Number 09C0130) indicates that the bridge is scour critical. A specific study would be required to identify the risk and present specific recommendations for mitigation. In addition to the Gulling Street Bridge being in the flood plain, a municipal water well and some of Portola's housing are also located in the flood plain. Finally, the City is concerned with damage to river walk and West End Park, damage to recreation areas including City baseball fields, and localized street flooding due to undersized culverts. Ensuring development is not in flood risk areas or properly planned to mitigate this hazard is of importance to the City.

Assets at Risk

Assets at risk from flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Portola's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer. Those residential parcels that intersect the flood zones were counted and multiplied by the 2023 Census Bureau average household factors for the City of Portola – 2.29. According to this analysis, there is a total population of 82 and 0 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table A-27.

Table A-27 City of Portola – Improved Residential Parcels and Population by Summary FEMA DFIRM Flood Zone

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
City of Portola	36	82	0	0

Source: FEMA DFIRM 03/02/2005, Plumas County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Certain structures in the City are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the City of Portola. The methodology described in Section 4.3.11 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table A-28 is a summary table for the City of Portola. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table A-29

breaks down Table A-28 and shows the same analysis further broken out by detailed FEMA flood zone and property use.

Table A-28 City of Portola – Count and Value of Parcels and Structures in Summary DFIRM Flood Zone

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	136	50	$5,846,857	$23,227,628	$1,322,526	$20,717,340	$51,114,351
0.2% Annual Chance Flood Hazard	2	1	$137,332	$374,544	$0	$374,544	$886,420
Other Areas	1,505	970	$31,966,182	$127,648,862	$592,546	$73,550,325	$233,757,915
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: FEMA DFIRM 03/02/2005, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table A-29 City of Portola – Count and Values of Parcels and Structures by Detailed DFIRM Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard							
Zone A							
Residential	10	1	$1,607,108	$266,607	$91,460	$133,304	$2,098,479
ROW/Utilities	2	0	$0	$0	$0	$0	$0
Zone A Total	**12**	**1**	**$1,607,108**	**$266,607**	**$91,460**	**$133,304**	**$2,098,479**
Zone AE							
Commercial	15	9	$1,175,806	$3,112,199	$11,385	$3,112,199	$7,411,589
Government	2	0	$0	$0	$0	$0	$0
Institutional	1	1	$6,510	$147,552	$0	$147,552	$301,614
Residential	37	20	$634,510	$1,939,439	$5,280	$969,720	$3,548,949
ROW/Utilities	1	0	$0	$0	$0	$0	$0
Zone AE Total	**56**	**30**	**$1,816,826**	**$5,199,190**	**$16,665**	**$4,229,471**	**$11,262,152**
Zone AE: Regulatory Floodway							
Commercial	8	4	$1,441,811	$14,947,300	$1,214,401	$14,947,300	$32,550,812
Government	7	0	$0	$0	$0	$0	$0

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Institutional	1	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0	$0
Residential	41	15	$981,112	$2,814,531	$0	$1,407,266	$5,202,909
ROW/Utilities	10	0	$0	$0	$0	$0	$0
Zone AE: Regulatory Floodway Total	**68**	**19**	**$2,422,923**	**$17,761,831**	**$1,214,401**	**$16,354,566**	**$37,753,721**
1% Annual Chance Flood Hazard Total	**136**	**50**	**$5,846,857**	**$23,227,628**	**$1,322,526**	**$20,717,340**	**$51,114,351**
0.2% Annual Chance Flood Hazard							
Zone X (shaded)							
Commercial	2	1	$137,332	$374,544	$0	$374,544	$886,420
Zone X (shaded) Total	**2**	**1**	**$137,332**	**$374,544**	$0	**$374,544**	**$886,420**
0.2% Annual Chance Flood Hazard Total	**2**	**1**	**$137,332**	**$374,544**	**$0**	**$374,544**	**$886,420**
Other Areas							
Zone X (unshaded)							
Commercial	121	89	$4,828,348	$12,267,576	$258,454	$12,267,576	$29,621,954
Government	25		$0	$0	$0	$0	$0
Industrial	10	3	$325,236	$230,745	$0	$346,118	$902,099
Institutional	8	7	$218,388	$5,322,010	$147,200	$5,322,010	$11,009,608
Miscellaneous	1		$19	$0	$0	$0	$19
Recreational	1		$0	$0	$0	$0	$0
Residential	1,270	849	$24,596,595	$104,058,761	$186,892	$52,029,381	$180,871,629
ROW/Utilities	35		$0	$0	$0	$0	$0
Zone X (unshaded) Total	**1,471**	**948**	**$29,968,586**	**$121,879,092**	**$592,546**	**$69,965,084**	**$222,405,308**
Zone D (unmapped)							
Agricultural	2	1	$536,231	$1,400,712	$0	$1,400,712	$3,337,655
Residential	31	21	$1,461,365	$4,369,058	$0	$2,184,529	$8,014,952
ROW/Utilities	1	0	$0	$0	$0	$0	$0
Zone D (unmapped) Total	**34**	**22**	**$1,997,596**	**$5,769,770**	**$0**	**$3,585,241**	**$11,352,607**
Other Areas Total	**1,505**	**970**	**$31,966,182**	**$127,648,862**	**$592,546**	**$73,550,325**	**$233,757,915**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: FEMA DFIRM 03/02/2005, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table A-30 summarizes Table A-29 and shows City of Portola loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. According to Table A-29 and Table A-30, the City of Portola has 50 parcels and $45.3 million of structure and contents values or values in the 1% annual chance flood zone, and 1 improved parcel and $749,088 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, there is a 1% chance in any given year of a flood event causing $9 million in damage and a 0.2% chance in any given year of a flood event causing $149,918 in damage in the City of Portola. The loss ratio of 0.179% indicates that flood losses for the 1% annual chance flood and 0.003% for the 0.2% annual chanced flood would be minor and the City would be able recover relatively quickly.

Table A-30 City of Portola – Flood Loss Estimates

Flood Zone	Total Parcel Count	Imp. Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	136	50	$5,846,857	$23,227,628	$1,322,526	$20,717,340	$45,267,494	$9,053,499	0.179%
0.2% Annual Chance Flood Hazard	2	1	$137,332	$374,544	$0	$374,544	$749,088	$149,818	0.003%
Total	**138**	**51**	**$5,984,189**	**$23,602,172**	**$1,322,526**	**$21,091,884**	**$46,016,582**	**$9,203,317**	**0.182%**

Source: FEMA DFIRM 03/02/2005, Plumas County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

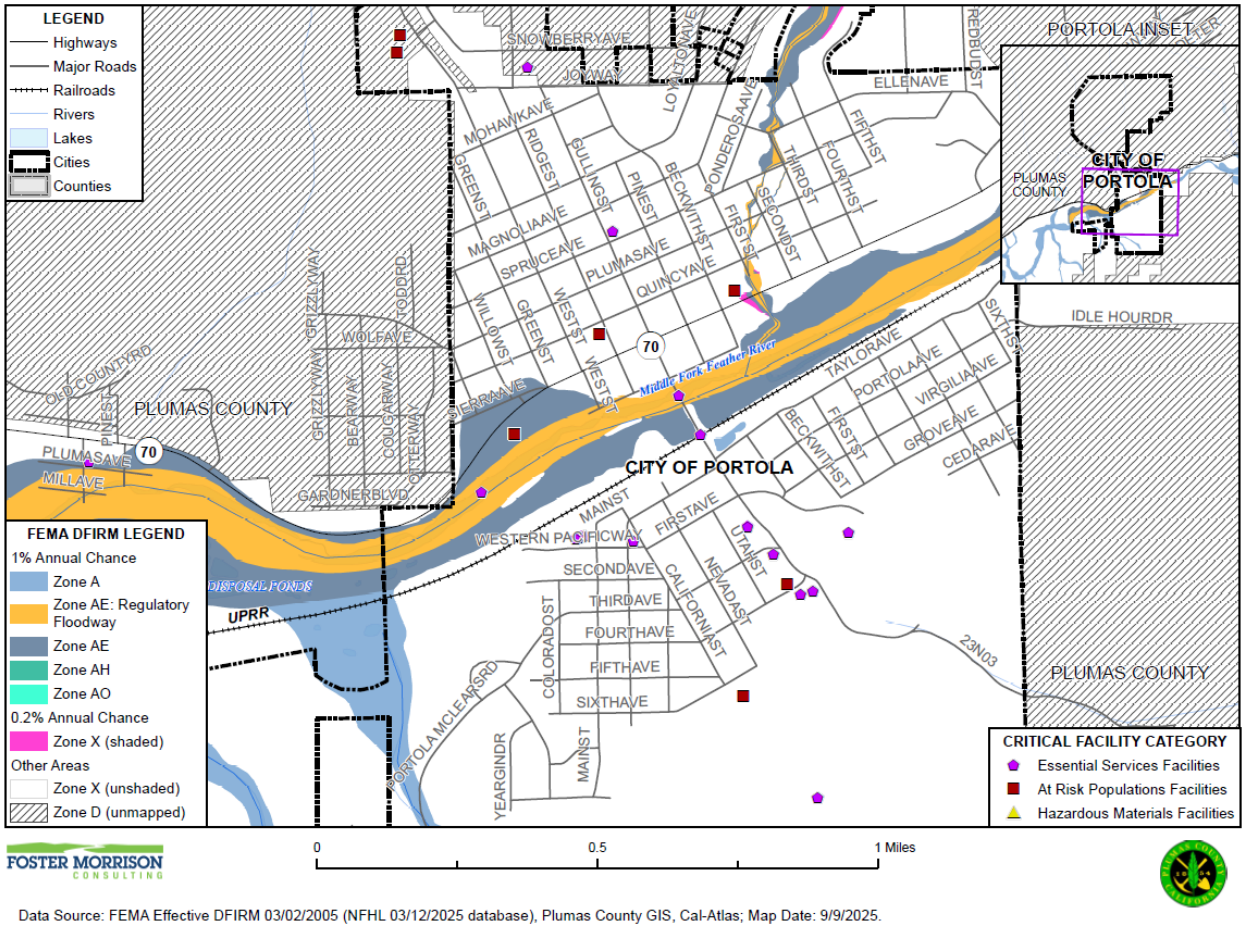
**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Critical Facilities and Infrastructure

1% and 0.2% annual chance flooding present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each FEMA DFIRM flood zone. Using GIS, the FEMA DFIRM flood zones were overlayed on the critical facility GIS layer. This is shown

on Figure A-26 for the FEMA DFIRM flood zones. Table A-63 details which critical facilities fall in which FEMA DFIRM flood zones. Details of critical facility categories, type, name, and address by FEMA DFIRM flood zones are listed in Appendix F.

Figure A-20 City of Portola – Critical Facilities in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 03/02/2005 (NFHL 03/12/2025 database), Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table A-31 City of Portola – Critical Facilities by Category in FEMA DFIRM Flood Zones

Jurisdiction / Flood Zone	Critical Facility Category and Critical Facility Type	Facility Count
Portola		
1% Annual Chance Flood Hazard		
Zone AE: Regulatory Floodway	**Essential Services Facilities**	
	Public Utility Plant and Substation Facilities	1
	Transportation Lifeline Systems	1
	Essential Services Facilities Total	**2**
	At Risk Populations Facilities	
	Public Safety	1
	At Risk Populations Facilities Total	**1**

Jurisdiction / Flood Zone	Critical Facility Category and Critical Facility Type	Facility Count
	Zone AE: Regulatory Floodway Total	**3**
1% Annual Chance Flood Hazard Total		**3**
Other Areas		
Zone X (unshaded)	**Essential Services Facilities**	
	Emergency Medical	1
	Essential Government Operations	3
	Public Safety	2
	Public Utility Plant and Substation Facilities	6
	Transportation Lifeline Systems	1
	Essential Services Facilities Total	**13**
	At Risk Populations Facilities	
	Designated Emergency Shelter	1
	School	3
	At Risk Populations Facilities Total	4
	Zone X (unshaded) Total	**17**
Zone D (unmapped)	**Essential Services Facilities**	
	Public Utility Plant and Substation Facilities	1
	Essential Services Facilities Total	**1**
	At Risk Populations Facilities	
	School	3
	At Risk Populations Facilities Total	**3**
	Zone D (unmapped) Total	**4**
Other Areas Total		**21**
Portola Total		**24**

Source: FEMA DFIRM 03/02/2005, City of Portola

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure A-17 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood insurance for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

The City of Portola joined the National Flood Insurance Program (NFIP) as an emergency entrant of April 14, 1975 and as a regular entrant on July 18, 1985. The City does not participate in CRS program. NFIP

data indicates that as of December 2, 2024, there were two flood insurance policies in force in the City with $514,000 of coverage. Both policies were for single family homes were residential (single-family homes). One was in an A Zone, and one was in B, C, and X zones. There have been five historical claims for flood losses totaling $37,720.02. NFIP data further indicates that there are no repetitive loss (RL) and no severe repetitive loss (SRL) buildings in the City of Portola. There have been one substantial damage claims since 1978 in the City.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 36 improved parcels within the 1% annual chance flood zone, 2 of those parcels maintain flood insurance. This can be seen on Table A-32.

Table A-32 City of Portola – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Portola	36	2	5.5%

Source: FEMA DFIRM 03/02/2005, Plumas County 2024 Parcel/Assessor Data, NFIP CIS data.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Portola include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population in the City of Portola is expected to shrink with the rest of the County. If this were to change, additional growth within the 1% and 0.2% annual chance floodplains would place additional populations at risk to flood. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from flooding and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. However, City building codes and the City's floodplain ordinance are in effect to reduce this risk and should be updated as necessary to continue to address future flood conditions.

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on built out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

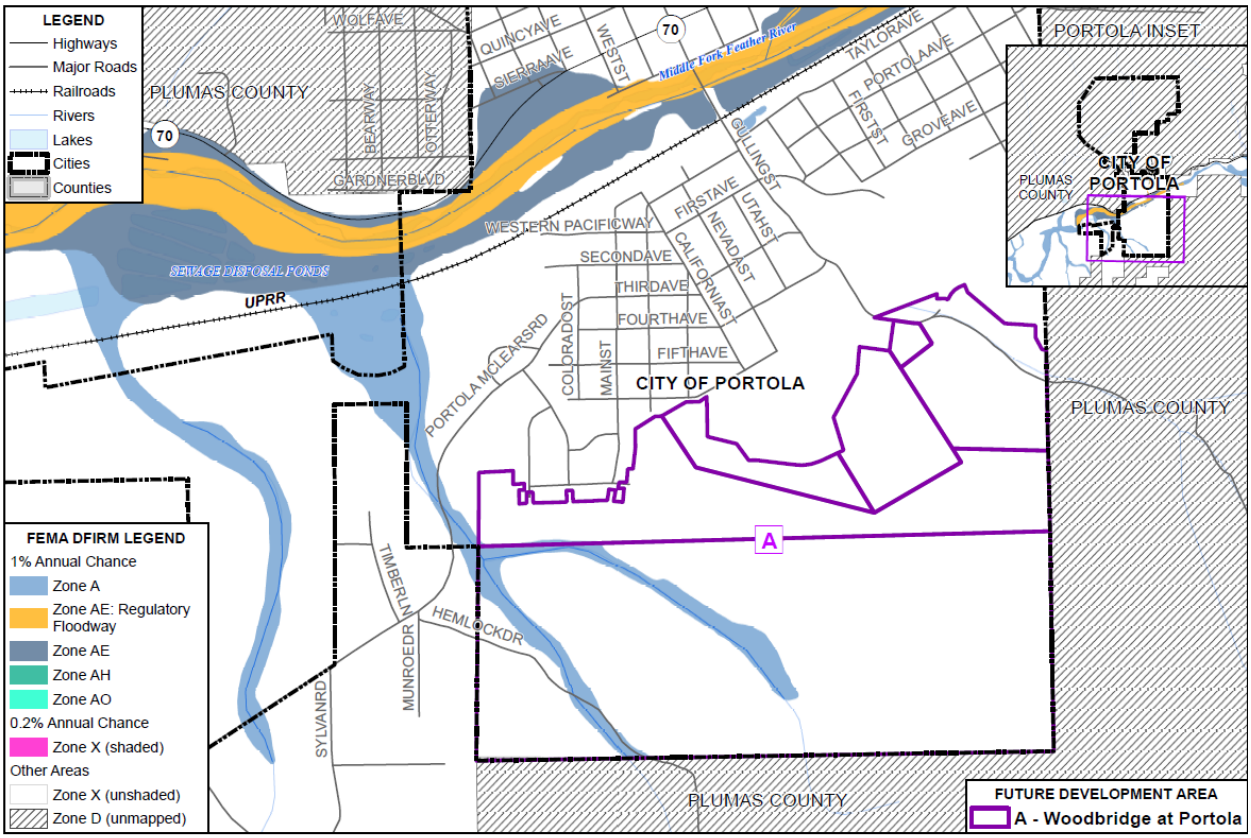
The City enforces its floodplain management ordinance. The City's floodplain ordinance should be updated to ensure new development within floodplains is adequately protected. More detail on the specifics of the floodplain ordinance can be found in the Capability section below.

Future development areas and their vulnerability to 1% and 0.2% annual chance flood are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each DFIRM flood zone. Figure A-21 shows the locations of the future development area overlayed on the DFIRM flood zones. Table A-33 shows which flood zones the future development area lies in. As shown, portions of two parcels fall in the 1% annual chance flood zone.

Figure A-21 City of Portola – Future Development Areas in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 03/02/2005 (NFHL 03/12/2025 database), Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Table A-33 City of Portola – Future Development Parcels and Acres in FEMA DFIRM Flood Zones

Future Development / Flood Zones	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Woodbridge at Portola, Inc.						
1% Annual Chance Flood Hazard						
Zone A	2	0	2	321.76	0	321.76
1% Annual Chance Flood Hazard Total	**2**	**0**	**2**	**321.76**	**0**	**321.76**
Other Areas						
Zone X (unshaded)	4	0	4	76.76	0	76.76
Other Areas Total	**4**	**0**	**4**	**76.76**	**0**	**76.76**

Future Development / Flood Zones	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Grand Total	**6**	**0**	**6**	**398.52**	**0**	**398.52**

Source: FEMA 03/02/2005 DFIRM, City of Portola

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Portola is subject to localized flooding throughout the City. This is discussed in Table A-34 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods. There would most likely have been localized flood events during the disaster declarations from flood as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted.

City of Portola Events

The City noted that localized flood event past occurrences are discussed in the Flood:1%/0.2% Annual Chance Flood section above. Localized flooding is an annual occurrence at areas in the City.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the City. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the City are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the City has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the City and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the City. The lack of or inadequate drainage infrastructure in the City contributes to localized flooding issues. Of concern to the City is future developments. Ensuring the developments are not in flood risk areas or properly planned.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Portola are summarized in Table A-34.

Table A-34 City of Portola – List of Localized Flooding Problem Areas

Road/Location Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Riverwalk/Disc Golf Course	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Road/Location Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Riverside & Gulling	Yes	Yes	Yes	Yes	No	Yes	No
Taylor & Gulling	Yes	Yes	Yes	Yes	No	Yes	No
Rock & Sierra	Yes	Yes	Yes	Yes	No	Yes	No
Highway 70	Yes	Yes	Yes	Yes	No	Yes	No

Source: City of Portola

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the City.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the City actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Portola include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the City to localized flood.
- Population in the City of Portola is expected to shrink with the larger County. If this were to change, additional population growth would likely bring continued diversity to the City. This can also impact the vulnerable populations, like low-income individuals and households living in areas that are typically more hazardous. Vulnerable population groups such as low-income individuals and households living in flood prone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability

of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.

- Land use planning should be proactive to address future hazard conditions. Development in more urban areas causes an increase in peak flow and stormwater runoff. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. These considerations will also aid the vulnerable populations within the City, since these groups face a disproportionate impact from hazards. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Hazardous Material Transportation

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

According to the Environmental Protection Agency (EPA), a hazardous material is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained.

The U.S. Occupational Safety and Health Administration's (OSHA) definition of hazardous material includes any substance or chemical which is a "health hazard" or "physical hazard," including: chemicals which are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, oxidizers, pyrophoric, unstable-reactive or water-reactive; and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapors, mists or smoke which may have any of the previously mentioned characteristics.

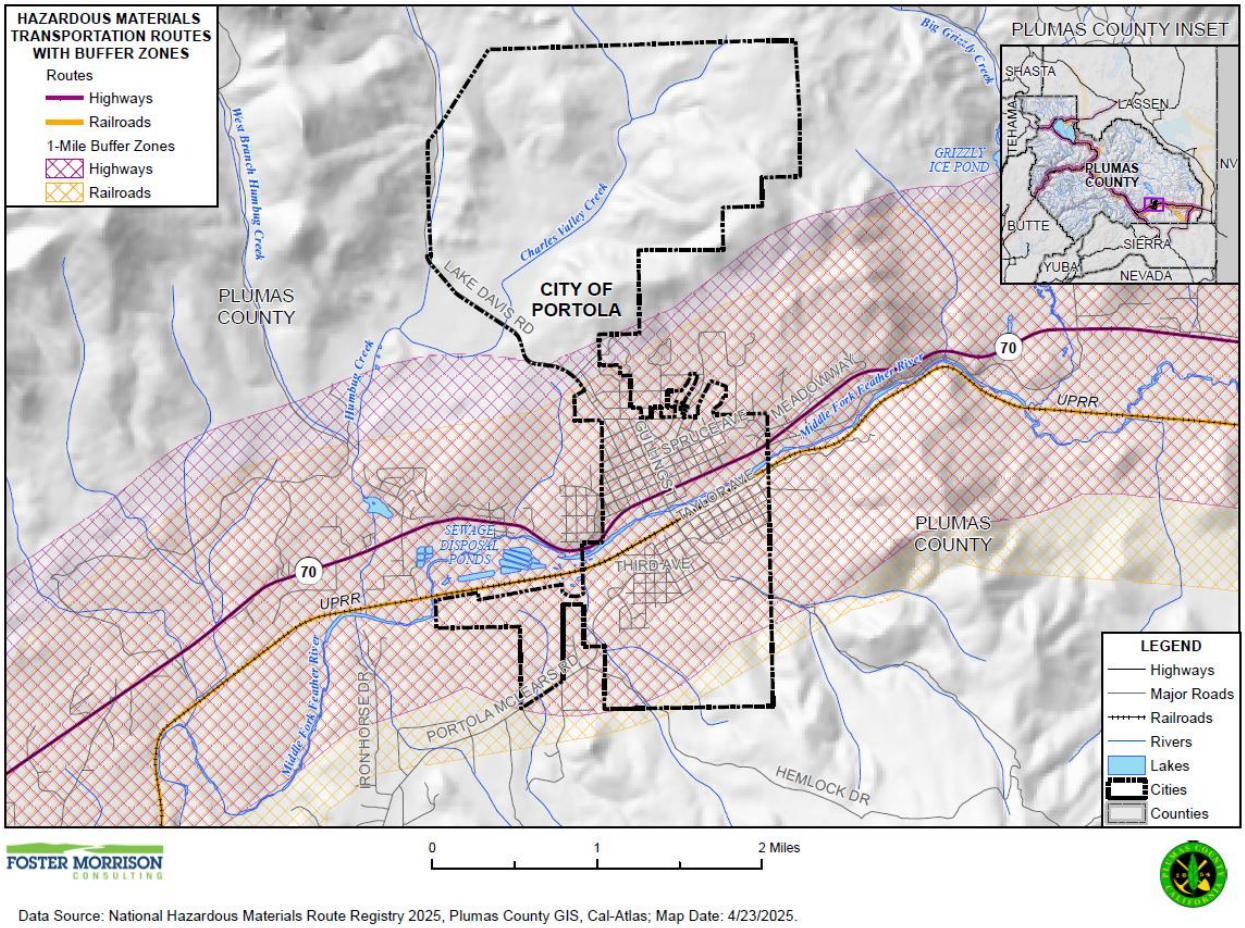
The EPA incorporates the OSHA definition and adds any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. The EPA maintains a list of 366 chemicals that are considered extremely hazardous substances (EHS). This list was developed under the Superfund Amendments and Reauthorization Act. The presence of EHSs in amounts in excess of a threshold planning quantity requires that certain emergency planning activities be conducted.

A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of water, people, and property. The effects may involve a local area or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual, such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Location and Extent

In Plumas County there are multiple hazardous materials transportation routes. State Roads 36, 49, 70, 89, and 147 are all hazardous materials routes. The Union Pacific, BNSF, Quincy Railroad, and Almanor Railroad are railroad hazardous materials. Of these, SR 70 and the Union Pacific Railroad run through Portola. Figure A-22 shows the hazardous materials transportation corridors (for roadways and rail) in the City as well as the one-mile buffer zone (on each side of the corridor for a two-mile total buffer) used for this analysis as detailed further in the methodology below. Geographic hazardous materials buffer zones for the City are detailed by highway in Table A-35 and by railroad in Table A-36.

Figure A-22 City of Portola – Hazardous Materials Highway and Railroad Routes and Buffer Zones



Data Source: National Hazardous Materials Route Registry 2025, Plumas County GIS, Cal-Atlas; Map Date: 4/23/2025.

https://www.google.com/maps/d/viewer?mid=1Yyz6yA9I9I5DQ5Gb2U1X7f_8enM&hl=en_US&ll=40.06685558595711%2C-120.77095846290442&z=10

Table A-35 City of Portola – Geographical Extent of Hazardous Materials Transportation Buffer Zones for Highways

Hazardous Materials Routes / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Highway 70						
Agricultural	10	0.3%	10	0.5%	0	0.0%
Commercial	41	1.2%	25	1.1%	16	1.3%
Federal Lands	0	0.0%	0	0.0%	0	0.0%
Government	129	3.7%	0	0.0%	129	10.3%
Industrial	9	0.3%	1	0.1%	8	0.6%
Institutional	23	0.7%	5	0.2%	19	1.5%
Miscellaneous	7	0.2%	0	0.0%	7	0.5%
Recreational	2	0.1%	0	0.0%	2	0.1%
Residential	974	27.9%	263	11.7%	711	56.7%
ROW/Utilities	162	4.6%	0	0.0%	162	12.9%

Source: National Hazardous Materials Routes Registry (2025)

Table A-36 City of Portola – Geographical Extent of Hazardous Materials Transportation Buffer Zones for Railroads

Hazardous Materials Routes / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
UP / BNSF						
Agricultural	0	0.0%	0	0.0%	0	0.0%
Commercial	41	1.2%	25	1.1%	16	1.3%
Federal Lands	0	0.0%	0	0.0%	0	0.0%
Government	129	3.7%	0	0.0%	129	10.3%
Industrial	9	0.3%	1	0.1%	8	0.6%
Institutional	23	0.7%	5	0.2%	19	1.5%
Miscellaneous	7	0.2%	0	0.0%	7	0.5%
Recreational	2	0.1%	0	0.0%	2	0.1%
Residential	1,031	29.5%	248	11.1%	783	62.4%
ROW/Utilities	161	4.6%	0	0.0%	161	12.8%

Source: National Hazardous Materials Routes Registry (2025)

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations for hazardous materials in the County.

NCDC Events

The NCDC does not track hazardous materials events.

Pipeline and Hazardous Materials Safety Administration Events

The USDOT Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety performs a range of functions to support the safe transport of hazardous materials. One of these functions is the tracking of hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in the County. A summary of rail and highway incidents since 1970 in the Plumas County Planning Area are shown in Section 4.3.13. 11 separate events were contained in the database. None of these were known to affect the City.

City of Portola Events

The City noted no past events of hazardous materials transportation where damages occurred.

Climate Change and Hazardous Materials

Climate change is unlikely to affect hazardous materials transportation incidents.

Vulnerability to Hazardous Materials Transportation

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified values will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. The most significant impact from hazardous materials transport is life safety. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key Planning Area values relative to the hazardous materials transportation corridors identified above.

Much of the City is at some measure of vulnerability to hazardous materials transport. An assessment of a community's vulnerability begins with an understanding of local exposure to hazardous materials transport. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned that the Highway 70 corridor and the railroad runs through the middle of city. A15 County Road may also see the transport of hazardous materials. Should a spill on any of these routes occur, much of the City would be in a possible evacuation zone. The City plans to pursue an emergency response plan in conjunction with the County in the future.

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at some vulnerability to a hazardous materials transportation release. Certain vulnerable populations are at the greatest risk to the effects of hazardous materials. Vulnerable populations include:

- The unsheltered
- Those with breathing difficulties or other underlying health conditions
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals who work, exercise, or physically train outdoors
- Individuals with impaired mobility

To determine the overall populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway and railroad corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel and structure data and results tabulated for the Planning Area, as found in Table A-37. Those residential parcel polygons that intersect the buffered corridor were counted and multiplied by the 2023 Census Bureau average household factors for Portola – 2.29. According to the analysis, there are 2,075 residents in the City in the hazardous materials buffer zones associated with the hazardous materials transportation routes and potentially at risk.

Table A-37 Plumas County Planning Area–Improved Residential Parcels and Populations at Risk in Hazardous Materials Buffer Zones

Jurisdiction	Improved Residential Parcels	Population at Risk
City of Portola	906	2,075

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data, 2023 US Census American Community Survey Average Household Size – City of Portola (2.29).

Structures

Structures in the City have some measure of risk to hazardous materials which can affect the built environment of the City. During a hazardous materials transportation spill, it is generally the people that are at risk to the effects of the spill. During a spill, buildings, property, and their values are at a lessor risk;

however, given the location and breadth of hazardous materials routes in the City, an analysis is performed here. The methodology described in Section 4.3.13 of the Base Plan was followed in determining structures and values at risk to the hazardous materials buffer zones. Analysis results for Portola are summarized in Table A-38. This analysis is broken down in in Table A-39 for highways and in Table A-40 for railroads. These tables summarize by total parcel counts, improved parcel (structure) counts, and their improved and land values and the estimated contents replacement values based on the CRV factors detailed in Section 4.2.1 of the Base Plan.

Table A-38 City of Portola – Count and Value of Parcels in All (Railroad and Highway) Hazardous Materials Transportation Buffer Zone by Jurisdiction

Hazardous Materials Routes	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Hazardous Materials Route	1,642	1,021	$37,943,783	$151,251,034	$1,915,072	$94,642,209	$285,752,098
Not in a Hazardous Materials Route	1	0	$6,588	$0	$0	$0	$6,588
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data,

Table A-39 City of Portola – Count and Value of Parcels in Highway Hazardous Materials Transportation Buffer Zone by Route and Property Use

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Hazardous Materials Route							
Agricultural	1	1	$529,643	$1,400,712	$0	$1,400,712	$3,331,067
Commercial	146	103	$7,583,297	$30,701,619	$1,484,240	$30,701,619	$70,470,775
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	34	0	$0	$0	$0	$0	$0
Industrial	10	3	$325,236	$230,745	$0	$346,118	$902,099
Institutional	10	8	$224,898	$5,469,562	$147,200	$5,469,562	$11,311,222
Miscellaneous	2	0	$19	$0	$0	$0	$19
Recreational	1	0	$0	$0	$0	$0	$0
Residential	1,389	906	$29,280,690	$113,448,396	$283,632	$56,724,198	$199,736,916
ROW/Utilities	49	0	$0	$0	$0	$0	$0
Hazardous Materials Route Total	**1,642**	**1,021**	**$37,943,783**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,752,098**

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Not in a Hazardous Materials Route							
Agricultural	1	0	$6,588	$0	$0	$0	$6,588
Commercial	0	0	$0	$0	$0	$0	$0
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0	$0
Recreational	0	0	$0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0	$0
ROW/Utilities	0	0	$0	$0	$0	$0	$0
Not in a Hazardous Materials Route Total	**1**	**0**	**$6,588**	**$0**	**$0**	**$0**	**$6,588**
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data
To avoid duplication of parcel count, the parcels located in areas where multiple haz-mat route buffers overlap were assigned the route grouping listed above.

Table A-40 City of Portola – Count and Value of Parcels in Railroad Hazardous Materials Transportation Buffer Zone by Route and Property Use

Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Highway 70							
Agricultural	1	1	$529,643	$1,400,712	$0	$1,400,712	$3,331,067
Commercial	146	103	$7,583,297	$30,701,619	$1,484,240	$30,701,619	$70,470,775
Federal Lands	0	0	$0	$0	$0	$0	$0
Government	34	0	$0	$0	$0	$0	$0
Industrial	10	3	$325,236	$230,745		$346,118	$902,099
Institutional	10	8	$224,898	$5,469,562	$147,200	$5,469,562	$11,311,222
Miscellaneous	2	0	$19	$0	$0	$0	$19
Recreational	1	0	$0	$0	$0	$0	$0
Residential	1,389	906	$29,280,690	$113,448,396	$283,632	$56,724,198	$199,736,916
ROW/Utilities	49	0	$0	$0	$0	$0	$0

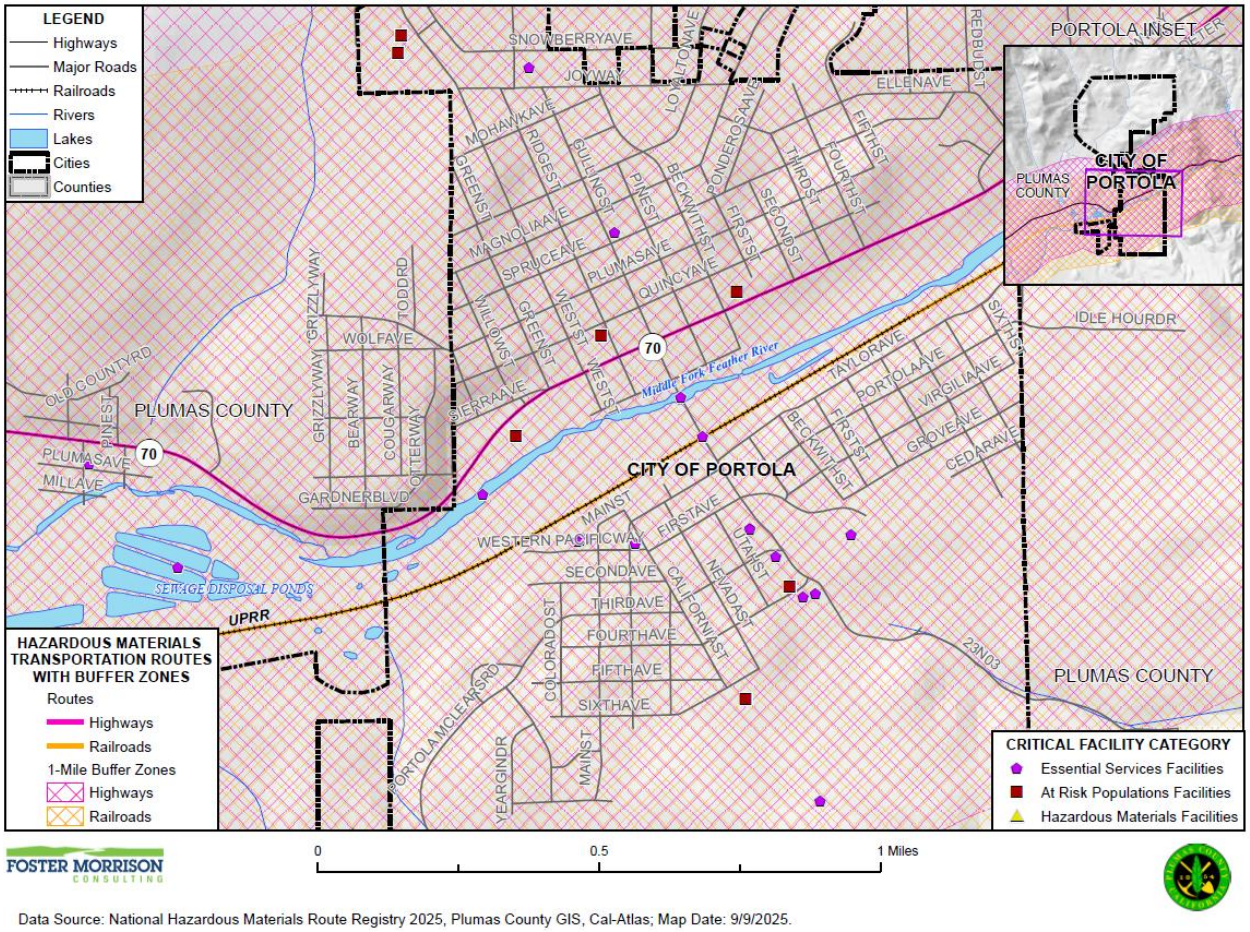
Hazardous Materials Routes/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Highway 70 Total	**1,642**	**1,021**	**$37,943,783**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,752,098**

Source: National Hazardous Materials Routes Registry (2025), Plumas County 2024 Parcel/Assessor's Data
To avoid duplication of parcel count, the parcels located in areas where multiple haz-mat route buffers overlap were assigned the route grouping listed above.

Critical Facilities and Infrastructure

Hazardous materials transport present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into a highway or railroad hazardous materials buffer zones. Using GIS, the hazardous materials buffer zones were overlayed on the critical facility GIS layer. This is shown on Figure A-23 for the hazardous materials buffer zones. Table A-41 details which critical facilities fall in which hazardous materials buffer for highways, while Table A-42 details which critical facilities fall in the hazardous materials buffer zones for rail lines.. Details of critical facility categories, type, name, and address by hazardous materials buffer are listed in Appendix F.

Figure A-23 City of Portola – Critical Facilities in Hazardous Materials Buffer Zones



Data Source: National Hazardous Materials Route Registry 2025, Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table A-41 City of Portola – Critical Facilities by Category in Highway Hazardous Materials Buffer Zones

Jurisdiction / Hazardous Materials Routes	Critical Facility Category / Critical Facility Type	Facility Count
Portola		
Highway 70	**Essential Services Facilities**	
	Emergency Medical	1
	Essential Government Operations	3
	Public Safety	2
	Public Utility Plant and Substation Facilities	8
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	**16**
	At Risk Populations Facilities	
	Designated Emergency Shelter	1
	Public Safety	1
	School	6
	At Risk Populations Facilities Total	**8**
	Highway 70 Total	**24**
Portola Total		**24**

Source: National Hazardous Materials Routes Registry (2025), City of Portola

Table A-42 City of Portola – Critical Facilities by Category in Railroad Hazardous Materials Buffer Zones

Jurisdiction / Hazardous Materials Routes	Critical Facility Category / Critical Facility Type	Facility Count
Portola		
UP/BNSF	**Essential Services Facilities**	
	Emergency Medical	1
	Essential Government Operations	3
	Public Safety	2
	Public Utility Plant and Substation Facilities	8
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	**16**
	At Risk Populations Facilities	
	Designated Emergency Shelter	1
	Public Safety	1
	School	6

Jurisdiction / Hazardous Materials Routes	Critical Facility Category / Critical Facility Type	Facility Count
	At Risk Populations Facilities Total	**8**
	Highway 70 Total	**24**
Portola Total		**24**

Source: National Hazardous Materials Routes Registry (2025), City of Portola

Natural, Historic, and Cultural Resources

Any natural, historic, or cultural resource that falls in the buffer zone shown on Figure A-22 has some measure of vulnerability. If a release caused a fire, it could affect historic and cultural resources in the City. Natural resources can be more greatly affected by a hazardous materials spill. Clean up of a spill into a natural resource (such as a creek, stream, or river) may be difficult to complete. Hazardous releases can significantly harm wildlife and habitat areas. The contamination also can make its way up the food chain, affecting the food supply. Open water and wetland environments experience significant exposure to hazardous materials events, which may result in further loss of ecosystem functions.

Impacts from Hazardous Materials Transportation

Impacts from hazardous materials transportation incidents vary by location and severity of any given event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it a hazardous materials transportation release could have potential adverse impacts to affected areas of the City as described below. However, the majority releases in the City are minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Contaminated water supplies
- Contaminated buildings
- Soil contamination that results in mass die-off of vegetation
- Fire and explosions
- Public health impacts
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Business closures and significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

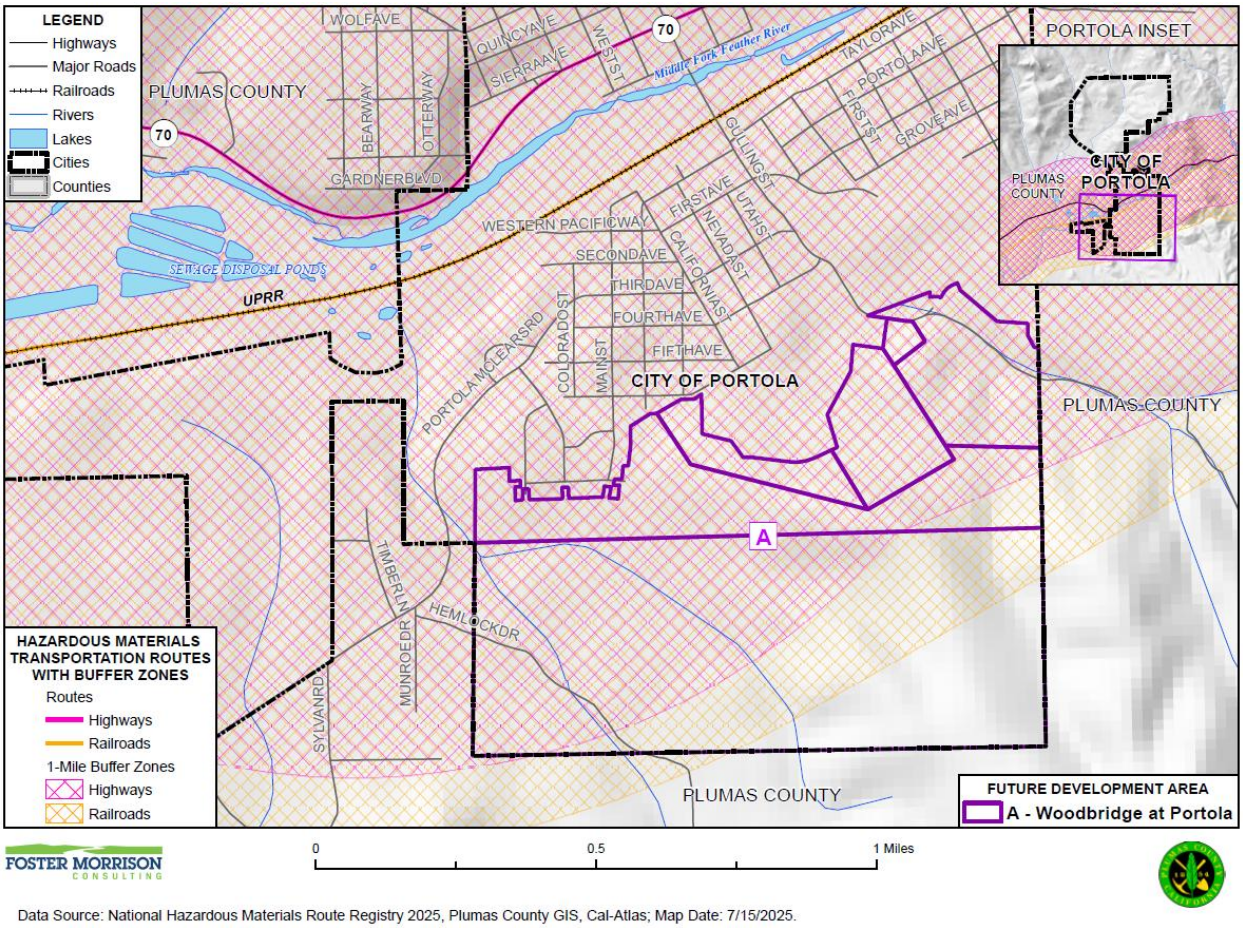
- Climate change is unlikely to exacerbate future hazardous material transportation events and associated impacts and vulnerability of the City.
- Population in City is expected to decrease. Vulnerable population groups could face disproportionate effects from a hazardous materials release and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. However, it is difficult to locate development outside of the hazardous materials buffer zones, due to the location of rail lines and highways in the City. Building codes do not account for hazardous materials spills or incidents.

Development will continue to happen within hazardous materials transportation corridors due to the large area within the City located within these corridors. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route. Future development areas and their vulnerability to hazardous materials transport are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within both the highway and railroad hazardous material buffer zones. Figure A-24 shows the locations of the future development area overlayed on the hazardous materials buffer zones. As shown in Table A-43, portions of all of these parcels fall in the hazardous material buffer zones from both highways and railroads.

Figure A-24 City of Portola – Future Development Areas in Highway and Railroad Hazardous Materials Buffer Zones



Data Source: National Hazardous Materials Route Registry 2025, Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Table A-43 City of Portola – Future Development Parcels and Acres in Highway and Railroad Hazardous Materials Buffer Zones

Future Development / Hazardous Material Transport Route	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Woodbridge at Portola, Inc.						
Highways						
Highway 70	6	0	6	398.52	0	398.52
Highways Total	**6**	**0**	**6**	**398.52**	**0**	**398.52**
Railroads						
UP/BNSF	6	0	6	398.52	0	398.52
Railroad Total	**6**	**0**	**6**	**398.52**	**0**	**398.52**

Source: CalTrans, City of Portola

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

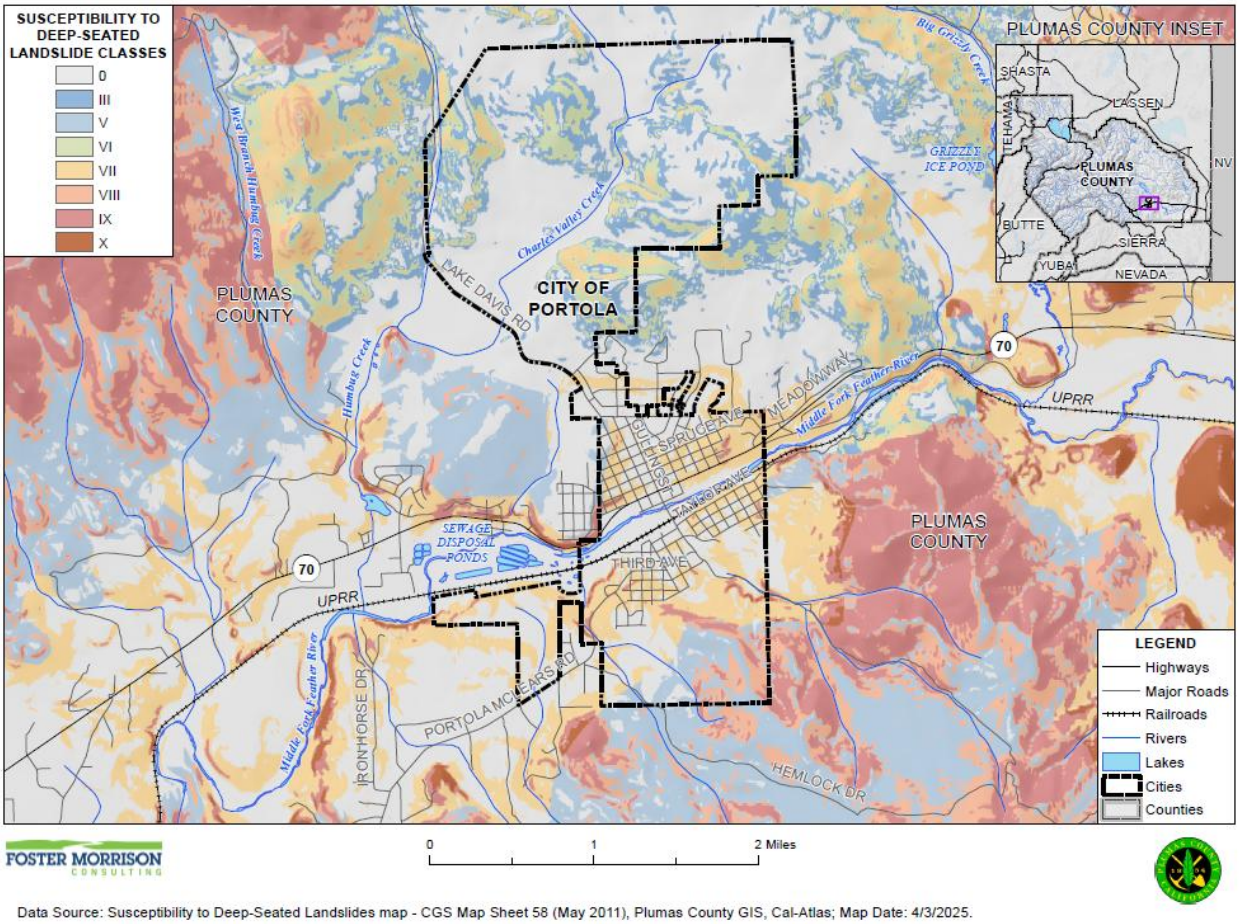
The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas bordering the City where the topography is characterized by rolling hills and ridges.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides may also occur in fire burn scar areas.

Figure A-25 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure A-25 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table A-44. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the portions of the City and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure A-25 City of Portola – Susceptibility to Deep-Seated Landslides



FOSTER MORRISON CONSULTING

Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 4/3/2025.

Table A-44 City of Portola – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Deep Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	2,001	57%	1,372	61%	629	50%
III	402	12%	402	18%	0.5	0.04%
V	116	3%	5	0.2%	111	9%
VI	248	7%	248	11%	-	
VII	598	17%	204	9%	394	31%
VIII	60	2%	1	0.03%	59	5%
IX	59	2%	4	0.2%	55	4%
X	6	0.2%	1	0.1%	5	0.4%
Grand Total	**3,491**	**100%**	**2,237**	**100%**	**1,254**	**100%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with solely landslides in Plumas County; however, as shown in Table A-45, there have been 9 state and 10 federal disaster declarations for flood which included landslides as a component.

Table A-45 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993. These were not known to affect the City.

City of Portola Past Occurrences

The City noted no past occurrences since the 2019 LHMP was completed.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the City are at some measure of vulnerability to landslide. This is true when atmospheric river or heavy rain and storm events occur. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that Highway 70 is of concern for landslide. If the highway were affected, means of ingress and egress for the city would be impacted, especially during an emergency situation. Evacuation would become more challenging and emergency response could be delayed or stopped completely.

Assets at Risk

Assets at risk from landslide include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City's residential population residing within these hazard areas, an analysis was conducted of those who physically reside in the mapped landslide susceptibility areas. The CGS Susceptibility to Deep-Seated Landslide maps were overlayed on the parcel layer and linked to the assessor data. Those residential parcel polygons that intersect the High or Very High risk areas (Class VII or higher) were counted and multiplied by the 2023 Census Bureau average household factors for Portola – 2.29. Analysis results are shown in Table A-46. According to this analysis, there is a total population of 1,297 residents of the City at high or very high risk to landslides.

Table A-46 City of Portola – Improved Residential Parcels and Population in Susceptibility to Deep-Seated Landslides - Classes VII, VIII, IX, and X

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population at Risk
Class VII		
City of Portola	513	1,175
Class VIII		
City of Portola	0	0
Class IX		
City of Portola	44	101
Class X		
City of Portola	9	21

Source: CGS, Plumas County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Landslides can affect the built environment of the City and those structures located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The CGS Deep-Seated Landslide layer was overlaid with the City parcel (structure) layer in GIS and linked to the assessor data. The mapped landslide susceptibility areas are shown on Figure A-25. Table A-47 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City for landslide susceptibility areas. Table A-48 shows the same analysis further broken out by property use.

Table A-47 City of Portola – Count and Value of Parcels and Structures Susceptible to Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
0	540	395	$12,942,889	$49,148,720	$53,696	$29,001,715	$91,147,020
III	2	0	$56,463	$0	$0	$0	$56,463
V	22	10	$560,793	$2,627,044	$0	$2,241,074	$5,428,911
VI	1	1	$21,106	$2,429	$0	$1,215	$24,750
VII	940	557	$19,519,134	$86,443,389	$1,678,026	$55,910,625	$163,551,174
VIII	2	1	$529,643	$1,400,712	$0	$1,400,712	$3,331,067
IX	105	48	$2,773,597	$6,470,686	$35,120	$3,507,842	$12,787,245
X	31	9	$1,546,746	$5,158,054	$148,230	$2,579,027	$9,432,057
Not in a Landslide Class	0	0	$0	$0	$0	$0	$0
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	$1,915,072	**$94,642,209**	**$285,758,686**

Source: CGS, Plumas County 2024 Parcel/Assessor Data

Table A-48 City of Portola – Count and Value of Parcels and Structures in Deep-Seated Landslide Classes by Property Use

Susceptibility to Deep-Seated Landslide Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
0							
Commercial	89	65	$3,465,499	$8,854,710	$45,566	$8,854,710	$21,220,485
Government	13	0	$0	$0	$0	$0	$0
Institutional	1	0	$0	$0	$0	$0	$0
Miscellaneous	1	0	$19	$0	$0	$0	$19
Residential	434	330	$9,477,371	$40,294,010	$8,130	$20,147,005	$69,926,516
ROW/Utilities	2	0	$0	$0	$0	$0	$0
0 Total	**540**	**395**	**$12,942,889**	**$49,148,720**	**$53,696**	**$29,001,715**	**$91,147,020**
III							
Agricultural	1	0	$6,588	$0	$0	$0	$6,588
Residential	1	0	$49,875	$0	$0	$0	$49,875
III Total	**2**	**0**	**$56,463**	**$0**	**$0**	**$0**	**$56,463**
V							
Commercial	1	1	$234,257	$1,855,104	$0	$1,855,104	$3,944,465
Government	1	0	$0	$0	$0	$0	$0
Residential	20	9	$326,536	$771,940	$0	$385,970	$1,484,446
V Total	**22**	**10**	**$560,793**	**$2,627,044**	**$0**	**$2,241,074**	**$5,428,911**
VI							
Residential	1	1	$21,106	$2,429	$0	$1,215	$24,750
VI Total	**1**	**1**	**$21,106**	**$2,429**	**$0**	**$1,215**	**$24,750**
VII							
Commercial	49	34	$3,462,174	$19,594,360	$1,427,289	$19,594,360	$44,078,183
Government	17	0	$0	$0	$0	$0	$0
Industrial	10	3	$325,236	$230,745	$0	$346,118	$902,099
Institutional	8	7	$218,388	$5,322,010	$147,200	$5,322,010	$11,009,608
Miscellaneous	1	0	$0	$0	$0	$0	$0
Recreational	1	0	$0	$0	$0	$0	$0
Residential	824	513	$15,513,336	$61,296,274	$103,537	$30,648,137	$107,561,284
ROW/Utilities	30	0	$0	$0	$0	$0	$0
VII Total	**940**	**557**	**$19,519,134**	**$86,443,389**	**$1,678,026**	**$55,910,625**	**$163,551,174**

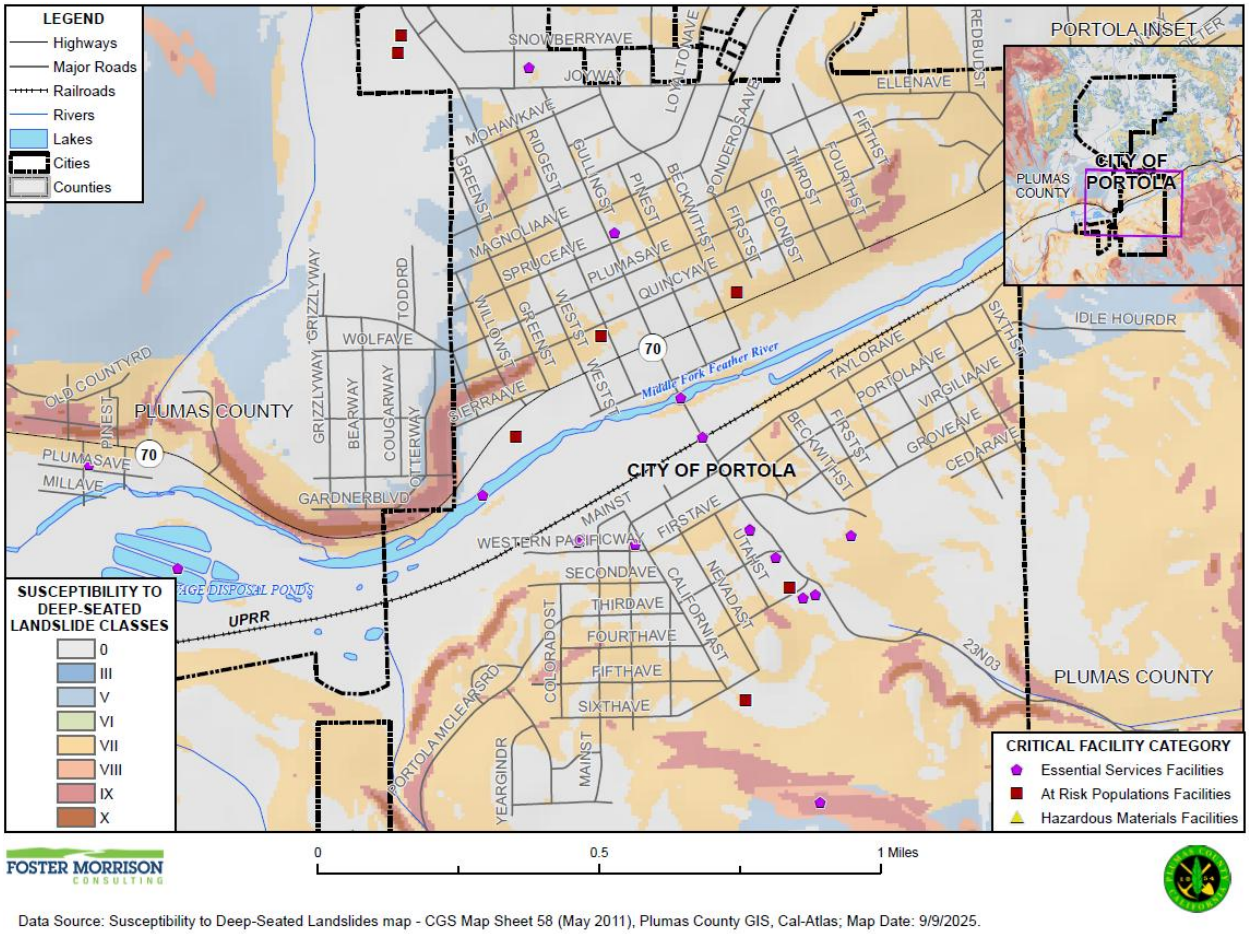
Susceptibility to Deep-Seated Landslide Class / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
VIII							
Agricultural	1	1	$529,643	$1,400,712	$0	$1,400,712	$3,331,067
ROW/Utilities	1	0	$0	$0	$0	$0	$0
VIII Total	**2**	**1**	**$529,643**	**$1,400,712**	**$0**	**$1,400,712**	**$3,331,067**
IX							
Commercial	5	3	$386,280	$397,445	$11,385	$397,445	$1,192,555
Government	2	0	$0	$0	$0	$0	$0
Institutional	1	1	$6,510	$147,552	$0	$147,552	$301,614
Residential	85	44	$2,380,807	$5,925,689	$23,735	$2,962,845	$11,293,076
ROW/Utilities	12	0	$0	$0	$0	$0	$0
IX Total	**105**	**48**	**$2,773,597**	**$6,470,686**	**$35,120**	**$3,507,842**	**$12,787,245**
X							
Commercial	2	0	$35,087	$0	$0	$0	$35,087
Government	1	0	$0	$0	$0	$0	$0
Residential	24	9	$1,511,659	$5,158,054	$148,230	$2,579,027	$9,396,970
ROW/Utilities	4	0	$0	$0	$0	$0	$0
X Total	**31**	**9**	**$1,546,746**	**$5,158,054**	**$148,230**	**$2,579,027**	**$9,432,057**
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: CGS, Plumas County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Landslides present a threat to both critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each deep-seated landslide classes. Using GIS, the deep-seated landslide classes were overlayed on the critical facility GIS layer. This is shown on Figure A-26 for the deep-seated landslide classes. Table A-49 summarizes Table A-50 details which critical facilities fall in which landslide class. Details of critical facility categories, type, name, and address by deep-seated landslide class are listed in Appendix F.

Figure A-26 City of Portola – Critical Facilities in Deep-Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table A-49 City of Portola– Critical Facilities by Category in Deep-Seated Landslide Classes

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Count
Portola		
0	Essential Services Facilities	14
	At Risk Populations Facilities	5
	Hazardous Materials Facilities	0
	0 Total	**19**
VII	Essential Services Facilities	1
	At Risk Populations Facilities	3
	Hazardous Materials Facilities	0
	VII Total	**4**
IX	Essential Services Facilities	1
	At Risk Populations Facilities	0
	Hazardous Materials Facilities	0

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Count
	IX Total	**1**
Portola Total		**24**

Source: CGS, City of Portola

Table A-50 City of Portola – Critical Facilities by Category and Type in Deep-Seated Landslide Classes

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Critical Facility Category and Critical Facility Type	Facility Count
Portola		
0	**Essential Services Facilities**	
	Essential Government Operations	3
	Public Safety	2
	Public Utility Plant and Substation Facilities	7
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	**14**
	At Risk Populations Facilities	
	Public Safety	1
	School	4
	At Risk Populations Facilities Total	**5**
	0 Total	**19**
VII	**Essential Services Facilities**	
	Emergency Medical	1
	Essential Services Facilities Total	**1**
	At Risk Populations Facilities	
	Designated Emergency Shelter	1
	School	2
	At Risk Populations Facilities Total	**3**
	VII Total	**4**
IX	**Essential Services Facilities**	
	Public Utility Plant and Substation Facilities	1
	Essential Services Facilities Total	**1**
	IX Total	**1**
Portola Total		**24**

Source: CGS, City of Portola

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat,

and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure A-25 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area of the City.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the City susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the City. Most, but not all, of the historic landslides in the City have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the City to landslide.

- Population in the City is expected to shrink with the rest of the County. If this were to change, additional growth within the areas at risk to deep-seated landslides in the City would place additional populations at risk. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from a landslide and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of landslide risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. It should be noted that most of the growth in the City is occurring in areas outside the landslide risk areas. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Future Development

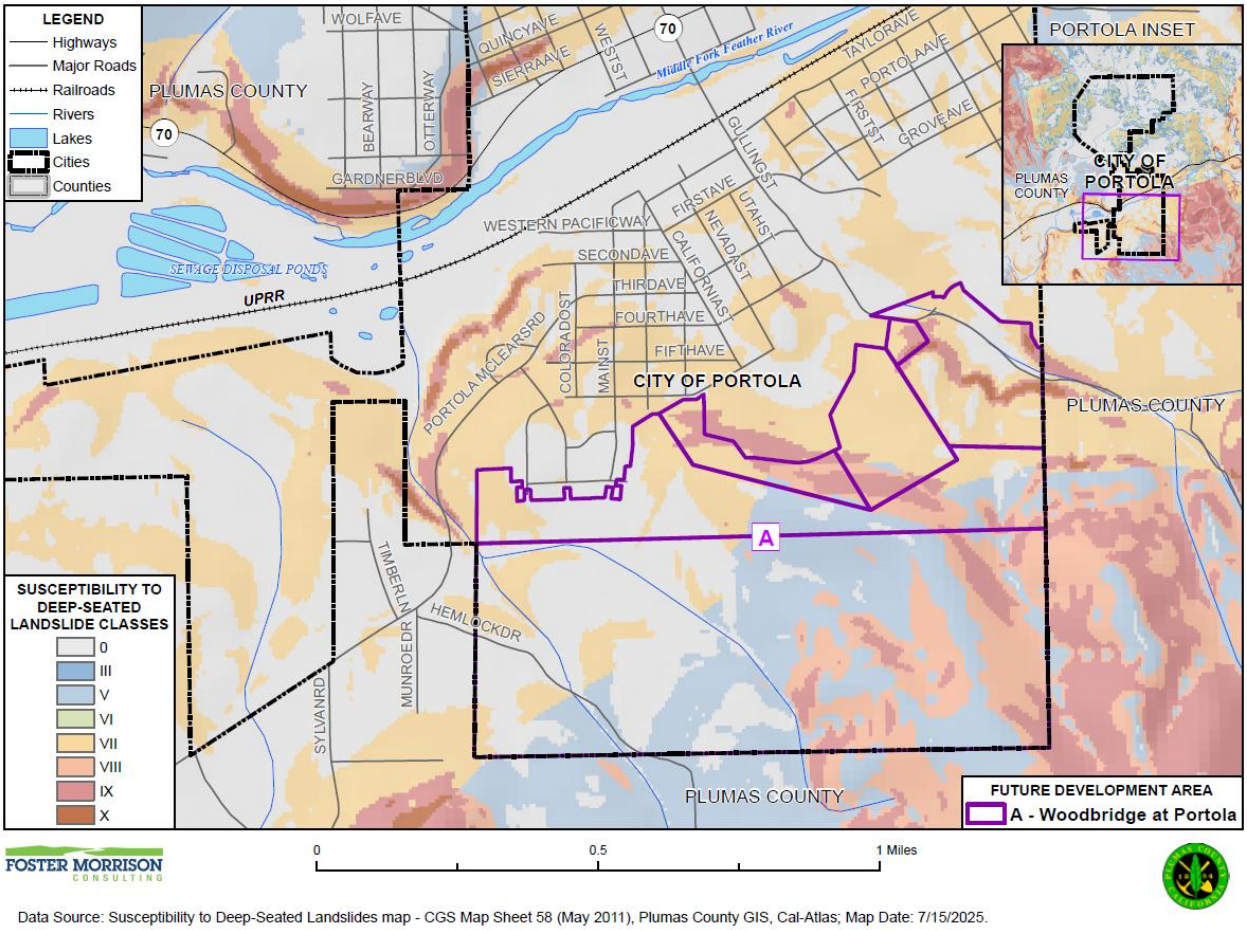
Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the City would place additional values at risk to landslide. More vulnerable populations may experience a disproportionate impact from landslide, and this should be considered as development continues.

Future development areas and their vulnerability to landslides are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each deep-seated landslide class. Figure A-27 shows the locations of the future development area overlayed on the deep-seated landslide classes. These lie inside in the IX and X deep-seated landslide class, as shown in Table A-51.

Figure A-27 City of Portola – Future Development Areas in Deep-Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Table A-51 City of Portola – Future Development Parcels and Acres in Deep-Seated Landslide Classes

Future Development / Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Woodbridge at Portola, Inc.						
IX	4	0	4	360.10	0	360.10
X	2	0	2	38.42	0	38.42
Total	**6**	**0**	**6**	**398.52**	**0**	**398.52**

Source: CGS, City of Portola

Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Excess snow can cause avalanches to occur. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to agricultural industry.

Location and Extent

Extreme cold and freeze events occur on a regional basis. There is no scale for extreme cold and freeze other than temperatures below 32°F. Extreme cold and freeze have a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Extreme cold can occur in any location of the City. All portions of the City and County are at risk to extreme cold and freeze.

Snowfall can affect almost all areas of the County. Depending on the elevation of any given area, severe snowstorms are some of the most common extreme weather events that occur in the City and Plumas County. There is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of snowfall other than snow depths. Heavy snow has a slow to moderate onset and can generally be predicted in advance for the County. Snow events can last for hours or for days, and snow can stay on the ground for weeks to months at a time.

Avalanche affects only certain areas of the County. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement to create an avalanching episode. Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This scale can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for extreme cold and freeze. There were no disasters from snow or from avalanche. Table A-52 shows the dates of the disaster declarations. There have been USDA disaster declarations (2016, twice in 2022, 2023) from cold and freeze.

Table A-52 Plumas County – Federal and State Disaster Declarations for Freeze 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	2007	0	–

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 549 extreme cold, freeze, and snow incidents for Plumas County since 1993, some of which likely affected the City.

City of Portola Events

The City noted that annual periods of heavy snowfall have been experienced since the 2019 LHMP. When this occurs, the event disrupts operations of the City.

Climate Change and Extreme Cold, Freeze, and Snow (w/avalanche)

According to the 2021 CAS (as well as the 2024 Draft CAS), freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow (w/avalanche)

Extreme cold and freeze events happen in the City each year. Snow occurs regularly and can cause avalanche. Cold, freeze, snow, and avalanche can impact both structures and populations in the Planning Area. The whole of the City and County Planning Area has some measure of vulnerability to extreme cold, freeze, snow, and avalanche.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to City. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the City. These sections include assets at risk, impacts, and how future development and future conditions can be affected by this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City's infrastructure can experience challenges when a heavy snow and cooler than normal temperatures impact the area. Freezing is of concern to the City, since the infrastructure for fire hydrants

are in need of replacement. Along with this, water and sewer systems can become inundated if water is not allowed to flow. Updating these water systems would help to mitigate the affects and impacts of this hazard.

Assets at Risk

Assets at risk from extreme cold, freeze, snow, and avalanche include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme cold and freeze, but this hazard generally affects vulnerable populations and those spending large amounts of time outside. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Snow has an effect on buildings, but its effect on people and populations are minimal. Avalanche can affect populations, though the City has few residential (or other) structures in areas at risk to avalanche.

Structures

Structures in the City have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur, but it is usually not heavy enough to damage structures. Buildings in the upper elevations of the County can be affected directly by avalanche events. Most of these events occur away from structures in the City.

Critical Facilities and Infrastructure

Extreme cold and freeze, occasionally accompanied by high winds and snow, can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the City. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by freeze. Damage to pipes that feed buildings can be damaged during periods of extreme cold. Other equipment may also be affected. Infrastructure such as roads, highways, and bridges can become slippery, causing accidents and road closures. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by avalanche events. Infrastructure such as roads, highways, and bridges can be blocked during these events.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the City may be affected. During periods of freeze, trees in the City may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources

like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures. Snow and avalanche are unlikely to affect natural, historic, or cultural facilities.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the City. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the City can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes and where wind-blown snow is common. The combination of steep slopes, abundant snow, weather, snowpack, and a trigger to cause movement create avalanches.

The most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur independently of other types of hazards, although it is possible for avalanches to be triggered by severe weather and earthquakes. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the City include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow and their associated impacts to the City.

- The population of the City is expected to slowly shrink as time progresses. If this trend reverses, future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Changes in populations patterns should also be considered. Especially vulnerable individuals to this hazard include older adults, children, outdoor workers, those below the poverty line, and the unhoused. During hazard events, existing inequities can get worse, and these groups are the most likely to be affected and may require extra assistance. Planning for population changes will help to decrease the City's overall vulnerability. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of population growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future freeze and extreme cold conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the City to this hazard.

Future development built to code should be able to withstand extreme cold, freeze, and heavy snow. Current building codes provide such provisions for new construction. Older buildings and infrastructure should be evaluated to ensure that extreme cold and freeze will not cause negative impacts. Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements such as building codes are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more resilient community.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the City as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table A-34 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the City and Plumas County.

Duration of severe storms in the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding are shown on Table A-53.

Table A-53 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and winter weather incidents for Plumas County since 1950.

City of Portola Events

The City noted that heavy rains and storms are an annual occurrence. Events causing issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the City of Portola. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the City is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned with flooding that occurs due to heavy rains and storms. High winds often accompany these events (and are discussed in the Severe Weather: High Wind and Tornado section below). This can cause damage to structures as well as infrastructure. Power outages can occur from these events which affects vulnerable populations (as well as the remainder of the population) in the City. Loss of revenue from local businesses can also occur. In addition, lightning strikes present a relatively high incidence of occurrence; and a significant risk factor when considering the potential to ignite a wildfire (refer to the section on Wildfires for further discussion). Flash flooding, fueled by wet microbursts and downpours, although localized can cause extensive damage. However, the potential for an occurrence which would result in a significantly adverse impact to the overall community is low and flash floods are not considered to present a specifically identifiable risk that can be reasonably mitigated. Should high levels of flooding occur, the Gulling Street Bridge above the Feather River is in need of rehabilitation and would be at risk during a high flow event.

The City also noted that heavy rains and storms cause localized flooding in the City. The problem areas area shown on Table A-34 above.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (including vulnerable populations) in the City have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those

who live in floodplains (discussed in further detail in the Flood: 1%/0.2% Annual Chance section above) and those who live in and near localized flooding areas (discussed in further detail in the Flood: Localized Stormwater Flooding section above).

Structures

Structures in the City have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including high winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure,

Heavy rain and storms can affect critical facilities and infrastructure during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure can impact operations. City roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the City. In certain areas, large storms can cause erosion and localized landslides which can impact facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the City to flooding.
- Population is expected to decrease for the City of Portola; however, the vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as the unhoused, could experience disproportional effects from this hazard. and should be addressed as the City continues to grow. Thus, changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City. Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. With adherence to development standards, future losses to new development should be minimal.

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City.

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the City.

Portions of the City are also located in or near a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. These types of winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, can affect areas of the City, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire City is subject to significant, non-tornadic (straight-line), winds. Each area of the City is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the City. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

NCDC Events

The NCDC data recorded 94 high wind and 0 tornado incidents for Plumas County since 1950. Many of these wind events likely affected the City.

City of Portola Past Occurrences

The City noted that in spring of 2023, a severe winter storm brought straight line winds to the City. Damages occurred throughout the City, but estimates were unavailable.

Climate Change and High Winds and Tornado

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The City is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the City is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is in or adjacent to a special wind hazard region, which is a result of foehn winds (locally referred to as a Washoe Zephyr). A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds.

Winds can cause damage to structures as well as infrastructure. Power outages can occur from these events which affects vulnerable populations (as well as the remainder of the population) in the City. Loss of revenue from local businesses can also occur. Protection of critical infrastructure and facilities are of highest importance to the City.

Assets at Risk

Assets at risk from winds and tornadoes include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include:

- The unsheltered.
- Citizens who reside in mobile homes.
- Citizens in buildings with no tornado shelter or below ground floors.
- Those with access and functional needs.
- The medically fragile experiencing power outages as a result of wind events.
- Those working or caught outdoors during a wind or tornado event.

Structures

All structures in the City have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, power lines in the City can be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in the West.

Critical Facilities and Infrastructure

Though most critical facilities are built to withstand winds, high wind speeds can still cause damage to critical facilities and infrastructure in the City. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. Winds can cause power outages affecting system operations. Winds can also contribute to PSPS events, and lead to out of control wildfires, which can damage critical facilities and impact their abilities to perform their critical roles in the community.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased levee and streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Wind and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to levees and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity and more tornadoes to affect the City.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the City. Climate change is not likely to affect future tornado conditions.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population in the City is expected to slowly shrink. The population makeup of the City may change even while the population shrinks. Vulnerable populations could experience disproportional effects from this hazard and should be planned for as development of the City continues. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Building codes in the County ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the County from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help make for a more resilient community. The City enforces the state building codes which includes standards for new development to minimize damage from windstorms. New and existing critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Portola. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human

access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the City.

Wildfire Smoke and Air Quality

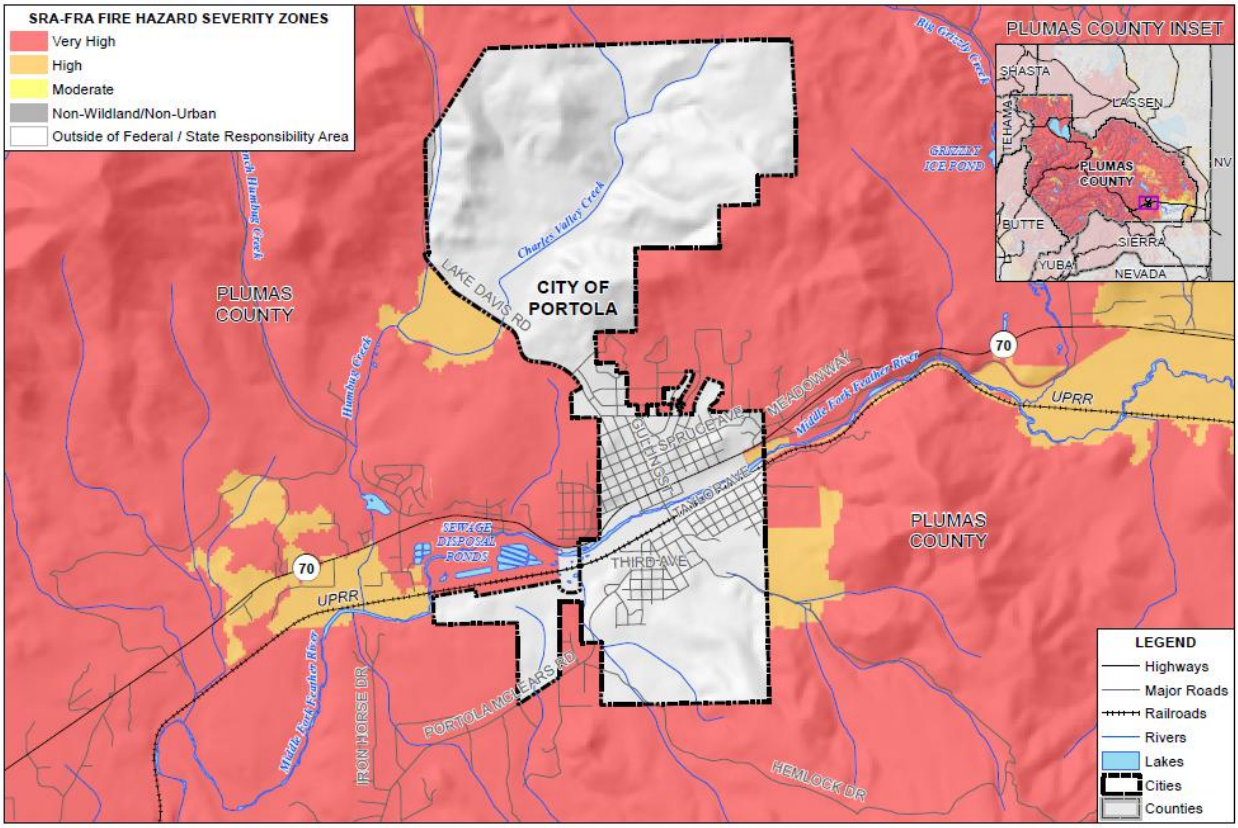
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County and nearby northern California communities since the 2019 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

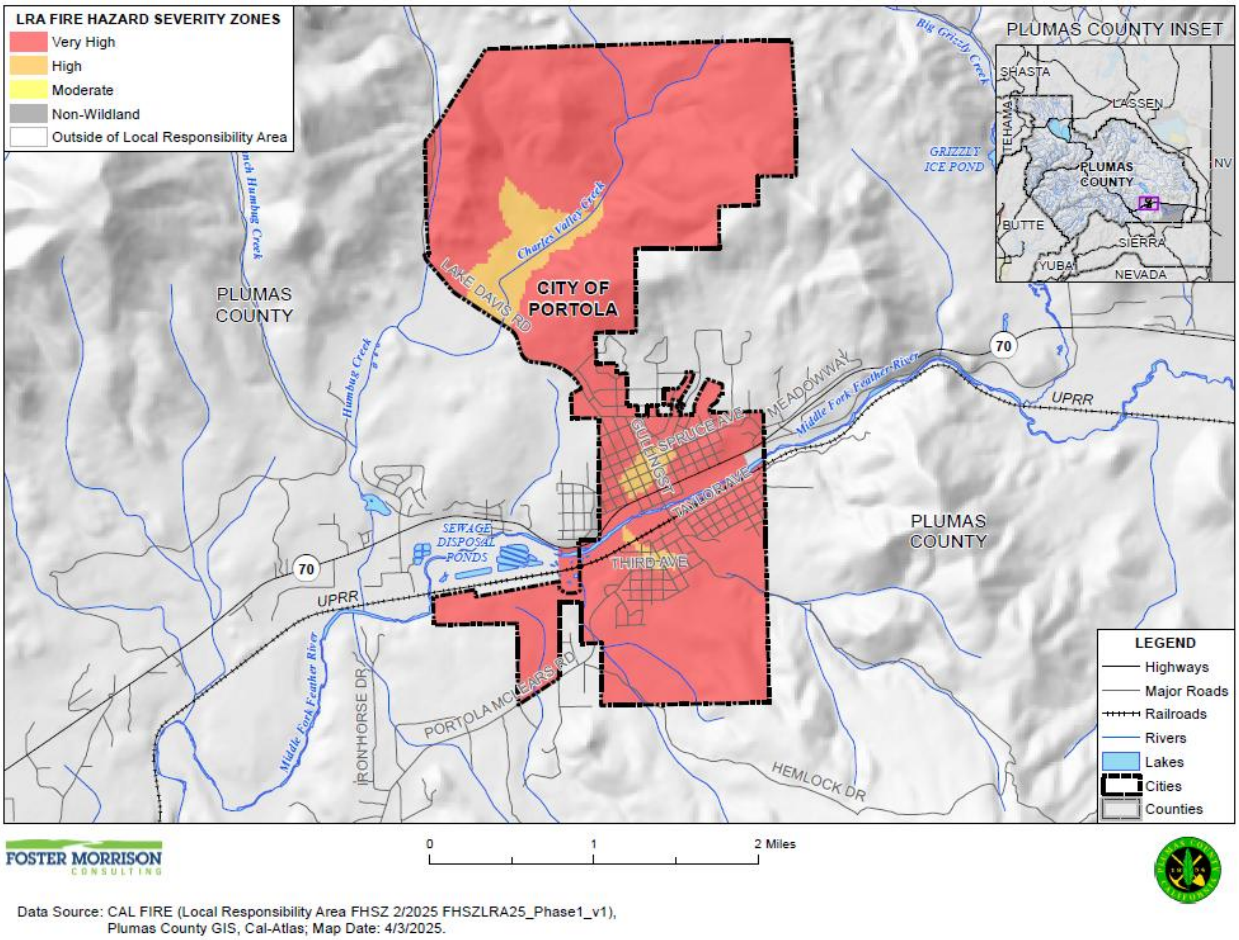
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the City of Portola were created. Figure A-28 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. Figure A-29 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown on the maps, FHSZs within the City range from Moderate to Very High.

Figure A-28 City of Portola – CAL FIRE FRA/SRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Figure A-29 City of Portola – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 4/3/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the FRA/SRA are shown in Table A-54, while extents in the LRA are shown on Table A-55.

Table A-54 City of Portola – CAL FIRE FRA/SRA Fire Hazard Severity Zone Geographical Extents

SRA/FRA Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	5	0.2%	3	0.1%	2	0.2%
High	5	0.1%	0.0001	0.000004%	5	0.4%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland/Non-Urban	0	0.0%	0	0.0%	0	0.0%

SRA/FRA Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Outside of Federal / State Responsibility Area	3,481	99.7%	2,234	99.9%	1,246	99.4%
Grand Total	**3,491**	**100.0%**	**2,237**	**100.0%**	**1,254**	**100.0%**

Source: CAL FIRE

Table A-55 City of Portola – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

LRA Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	3,235	92.7%	2,016	90.1%	1,219	97.2%
High	250	7.2%	221	9.9%	28	2.26%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland	0	0.0%	0	0.0%	0	0.0%
Outside of Local Responsibility Area	6	0.2%	0	0.0%	6	0.5%
Grand Total	**3,491**	**100.0%**	**2,237**	**100.0%**	**1,254**	**100.0%**

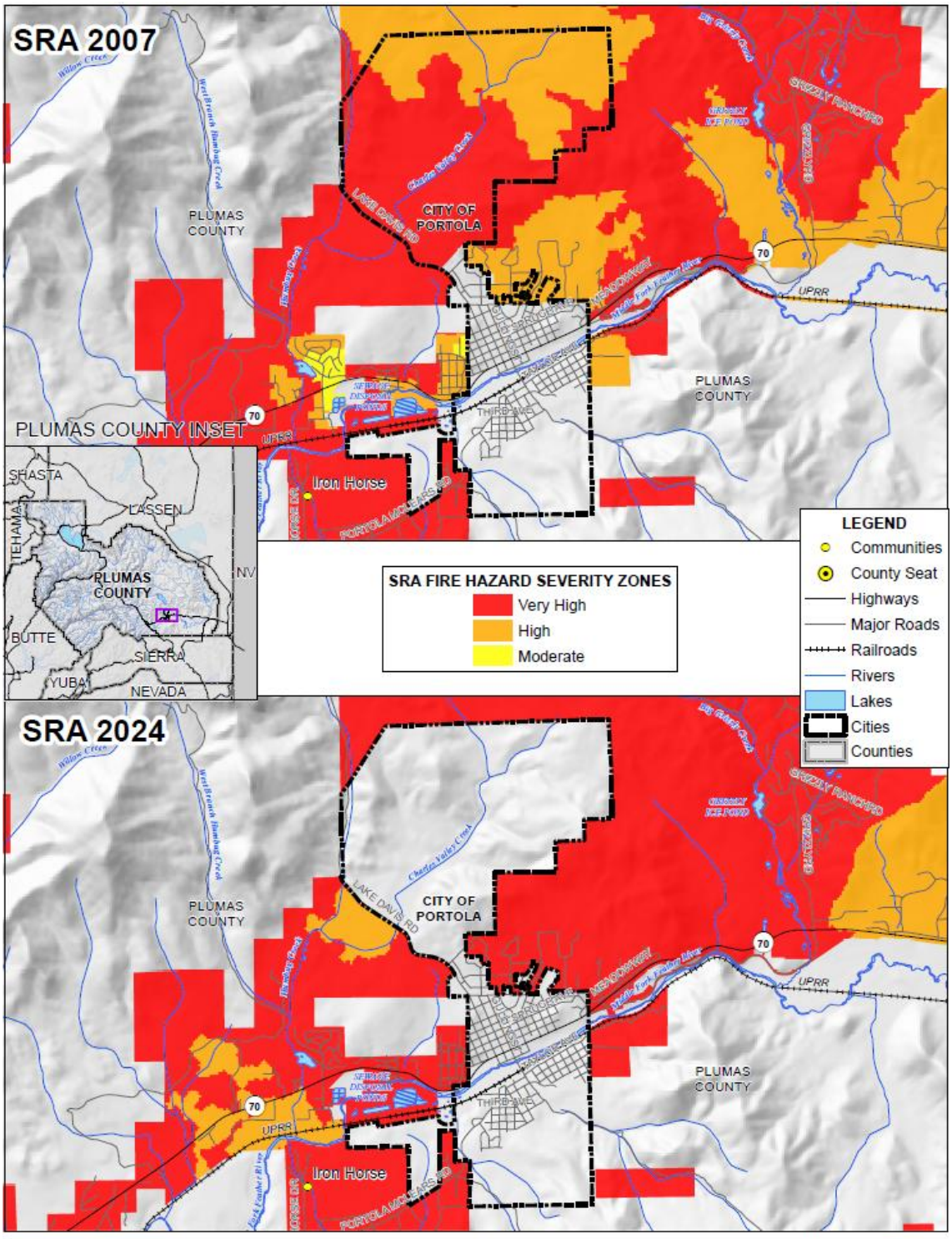
Source: CAL FIRE

CAL FIRE Fire Hazard Severity Zone Comparison

Given the new CAL FIRE Fire Hazard Severity Zone mapping for the SRA (2024) and the LRA (2025), a comparison of the previous CAL FIRE FHSZ mapping from 2007 was conducted. Figure A-30 and Table A-56 shows the 2007 FHSZ data compared to the 2024 FHSZ data for the SRA within the City and Figure A-31 and Table A-57 shows the FHSZ data comparison for the LRA datasets.

Based on this comparative analysis, while many of the FHSZs have changed within the two (SRA and LRA) analyses, much of the change can be contributed to mapped areas being reallocated to new State and Local Fire Responsibility Areas. As such, the risk and vulnerability of the City to wildfire remains significant. Further given the topography and fuels located throughout the City, and the history of devastating wildfires in and around Plumas County, wildfire continues to be one of the City's most significant hazard of concern.

Figure A-30 City of Portola – SRA FHSZ Comparison



2007 Data Source: CAL FIRE (State Responsibility Area: fhszs06_3_32) November 2007, Plumas County GIS, Cal-Atlas; Map Date: 03/01/2020.

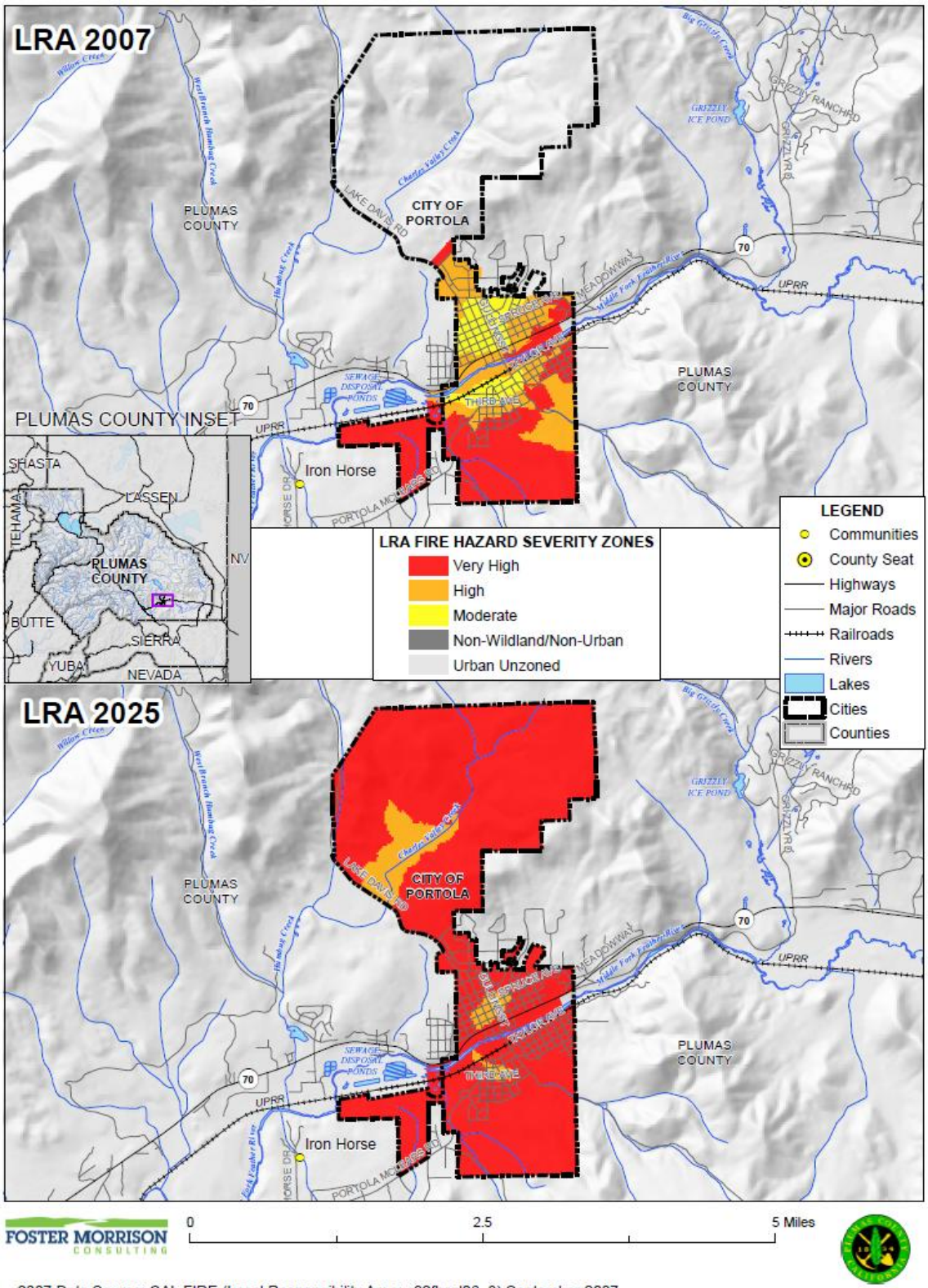
2024 Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024, Plumas County GIS, Cal-Atlas; Map Date: 9/30/2025.

Table A-56 City of Portola – SRA/FRA FHSZ Comparisons

Fire Hazard Severity Zones	Overall Acre Change			% Acre Change		
	Total Acres Plumas 2007	Total Acres Plumas 2024	Overall Change in Total Acres	% of Total Acres Plumas 2007	% of Total Acres Plumas 2024	Overall Change in % Total Acres
Very High	1,265	0.02	-1,265	0.3%	0.000004%	-0.3%
High	777	0.0001	-777	0.2%	0.00000002%	-0.2%
Moderate	0.001	0	-0.001	0.0000002%	0%	-0.0000002%
City of Portola Total	**2,043**	**0.0201**	**-2,043**	**0.5%**	**0.000004%**	**-0.5%**

Source: CAL FIRE

Figure A-31 City of Portola – LRA FHSZ Comparison



2007 Data Source: CAL FIRE (Local Responsibility Area: c32fhszl06_3) September 2007, Plumas County GIS, Cal-Atlas; Map Date: 03/01/2020.

2025 Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase1_v1) February 2025, Plumas County GIS, Cal-Atlas; Map Date: 9/30/2025.

Table A-57 City of Portola – LRA FHSZ Comparisons

Fire Hazard Severity Zones	Overall Acre Change			% Acre Change		
	Total Acres Plumas 2007	Total Acres Plumas 2025	Overall Change in Total Acres	% of Total Acres Plumas 2007	% of Total Acres Plumas 2025	Overall Change in % Total Acres
Very High	812	3,235	2,423	2%	6.7%	5.0%
High	468	250	-218	1%	0.5%	-0.5%
Moderate	205	0	-205	0.4%	0%	-0.4%
Non-Wildland/Non-Urban	0	0	0	0%	0%	0%
Urban Unzoned	0	0	0	0%	0%	0%
City of Portola Total	**1,485**	**3,485**	**2,000**	**3%**	**7%**	**4%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been seven state and six federal disaster declarations due to fire, as shown in Table A-58.

Table A-58 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	7	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

City of Portola Events

Portola has an active history of fire ignitions within the Wildland-Urban Interface (WUI), a five-mile buffer around the City. In **1988** a lightning caused fire burned 783 acres directly south of the high school, well within the City limits. In **2008** the "Cold" fire burned approximately ten square miles about fifteen miles to the west of Portola.

It was noted that in **2021** the City was threatened by the Dixie Fire. Wildfire smoke from this event affected City residents.

The City was partially evacuated in **2024** due to the Gold Complex wildfire. The south side of City evacuated, while the north side of City was under evacuation warning. The city had to evacuate roughly 931 residents. City Hall was evacuated, but Public Works was manned throughout event. The City water line from Golden Springs to South Water Tanks was damaged in fire line efforts.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the City from wildfire is of significant concern. Wildfires that occur in the City occur from a variety of both natural and manmade causes. The City can be affected both by fires that start on or near City lands as well as those that start elsewhere and move into the City. In addition to burning large areas of land, air quality can be affected in the City by smoke from fires occurring inside the City as well as those from many miles away. As growth continues and populations increase in the City, the potential for wildfires will also increase.

The whole of the City is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

It was noted that the majority of the City has been noted as "Very High" by CALFIRE on the Local Responsibility Area Fire Hazard Severity Zones maps provided by CALFIRE in 2025. The worst-case scenario wildland fire in the Portola WUI would be wind driven crown fire late in the fire season when fuel

moisture is at its lowest. These conditions in combination with hot and dry weather, steep slopes, or high winds can create a situation in which the worst-case fire severity scenario can occur. The ignition source could be either a lightning strike or structure fire. Given the frequency of lightning strikes, number of human driven ignitions, and frequency of historical events, the probability of future events should be considered high.

Depending on how closely the wildfire approaches Portola, the City could have much at risk. The high school and hospital are both near the perimeter of the town and therefore somewhat more exposed. Current proposed future development for the City is also located on the outside edge of the City, adjacent to woodland urban interfaces, increasing the fire risk. Incidental drainages and stream locations become more critical with post fire debris flows as they can serve as a main channel or conduit to funnel mud and debris to areas typically outside the stream's immediate influence area. Reducing hazardous fuel reduction, forest mastication, and other mitigation measures throughout the jurisdiction and the surrounding area will help to reduce the risk of wildfire.

The City noted that air quality is always a concern during wildfires. Risk of wildfire smoke is greater for vulnerable populations. The City is impacted on an air quality perspective by surrounding wildfire events even if they do not occur geographically close to the City.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at vulnerable to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

To further evaluate the impact to the residential population within the City, the CAL FIRE FHSZ dataset was overlayed on the parcel layer. Those residential parcels that intersect the FHSZs were counted and multiplied by the 2023 Census Bureau average household factors for the City of Portola – 2.29 According to this analysis, there is a total population of 66 residents of the City of Portola falling within the moderate or higher FRA/SRA FHSZs. This is shown in Table A-59. There is a total population of 2,074 residents of the City of Portola falling within the moderate or higher LRA FHSZs, as shown on Table A-60.

Table A-59 City of Portola – Improved Residential Parcels and Population by CAL FIRE FRA/SRA Fire Hazard Severity Zone

FRA/SRA Fire Hazard Severity Zone/Jurisdiction	Improved Residential Parcels	Population at Risk
Moderate	0	0
High	0	0
Very High	29	66

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

Table A-60 City of Portola – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone

LRA Fire Hazard Severity Zone/Jurisdiction	Improved Residential Parcels	Population at Risk
Moderate	0	0
High	125	286
Very High	781	1,788

Source: CAL FIRE, 2024 Plumas County Parcel/Assessor's Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

All structures in the City have some risk to wildfire. GIS was used to determine the possible impacts of wildfire within the City of Portola. The methodology described in Section 4.3.16 of the Base Plan was followed in determining structures and values at risk in both the CAL FIRE's FRA/SRA and LRA Fire Hazard Severity Zone layer. Analysis results for the FRA/SRA in the City of Portola are shown in Table A-61, which summarizes total parcel counts, improved parcel counts and their structure values by FRA/SRA FHSZs. Analysis results for the LRA in the City of Portola are shown in Table A-62, which summarizes total parcel counts, improved parcel counts and their structure values by FRA/SRA FHSZs.

Table A-61 City of Portola – Count and Value of Parcels and Structures by CAL FIRE FRA/SRA Fire Hazard Severity Zone

SRA/FRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Very High							
Agricultural	2	1	$536,231	$1,400,712	$0	$1,400,712	$3,337,655

SRA/FRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Commercial	3	1	$259,517	$121,616	$11,385	$121,616	$514,134
Government	3	0	$0	$0	$0	$0	$0
Industrial	2	0	$115,464	$0	$0	$0	$115,464
Residential	67	29	$3,838,318	$9,025,414	$1,220	$4,512,707	$17,377,659
ROW/Utilities	15	0	$0	$0	$0	$0	$0
Very High Total	**92**	**31**	**$4,749,530**	**$10,547,742**	**$12,605**	**$6,035,035**	**$21,344,912**
High							
Government	1	0	$0	$0	$0	$0	$0
Residential	1	0	$76,842	$0	$0	$0	$76,842
High Total	**2**	**0**	**$76,842**	**$0**	**$0**	**$0**	**$76,842**
Outside of State/Federal Responsibility Area							
Commercial	143	102	$7,323,780	$30,580,003	$1,472,855	$30,580,003	$69,956,641
Government	30	0	$0	$0	$0	$0	$0
Industrial	8	3	$209,772	$230,745	$0	$346,118	$786,635
Institutional	10	8	$224,898	$5,469,562	$147,200	$5,469,562	$11,311,222
Miscellaneous	2	0	$19	$0	$0	$0	$19
Recreational	1	0	$0	$0	$0	$0	$0
Residential	1,321	877	$25,365,530	$104,422,982	$282,412	$52,211,491	$182,282,415
ROW/Utilities	34	0	$0	$0	$0	$0	$0
Outside of Federal / State Responsibility Area Total	**1,549**	**990**	**$33,123,999**	**$140,703,292**	**$1,902,467**	**$88,607,174**	**$264,336,932**
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor Data

Table A-62 City of Portola – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone

LRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Very High							
Agricultural	2	1	$536,231	$1,400,712	$0	$1,400,712	$3,337,655
Commercial	143	100	$7,452,926	$30,288,521	$1,481,391	$30,288,521	$69,511,359

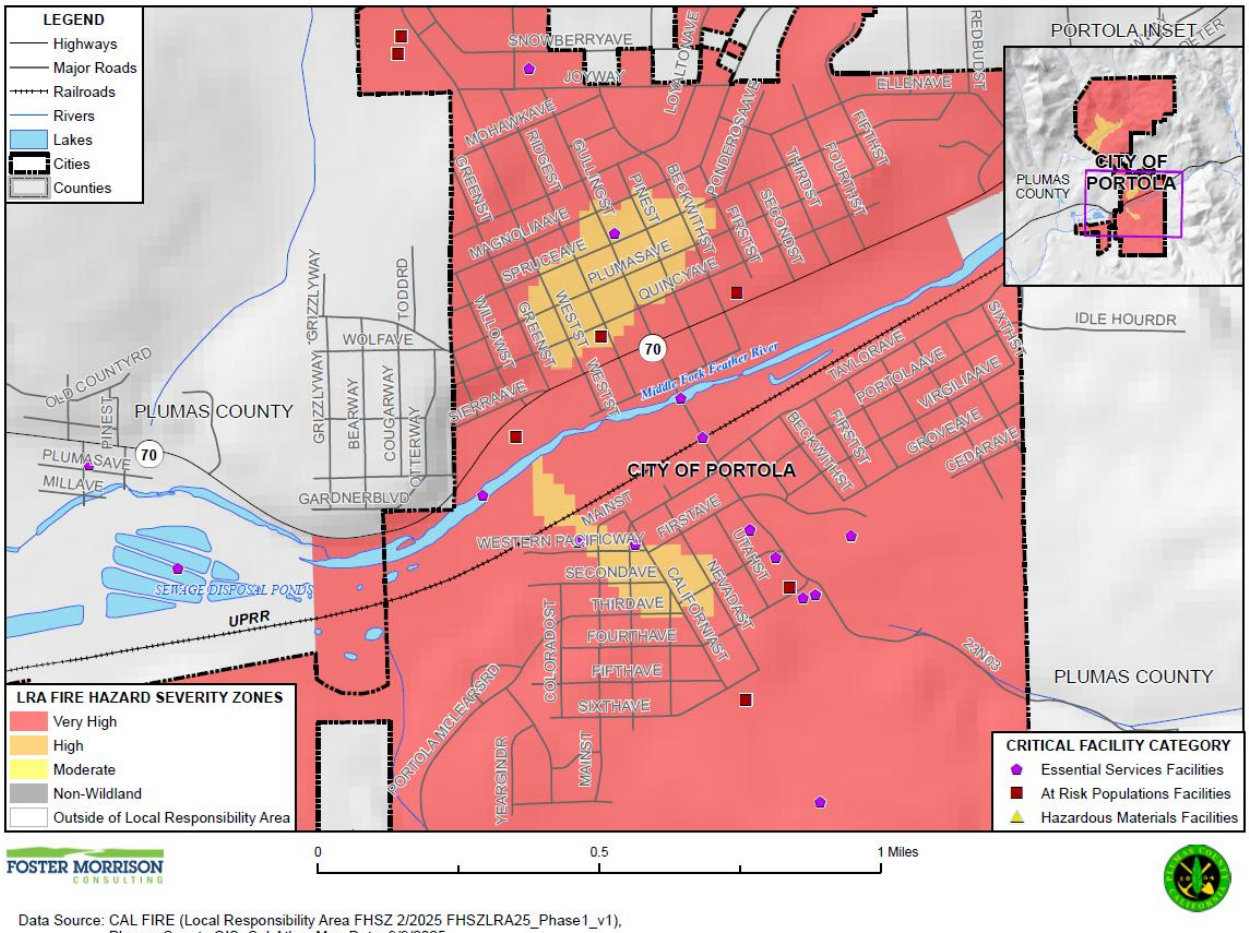
LRA Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Government	33	0	$0	$0	$0	$0	$0
Industrial	10	3	$325,236	$230,745	$0	$346,118	$902,099
Institutional	8	6	$178,938	$4,914,442	$147,200	$4,914,442	$10,155,022
Miscellaneous	2	0	$19	$0	$0	$0	$19
Recreational	1	0	$0	$0	$0	$0	$0
Residential	1,240	781	$26,878,299	$102,197,186	$283,632	$51,098,593	$180,457,710
ROW/Utilities	49	0	$0	$0	$0	$0	$0
Very High Total	**1,488**	**891**	**$35,371,649**	**$139,031,606**	**$1,912,223**	**$88,048,386**	**$264,363,864**
High							
Commercial	3	3	$130,371	$413,098	$2,849	$413,098	$959,416
Government	1	0	$0	$0	$0	$0	$0
Institutional	2	2	$45,960	$555,120	$0	$555,120	$1,156,200
Residential	149	125	$2,402,391	$11,251,210	$0	$5,625,605	$19,279,206
High Total	155	130	$2,578,722	$12,219,428	$2,849	$6,593,823	$21,394,822
City of Portola Total	**1,643**	**1,021**	**$37,950,371**	**$151,251,034**	**$1,915,072**	**$94,642,209**	**$285,758,686**

Source: CAL FIRE, Plumas County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each fire hazard severity zone. Using GIS, the FRA/SRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Only LRA fire hazard severity zones intersect the City; as such no FRA/SRA analysis is presented here. Only LRA analysis is presented. This is shown on Figure A-26 for the LRA fire hazard severity zones. Table A-63 details which critical facilities fall in which LRA fire hazard severity zone. Details of critical facility categories, type, name, and address by FRA/SRA and LRA fire hazard severity zones are listed in Appendix F.

Figure A-32 City of Portola – Critical Facilities in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 9/9/2025.

Table A-63 City of Portola – Critical Facilities by Category in LRA Fire Hazard Severity Zones

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category and Critical Facility Type	Facility Count
Portola		
Very High	**Essential Services Facilities**	
	Emergency Medical	1
	Essential Government Operations	2
	Public Safety	1
	Public Utility Plant and Substation Facilities	5
	Transportation Lifeline Systems	2
	Essential Services Facilities Total	**11**
	At Risk Populations Facilities	
	Public Safety	1
	School	6
	At Risk Populations Facilities Total	**7**

Jurisdiction / Fire Hazard Severity Zones	Critical Facility Category and Critical Facility Type	Facility Count
Very High Total		**18**
High	**Essential Services Facilities**	
	Essential Government Operations	1
	Public Safety	1
	Public Utility Plant and Substation Facilities	3
	Essential Services Facilities Total	**5**
	At Risk Populations Facilities	
	Designated Emergency Shelter	1
	At Risk Populations Facilities Total	**1**
High Total		**6**
Portola Total		**24**

Source: CGS, City of Portola

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the City, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the City, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition,

catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Portola include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the City to wildfire.
- Population in the City of Portola is expected to shrink with the rest of the County. If this changes, additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Specifically, with the release of the new 2025 LRA mapping for Plumas County, wildfire building codes should be updated as required to include enhanced measures to reduce wildfire impacts on new construction, and including the formal

adoption of the new LRA maps. It should be noted that most of the growth in the City is occurring in areas outside the moderate or higher fire hazard severity zones. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard. It should also be noted that once new building codes are adopted for LRA, should reduce vulnerability on new construction especially in the higher hazard zones.

Future Development

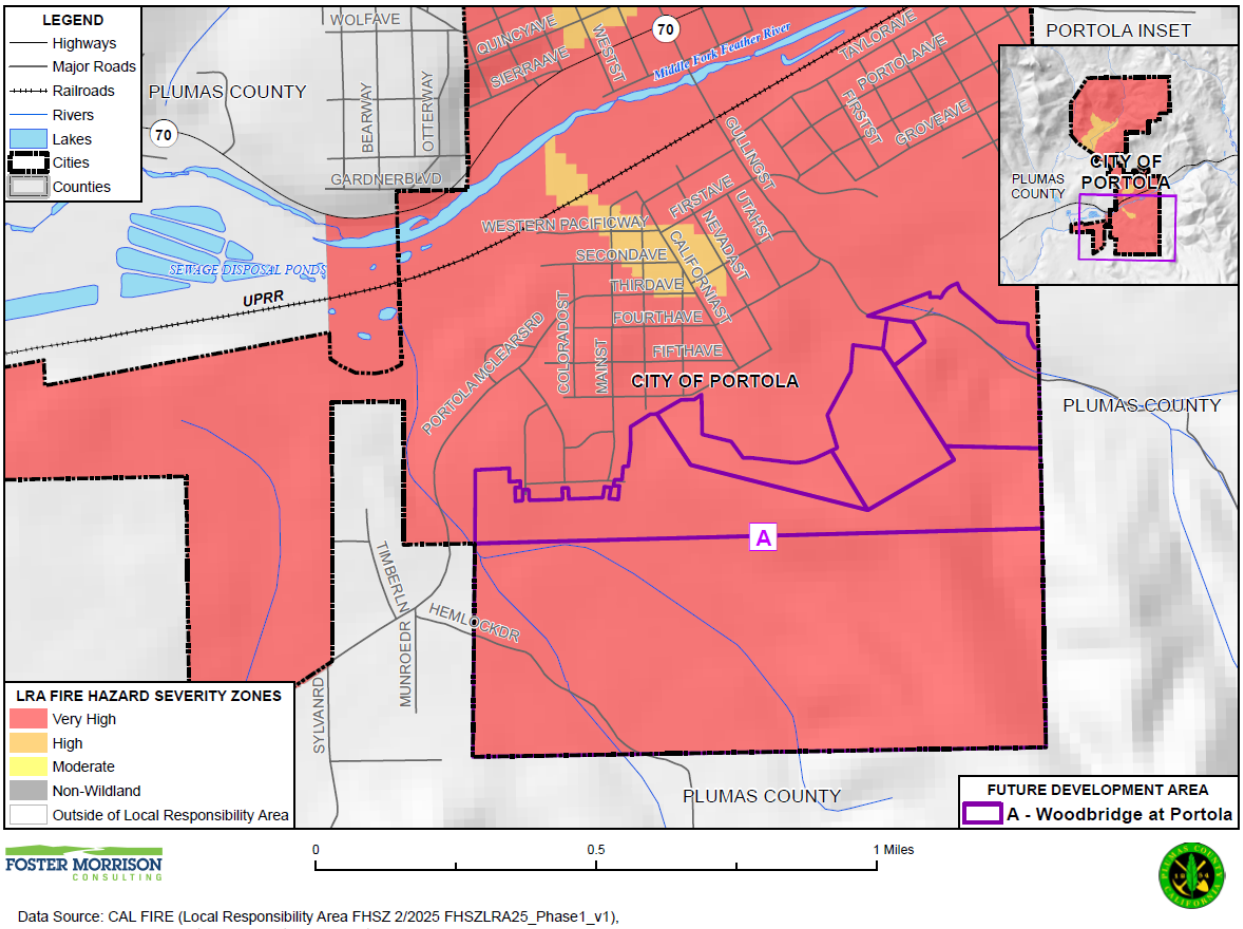
Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, City building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

Future development areas and their vulnerability to wildfire are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each SRA/FRA and LRA fire hazard severity zone. No facilities fell in the SRA/FRA fire hazard severity zones. Figure A-33 shows the locations of the future development area overlayed on the LRA fire hazard severity zones. As shown in Table A-64, the future development area falls in the Very High fire hazard severity zone.

Figure A-33 City of Portola – Future Development in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Table A-64 City of Portola – Future Development Parcels and Acres in LRA Fire Hazard Severity Zones

Future Development / Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Woodbridge at Portola, Inc.						
Very High	6	0	6	398.52	0	398.52
Total	**6**	**0**	**6**	**398.52**	**0**	**398.52**

Source: CAL FIRE, City of Portola

A.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

A.5.1. Regulatory Mitigation Capabilities

Table A-65 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Portola.

Table A-65 City of Portola's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	Y	(was current with the 2019 LHMP; yes, addresses hazards)
General Plan/Comprehensive Plan/Master Plan	Y	Yes, addresses hazards. Policies and programs are included that may be used a mitigation actions. Update June 2024
Continuity of Operations Plan	N	
Economic Development Plan	Y	Economic Development Element is included in the General Plan 2045
Land Use Plan	Y	Land Use Element is included in the General Plan 2045
Local Emergency Operations Plan	Y	
Stormwater Management Plan	Y	
Transportation Plan	Y	Transportation Element is included in the General Plan 2045
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	Y	Yes
Flood insurance rate maps	Y	NA- Produced by FEMA
Floodplain ordinance	Y	Yes
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	
Subdivision ordinance	Y	Yes
Zoning ordinance	Y	Yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City uses a Planning Consultant for a large portion of these requests. Efforts to staff this position internally have not been successful in the past for a variety of reasons. The City continues to balance the potential need for an internal resource for these efforts against a variable workload, lack of availability of local resources meeting the requirements of the position, and funding for consulting services.		

Source: City of Portola

A.5.2. Administrative/Technical Mitigation Capabilities

Table A-66 identifies the City department(s) responsible for activities related to mitigation and loss prevention in the City of Portola.

Table A-66 City of Portola's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Director of Public Works
Civil Engineer, including dam and levee safety	Y	Consultant
Community Planner	Y	Consultant
Emergency Manager	Y	City Manager & CalOES assistance
Floodplain Administrator	Y	Director of Public Works
GIS Coordinator	N	
Planning Commission	Y	City Council temporarily serves as this function
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	N	
Hazard data and information	Y	Planning consultant
GIS analysis	N	
Mutual aid agreements	Y	Beckworth Peak Fire Protection District, Plumas County Sherrif's Office
Other		
How can these capabilities be expanded and improved to reduce risk?		
Grant writing specific to hazard mitigation efforts would help assist the City with these efforts overall.		

Source: City of Portola

A.5.3. Fiscal Mitigation Capabilities

Table A-67 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A-67 City of Portola's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Community Development Block Grant	Y	Underserved community project with PCIRC
Federal funding programs (non-FEMA)	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
State funding programs	Y	
Stormwater utility fee	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Grant writing specific to hazard mitigation efforts would help assist the City with these efforts overall.		

Source: City of Portola

A.5.4. Mitigation Education, Outreach, and Partnerships

Table A-68 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table A-68 City of Portola's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	City website, mailers, and City Facebook messaging
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Firewise messaging
Local news	Y	Plumas Sun, Mountain Messenger, Sierra Booster
Organizations that interact with underserved and vulnerable communities	Y	Veterans Hall, Plumas Crisis Intervention & Resource Center, Food Bank (EPCAN)
Social media	Y	Facebook, LinkedIn

Program/Organization	In Place Y/N	How widespread are each of these in your community?
How can these capabilities be expanded and improved to reduce risk?		
The availability of local news outlets has decreased recently. To offset this, the City has taken a proactive approach with outward messaging on social media, the City's website, and a quarterly newsletter. The City works closely with Firewise to ensure information is available to the public. We also have fostered relationships with organizations that interact with underserved and vulnerable communities in our City. Capabilities could be expanded through additional potential public workshops/table tops between local stakeholders in order to continue to foster a collaborative approach for issues that effect the public and multiple parties. Groups could also perform more collaborative messaging that is shared among all parties.		

Source: City of Portola

A.5.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

CAN THE CITY PROVIDE A LIST OF PAST HAZARD MITIGATION TYPE PROJECTS AND ACTIVITIES THAT HAVE BEEN IMPLEMENTED BY HAZARD. INCLUDE ANY HAZARD RISK REDUCTION MEASURES REGARDLESS OF WHETHER IT WAS INCLUDED IN THE 2019 LHMP

A.6 Mitigation Strategy

A.6.1. Mitigation Goals and Objectives

The City of Portola adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

A.6.2. NFIP Mitigation Strategy

The City of Portola joined the National Flood Insurance Program (NFIP) as an emergency entrant on April 14, 1975. The City followed up with a regular entry on July 18, 1985. As a participant of the NFIP, the City of Portola has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Portola will continue to comply with the requirements of the NFIP in the future.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development and maintaining drainage systems. The goal of the program is to enhance public safety and reduce impacts and losses while protecting the environment. The City's Municipal Code has a Flood Damage Prevention Section under the Zoning Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Plumas County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As

a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Portola is not a current participant in the CRS program.

More information about the floodplain administration in the City of Portola can be found in Table A-69. FILL OUT REMAINDER OF TABLE

Table A-69 City of Portola Compliance with NFIP

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	Ryan Bonk- City Manager; Todd Roberts- Director of Public Works. Yes, they serve various roles outside of this function.
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	Todd Roberts serves in this capacity.
Is floodplain management an auxiliary function?	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, code compliance education and outreach, inspections
What are the barriers to running an effective NFIP program in the community, if any?	Staffing and resource constraints
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	2 policies in force $514,000 of insurance in force $1,021 in annual premiums
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	5 paid losses $37,720 in paid losses 1 substantial damage claim
How many structures (residential and non-residential) are exposed to flood risk within the community?	50 in 1% Annual Chance Flood Hazard 1 in 0.2% Annual Chance Flood Hazard
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	0 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	
How does the community teach property owners or other stakeholders about the importance flood insurance?	
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues (i.e., current violations)?	No

NFIP Topic	Comments
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 7/19/2011
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	7/18/1985
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	
Has the community adopted the latest effective FIRM? Date adopted?	
How does the community enforce local floodplain regulations and monitor compliance?	
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	
How are Letters of Map Change (LOMCs) tracked and compiled?	
Provide an explanation of the permitting process.	
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: City of Portola

A.6.3. Mitigation Actions

The Planning Team for the City of Portola identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Floods: 1%/0.2% annual chance

- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Severe Weather: High Winds and Tornados
- Wildfire

Low priority hazards for mitigation planning include:

- Ag Hazards: Severe Weather/Invasive Species (Pests and Weeds)
- Severe Weather: Extreme Heat

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Public Education on Hazards in the City of Portola

Hazards Addressed: Climate Change, Dam Failure, Drought & Water Shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Severe Weather: Extreme Cold and Freeze, Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning), Severe Weather: High Winds and Tornados, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Educating the public on potential hazards that effect our community is paramount. Actions taken in this area to enhance public knowledge will lead to greater mitigation efforts within the community as a whole.

Project Description: Partnering with local resources (Cal OES, Beckwourth Peak Fire Protection District, Plumas County Sheriff's Office), the project will offer a variety of public education outreach efforts. Public education including but not limited to:

- Potential hazards and high hazard areas
- Property owners personal mitigation measures related to natural hazards specific to community and personal property

- Citywide (and County) emergency evacuation plan
- Living with fire, fire safe requirements, home hardening, etc.
- Forecasting information
- Hazard warning notification
- Emergency shelter locations
- General Plan Safety Element

Other Alternatives: Public obtains the knowledge through their own individual research and/or resources

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City Manager & Local Resources

Benefits (Losses Avoided): Increased mitigation of hazards and the effects of hazards on the community as an increased number of the public is educated on mitigation efforts. Effect of hazards on the public can be reduced with availability and knowledge of emergency evacuation plan

Potential Funding (Local Budgets, Grant Funds, etc.): Local Budgets (City budget), Grants from Cal OES, CAL FIRE, CA DWR, and other grant agencies.

Timeline: Ongoing- Through 2029

Project Priority (High, Medium, Low): High

Action 2. Essential Facilities Retrofit and Redundant Power Sources

Hazards Addressed: Climate Change, Earthquake, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Essential facilities need to be surveyed for points of weakness, both structurally and from a redundancy perspective, so the facilities can be used during an emergency situation.

Project Description: Survey and prioritize all critical and/or emergency facilities. Perform necessary upgrades to facilities and/or systems to ensure the facilities can be utilized effectively in the event of an emergency.

Other Alternatives: Continue existing as-is with the risk that critical facilities may not be operational in the event of an catastrophe

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City Manager

Benefits (Losses Avoided): Inability to utilize a critical facility in the event of an emergency. Power redundancy for critical facilities and systems.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA grant funds for secondary power sources, local budgets, grants

Timeline: 2027

Project Priority (High, Medium, Low): High

Action 3. Wildfire Risk and Impact Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The likelihood of occurrence and intensity of wildfires within our region has increased exponentially recently. These wildfires threaten all aspects of our communities.

Project Description: Perform hazardous fuel reduction, mastication, and other mitigation efforts throughout our jurisdiction and the surrounding areas to reduce the risk of wildfire.

Other Alternatives: Work alongside county resources and organizations to ensure mitigation efforts are undertaken

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City Manager

Benefits (Losses Avoided): Mitigation of catastrophic wildfire threatening life and property

Potential Funding (Local Budgets, Grant Funds, etc.): Local budgets, grants

Timeline: 2027

Project Priority (High, Medium, Low): High

Action 4. Gulling Street Bridge Structural Rehabilitation

Hazards Addressed: Earthquake, Haz Mat Transportation, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The Gulling Street Bridge's compromised condition, as noted in the Caltrans BIRIS Report from 12/06/2023 (Substructure as "2 CRITICAL"), poses a risk to the City of Portola, emergency response capabilities and the safety of its residents.

Project Description: Engineering analysis of the current conditions of the bridge to ascertain appropriate mitigation strategies for potential required structural rehabilitation due to conditions noted in the Caltrans BIRIS reports. Construction of mitigation solutions as engineered.

Other Alternatives: Continuously reshore the affected pier with temporary solutions. Construct a new bridge

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City Manager

Benefits (Losses Avoided): This bridge is a matter of urgent public safety, addressing an imminent threat to life and property for the City. The bridge is the sole viable access route connecting the northern and southern regions of the City, serving as a lifeline to essential emergency services, including Eastern Plumas Health Care Hospital, the Fire Station, the Plumas County Sheriff's Office, Portola High School, City Hall, and the core business district. The Eastern Plumas Health Care Hospital services the City of Portola as well as all eastern Plumas County and parts of eastern Sierra County, including the city of Loyalton. Any closure or failure of the bridge would cut off access to these critical facilities, jeopardizing the health, safety, and well-being of the community.

Moreover, in the event of a wildfire—such as the one experienced last summer—residents on the southern side of the City would lose all viable evacuation routes if the bridge were to fail or be closed. The city had to evacuate roughly 931 residents utilizing the bridge as the only emergency egress during the most recent Gold Complex wildfire in 2024 due to County Road A-15 being closed.

In addition to the above, our area has experienced multiple seismic events over the past year, further increasing the risk of failure for this critical piece of infrastructure. Given the propensity for seismic activity in our area, we are extremely concerned about the inevitability of future events and their impact on the bridge.

Potential Funding (Local Budgets, Grant Funds, etc.): Caltrans Highway Bridge Program, FEMA

Timeline: 2029

Project Priority (High, Medium, Low): High

Action 5. Fire Suppression Enhancements

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Hydrant supply lines are aging infrastructure that can be subject to damage in the event of a catastrophe requiring high volume use of the lines.

Project Description: Replace all hydrant supply lines and upgrade aged hydrants

Other Alternatives: Operate with current system limitations and risks

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City Manager

Benefits (Losses Avoided): Catastrophic wildfire threating life and property

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA, Local budgets, grants

Timeline: 2027

Project Priority (High, Medium, Low): High

Annex B Chester Public Utility District

B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Chester Public Utility District (Chester PUD or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the Chester PUD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

B.2 Planning Process

As described above, the Chester PUD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-1. Additional details on Plan participation and District representatives are included in Appendix A. FILL OUT TABLE WITH WHO PARTICIPATED AND HOW.

Table B-1 Chester PUD – Planning Team

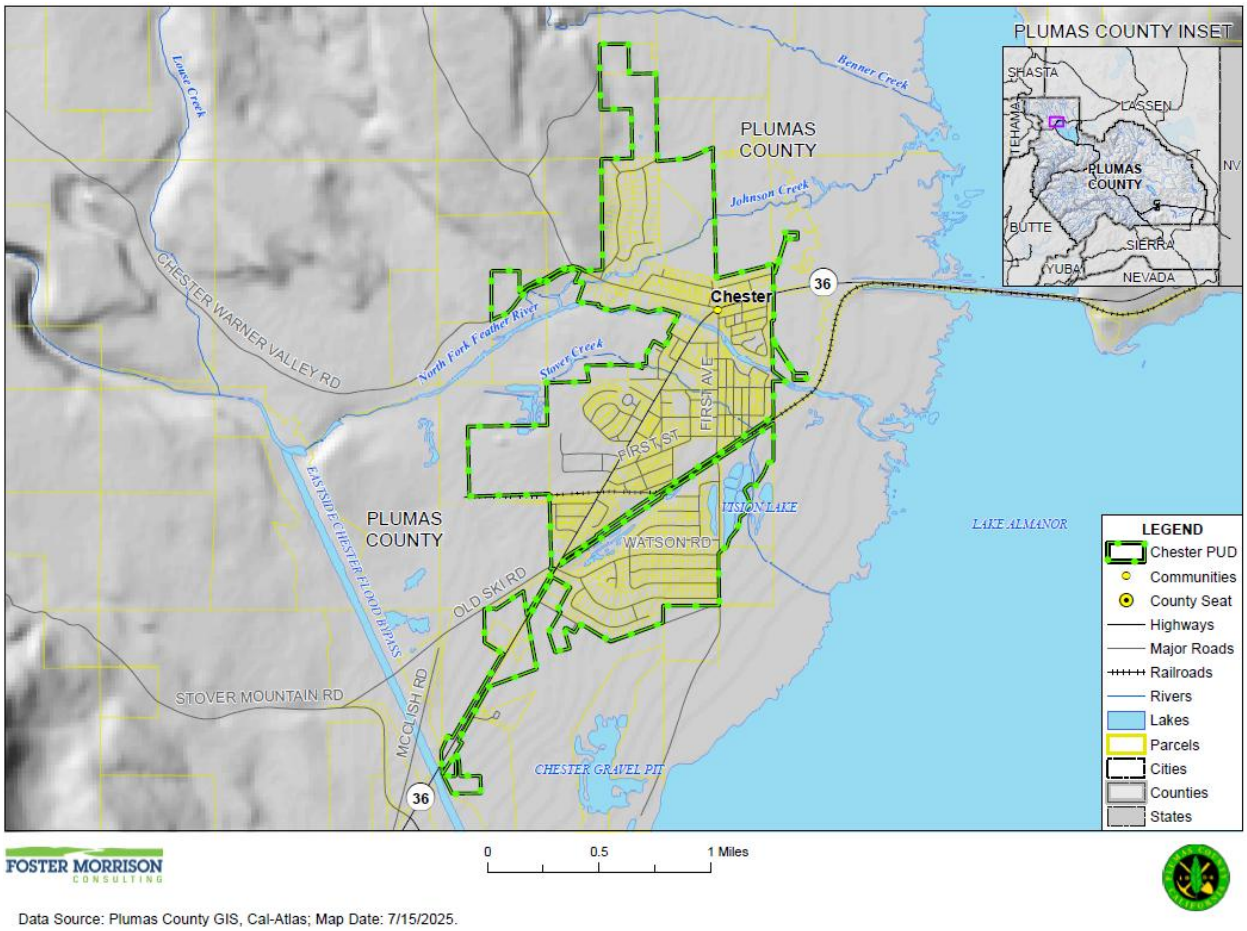
Name	Position/Title	How Participated

Source: Chester PUD

B.3 District Profile

The community profile for the Chester PUD is detailed in the following sections. Figure B-1 displays a District map and the location of Chester PUD within Plumas County.

Figure B-1 Chester PUD



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

B.3.1. Overview and Background

Chester Public Utility District (Chester PUD) provides domestic water distribution, wastewater collection and treatment, fire protection and ambulance services. In addition, Chester PUD is partially reimbursed from the County for providing street lighting services and also awards and administers a solid waste collection franchise for the area.

Chester PUD was formed in 1947 as an independent special district. It was organized to provide water and wastewater services to the residents of Chester. In 2009, Chester PUD consolidated with Chester Fire Protection District (FPD), and consequently, took on fire protection and ambulance services. The principal act that governs the District is the Public Utility District Act. The principal act empowers the District to acquire, construct, own, operate, control, or use works for supplying light, water, power, heat, transportation, telephone service, or other means of communication, or means for the disposal of garbage, sewage, or refuse matter. In addition, the District may acquire, construct, own, complete, use, and operate a fire department, street lighting system, public parks and other recreation facilities, and provide for the drainage of roads, streets, and public places.

Prior to 2024, the Chester Fire Department offered comprehensive fire services, including fire suppression, emergency medical care, and ambulance services to the Chester fire protection service Sphere of Influence (SOI). However, due to recurring budget deficits, the department significantly reduced its services. Currently, the Department operates only about three days per week, providing limited emergency and medical response services but no longer transporting patients. The Chester Fire Department now heavily relies on Peninsula Fire Protection District for patient transport and coverage on nonoperational days.

Chester PUD is located on the northwestern shore of Lake Almanor in Plumas County. Sitting at 4,534 ft in elevation, the climate is moderate with warm summers and mild winters. Average summer temperatures range from highs in the upper 70s to mid-90s, while winter temperatures average from highs in the 50s to lows in the low 30s. While there can be occasional rain or snow during the winter months, precipitation is generally light throughout the year. In addition to sunny skies and mild weather, Chester enjoys cool ocean breezes off of Lake Almanor during its warmest days and crisp mountain air during its cooler months.

The District does not border any other water, wastewater or fire providers. West Almanor CSD is located to the south of Chester PUD, and Walker Ranch is to the east. The Chester PUD boundary is entirely within Plumas County. The District's boundaries encompass approximately 1.75 square miles.

Chester PUD provides extra-territorial services under an out-of-area service agreement (OASA). An agreement was entered into by Chester PUD, Collins Pine Company and the Almanor Park and Recreation District in 2010 for a 20-year lease of property known as the Truman Collins Sports Complex on a 2.3-acre area needing water, wastewater and fire and EMS services provided by Chester PUD. The Almanor Park and Recreation District, through the Collins Pine Company, filed a Plumas LAFCo application for an OASA and Chester PUD agreed to serve and provide the sports complex area with domestic water and fire and EMS services, and in the future with wastewater.

TALK ABOUT PENN FIRE ADDITION?

B.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The Chester PUD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- B.4.1 Assets Inventory and Growth and Development Trends
- B.4.2 Hazard Identification
- B.4.3 Hazard Profiles and Vulnerability to Specific Hazards

B.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the Chester PUD's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the Chester PUD's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section B.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section B.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

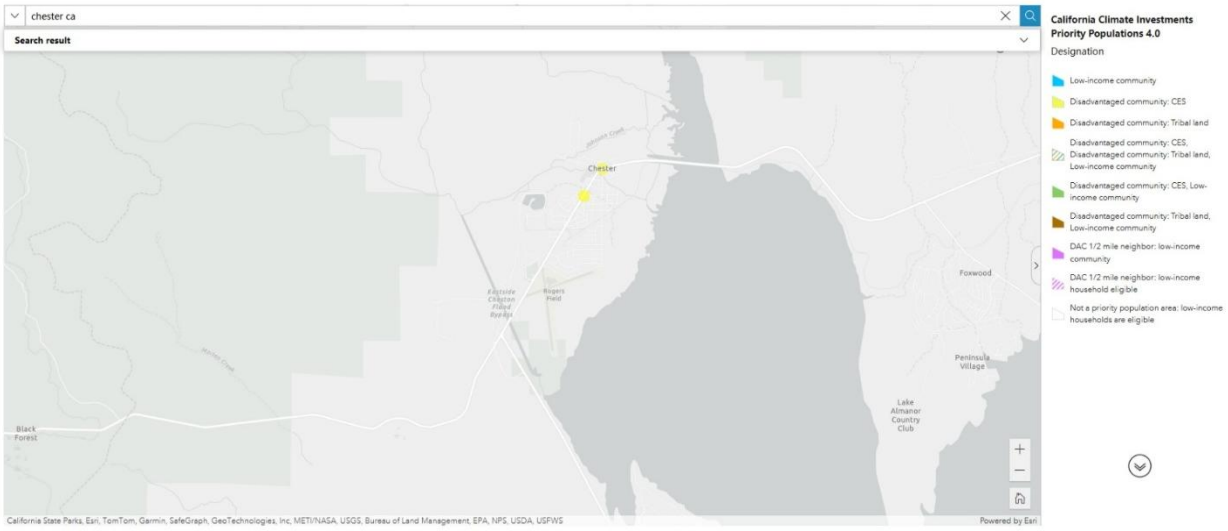
The most important asset within any community are the people and populations that reside in the District. The District has X staff. NUMBER OF DISTRICT STAFF? PUT THIS IN THE POP SECTIONS BELOW. In addition to District staff, the District provides services to PLACE NUMBER OF PEOPLE SERVED.

The District provided information about priority populations that they serve. This is similar to the vulnerable and underserved populations discussed in the Base Plan. For Chester, this can be seen in Figure

B-2. As shown in the areas in yellow, there are areas known as Disadvantaged Communities. This comes from the Cal EPA's Enviroscreen Tool. These "Disadvantaged Community: CES) areas include census tracts that met one of the criteria below:

- Received the highest 25% of overall scores in CES 4.0
- Lacked overall scores in CES 4.0 due to data gaps, be received the highest 5% of CES 4.0 cumulative pollution burden scores.
- Identified in the 2017 DAC designations as disadvantaged, regardless of their score in CES 4.0.

Figure B-2 Chester PUD Priority Populations



Source: California Climate Investments Priority Populations Mapping Tool 4.0. Provided by Chester PUD on 7/13/2025.

The District noted other special populations in the District. There is an elderly care facility. The hospital has a long-term skilled nursing facility. There is a portion of the population that is low income, as well. Both would need assistance.

Structures and Critical Facilities

This section considers Chester PUD's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table B-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. Chester PUD's physical assets, valued at over $63 million, consist of structures and infrastructure to support the District's operations.

Table B-2 Chester PUD Critical Facilities and Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
Tanks x2 (500k and 640k)	Water	$6,000,000	Fire, Earthquake, Extreme Weather
Well x4 +1 unused	Water	$5,000,000	Fire, Earthquake, Extreme Weather, Flood
Treatment Plant and CL Contact and Ponds	Wastewater	$20,000,000	Fire, Earthquake, Extreme Weather, Flood
Sewer Lines and Lift Stations	Wastewater	$20,000,000	Fire, Earthquake, Extreme Weather, Flood
Hydrants x240	Water	$1,000,000	Fire, Earthquake, Flood
Office Supplies, Electronics, Furniture	Water/Wastewater	$500,000	Fire, Earthquake, Extreme Weather, Flood
198 Main Building and Property	Water/Wastewater	$500,000	Fire, Earthquake, Extreme Weather, Flood
Water Lines and Meters	Water	$10,000,000	Fire, Earthquake, Extreme Weather, Flood
Total		**$63,000,000**	

Source: Chester PUD

Community Lifelines

Assessing the vulnerability of the Chester PUD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.

- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the Chester PUD to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Chester PUD has a variety of natural resources of value to the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. ANY UNIQUE NATURAL RESOURCES IN THE DISTRICT?

Historic and Cultural Resources

Chester PUD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. ANY UNIQUE HISTORICAL OR CULTURAL RESOURCES IN THE DISTRICT?

Economic Assets and Community Activities of Value

Assessing the vulnerability of the Chester PUD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

The District noted that there are economic assets in the Districts. Mill, Holiday Market, multiple restaurants, schools, churches, lake recreation and campgrounds, airport, hospital, Main St Bridge over Feather River, Causeway over Lake Almanor, bike trail, Chester Park,

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.

- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

The District noted that population is expected to stay flat or decrease over time.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

There are no current growth development plans the District is aware of, but there is potential. There's a lot of land owned by private owners and the Maidu Tribe. Some community members are working on creating more winter activities. The District noted that it does not cause future development to occur, but reacts to it by providing increased (or decreased) services.

B.4.2. Hazard Identification

The Chester PUD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table B-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table B-3 Chester PUD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather / Insects/Pests	Extensive	Highly Likely	Limited	Low	Medium
Climate Change	Extensive	Likely	Critical	Low	--
Dam Failure	Extensive	Unlikely	Critical	Low	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Unlikely/Occasionally	Catastrophic	Low	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Unlikely/Occasionally	Catastrophic	Medium	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Haz Mat Transportation	Significant	Occasionally	Critical	Low	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Low	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligent	Low	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Occasionally	Limited	Low	Medium
Volcano	Extensive	Unlikely	Critical	Low	
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

B.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the Chester PUD (as identified in the Significance column of Table B-3). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section B.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section B.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The District noted that there have been occasional Power Outages during heavy snow events, including those associated with PSPS events, that have affected them. Specific events couldn't be recalled. Power outages is common with heavy snow.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the secondary hazards of drought in the Plumas County Planning Area, that can also affect Chester PUD, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Plumas County. This can be seen in Table B-4. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County since 2012.

Table B-4 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the District.

Chester PUD Events

Based on historical information, the occurrence of drought in California, including the Chester PUD, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years that likely affected the District.

Specifically, 2020-2023 was the most recent drought. The District noted that a moderate drought caused impacts including wildfire-related injuries, mental health effects, water-related illnesses and injuries, Valley fever, and respiratory illnesses. During this time, the Dixie Fire occurred causing one firefighter's death, infrastructure damage, and property damage. This drought along with the wildfire, caused reduced tourism and recreation use, economically affecting the District. While there is not much cropland in Chester, this was also an area that was affected during these years.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the Chester PUD to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District's greatest concern from drought is from increased wildfire risk. Wildfire risk is discussed in greater detail in the Wildfire profile below.

In addition, within the District, there are two health care facilities, an elderly care facility and long-term skilled nursing facility. Along with this, there are populations of Chester PUD that are low-income, which could be affected by drought if assistance is needed.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

The District noted that the facilities listed in Table B-2 are all at some risk of drought, but the greater risk is the wildfires that occur during periods of drought.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially

making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to And cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Chester PUD include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Planning Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

HOW WILL FUTURE DEVELOPMENT AFFECT YOUR DISTRICT'S DROUGHT RISK? WHAT SUPPLIES YOUR DISTRICT WITH WATER? HOW ARE YOU PROTECTING IT CURRENTLY AND WILL BE PROTECTING IT IN THE FUTURE?

Flood: 1%/0.2% Annual Chance (w/Levee Failure)

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–Moderate

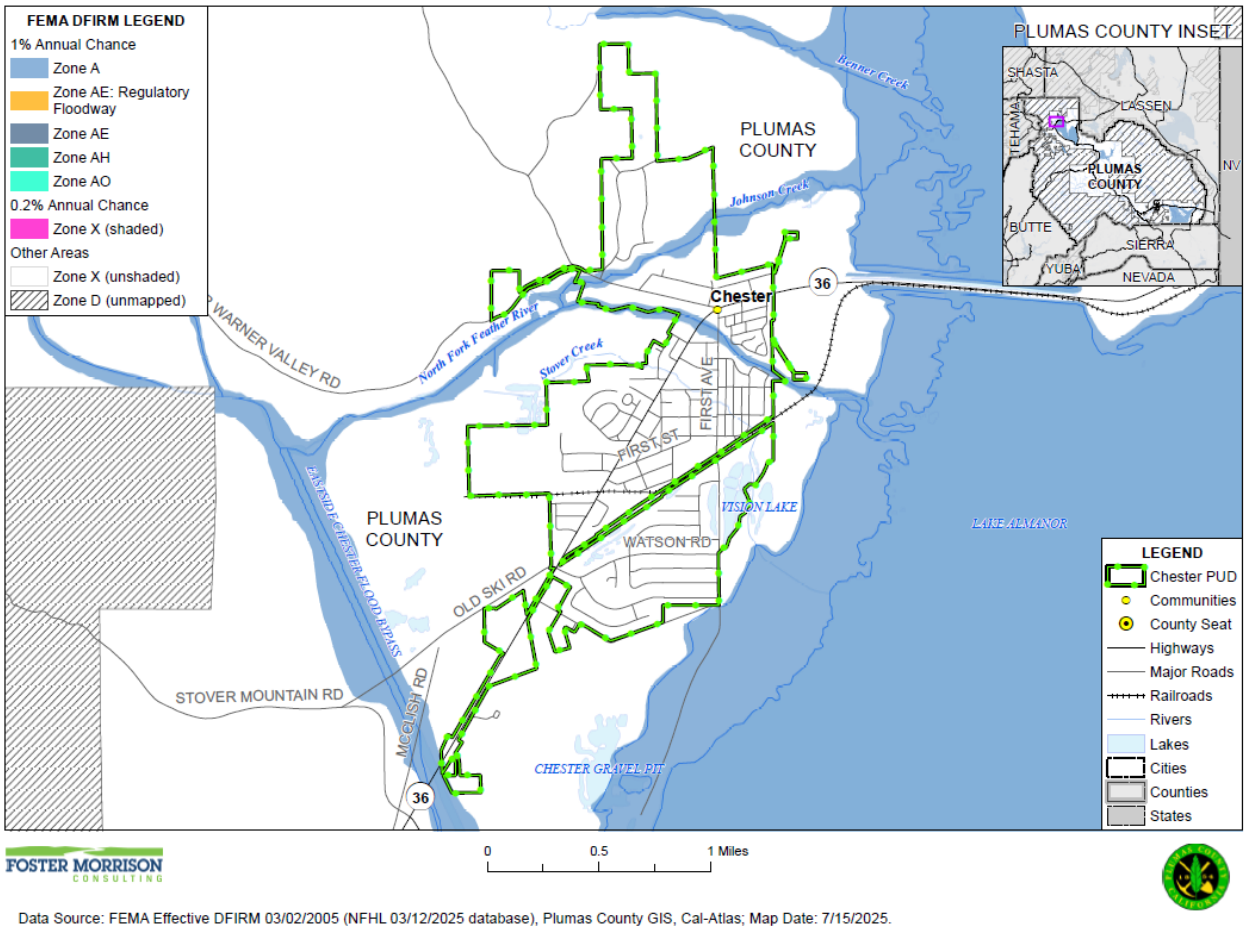
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the District and have caused damage in the past. Flooding can be a problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the District swell with heavy rainfall and snowmelt runoff. The District has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures (like levees) located throughout the Plumas County Planning Area and the Chester PUD. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred within the 1% annual chance floodplains and in other localized areas in the District.

Location and Extent

The Chester PUD has areas located in the 1% annual chance flood zones. This is seen in Figure B-3.

Figure B-3 Chester PUD – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 03/02/2005 (NFHL 03/12/2025 database), Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Table B-5 details the DFIRM mapped flood zones located within the District.

Table B-5 Chester PUD– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in District
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X (unshaded)	Area of minimal flood hazard	X

Source: FEMA DFIRM 03/02/2005

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific

depths are unknown. Flood durations in the District tend to be short to medium term, until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Geographical flood extents for the District from the FEMA DFIRMs are shown in Table B-6.

Table B-6 Chester PUD – Geographical DFIRM Flood Zone Extents

Jurisdiction/ Flood Zone/ Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	0	0.0%	0	0.0%	0	0.0%
Commercial	2	0.2%	1	0.2%	1	0.1%
Federal Lands	0	0.0%	0	0.0%	0	0.0%
Government	4	0.4%	0	0.0%	4	1%
Industrial	0	0.0%	0	0.0%	0	0.0%
Institutional	1	0.1%	0	0.0%	1	0.2%
Miscellaneous	0	0.0%	0	0.0%	0	0.0%
Recreational	0	0.0%	0	0.0%	0	0.0%
Residential	37	3%	33	5%	4	1%
ROW/Utilities	5	0.4%	0	0.0%	5	1%
Zone A Total	**49**	**4%**	**35**	**5%**	**14**	**3%**
1% Annual Chance Flood Hazard Total	**49**	**4%**	**35**	**5%**	**14**	**3%**
Other Areas						
Zone X (unshaded)						
Agricultural	3	0.2%	0	0.0%	3	1%
Commercial	164	14%	121	17%	42	9%
Federal Lands	0	0.0%	0	0.0%	0	0.0%
Government	109	9%	0	0.0%	109	23%
Industrial	17	1%	13	2%	4	1%
Institutional	26	2%	4	1%	22	5%
Miscellaneous	15	1%	0	0.0%	15	3%
Recreational	1	0.05%	1	0.1%	0	0.0%
Residential	634	54%	541	76%	94	20%
ROW/Utilities	163	14%	-		163	35%
Zone X (unshaded) Total	**1,130**	**96%**	**680**	**95%**	**451**	**97%**

Jurisdiction/ Flood Zone/ Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Other Areas Total	**1,130**	**96%**	**680**	**95%**	**451**	**97%**
Grand Total	**1,179**	**100%**	**714**	**100%**	**465**	**100%**

Source: FEMA DFIRM 03/02/2005

THERE ARE LEVEES IN THE AREA SERVED BY THE DISTRICT. ARE ANY DISTRICT FACILITIES PROTECTED BY ANY LEVEES?

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Plumas County from flooding is shown on Table B-7. These events also likely affected the District to some degree.

Table B-7 Plumas County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storm)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA
*included a landslide component

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Plumas County has seen 15 events. Depending on the location, these events most likely had some impact on the District.

Chester PUD Events

The District noted that the following events had affects or damages to the District:

Chester had a history of annual flooding (especially in 1937) until the super ditch was built in 1938 to allow water to bypass during high flows. This reduced flooding, however, the District noted two events after the construction of the super ditch.

- 1956 flooding
- 1964 flooding

All of the events above caused significant property damage, structural damage to homes and businesses and caused school and road closures throughout the District. To aid the super ditch, the Chester diversion dam was installed in 1976. This significantly reduced flooding. Once a decade the District noted that typically a more critical flood occurs, generally caused by snowpack melting from warmer temps. Water meters can get buried with debris, the populations can decline temporarily, schools close, and businesses closed as Chester may see flood depths in areas of a couple feet of water.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Plumas County Planning Area, and the Chester PUD. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the District. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the District is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The diversion dam significantly reduced the risk but if the diversion dam fails or the lake drainage system fails, Chester could see significant devastation.

If the super ditch fails, the snowpack melts in a rainstorm, or if the lake gets too full and cannot drain fast enough. Chester is flat and low in comparison to the surrounding mountains. Flooding could damage all

electronic devices and destroy infrastructure along with the potential to break the wastewater pond levees. It could be as catastrophic as fire and create full destruction of the community.

The District is also concerned with rain on snow events, which can cause greater flooding in the District.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? DO FLOOD EVENTS RESULT IN LOSS OF SERVICE, EVEN TEMPORARILY? CAN THE DISTRICT PROVIDE DETAILS ON THE ROOT CAUSE OF FLOOD ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those in the Service Area) located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Populations served by the District can be the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. The District's ability to provide services to its populations during flood events is paramount.

Structures and Critical Facilities

Certain District structures are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. District assets listed in Table B-2 would be at risk to flooding.

Flooding presents a threat to both critical facilities and infrastructure, as well as community lifelines. Critical infrastructure plays an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on water infrastructure for drinking water, wastewater service, and draining streets of rainwater. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California.

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be

widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure B-3 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Chester PUD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.

- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development is expected to be minimal in the District. Future development in the District may be built in the floodplain, as long as it conforms to the standards of the floodplain ordinance. The County enforces their floodplain management ordinance on areas inside the District. More detail on the specifics of the floodplain ordinance can be found in Section 4.4.1 of the Base Plan. New District facilities and assets will be sited in such a way as to reduce the risk from flooding to District structures.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The Chester PUD is subject to localized flooding throughout the District. This is discussed in **Error! R eference source not found.** below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

Chester PUD Events

While a large storm event caused flooding in other areas, Chester did not flood in 2023. Instead, it was severely impacted with snow. There were road closures and property damage. There was a significant flood in 1971 that caused damage and population relocation. Chester had a history of annual flooding until the super ditch was built in 1938 to allow water to bypass during high flows. This significantly reduced flooding.

Once a decade there's typically a more critical flood, generally caused by Snowpack melting from warmer temps. Water meters were buried with debris, the population declined temporarily, schools closed and some businesses closed. These larger flood events can be seen in the Flood section above.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the District has been affected by flooding of streams and creeks occurring during large snow melt events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of or inadequate drainage infrastructure in the District contributes to localized flooding issues. This includes those locations on Table B-8.

Table B-8 CPUD - List of Localized Flooding Areas

Road/Location Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
All of Chester if the lake drainage system or super ditch bypass fails	X	X	X	X		X	
Where the bypass ditch and Feather River go through town	X	X	X	X		X	

Source: Chester PUD

The District is also concerned with rain on snow events, which can cause greater flooding in the District. While this is an issue for the District, specific flooding problem areas couldn't be identified.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

No assets from Table B-2 were specifically identified as being at risk to localized flooding.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Chester PUD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The District noted that no future development is currently known to be occurring. However, he risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the District will add to the drainage issues already faced by the District, unless adequate drainage facilities are installed in new development locations.

Severe Weather: Extreme Cold, Freeze, and Snow

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Excess snow can cause avalanches to occur. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are some of the most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to agricultural industry.

Location and Extent

Extreme cold and freeze events occur on a regional basis. Average low temperatures in the District can reach as low as 29º. There is no scale for extreme cold and freeze other than temperatures below 32°F.

Extreme cold and freeze have a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Extreme cold can occur in any location of the City. All portions of the District and County are at risk to extreme cold and freeze.

Snowfall can affect almost all areas of the County and the District. While an average snowfall in the district can be up to 7 inches in a month, there have been instances where up to four feet have fallen in a 24 hour span as ween in the Chester PUD events section. Depending on the elevation of any given area, severe snowstorms are some of the most common extreme weather events that occur in the City and Plumas County. There is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of snowfall other than snow depths. Heavy snow has a slow to moderate onset and can generally be predicted in advance for the County. Snow events can last for hours or for days, and snow can stay on the ground for weeks to months at a time.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for extreme cold and freeze. There were no disasters from snow or from avalanche. Table B-9 shows the dates of the disaster declarations. There have been USDA disaster declarations (2016, twice in 2022, 2023) from freeze since 2012.

Table B-9 Plumas County – Federal and State Disaster Declarations for Freeze 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	2007	0	–

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 549 extreme cold, freeze, and snow incidents for Plumas County since 1993, some of which likely affected the District.

Chester PUD Events

Heavy snow caused white out conditions, tree limbs falling on cars and homes, cars stalled due to white out conditions, freezing and breaking of water lines, and road closures occurred in Dec of 2022, Jan of 2023, and March of 2023. In Jan of 2023 up to 4 feet of snow fell in 24 hours. A church caved in and multiple outbuildings were damaged. Roads were closed, it was hard to get supplies to businesses

Climate Change and Extreme Cold, Freeze, and Snow (w/avalanche)

According to the 2021 CAS (as well as the 2024 Draft CAS), freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would

decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow

Extreme cold and freeze events happen in the District each year. Snow occurs regularly and can contribute to avalanches occurring in sloped areas. Cold, freeze, snow, and avalanche can impact both structures and populations in the Planning Area and in extreme conditions, may affect the ability of the District to operate. The whole of the District and County Planning Area has some measure of vulnerability to extreme cold, freeze, and snow.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to District. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Chester PUD is most concerned with an inability to access District source and treatment locations. Along with this, the risk of pipes and water lines freezing is high and power outages can occur during heavy snow events. The District is also concerned with rapid snowmelt from heat or rain on snow events, which can cause greater flooding in the District.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations the District serve are at some vulnerability to extreme cold, freeze, and snow. Some employees may face a risk while working outdoors. All populations served by the District are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside (including District staff). Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Snow has an effect on buildings, but its effect on people and populations are minimal. Avalanche can affect populations, though the District has few developed areas at risk to avalanche.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur and can be heavy enough to damage structures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the District. Infrastructure such as roads, highways, and bridges can become slippery or blocked by large snow events, causing accidents and road closures.

Those District assets noted as being at risk to severe weather in Table B-2 are at risk.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the District may be affected. During periods of freeze, trees in the District may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the District. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the District can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

One of the most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur during extended periods of snow when new snow is deposited on the existing snow pack causing stress on the layers beneath and triggering a collapse resulting in an avalanche. Avalanches can also be triggered by severe weather such as high winds and unusually warm weather and even earthquake events. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the District include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow (and avalanche) and their associated impacts to the District.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District area are expected to be limited in the near future and thus are not likely to affect extreme cold and freeze and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current State of California and Plumas County codes provide such provisions for new construction.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in

excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the District.

Location and Extent

Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the District as discussed below. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the District and Plumas County. Duration of severe storms in the District can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table B-10. IN addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table B-10 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

Chester PUD Events

In 2023, a severe weather event caused significant snowfall to accumulate within the District, causing road closures and property damage.

In addition, the District noted that heavy rains and storms are an annual occurrence often resulting in flooding. Events causing flood issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the Chester PUD. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the District is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. The District is also concerned with rain on snow events, which can cause greater flooding in the District. In addition, the District is concerned about power outages, floods, road closures, ground saturation from flooding.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE HEAVY RAIN ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to heavy rains and storms. Those District employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the District have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

District facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the District. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

Those District assets noted as being at risk to severe weather in Table B-2 are at risk.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people.

Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New District facilities follow state and local building codes which should reduce the risk to future development in the District from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the District.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the Chester PUD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

Wildfire Smoke and Air Quality

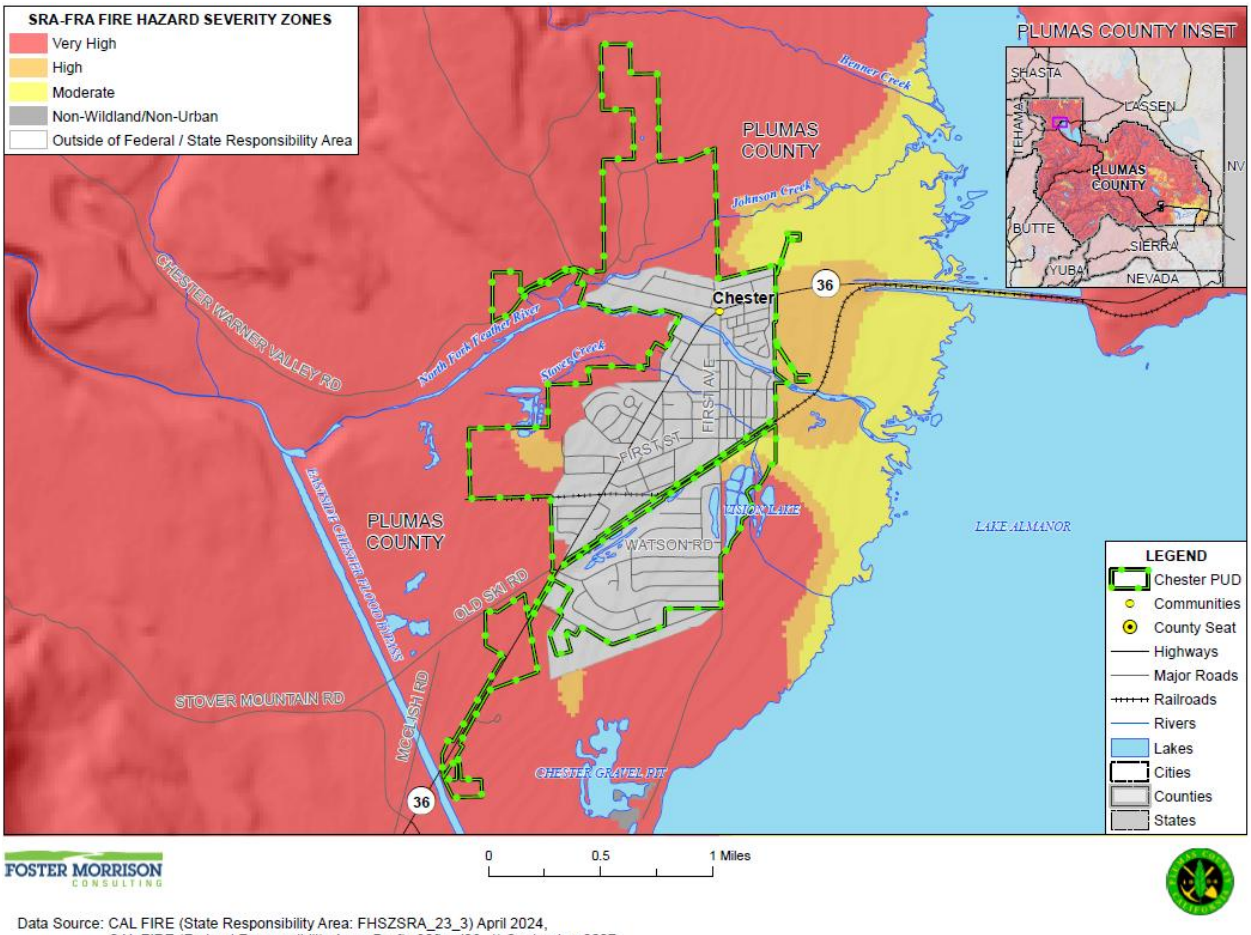
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

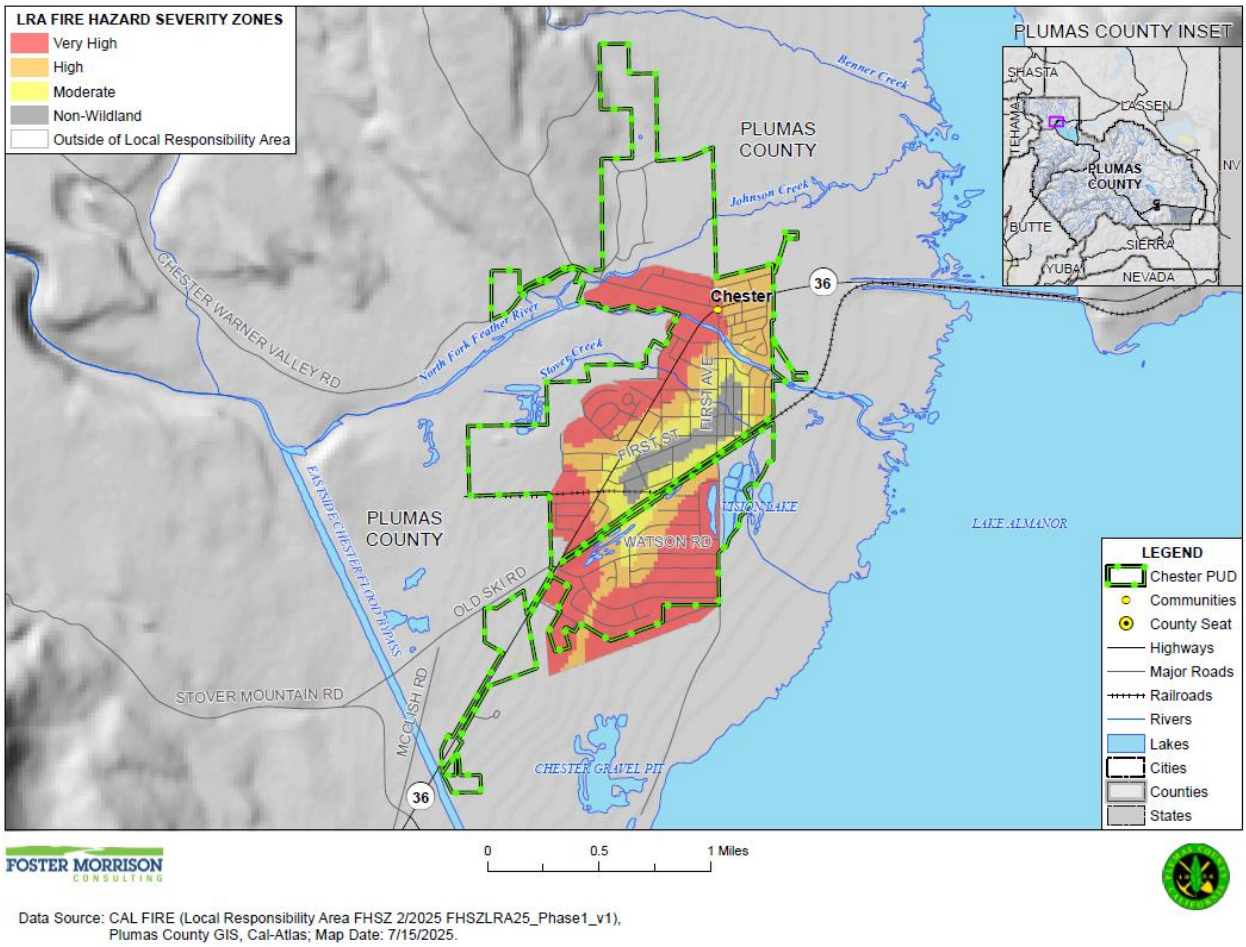
Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the Chester PUD were created. Figure B-4 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure B-5 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Moderate to Very High.

Figure B-4 Chester PUD – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Figure B-5 Chester PUD – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 7/15/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table B-11, while extents in the LRA are shown on Table B-12.

Table B-11 Chester PUD – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Jurisdiction / Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	435	37%	275	38%	161	35%
High	37	3%	22	3%	16	3%
Moderate	10	1%	0	0.0%	10	2%
Non-Wildland/Non-Urban	0	0.0%	0	0.0%	0	0.0%

Jurisdiction / Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Outside of Federal / State Responsibility Area	696	59%	418	59%	279	60%
Total	**1,179**	**100%**	**714**	**100%**	**465**	**100%**

Source: CAL FIRE

Table B-12 Chester PUD – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Jurisdiction / Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	350	30%	222	31%	128	27%
High	195	17%	113	16%	81	17%
Moderate	101	9%	54	8%	47	10%
Non-Wildland	51	4%	29	4%	23	5%
Outside of Local Responsibility Area	483	41%	296	41%	186	40%
Total	**1,179**	**100%**	**714**	**100%**	**465**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table B-13.

Table B-13 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

Chester PUD Events

There have been several wildfires over the years that have impacted Chester with air quality, road closures, and rising home insurance costs. The only fire that appears to have closely threatened the community of Chester was the Dixie fire. All but one road was closed, the entire town was evacuated for over a week, supplies were hard to get, 2 structures were burnt across Lake Almanor, smoke damage occurred to many homes through the ventilation, and animals were pushed into town and farther out. The burn scar causes ecological and economical damages including tourism and population decline, fire insurance rising considerably, the dead trees becoming overloaded with beetles, no protection from the wind due to loss of trees, schools and businesses were shut down.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

If a large wildfire were to occur in the District, above ground infrastructure would have to be completely replaced. Economic impacts could be severe as Chester could lose a significant portion, if not all, of District income depending on the severity of the fire; from population decline as well as a reduction in tourism. Chester thrives off summer tourism and a fire significantly impacts the tourism of the area. The busyness of the summer allows small business to survive through the winter. Along with that, the nearby lake needs to maintain the beautiful surroundings for tourism to be continual throughout the summer.

Fire can cause the District, and the population that stay, to rebuild and restart with all aspects of having a functioning society. It can take years to rebuild District infrastructure. Income to rebuild could be diminished to nothing.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE WILDFIRE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused , infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. This includes most of the District assets that were shown on Table B-2 above.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts to the District include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. All wastewater equipment have generators, however, the water distribution equipment does not. Without backup electricity generation, water and wastewater cannot be conveyed. Water quality will also suffer if water treatment functionality is compromised. The economic impact alone to the District including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Chester PUD include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional assets at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, District building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

B.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

B.5.1. Regulatory Mitigation Capabilities

Table B-14 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the Chester PUD.

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table B-14 Chester PUD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	We will be creating one
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	Penn Fire will be working on this plan
General Plan/Comprehensive Plan/Master Plan	N	
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	N	
Stormwater Management Plan	N	
Transportation Plan	N	
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N/A	
Building code	N/A	
Flood insurance rate maps	N/A	
Floodplain ordinance	N/A	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N/A	
Subdivision ordinance	N/A	
Zoning ordinance	N/A	
Other		

How can these capabilities be expanded and improved to reduce risk?
The acquisition of land for recreational uses is an ordinance we need. The rest are covered pretty good by the County ordinances.

Source: Chester PUD

B.5.2. Administrative/Technical Mitigation Capabilities

Table B-15 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the Chester PUD.

Table B-15 Chester PUD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N	
Civil Engineer, including dam and levee safety	N	
Community Planner	Y	
Emergency Manager	Y	
Floodplain Administrator	N	
GIS Coordinator	Y	
Planning Commission	Y	
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	Y
Hazard data and information	N	
GIS analysis	N	
Mutual aid agreements	Y	Theres one with Indian Valley. We are working on updating it.
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District would like to work with all neighboring utility districts on mutual aid agreements. Most District grants are not for mitigation. They typically are for when we are under a violation notice or in an emergency situation.		

Source: Chester PUD

B.5.3. Fiscal Mitigation Capabilities

Table B-16 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table B-16 Chester PUD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	Water and wastewater facilities
Community Development Block Grant	N	
Federal funding programs (non-FEMA)	N	State funding is our normal grant source
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
State funding programs	Y	Water and wastewater facilities and Chester Fire
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The District is in need of a capital improvement plan. That will be worked on in the future.		

Source: Chester PUD

B.5.4. Mitigation Education, Outreach, and Partnerships

Table B-17 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table B-17 Chester PUD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	N	
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	N	
Local news	Y	
Organizations that interact with underserved and vulnerable communities	N	
Social media	N	

Program/Organization	In Place Y/N	How widespread are each of these in your community?
How can these capabilities be expanded and improved to reduce risk?		
We plan to have an informational Facebook page to communicate with the public. We also send out mass mailings when required		

Source: Chester PUD

B.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

CAN THE DISTRICT PROVIDE A LIST OF PAST HAZARD MITIGATION TYPE PROJECTS AND ACTIVITIES THAT HAVE BEEN IMPLEMENTED BY HAZARD. INCLUDE ANY NOTABLE HAZARD RISK REDUCTION MEASURES.

B.6 Mitigation Strategy

B.6.1. Mitigation Goals and Objectives

The Chester PUD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

B.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Many of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

B.6.3. Mitigation Actions

The Planning Team for the Chester PUD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, , and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Drought & Water shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)

- Climate Change
- Dam Failure
- Earthquake
- Hazardous Materials Transport
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornado
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Asbestos Water Line Natural Disaster Hazard

Hazards Addressed: Flood, Fire, Extreme Weather, Dam Failure, Drought and Water Shortage, Landslide, Mudslide, Debris, Volcano and Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): All of the water lines in Chester are made of asbestos cement. Contractors frequently installed asbestos cement (AC) pipes in water systems from the 1920s through the late 1970s. The use of these pipes was largely discontinued in North America by the 1980s due to growing health concerns about asbestos exposure. If the pipes are dry without water going through them, they can become brittle and will become a high health hazard. Asbestos water lines can release fibers into drinking water and air, posing a risk of health problems like kidney and gastrointestinal cancers, and potentially benign intestinal polyps. Undisturbed, intact asbestos-cement pipe is considered less hazardous, but damaged or dry asbestos pipe a serious concern. It is unknown how long the pipes would need to be dry to become brittle and release the excess of fibers. If there was a water outage (of an extended duration) CPUD would test the water once service was restored. If the test fails the required limit of 0.2 million fibers per liter (MFL), the asbestos pipe should be replaced immediately to avoid potential serious health issues that could lead to some cancers and possibly death.

Project Description: All asbestos cement water lines to be replaced with C900, which can withstand extended water outages.

Other Alternatives: Routinely notify the public of the hazard and failed tests, and continue to provide water with known serious health risks after a natural disaster occurs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Chester PUD does not have the funds to replace the water pipes with the correct material, C900 PVC. Grant funding to replace the pipes before a natural disaster creates the hazard, is CPUD's only option to avoid extended water outages, health hazards, and emergency public notifications. Implement as a stand alone project. The District will not be able to recover the required funds to replace the AC pipe due to the high cost of the project.

Responsible Office/Partners: Chester Public Utility District

Benefits (Losses Avoided): Human and animal life and wellness is a major concern with the ability to deliver safe drinking water after a natural disaster a top priority. The project could cost around 30 million dollars. If the District has to absorb that cost in a loan, the rate payers will have to absorb that cost in their monthly base rate and water will not be deliverable at a rate that anyone can afford, (around $4000 a month).

Potential Funding (Local Budgets, Grant Funds, etc.): The District is currently contracted with RCAC to apply for all grant options. We are researching Federal, State, County, and Foundations for grant options. Examples are; grants.gov, FEMA, DFA, Kevin Kiley's office, HMGP, USDA, RCAC, CRWA, EPA, SWRCB, WRFP, CWSRF, SWRPs, DWP, NFWF, RUS…

Timeline: To be initiated within the 5 years covered by this plan (may take longer due to planning and funding application processing)

Project Priority (High, Medium, Low): High

Action 2. Backup Power

Hazards Addressed: Flood, Fire, Extreme Weather, Dam Failure, Drought and Water Shortage, Landslide, Mudslide, Debris, Volcano and Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Climate change leads to drought, Fire, and flooding, and climate change which cause many natural hazards that can create extended power outages. The District is currently short a generator for one of our wells and has no solar. Fuel for generators can be a limited resource during an extended power outages.

Project Description: Add an additional automatic generator to provide backup power to one of the District's wells, a fuel reserve storage tank, solar to all well and wastewater powered locations. This will allow continuous operations for water and wastewater during extended power outages.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Implement as a stand alone project.

Responsible Office/Partners: Chester Public Utility District

Benefits (Losses Avoided): The district can continue regular facility services to customers during power outages. Solar would save thousands monthly on water pumping costs. Automated operations during power outages would save thousands annually on staff time. Customer's quality of life during emergencies would be improved with continuous service.

Potential Funding (Local Budgets, Grant Funds, etc.): The District is currently contracted with RCAC to apply for all grant options. We are researching Federal, State, County, and Foundations for grant options. Examples are; grants.gov, FEMA, DFA, Kevin Kiley's office, HMGP, USDA, RCAC, CRWA, EPA, SWRCB, WRFP, CWSRF, SWRPs, DWP, NFWF, RUS…

Timeline: Within 2 years

Project Priority (High, Medium, Low): High

Action 3. Public Outreach Program

Hazards Addressed: All community assessed hazards and emergencies: flood, fire, extreme weather, dam failure, drought, water shortage, landslide, mudslide, debris, environmental awareness, earthquakes, volcanos, road closures, public safety

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Community preparedness is vital during emergencies and natural disasters.

Project Description: Bringing awareness to the community of how to be prepared for community emergency situations. There is a ham radio at Chester PUD at other local locations, monitored and tested monthly by a local group, Almanor Repeater Foundation. The same group maintains an AM radio frequency 147.735 MHz WRTZ-707 for emergency communications and alerts. We want to help promote the Ham and AM radio stations as part of our emergency outreach program by means of CPUD's website, Facebook, and through the Chamber of commerce's public outreach platform.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: CPUD will coordinate with the Almanor Hams, become members of the Chamber of Commerce and utilize their platform, attend town hall meetings, and maintain our Facebook page and website.

Responsible Office/Partners: Chester Public Utility District and the Almanor Hams

Benefits (Losses Avoided): Being prepared avoids chaos, loss of life and property, unnecessary costs, panic, vehicle accidents and added stress

Potential Funding (Local Budgets, Grant Funds, etc.): Internal district and staff time

Timeline: Less than a year

Project Priority (High, Medium, Low): High

Action 4. Tree and Brush Removal

Hazards Addressed: Flood, Fire, Extreme Weather, Dam Failure, Drought and Water Shortage, Landslide, Mudslide, Debris, Volcano, and Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Trees and brush around our facilities pose a hazard in a natural disaster. Drought kills trees and brush, and creates high fire hazard conditions. The weight of heavy snow can cause trees and limbs to fall on buildings.

Project Description: Remove trees and brush within defensible space limits set by Cal Fire.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Implement as a stand alone project. Hire a licensed company to create a defensible space around all infrastructure facilities.

Responsible Office/Partners: Chester Public Utility District

Benefits (Losses Avoided): Possibly millions in damages and District wide water and wastewater outages can be prevented depending on the natural disaster that occurs.

Potential Funding (Local Budgets, Grant Funds, etc.): RCAC are contracted to apply for grants for CPUD. Some of the following sources will be applied for: Sierra Nevada Conservancy (SNC) Wildfire and Forest Resilience Directed Grant Program, Community Wildfire Defense Grant Program (CWDG), State Fire Capacity (SFC) Grant Program, Cal Fire, other State and Federal grants, foundations.

Timeline: 1 year

Project Priority (High, Medium, Low): High

Action 5. Wastewater Infrastructure

Hazards Addressed: Flood, Fire, Extreme Weather, Dam Failure, Drought and Water Shortage, Landslide, Mudslide, Debris, Volcano and Earthquake

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): A natural disaster emergency could cause damage to our existing wastewater collection and treatment system. If the wastewater collection pipes are broken, the levees at the ponds are broken, or the treatment plant burned or flooded due to a natural hazard it would mean around 1400 customers without the ability to occupy their homes or businesses until repair work was

completed and potentially a major environmental contamination. It could contaminate the drinking water system and Lake Almanor. Our existing wastewater system is approximately 60 years old, making it more susceptible to breaks from natural disasters.

Project Description: Wastewater collection and treatment system

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: We are in the construction grant application process to perform upgrades to the treatment plant and replace a section of the collection system which will mitigate weak areas. The pond levees and most of the collection system do not currently have any grant applications in process. Replacing weak points is the best form of mitigation. Implement as a stand alone project.

Responsible Office/Partners: Chester Public Utility District

Benefits (Losses Avoided): Replacing weak parts of the wastewater system will protect the environment from wastewater contamination, as well as reinforcing the pond levees. If the wastewater system is damaged in an emergency the cost would be much higher to replace and clean up contamination. Human health is a grave concern if the drinking water or lake Almanor is contaminated with wastewater.

Potential Funding (Local Budgets, Grant Funds, etc.): Chester PUD does not have the funds to replace the wastewater system and clean up contamination. The customers would have to spend thousands to relocate temporarily or permanently. We are currently contracted with RCAC to apply for all grant options. We are researching Federal, State, County, and Foundations for grant options. Examples are; grants.gov, FEMA, DFA, Kevin Kiley's office, HMGP, USDA, RCAC, CRWA, EPA, SWRCB, WRFP, CWSRF, SWRPs, DWP, NFWF, RUS…

Timeline: To be initiated within the 5 years covered by this plan (may take longer due to planning and funding application processing)

Project Priority (High, Medium, Low): High

Action 6. Wireless Radio Meters

Hazards Addressed: Flood, Fire, Extreme Weather, Dam Failure, Drought and Water Shortage, Landslide, Mudslide, and Debris

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Sever weather and heavy snow makes it impossible to read meters in the winter. Currently CPUD waits until the snow is removable or mostly melted to read meters and bills for the total usage. The problem is there is no way to tell if there are any leaks from freezing pipes or other breaks. This can cause storage capacity issues and high customer bills. During fires and other natural disasters meters can still be safely read with wireless radio meters, leaks immediately detected and storage capacity maintained.

Project Description: Replace existing manually read meters with wireless radio meters.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Implement as a stand alone project. CPUD needs a grant to pay for the meters and install them. We can require them with all new annexed parcels.

Responsible Office/Partners: Chester Public Utility District

Benefits (Losses Avoided): Huge financial savings for the District and the customers. Ability to maintain water storage and deliver continuous water service to all customers throughout the extreme conditions and natural disasters.

Potential Funding (Local Budgets, Grant Funds, etc.): We are currently contracted with RCAC to apply for all grant options. We are researching Federal, State, County, and Foundations for grant options. Examples are; grants.gov, FEMA, DFA, Kevin Kiley's office, HMGP, USDA, RCAC, CRWA, EPA, SWRCB, WRFP, CWSRF, SWRPs, DWP, NFWF, RUS…

Timeline: Within 2 years

Project Priority (High, Medium, Low): High

Annex C Feather River Resource Conservation District

C.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Feather River Resource Conservation District (FRRCD or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the FRRCD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

C.2 Planning Process

As described above, the FRRCD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table C-1. Additional details on Plan participation and District representatives are included in Appendix A. FILL OUT TABLE WITH WHO PARTICIPATED AND HOW.

Table C-1 FRRCD – Planning Team

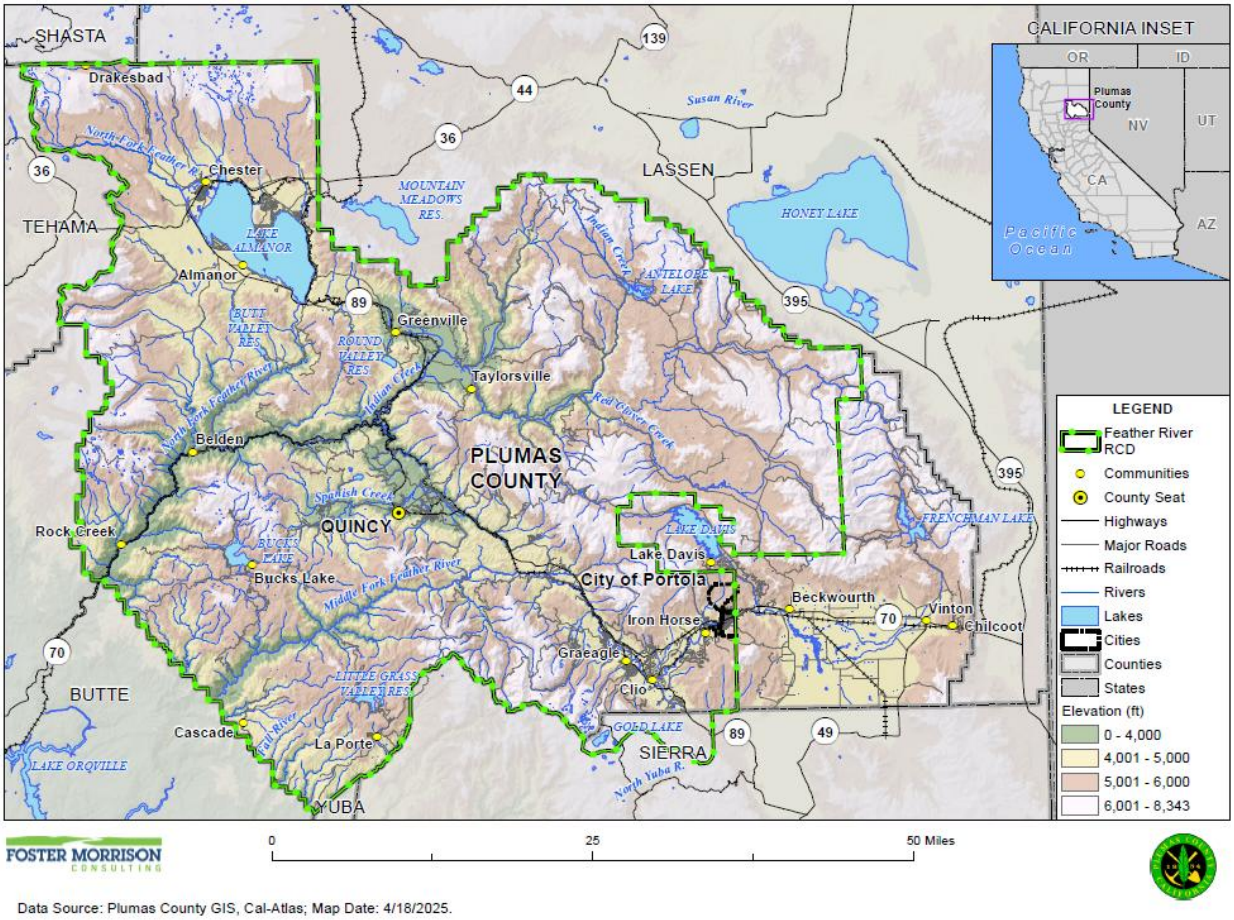
Name	Position/Title	How Participated

Source: FRRCD

C.3 District Profile

The community profile for the FRRCD is detailed in the following sections. Figure C-1 displays a District map and the location of FRRCD within Plumas County.

Figure C-1 FRRCD



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

C.3.1. Overview and Background

In response to the national "Dust Bowl" crisis of the 1930s, the federal government passed legislation in 1937 establishing the Soil Conservation Service (SCS). Local Conservation Districts were set up under state law to be controlled by board of directors in order to provide local input and direction to the SCS. In California, Conservation Districts have been formed in nearly all parts of the state beginning in the 1940s. Many have been consolidated over time and of the hundreds of districts that once existed in California, 102 remain. Soil Conservation Districts were originally empowered to manage soil and water resources for conservation, but these powers were expanded in the early 1970s to include "related resources," including fish and wildlife habitat. This expansion is responsible for the name change to "Resource" Conservation Districts in 1971.

Once called the Indian-American Valleys Resource Conservation District, the Feather River RCD was instated in 1954. In 1993, the District boundaries were expanded to coincide closer to the boundaries of Plumas County. It was during this boundary expansion that the District's name was changed to the Feather River RCD. The Feather River RCD is located in the Sacramento Valley Region of California RCDs.

The District's mission is to advocate resource conservation through education and collaborative efforts with willing landowners and organizations that promote economic and ecological sustainability.

The District Boundary encompasses a service area of approximately 2,259 square miles (1,445,907 acres) including a variety of landowners and land uses. The District Boundary falls in and around many communities including Quincy, Portola, Genesee, Taylorsville, Greenville, Crescent Mills, Lake Almanor, Canyon Dam, and Chester. The District's boundary extends to the Lassen, Shasta, Tehama, Butte, Yuba, and Sierra County lines.

C.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The FRRCD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- C.4.1 Assets Inventory and Growth and Development Trends
- 0 Hazard Identification
- C.4.3 Hazard Profiles and Vulnerability to Specific Hazards

C.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the FRRCD's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the FRRCD's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section C.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- Structures

- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section C.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District. The District has 7 staff. In addition to District staff, the District provides services to the entire Plumas County Planning Area, which was discussed in greater detail in Chapter 4 (including discussion on vulnerable populations).

Structures and Critical Facilities

This section considers the FRRCD's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

FRRCD owns no facilities or properties.

Community Lifelines

Assessing the vulnerability of the FRRCD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential

to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the FRRCD to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

FRRCD has a variety of natural resources of value to the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Historic and Cultural Resources

FRRCD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the FRRCD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future

development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

General growth in the District parallels that of the Plumas County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. The District has no control over future development in areas the District provides services in.

C.4.2. Hazard Identification

The FRRCD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table C-2 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table C-2 FRRCD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	–	–	–	–	Medium
Avalanche					Medium
Climate Change	Extensive	Highly Likely	Limited	High	–
Dam Failure	–	–	–	–	Medium
Drought & Water shortage (w/ tree mortality)	–	–	–	–	High
Earthquake (w/subhazards)	–	–	–	–	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	–	–	–	–	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Medium	Medium
Hazardous Materials Transport	–	–	–	–	
Landslide, Mudslide, Debris Flow	Limited	Likely	Limited	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	–	–	–	–	Medium
Severe Weather: Extreme Heat	–	–	–	–	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	–	–	–	–	Medium
Severe Weather: High Winds and Tornadoes	–	–	–	–	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	High

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

C.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the FRRCD (as identified in the Significance column of Table C-2). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section C.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section C.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The District has no specific concerns from PSPS events, as it owns no facilities that could be affected. Local concerns of the District are the same as that of Plumas County as a whole. Those are found in Section 4.3 of the Base Plan.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The District falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the FRRCD, the Plumas County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

FRRCD Events

Climate change is well-understood to be already increasing the likelihood and frequency of many types of adverse events affecting the District. However, because climate change by its nature cannot be conclusively implicated in any single event, it has never been directly linked to a past event affecting the District.

Vulnerability to Climate Change

The whole of the District is at some measure of vulnerability to climate change. The District Planning Team has concerns that the vulnerability of the District to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the District's assets at risk, and impacts to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Climate change is thought to exacerbate other natural hazards, increasing the likelihood of natural disasters. These disasters can have negative impacts on ecosystems, including changing vegetation type, introducing noxious weeds, increasing erosion and sedimentation, and reduced or altered wildlife habitat.

THIS SECTION IS FROM BUTTE COUNTY RCD AND CAN SERVE AS A TEMPLATE FOR FRRCE. USE OR MODIFY AS YOU SEE FIT.

As one tangible impact from climate change, Butte County is seeing more precipitation fall as rain and more rain-on-snow events, which results in shorter but stronger surges of runoff. The area most affected is the mountainous area of Butte County between about 4000 and 7000 feet. Runoff surges can overwhelm culverts, erode hillsides (especially post-wildfire), and increase the amount of sediment that runs into streams, which in turn has a negative impact on fisheries and aquatic life. The District has many projects across the County (on both County-maintained and Forest Service roads) to re-grade, re-align, out slope, decommission, and/or replace culverts/crossings on, various natural-service roads to reduce the amount of sediment they contribute to streams. The District also works on post-fire slope stabilization and meadow restoration projects, again to reduce sediment erosion into streams. These projects may be discussed in

greater detail in discussion under "Extreme Weather- Heavy Rains and Storms" and "Landslides/Mudslides/Debris Flows."

Another tangible impact from climate change affects reforestation. The precipitation Butte County receives comes in more intense but more isolated bursts. This significantly shortens the tree-planting season and has almost eliminated the spring planting season for mountain conifers in Butte County, impacting the ability to reforest after high-severity wildfire. The District has had, and continues to have, reforestation projects (on both private and Federal lands) that are impacted by climate change. As a response to climate change, the District is changing and adapting its reforestation densities, species mixes, and the technical assistance it provides to forest landowners.

A third tangible impact from climate change is that stream and lake temperatures are warmer on average and there is a higher average number of days per year that the temperatures are warmer than the comfortable range for many native fish species. In 2021, an estimated 91% of the year's spring-run Chinook salmon run were killed by high stream temperatures before they could spawn. The District works regularly with Friends of Butte Creek, the Mechoopda Indian Tribe, the Lassen National Forest, and other partners on a number of projects to improve conditions for salmon in Butte Creek.

The impacts of climate change on Butte County agriculture will be extremely various and diverse, some predictable and unpredictable, and many will be negative. The District will continue to partner with the USDA-NRCS (Natural Resources Conservation Service) and other funding mechanisms to deliver climate change adaptation and mitigation project funding to local farmers and ranchers.

IF THE ABOVE DOES NOT WORK, ADD VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT. CAN THE DISTRICT PROVIDE DETAILS ON THE CLIMATE CHANGE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations (the seven District staff and those served by the District) can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section C.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

The District noted that the services provided are focused on helping landowners cultivate more climate resistant lands. While some of these landowners are more vulnerable to climate change, there's no distinction between who is helped.

Structures and Critical Facilities and Infrastructure

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the District support rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the District are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the extreme heat and drought hazard, areas of wetlands in the District may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the District is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

ANY DISTRICT SPECIFIC IMPACTS?

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As climate change continues to accelerate over time, climate related impacts to the District will continue to increase.
- Population projections for the area served by the District show shrinking populations, which should reduce the affect of this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect climate change impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District's facilities will not be at future risk to this hazard. Since the District shares the same boundaries as the unincorporated County, future conditions in the District regarding land use, migration, population changes, and climate change are the same as those in Section 4.3.7 of the Base Plan.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall

(including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The FRRCD is subject to localized flooding throughout the District. This is discussed below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture, or when rain-on-snow events rapidly release snowpack.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

FRRCD Events

The localized flooding the District responds to tends to be highly site-specific and occurs in different places each year. Fire, localized rainfall events, and clogged culverts are the drivers of this type of flooding and occur stochastically across the District. The District could not give specific instances or dates of localized flooding.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the District has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of or inadequate drainage infrastructure in the District contributes to localized flooding issues. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? WHAT DISTRICT ASSETS ARE ADVERSELY AFFECTED BY FLOOD EVENTS? DO FLOOD EVENTS RESULT IN LOSS OF SERVICE, EVEN TEMPORARILY?CAN THE DISTRICT PROVIDE DETAILS ON THE ROOT CAUSE OF LOCALIZED FLOOD ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All seven District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Farmers and landowners are specifically vulnerable to this hazard. The District noted that, although the services provided are not human specific, that they provide help to make lands more flood resilient. These services are provided to both well-resourced as well as less prosperous landowners.

Structures and Critical Facilities and Infrastructure

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the FRRCD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District's facilities will not be at future risk to this hazard. Since the District shares the same boundaries as the unincorporated County, future conditions in the District regarding land use, migration, population changes, and climate change are the same as those in Section 4.3.12 of the Base Plan.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris

flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

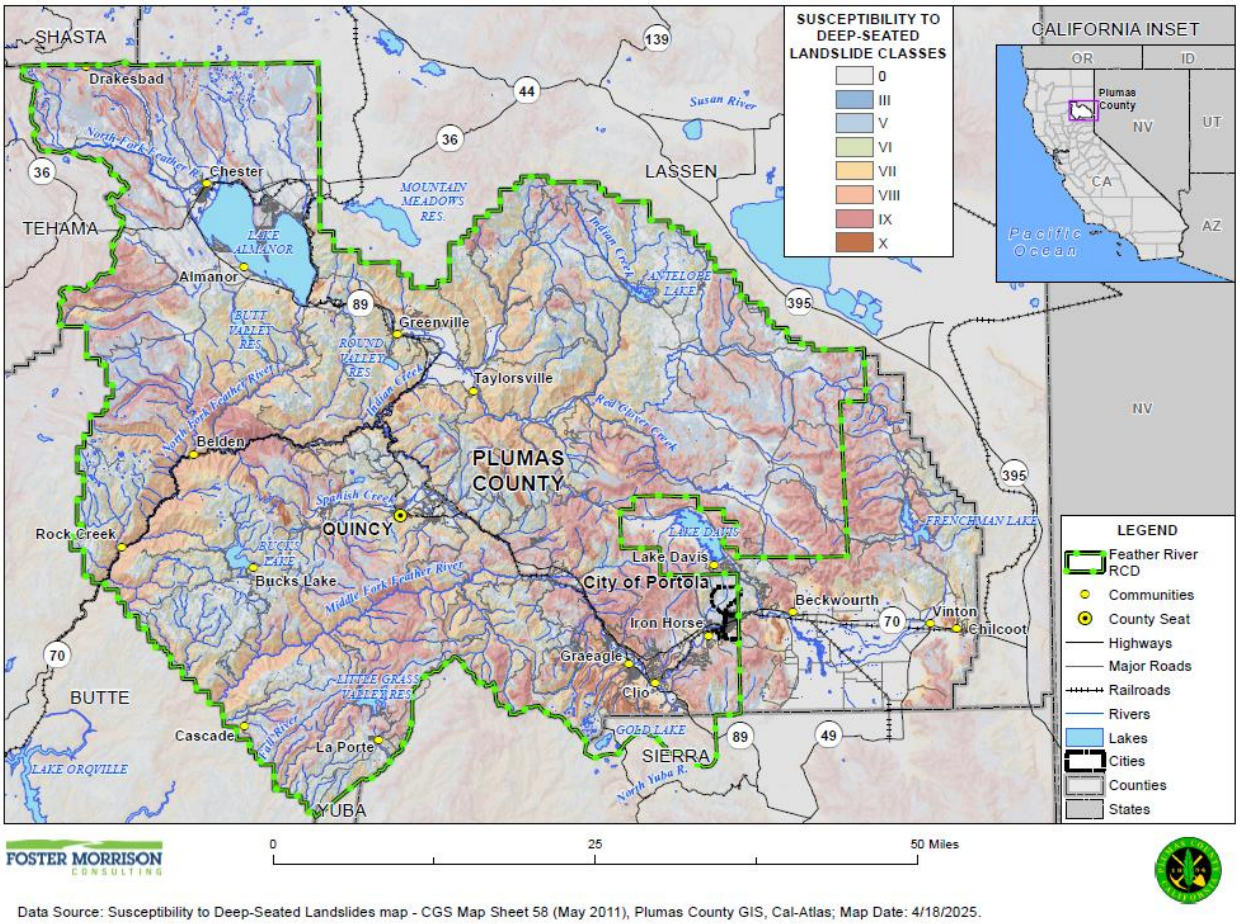
The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas in the County where the topography is characterized by rolling hills and ridges.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

Figure C-2 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure C-2 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table C-3. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that portions of the District and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure C-2 FRRCD – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Table C-3 FRRCD – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	292,016	20%	23,927	52%	268,089	19%
III	120,829	8%	2,198	5%	118,631	9%
V	193,532	13%	3,819	8%	189,712	14%
VI	121,890	8%	1,791	4%	120,099	9%
VII	249,182	17%	8,938	19%	240,245	17%
VIII	237,866	17%	1,858	4%	236,008	17%
IX	196,247	14%	2,499	5%	193,748	14%
X	24,605	2%	1,353	3%	23,252	2%
Grand Total	1,436,167	100%	46,384	100%	1,389,783	100%

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Plumas County; however, as shown in Table C-4, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table C-4 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993.

FRRCD Past Occurrences

The District noted that its past occurrences are the same as the County's, which were discussed in Section 4.3.13 of the Base Plan.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the District are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. Post wildfire areas are also more prone to landslide events. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted a concern that landslides can have negative impacts on ecosystems, including changing vegetation type, introducing noxious weeds, increasing sedimentation, and reduced or altered wildlife habitat.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE ROOT CAUSE OF LANDSLIDE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and District residents) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. Most vulnerable are those people working or residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in the District service areas as well as District staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure C-2 would be most vulnerable, as well as those in the run-out areas.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the District susceptible to landslide. Based on the risk assessment, there is potential for significant landslides to occur in the District. Most, but not all, of the historic landslides in the District have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the District to landslide.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the District. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District's facilities will not be at future risk to this hazard. Since the District shares the same boundaries as the unincorporated County, future conditions in the District regarding land use, migration, population changes, and climate change are the same as those in Section 4.3.14 of the Base Plan.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the FRRCD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

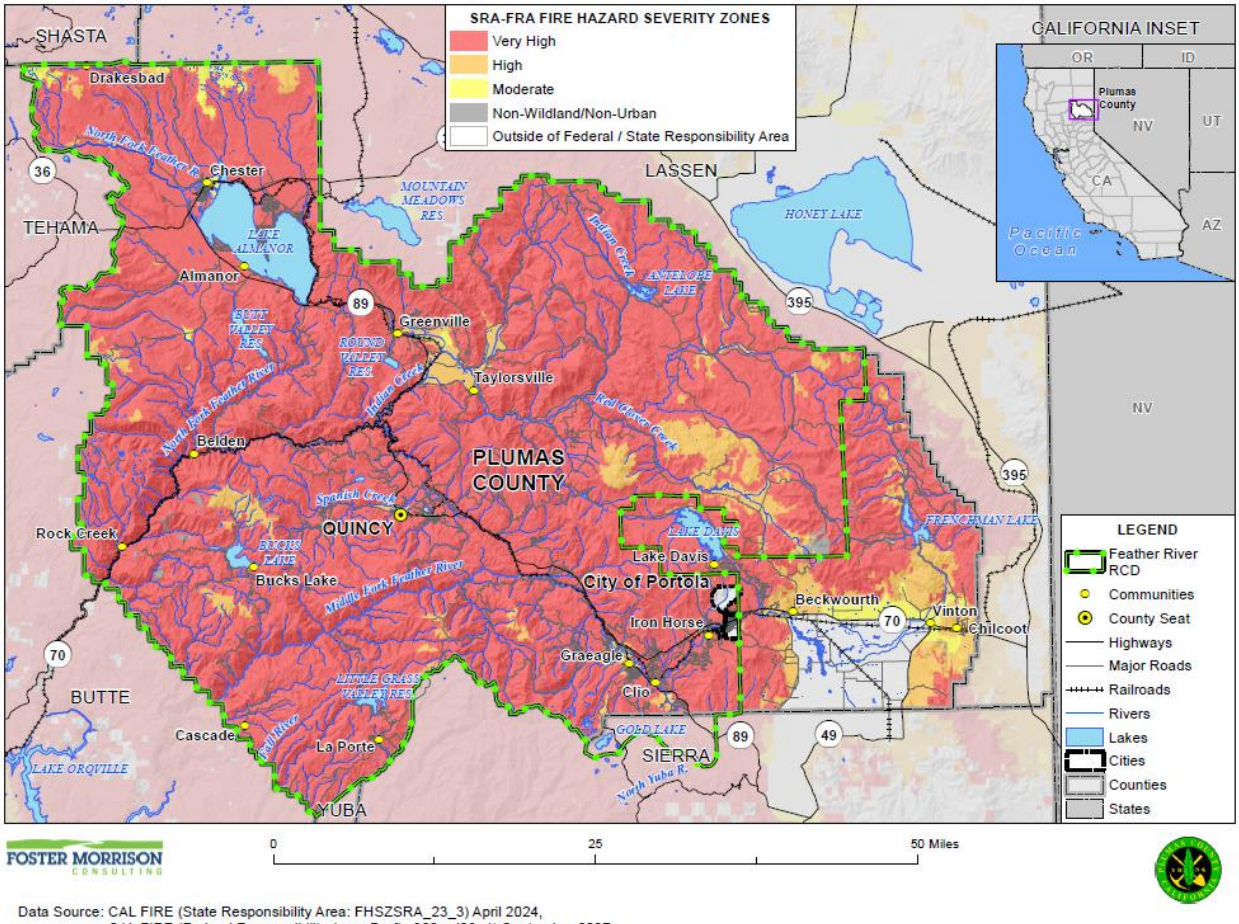
Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the FRRCD were created. Figure C-3 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure C-4 shows the CAL FIRE Local Responsibility Areas (LRA)

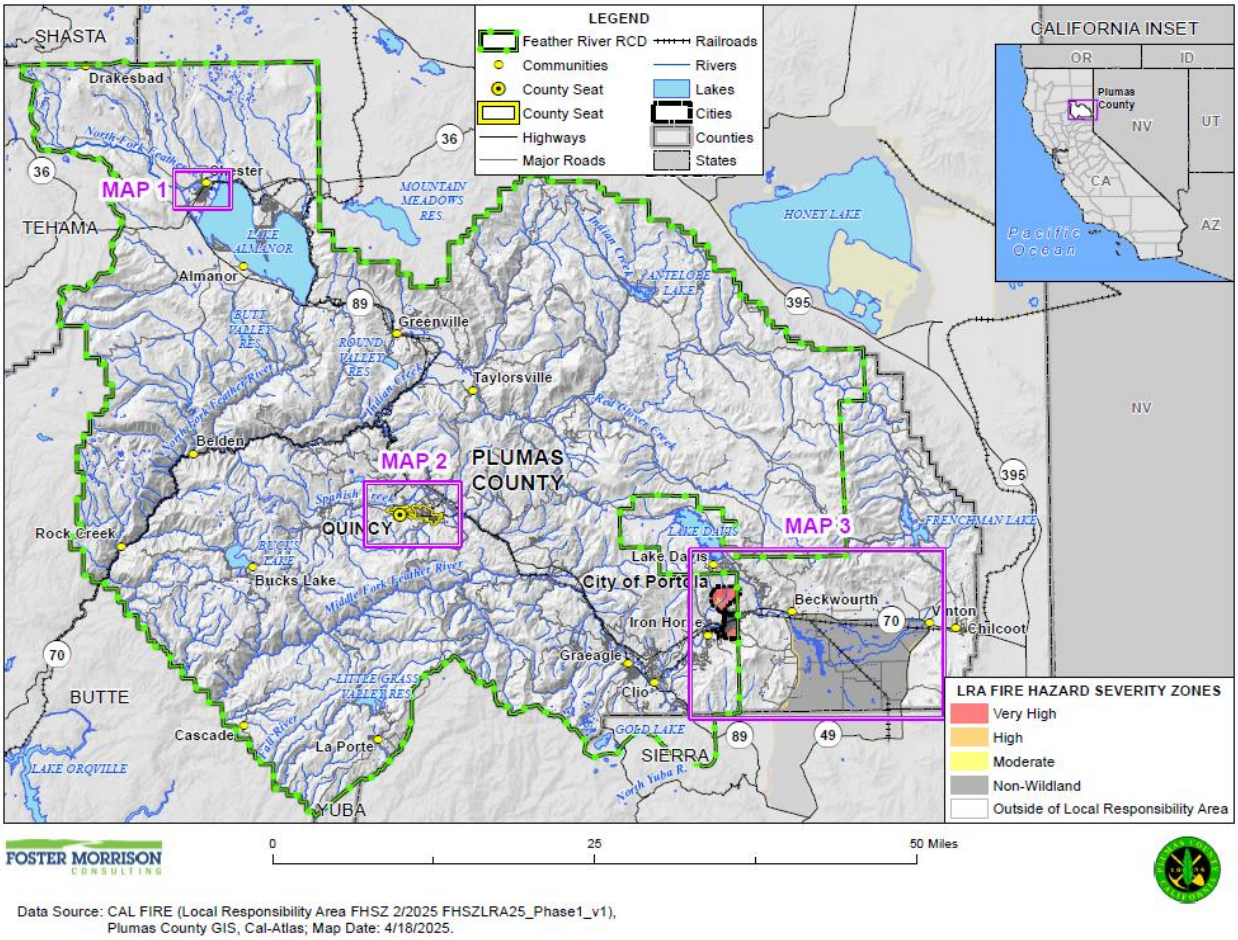
and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Non-Wildland to Very High.

Figure C-3 FRRCD – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Figure C-4 FRRCD – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table C-5, while extents in the LRA are shown on Table C-6.

Table C-5 FRRCD – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	1,344,176	92.3%	35,015	75.5%	1,309,161	92.8%
High	72,737	5.0%	8,079	17.4%	64,658	4.6%
Moderate	27,825	1.9%	145	0.3%	27,680	2.0%
Non-Wildland/Non-Urban	6,838	0.5%	0.01	0.00003%	6,838	0.5%

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Outside of Federal / State Responsibility Area	5,197	0.4%	3,151	6.8%	2,046	0.1%
Grand Total	**1,456,773**	**100.0%**	**46,390**	**100.0%**	**1,410,383**	**100.0%**

Source: CAL FIRE

Table C-6 FRRCD – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	4,479	0.3%	2,683	5.8%	1,796	0.1%
High	563	0.04%	389	0.8%	175	0.01%
Moderate	107	0.01%	54	0.1%	53	0.004%
Non-Wildland	51	0.004%	29	0.1%	23	0.002%
Outside of Local Responsibility Area	1,451,047	99.6%	43,235	93.2%	1,407,812	99.9%
Grand Total	**1,456,248**	**100.0%**	**46,389**	**100.0%**	**1,409,859**	**100.0%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table C-7.

Table C-7 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

FRRCD Events

The wildfire events affecting the District are the same as those affecting the planning area as a whole. These were discussed in Section 4.3.15 of the Base Plan.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted that wildfire has affected approximately 60% of Plumas County since 2019. It has caused catastrophic loss of property, loss of tourism, and agricultural damage. Wildfire has resulted in mandatory evacuations, loss of property, loss of infrastructure, displaced communities.

The 2023 Plumas County Fuels Treatment Project Report noted that 150+ years of fire suppression, overstocking timber stands, and fire suppression have resulted in forest conditions across California with high levels of surface and ladder fuels. In Plumas County, the consequences of these conditions are readily

apparent in recent fire history. Wildfires since 2000 have burned 76% of Plumas county (1,284,129.9 acres). Since 2017, about 60% (1,010,340 acres) of Plumas County have burned in wildfires. The three most recent fires (2021 Dixie Fire, 2021 Beckwourth Complex, and the 2020 North Complex fire) burned 55% of Plumas County (932,362 acres). Plumas County is a mosaic of high severity-burn areas, shrub dominant regeneration areas, unburned areas with high fuel loads, private industrial timberland, and Plumas National Forest fuels reduction projects. Many unburned areas are still vulnerable, and planning efforts struggle to keep pace with environmental conditions. Further, the FRRCD planning team noted that wildfire has caused catastrophic loss of property, loss of tourism, and agricultural damage. Wildfire has resulted in mandatory evacuations, loss of property, loss of infrastructure, and displaced communities.

Insects, drought, and disease can affect trees in isolated stands or in residential areas. Early identification of these can improve safely removing these trees before they cause a hazard. Often trees in residential areas are costly to remove. Early identification and financial support would improve community response and reduce the risk of limbs or entire trees falling naturally and causing damage.

Finally, the realities of climate change have exacerbated the wildfire season in both duration and severity. Increasing average temperatures and an abundance of fuels have rendered California extremely vulnerable to wildfire threat.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused , infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

The District owns no facilities, so there are no structures or critical facilities at risk to this hazard.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more

vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the FRRCD include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

The District owns no property and has no plans to build facilities in the future. As such, the District's facilities will not be at future risk to this hazard. Since the District shares the same boundaries as the unincorporated County, future conditions in the District regarding land use, migration, population changes, and climate change are the same as those in Section 4.3.15 of the Base Plan.

C.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

C.5.1. Regulatory Mitigation Capabilities

Table C-8 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the FRRCD. ***Fill out relevant portions table and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will

conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table C-8 FRRCD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan		
Climate Change Adaptation Plan		
Community Wildfire Protection Plan		
Comprehensive/Master Plan		
Continuity of Operations Plan		
Economic Development Plan		
Land Use Plan		
Local Emergency Operations Plan		
Stormwater Management Plan		
Transportation Plan		
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use		
Building code		
Flood insurance rate maps		
Floodplain ordinance		
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)		
Subdivision ordinance		
Zoning ordinance		
Other		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: FRRCD

C.5.2. Administrative/Technical Mitigation Capabilities

Table C-9 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the FRRCD. ***Fill out relevant portions table and make sure to address the notes (third) column and the last cell of the table. Much of this will not apply to you as the District. Fill out the areas that do apply to you. The final table cell needs to be filled out as well.***

Table C-9 FRRCD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official		
Civil Engineer, including dam and levee safety		
Community Planner		
Emergency Manager		
Floodplain Administrator		
GIS Coordinator		
Planning Commission		
Other		
Technical	Y/N	Has capability been used to assess/mitigate risk in the past?
Grant writing		
Hazard data and information		
GIS analysis		
Mutual aid agreements		
Other		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: FRRCD

C.5.3. Fiscal Mitigation Capabilities

Table C-10 identifies financial tools or resources that the District could potentially use to help fund mitigation activities. ***Fill out relevant portions table and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table C-10 FRRCD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Community Development Block Grant		

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Federal funding programs (non-FEMA)		
Fees for water, sewer		
Capacity fees for new development		
State funding programs		
Stormwater utility fee		
Other		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: FRRCD

C.5.4. Mitigation Education, Outreach, and Partnerships

Table C-11 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. ***Fill out relevant portions of the table and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table C-11 FRRCD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters		
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)		
Local news		
Organizations that interact with underserved and vulnerable communities		
Social media		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

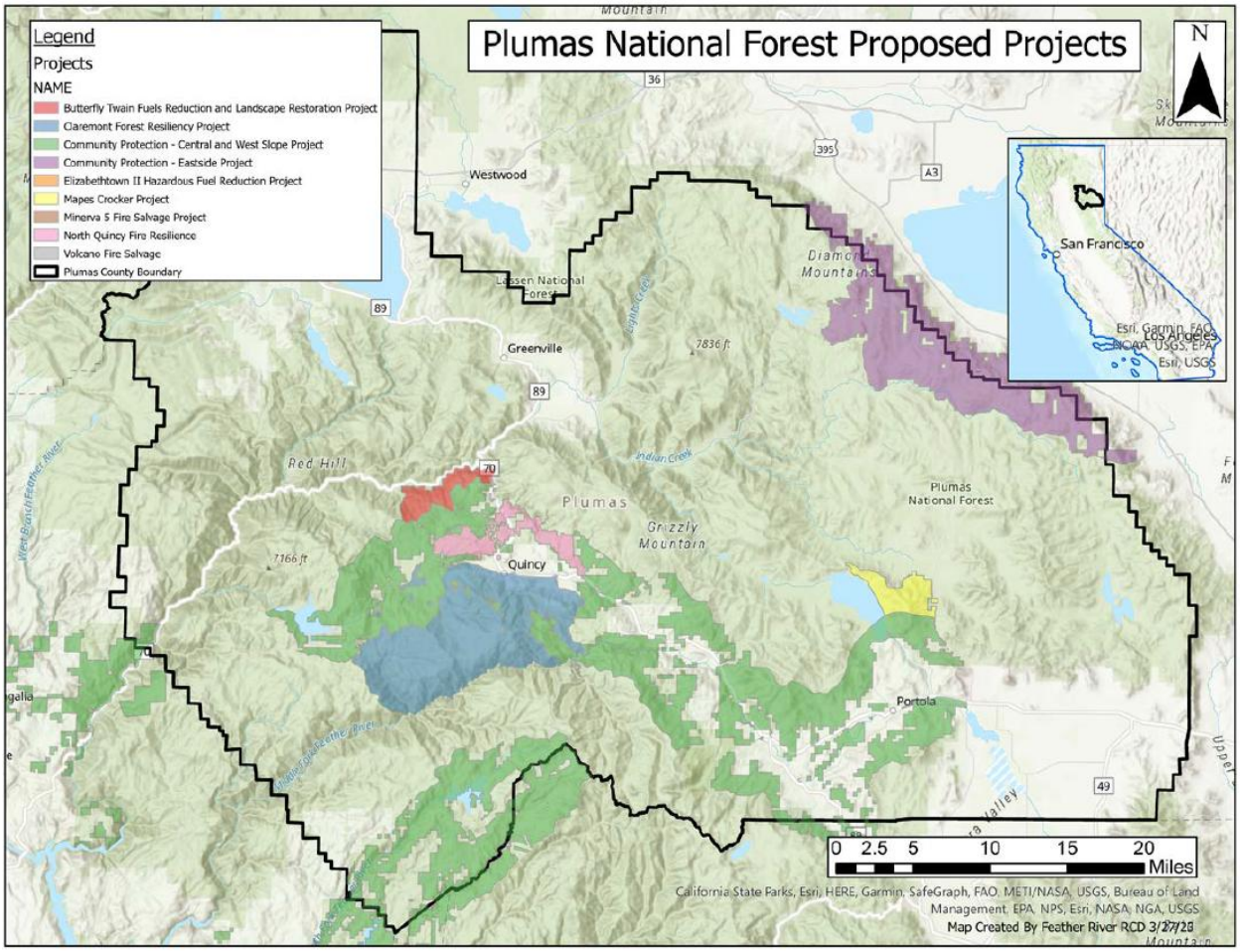
Source: FRRCD

C.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

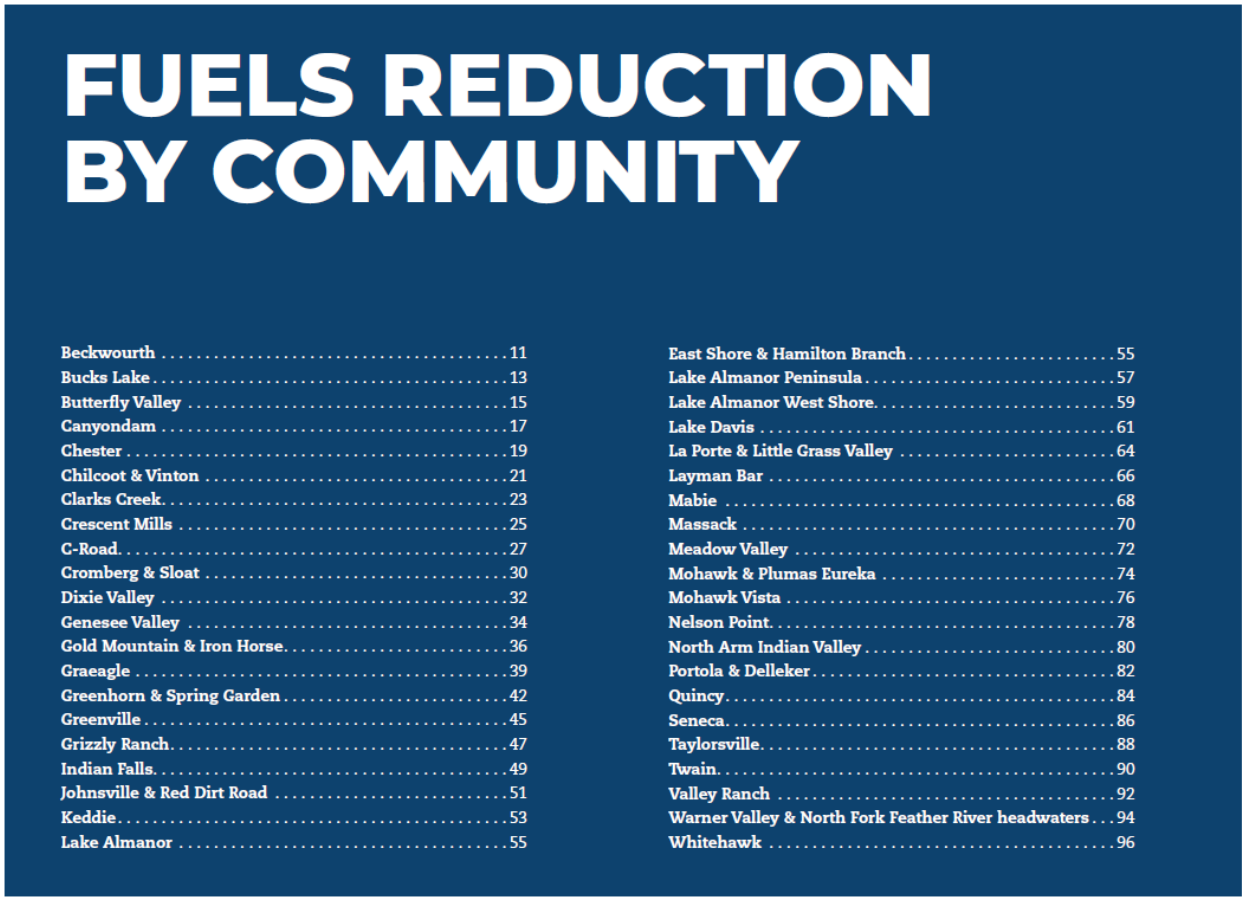
The 2023 Plumas County Fuels Treatment Project Report noted multiple fuels treatment projects in the County. This can be seen on Figure C-5. It also details fuels reduction projects by community. More detail can be found in the Project Report, but a list of communities seeing projects can be found on Figure C-6.

Figure C-5 Plumas National Forest Proposed Fuel Treatment Projects



Source: 2023 Plumas County Fuels Treatment Project Report

Figure C-6 Fuels Reduction Efforts in Communities



CAN THE DISTRICT PROVIDE A LIST OF PAST HAZARD MITIGATION TYPE PROJECTS AND ACTIVITIES THAT HAVE BEEN IMPLEMENTED BY HAZARD. INCLUDE ANY NOTABLE HAZARD RISK REDUCTION MEASURES.

C.6 Mitigation Strategy

C.6.1. Mitigation Goals and Objectives

The FRRCD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

C.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Many of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

C.6.3. Mitigation Actions

The Planning Team for the FRRCD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, , and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Climate Change
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Dam Failure
- Drought & Water shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Hazardous Materials Transport
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Severe Weather: High Winds and Tornado
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Ecological Restoration

Hazards Addressed: Multi Hazard – Climate Change, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, and Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3,4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Disaster can have negative impacts on ecosystems, including changing vegetation type, introducing noxious weeds, increasing erosion and sedimentation, and reduced or altered wildlife habitat.

Project Description: This project would make efforts to restore ecosystems to pre-disaster conditions or similar attainable conditions. Actions could include reforestation, revegetation, streambank stabilization, noxious weed removal, herbicide applications, or dead tree removal.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas CWPP, Plumas Hazardous Fuels Assessment (2025), Plumas National Forest, Lassen National Forest

Responsible Office/Partners: County, City, Feather River RCD, Plumas Firesafe Council, Plumas National Forest, Lassen National Forest, Plumas Under burn Cooperative

Benefits (Losses Avoided): Restores habitat and ecological functions following disasters or extreme weather events

Potential Funding (Local Budgets, Grant Funds, etc.): Grants, local budgets, volunteerism

Timeline: 2026-2031

Project Priority (High, Medium, Low): High

Action 2. Plumas Public Emergency Outreach Program

Hazards Addressed: Multi Hazard – Climate Change, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, and Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3,4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): A lack of public awareness of disaster preparation. Plumas county residents should be informed about preparations to make in advance of a disaster. Educational programs will encourage self sufficiency and reliance allowing responders more bandwidth to assist in an emergency.

Project Description: This project will offer workshops, training, and educational materials targeted towards citizens on topics that would help reduce damages caused by disasters.

Other Alternatives: Online resources. Educational videos

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas VOAD, stakeholder groups, county agencies

Responsible Office/Partners: County, City, Feather River RCD, Plumas Firesafe Council, volunteer fire departments, University of California Cooperative Extension

Benefits (Losses Avoided): Increases public self reliance, reduces burden on first responders

Potential Funding (Local Budgets, Grant Funds, etc.): Grants, local budgets, donations

Timeline: 2026-2031

Project Priority (High, Medium, Low): High

Action 3. Fuels and Vegetation Management

Hazards Addressed: Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3,4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County is a high wildfire risk area. Management of flammable materials reduces the intensity of fires and therefore the potential damage.

Project Description: This project would implement actions to manage and reduce fuel (primarily vegetation) buildup in communities and surrounding ecosystems. Actions could include thinning with machinery or hand tools, prescribed fire, grazing, chipping or other fuel rearrangement, defensible space programs, and home hardening (replacing flammable materials with fire resistant ones).

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas CWPP, Plumas Hazardous Fuels Assessment (2025), Plumas National Forest, Lassen National Forest

Responsible Office/Partners: County, City, Feather River RCD, Plumas Firesafe Council, volunteer fire departments, Plumas National Forest, Lassen National Forest, Plumas Under burn Cooperative

Benefits (Losses Avoided): Reduced damages from fire

Potential Funding (Local Budgets, Grant Funds, etc.): Grants, local budgets, volunteerism

Timeline: 2026-2031

Project Priority (High, Medium, Low): High

Action 4. Plumas Backup Generator and Air Purifier Loan Program

Hazards Addressed: Multi Hazard – Climate Change, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, and Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3,4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Disasters causing loss of power. Wildfire smoke causing health impacts. Lack of tools to address this problem for vulnerable populations.

Project Description: This project would purchase generators and air purifiers that could be loaned to citizens or businesses during emergencies.

Other Alternatives: Outside agency resources

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas VOAD, stakeholder groups, county agencies

Responsible Office/Partners: County, City, Feather River RCD, Plumas Firesafe Council, volunteer fire departments,

Benefits (Losses Avoided): Continuous electricity, reduced harm from smoke inhalation,

Potential Funding (Local Budgets, Grant Funds, etc.): Grants, local budgets, donations

Timeline: 2026-2031

Project Priority (High, Medium, Low): High

Action 5. Tree Mortality Tracking and Removal

Hazards Addressed: Multi Hazard

Goals Addressed: 1, 2, 3,4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Insects, drought, and disease can affect trees in isolated stands or in residential areas. Early identification of these can improve safely removing these trees before they cause a hazard. Often trees in residential areas are costly to remove. Early identification and financial support would improve community response and reduce the risk of limbs or entire trees falling naturally and causing damage.

Project Description: This project would establish a tree mortality tracker, it would provide waivers or cost share to landowners to remove trees showing signs of disease or insect infestation. It would provide technical assistance in the form or consultations with ISA certified arborists and would provide services to remove trees.

Other Alternatives: Private insurance

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas CWPP, Plumas Hazardous Fuels Assessment (2025), Plumas National Forest, Lassen National Forest

Responsible Office/Partners: County, City, Feather River RCD, Plumas Firesafe Council, volunteer fire departments, Plumas National Forest, Lassen National Forest, Plumas Under burn Cooperative

Benefits (Losses Avoided): Unexpected or unplanned tree/ limb falling and causing damage, particularly during storm or wind events.

Potential Funding (Local Budgets, Grant Funds, etc.): Grants, local budgets, volunteerism

Timeline: 2026-2031

Project Priority (High, Medium, Low): High

Annex D Gold Mountain Community Services District

D.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Gold Mountain Community Services District (GMCSD or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the GMCSD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

NOTE TO DISTRICT (PUTTING UP FRONT SO IT IS EASY TO SEE/FIND) – THERE WAS A 2005 LEACHFIELD FAILURE EVENT YOU PROVIDED. WE COULD NOT SEE WHAT HAZARD IT WAS ASSOCIATED WITH. WAS THE WATER TABLE HIGH DURING THIS TIME FROM FLOODING? LET US KNOW WHAT HAZARD THIS IS ASSOCIATED WITH, SO WE CAN GET THAT INFORMATION IN THE PLAN.

ALSO – CAN WE GET A COPY OF YOUR MOST RECENT MASTER PLAN?

D.2 Planning Process

As described above, the GMCSD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table D-1. Additional details on Plan participation and District representatives are included in Appendix A. FILL OUT TABLE WITH WHO PARTICIPATED AND HOW.

Table D-1 GMCSD – Planning Team

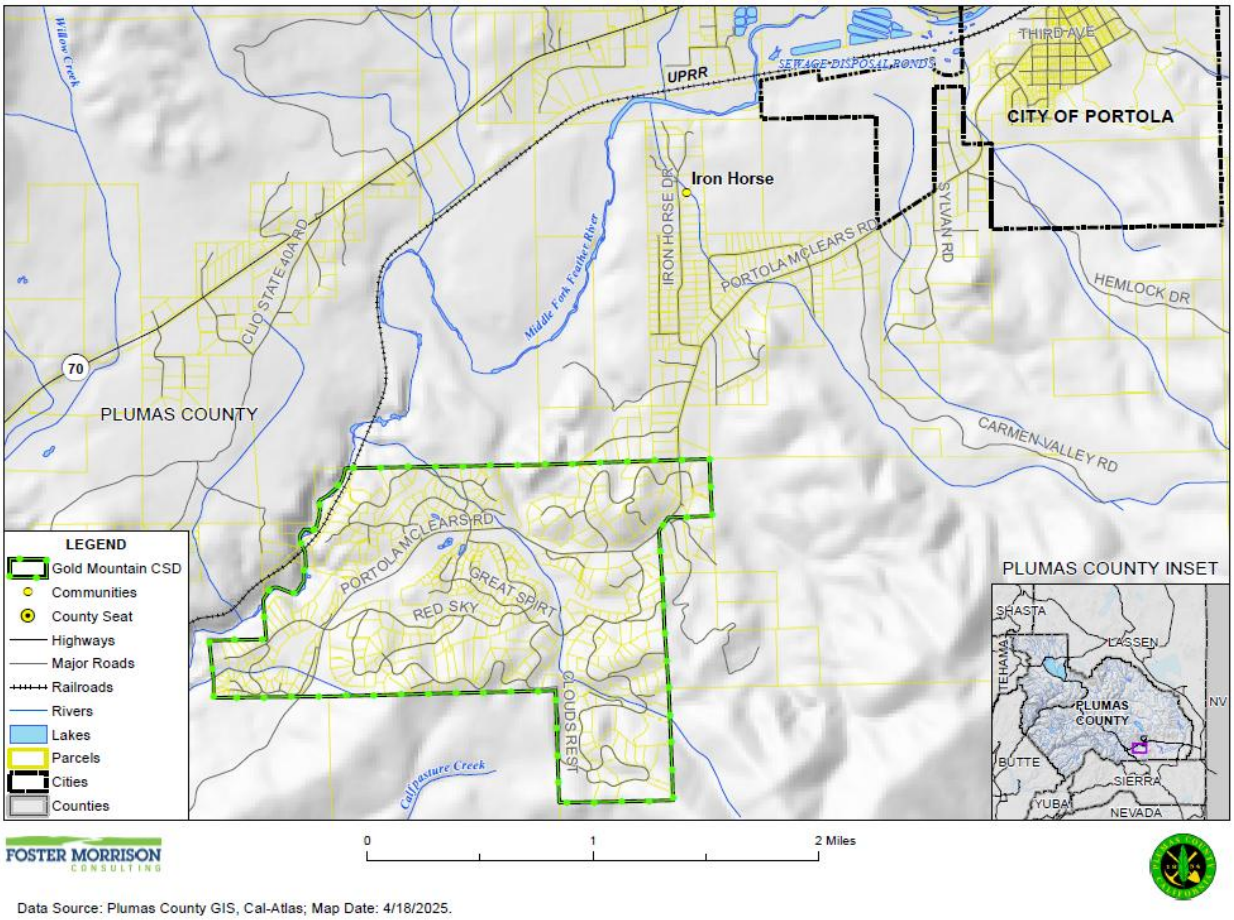
Name	Position/Title	How Participated

Source: GMCSD

D.3 District Profile

The community profile for the GMCSD is detailed in the following sections. Figure D-1 displays a District map and the location of GMCSD within Plumas County.

Figure D-1 GMCSD



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

D.3.1. Overview and Background

Gold Mountain Community Services District (GMCSD) provides fire suppression, fire prevention, emergency medical, retail water delivery, and wastewater collection and disposal. Fire and EMS services are provided via a contract with the City of Portola. Road maintenance and snow removal are provided by the Gold Mountain Homeowner's Association.

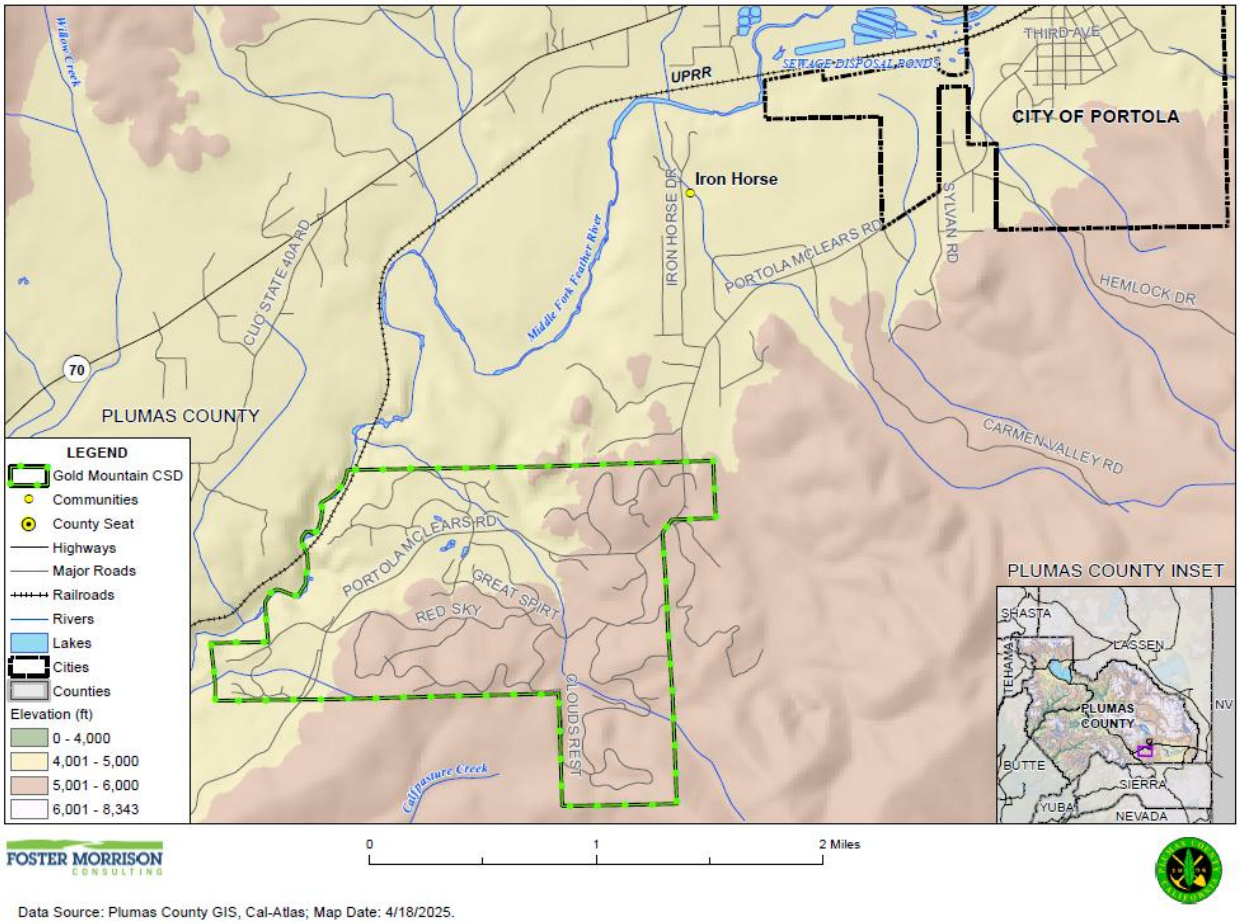
GMCSD was formed in 1996 as a dependent special district; when members from the Board of Supervisors were designated as the District's Board of Directors. In 2005, the board of directors was expanded to include five members and GMCSD became an independent service district. The principal act that governs the District is the State of California Community Services District Law. CSDs may potentially provide a wide array of services, including water supply, wastewater, solid waste, police and fire protection, street lighting and landscaping, airport, recreation and parks, mosquito abatement, library services; street maintenance and drainage services, ambulance service, utility undergrounding, transportation, abate graffiti, flood protection, weed abatement, hydroelectric power, among various other services.

The District was formed to serve the water, wastewater, and fire protection requirements for the Gold Mountain planned development, a predominately senior, retirement golf course and mountain community.

Two thirds of the developed residential structure are second homes or vacation homes resulting in a higher population during the summer months and a low winter population. Open year round, the resort population fluctuates dramatically between winter and summer, with upwards of several hundred guests during peak season weekend events. The District provides domestic water to residences and the resort from four deep granite wells, distributing water though nine pressure zones served by seven lift stations. The resort maintains its own golf course irrigation system fed by wells using the same deep granite aquifers shared with the district. To date, there is little evidence of any aquifer deterioration.

GMCSD is located in the eastern part of Plumas County, about three miles south and west of the City of Portola. The District borders the Feather River in the west, EPRFPD in the north, and the Plumas National Forest in the east and south. GMCSD's boundary is entirely within Plumas County. The District's boundaries encompass approximately 1,294 acres or two square miles. Since its formation, there have been no annexations to or detachments from GMCSD. There are elevation changes inside the District, as shown on Figure D-2.

Figure D-2 GMCSD - Elevation Map



D.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The GMCSD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- D.4.1 Assets Inventory and Growth and Development Trends
- D.4.2 Hazard Identification
- D.4.3 Hazard Profiles and Vulnerability to Specific Hazards

D.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the GMCSD's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the GMCSD's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section D.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section D.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District. The District has X staff. NUMBER OF DISTRICT STAFF? PUT THIS IN THE POP SECTIONS BELOW

In addition to District staff, the District provides services to 86 private residential structures, seven commercial residential properties, and two private residences under construction. Based on a household size slightly less than the County average of 2.1 people per household, the estimated population of GMCSD is 180. However, the District estimates that less than one quarter of these residences are occupied on a full-time basis. Summer resort business adds significant numbers to the local population including the hotel, rental units, and resort guests. Based on GIS analysis of 2020 Census data, it is estimated that there are approximately 76 residents that make use of the area as their primary residence. The population of the area tends to be mostly those over the age of 50.

Structures and Critical Facilities

This section considers the GMCSD's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table D-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. GMCSD's physical assets, valued at over $X million, consist of structures and infrastructure to support the District's operations. PLACE NAMES, FACILITY TYPES, AND VALUES WITH DISTRICT ASSETS. FILL OUT LAST COLUMN OF TABLE – WHAT HAZARDS ARE EACH DISTRICT FACILITY AT RISK FROM? THIS WILL HELP INFORM THE ASSETS AT RISK IN EACH OF THE HAZARD DISCUSSIONS BELOW.

Table D-2 GMCSD Critical Facilities and Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Total		**$ 0**	

Source: GMCSD

Community Lifelines

Assessing the vulnerability of the GMCSD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the GMCSD to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

GMCSD has a variety of natural resources of value to the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. ANY UNIQUE NATURAL RESOURCES IN THE DISTRICT?

Historic and Cultural Resources

GMCSD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. ANY UNIQUE HISTORICAL OR CULTURAL RESOURCES IN THE DISTRICT?

Economic Assets and Community Activities of Value

Assessing the vulnerability of the GMCSD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

TALK ABOUT FUTURE GROWTH IN THE DISTRICT. 2022 MSR HAD SOME ITEMS, BUT WE ARE NOT SURE IF THAT IS CURRENT. ARE MORE STAFF/CONTRACTORS GOING TO BE ADDED? ARE MORE PEOPLE EXPECTED TO BE NEEDING SERVICE? THIS WILL BACKFILL THE FD SECTIONS BELOW

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. NEED YOUR FUTURE DEVELOPMENT AREAS. WHAT WILL BE DEVELOPED OVER THE NEXT 5 YEARS?

D.4.2. Hazard Identification

The GMCSD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table D-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table D-3 GMCSD—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather / Insects/Pests	Extensive	Highly Likely	Limited	Low	Medium
Climate Change	Extensive	Likely	Limited	Low	--
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Critical	High	High
Earthquake	Extensive	Occasional	Limited	Medium	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Limited	Unlikely	Negligible	Low	Low
Flood: Localized Stormwater	Extensive	Highly Likely	Critical	High	Medium
Haz Mat Transportation	Limited	Likely	Critical	Low	Low
Landslide, Mudslide, and Debris Flow	Extensive	Highly Likely	Critical	High	High
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: Extreme Heat	Limited	Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Critical	High	Medium
Severe Weather: High Winds and Tornadoes	Significant	Likely	Critical	Medium	Low
Volcano	Limited	Unlikely	Catastrophic	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	High

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

D.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the GMCSD (as identified in the Significance column of Table D-3). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section D.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section D.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

HAS THE DISTRICT BEEN AFFECTED IN THE PAST BY POWER OUTAGE EVENTS? INCLUDE EVENTS AND DAMAGES. WHAT ARE THE DISTRICT'S PRIMARY CONCERNS WITH POWER OUTAGES? DO YOU HAVE OR NEED BACKUP POWER FOR CRITICAL INFRASTRUCTURE?

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the secondary hazards of drought in the Plumas County Planning Area, that can also affect GMCSD, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Plumas County. This can be seen in Table D-4. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County since 2012.

Table D-4 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the District.

GMCSD Events

Based on historical information, the occurrence of drought in California, including the GMCSD, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years that likely affected the District. Drought has occurred in the past and will occur in the future.

LIST PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the GMCSD to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The GMCSD provides the district with water from deep fractured granite aquifers. The district's domestic water system includes three producing wells, two 140,000-gallon water storage tanks, and a distribution system including both gravity fed and pressurized connection to our customers. The quality of the water is excellent and requires no specialized treatment. The CSD constantly monitors water quality in accordance with state regulations and provides notification to all customers on the rare occasion that tests for any contaminants exceed state defined levels.

GMCSD staff is very experienced with tracking water production and managing pumping to allow the wells to recharge and maintain natural hydrologic functions. The Nakoma Resort is the CSD's largest customer for domestic water, however Nakoma maintains its own private wells for golf course irrigation.

The GMCSD supports the California Water Board's position that efficient water use is the most cost-effective way to achieve long term conservation goals, as well as to provide for water supply reliability.

GMCSD water district depends on ground/deep well water for supply of potable water to community. There are no alternatives for water supply to community. In the event of a fire, water usage for hydrants vs community may be an issue, as seen in Gold Complex Fire of 2024.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE DROUGHT ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

INSERT ASSETS AT RISK FROM Table D-2

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought

conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought. This is however less of a concern due to the access to groundwater wells that the District uses

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the GMCSD include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.

- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Planning Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

While the existing domestic water infrastructure is capable of meeting current peak community demands, the GMCSD understands that the domestic water infrastructure will need to be increased to meet requirements at full buildout. The CSD maintains a professionally engineered "trigger point" study that allows us to keep capacity ahead of demand. We are currently in the process of developing two new wells with plans to have a fourth well online during the 2020 summer season, and a fifth well within the next few years. THIS IS FROM YOUR WEBSITE – CAN YOU UPDATE THIS? Longer term plans include installing a new higher elevation water tank in the district to increase overall storage capacity, provide for additional gravity flow connections, and to increase flow rates for district fire hydrants. The CSD also has room in our existing tank farm to eventually install another large capacity storage tank to support future growth. However, population growth in the District will add additional pressure to the District as a water company during periods of drought and water shortage.

ADD ANYTHING SENT.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. The GMCSD, Plumas County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults

in and around the District are shown in Section 4.3.10 of the Base Plan. These include the Almanor Fault, Butt Creek Fault Zone, the Mohawk Valley Fault, and others that traverse the County. The Indian Valley Fault is also considered an active fault located within the County. A significant seismic event on any of these major faults could cause damage in the GMCSD.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.10 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of some magnitude occur.. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Plumas County and the District fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Plumas County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

GMCSD Events

As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The HMPC noted no past occurrences of earthquakes that affected the District in any meaningful way.

IS THE ABOVE TRUE? IF NOT, LIST PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE LET US KNOW.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. More urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are

life safety and property damage. Although several faults are in and near the Plumas County Planning Area, seismic hazard mapping indicates that the District has low to moderate seismic hazard potential. There is the potential for the District and Plumas County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are limited areas in and near the District prone to liquefaction.

The whole of the District is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

BACKFILL FROM MITIGATION ACTIONS.

VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE EARTHQUAKE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those residing in the District Service Area) are at risk from earthquake shaking and associated hazards. The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County and District may be affected is included in Section 4.3.10 of the Base Plan.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the District are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Plumas County Planning Area show how structures may be affected. INSERT ASSETS AT RISK FROM Table D-2

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the GMCSD staff, residents, and visitors. Other impacts to the District could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the GMCSD include the following:

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The District enforces the California Building Code, which mandates construction techniques that minimize seismic hazards. Future development in the District is subject to these building codes and land use planning. LOOK AT THEIR FD INPUT.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The GMCSD is subject to localized flooding throughout the District. This is discussed in Table D-5 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized

flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

GMCSD Events

LIST PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized

flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the District has been affected by localized flooding occurring during heavy rain and storm (including atmospheric river) events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of or inadequate drainage infrastructure in the District contributes to localized flooding issues. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

Localized flooding could render leachfields useless, clog pipes, and cause vegetation to fall on facilities and impact accessibility to CSD facilities for repair.

The District tracks localized flooding areas. Affected localized flood areas identified by the GMCSD are summarized in Table D-5. FILL OUT TABLE WITH LOCALIZED FLOODING AREAS IN THE DISTRICT. IF NONE, LET US KNOW THAT AS WELL.

Table D-5 GMCSD – List of Localized Flooding Problem Areas

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees

Source: GMCSD

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? WHAT DISTRICT ASSETS ARE ADVERSELY AFFECTED BY FLOOD EVENTS? DO FLOOD EVENTS RESULT IN LOSS OF SERVICE, EVEN TEMPORARILY?CAN THE DISTRICT PROVIDE DETAILS ON THE ROOT CAUSE OF LOCALIZED FLOOD ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

INSERT ASSETS AT RISK FROM Table D-2

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the GMCSD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the District will add to the drainage issues already faced by the District, unless adequate drainage facilities are installed in new development locations. TRUE? ADD FROM ANY FD ITEMS SENT

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas that exists in much of the District.

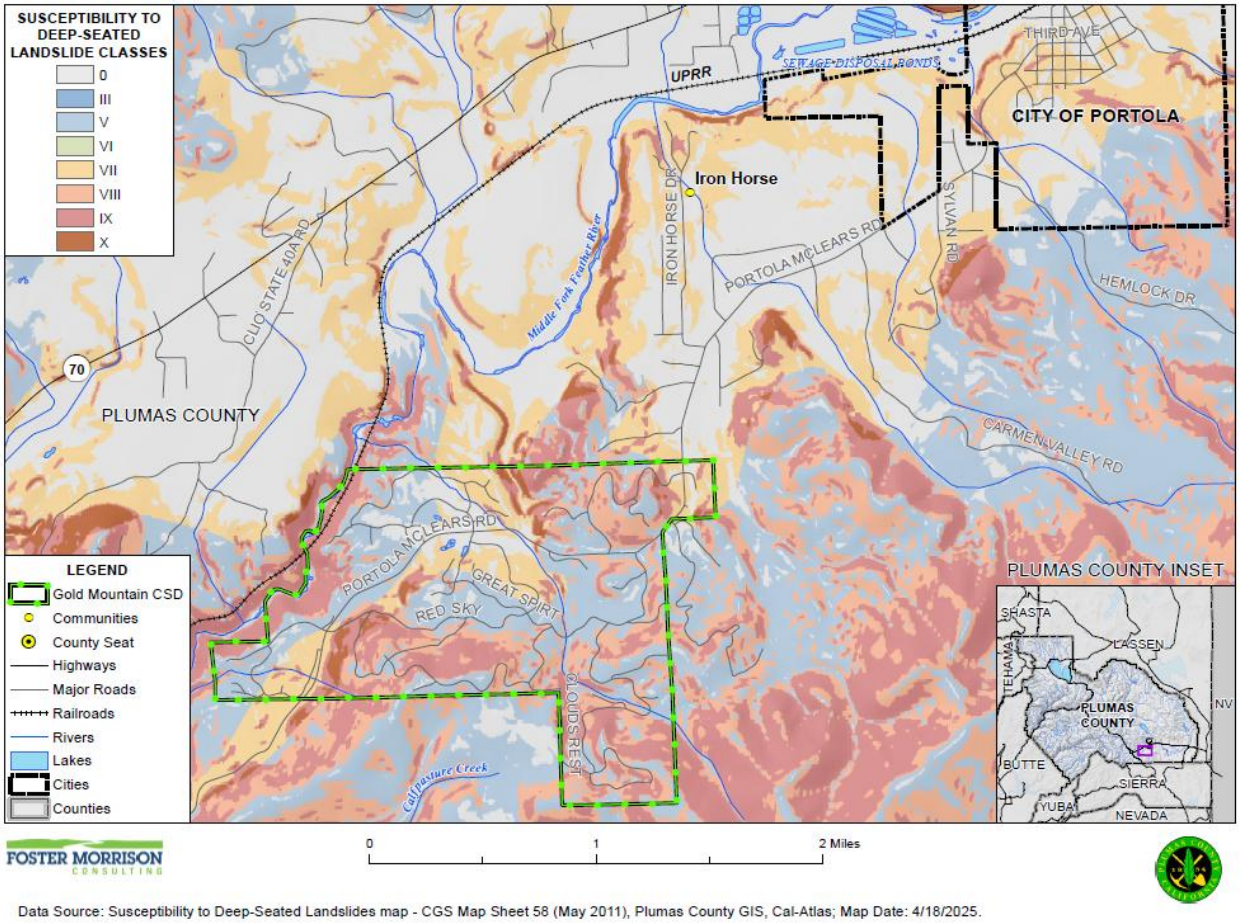
Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides

tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

Figure D-3 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure D-3 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table D-6. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that portions of the District and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure D-3 GMCSD – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Table D-6 GMCSD – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	123	10%	54	13%	69	8%
III	0	0.0%	0	0.0%	0	0.0%
V	441	34%	153	36%	288	33%
VI	0	0.0%	0	0.0%	0	0.0%
VII	150	12%	64	15%	86	10%
VIII	264	20%	58	14%	207	24%
IX	292	23%	80	19%	212	24%
X	26	2%	13	3%	13	1%
Grand Total	**1,297**	**100%**	**422**	**100%**	**875**	**100%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Plumas County; however, as shown in Table D-7, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table D-7 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993. Three was one that affected the District in April/May of 2005 as discussed below..

GMCSD Past Occurrences

The District noted the following event:

April/May 2005 – There was a landslide on cut bank above District water storage tanks at Lot 188/189 Dream Maker. No deaths or injuries occurred. There was property damage of $93,269, due to significant remediation and stabilization. In addition there were other damages of $46,731 for repairs to tank and water plumbing infrastructure. There were temporary traffic restrictions during repairs. Damage and subsequent

repairs required district to put water use restrictions in place until tanks could be returned to full operational capability.

LIST OTHER PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the District are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. Post wildfire areas are also more prone to landslide events. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

District staff noted that Gold Mountain is in an area of mountainous terrain with steep hillsides and canyon. Depending on ground saturation and levels of precipitation, further ground shifts can be expected. Landslide could damage a booster station, well system, or water tank, causing reduction of services to community until repair is completed which could be weeks. Landslides could also make access to the area or equipment limited for a longer time than just repair.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE ROOT CAUSE OF LANDSLIDE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and District residents) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. Most vulnerable are those people working or residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in the District service areas as well as District staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Landslides can affect the built environment of the District and those structures and critical facilities located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. INSERT ASSETS AT RISK FROM Table D-2.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure D-3 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a moderate area of the developed area District.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the District susceptible to landslide. Based on the risk assessment, there is moderate potential for significant landslides to occur in the District. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the District to landslide.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the District. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the District would place additional values at risk to landslide. New District facilities will take landslide into account when siting new facilities.

Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Excess snow can cause avalanches to occur. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are some of the most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to agricultural industry.

Location and Extent

Extreme cold and freeze events occur on a regional basis. There is no scale for extreme cold and freeze other than temperatures below 32°F, which can occur with some regularity in the winter months in the District. Extreme cold and freeze have a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Extreme cold can occur in any location of the City. All portions of the District are at risk to extreme cold and freeze.

Snowfall can affect almost all areas of the County and the District. In the elevations of the District, severe snowstorms are some of the most common extreme weather events that occur in the City and Plumas County. There is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of snowfall other than snow depths. Heavy snow has a slow to moderate onset and can generally be predicted in advance for the County. Snow events can last for hours or for days, and snow can stay on the ground for weeks to months at a time.

Avalanche affects only certain areas of the County and the District. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement to create an avalanching episode. This is rare in the District. Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This scale can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for extreme cold and freeze. There were no disasters from snow or from avalanche. Table D-8 shows the dates of the disaster declarations. There have been USDA disaster declarations (2016, twice in 2022, 2023) from freeze since 2012.

Table D-8 Plumas County – Federal and State Disaster Declarations for Freeze 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	2007	0	–

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 549 extreme cold, freeze, and snow incidents for Plumas County since 1993, some of which likely affected the District.

GMCSD Events

LIST PAST EVENTS AFFECTING THE DISTRICT FOR EXTREME COLD, FREEZE, AND AVALANCHE. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Extreme Cold, Freeze, and Snow (w/avalanche)

According to the 2021 CAS (as well as the 2024 Draft CAS), freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow (w/avalanche)

Extreme cold and freeze events happen in the District each year. Snow occurs regularly and can contribute to avalanches occurring in sloped areas. Cold, freeze, snow, and avalanche can impact both structures and populations in the Planning Area and in extreme conditions, may affect the ability of the District to operate. The whole of the District and County Planning Area has some measure of vulnerability to extreme cold, freeze, and snow, including avalanches.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to District. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

BACKFILL WITH MITIGATION ACTIONS.

The District is also concerned with rain on snow events, which can cause greater flooding in the District.

POWER OUTAGES? OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE EXTREME COLD, FREEZE, SNOW, AND AVALANCHE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations the District serve are at some vulnerability to extreme cold, freeze, and snow. Some employees may face a risk while working outdoors. All populations served by the District are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside (including District staff). Prolonged exposure to cold can cause frostbite or hypothermia and

can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Snow has an effect on buildings, but its effect on people and populations are minimal. Avalanche can affect populations, though the District has few developed areas at risk to avalanche.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur and can be heavy enough to damage structures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the District. Infrastructure such as roads, highways, and bridges can become slippery or blocked by large snow events, causing accidents and road closures.

INSERT ASSETS AT RISK FROM Table D-2.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the District may be affected. During periods of freeze, trees in the District may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the District. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the District can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

One of the most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur during extended periods of snow when new snow is deposited on the existing snowpack causing stress on the layers beneath and triggering a collapse resulting in an avalanche. Avalanches can also be triggered by severe weather such

as high winds and unusually warm weather and even earthquake events. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the District include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow (and avalanche) and their associated impacts to the District.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District area are expected to be limited in the near future and thus are not likely to affect extreme cold and freeze and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current State of California and Plumas County codes provide such provisions for new construction. New wells and appurtenances will be built inside insulated buildings, reducing the risk of loss of potable water due to frozen pipes. TRUE?

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the District. Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues.

Location and Extent

Extreme heat events occur on a regional basis. The District experiences temperatures in excess of 100°F during the summer and fall months. Extreme heat can occur in any location of the District. Extreme heat occurs throughout the District primarily during the summer months.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 7 extreme heat incidents for Plumas County since 1993, some of which likely affected the District.

GMCSD Events

LIST PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Plumas County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Plumas County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the District. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the District is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

BACKFILL WITH MITIGATION ACTIONS.

VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON EXTREME HEAT SSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to extreme heat. Those District employees that work outdoors or inside facilities without proper cooling systems are likely to be most affected by extreme heat conditions.

Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues. All populations served by the District are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers (like District staff); individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures and Critical Facilities and Infrastructure

Extreme heat normally does not generally impact structures and critical facilities and Infrastructure, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The District noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

INSERT ASSETS AT RISK FROM Table D-2

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in District, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the District that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the District may see an increase in dry fuels contributing to the wildfire hazard. Extreme heat can damage agricultural assets in the District service territory. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heat and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development in the District will take extreme heat into account. In the event of grid-tied power outages, a reliable backup power source must be included in development plans. Additionally, implementing energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves. TRUE? ANYTHING TO ADD TO HOW YOU WILL BE AFFECTED BY HEAT IN THE FUTURE?

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it

contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the District.

Location and Extent

Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the District as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table D-5 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the District and Plumas County. Duration of severe storms in the District can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table D-9. IN addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table D-9 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

GMCSD Events

KEEP THE BELOW INFO IF NO PAST OCCURRENCES ARE SENT

The District noted that heavy rains and storms are an annual occurrence often resulting in flooding. Events causing flood issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

LIST PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the GMCSD. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the District is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Flooding (from heavy rains and localized flooding) could render leachfields useless, clog pipes and cause vegetation to fall on facilities and impact accessibility to CSD facilities for repair.

The District noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. A list of localized flooding problem areas are shown on Table D-5 above. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE HEAVY RAIN ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to heavy rains and storms. Those District employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the District have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

District facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the District. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

INSERT ASSETS AT RISK FROM Table D-2.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New District facilities follow state and local building codes which should reduce the risk to future development in the District from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of

heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the District. ADD ANY FD ITEMS SENT

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, can cause power outages, and when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the District.

Portions of the District are also located in or near a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. These types of winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Another special type of wind event can occur in the District. Microbursts have occurred in the County. According to the National Weather Service, a microburst is a downdraft (sinking air) in a thunderstorm that is less than 2.5 miles in scale. Some microbursts can pose a threat to life and property, but all microbursts pose a significant threat to aviation. Although microbursts are not as widely recognized as tornadoes, they can cause comparable, and in some cases, worse damage than some tornadoes produce. In fact, wind speeds as high as 150 mph are possible in extreme microburst cases.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare in Plumas County, can affect areas of the District, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds (both straight line and microburst). Each area of the District is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

NCDC Events

The NCDC data recorded 94 high wind and 0 tornado incidents for Plumas County since 1950. Many of these wind events likely affected the District.

GMCSD Past Occurrences

LIST PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and High Winds and Tornado

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The District is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the District is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District is in or adjacent to a special wind hazard region, which is a result of foehn winds. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds.

High Winds are a permanent factor in the weather impact on the Nakoma Community, and GMCSD facilities. High winds could cause trees to fall on a booster station, well system, water tank, causing reduction of services to community until repair is completed which could be weeks.

POWER OUTAGES? OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE WIND ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include the unsheltered, those with access and functional needs, the medically fragile experiencing power outages as a result of wind events, and those working or caught outdoors during a wind or tornado event.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the District have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all District facilities in the tornado touchdown path. During a wind or tornado event, power lines in the District can be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole communities, as seen in recent wildfire events in the West.

INSERT ASSETS AT RISK FROM Table D-2

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to high winds. Increased streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or

cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Winds and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. District facilities may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity in the District.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the County. Climate change is not likely to affect future tornado conditions.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Building codes in the County ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the County from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

Future Development

The District relies on the County to enforce the local building codes which includes standards for new development to minimize damage from windstorms. New District facilities are built to state and local codes. New critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages. ADD ANY FD ITEMS SENT

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the GMCSD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

Wildfire Smoke and Air Quality

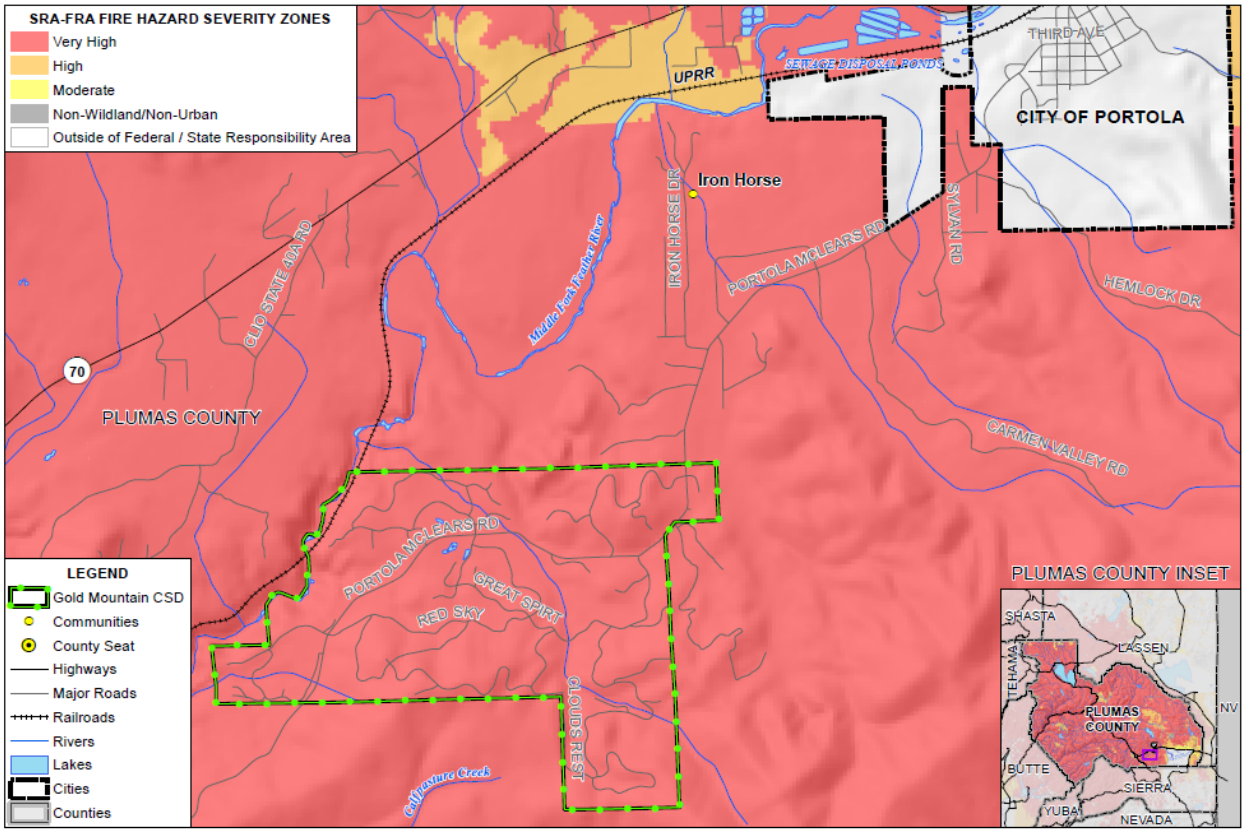
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

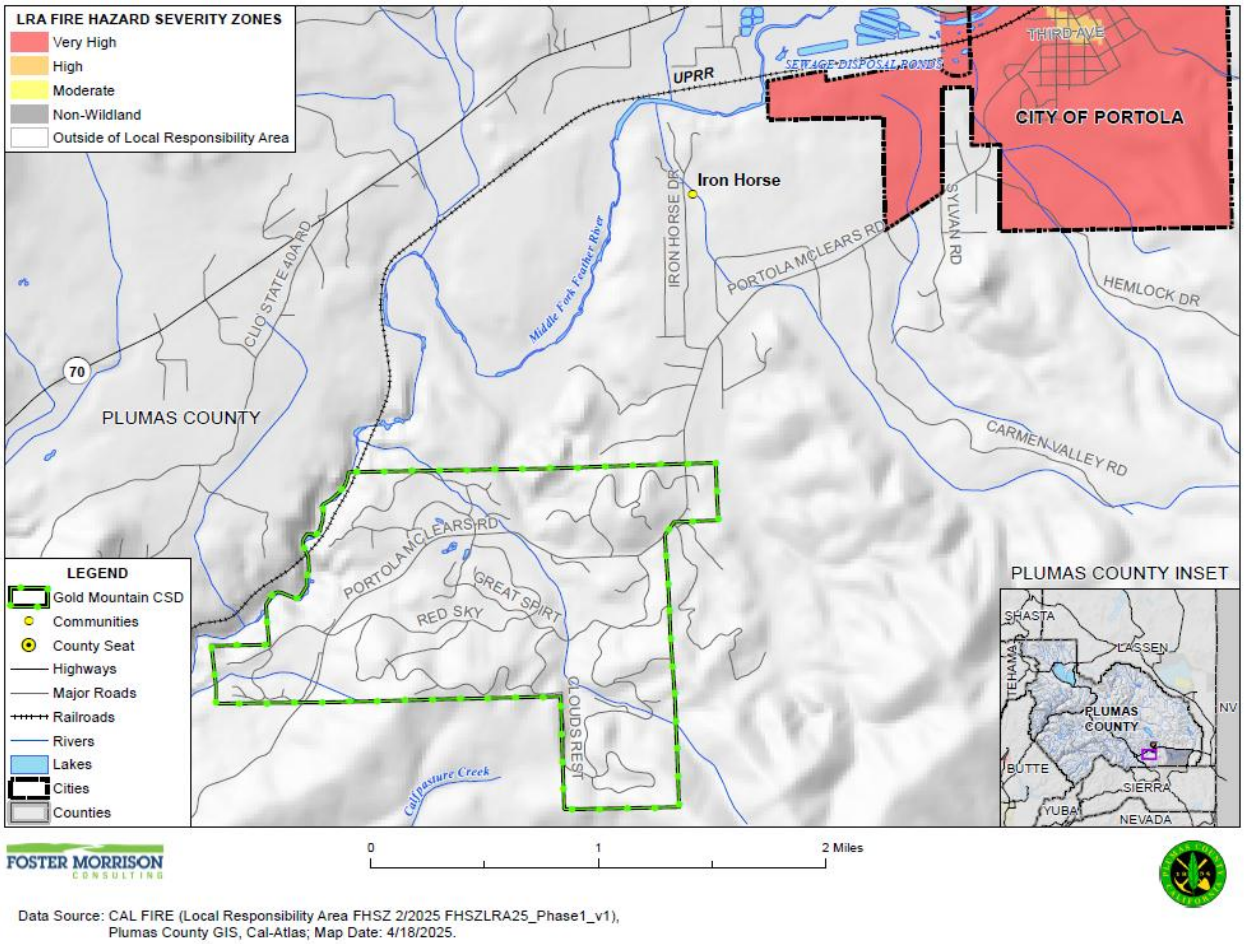
Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the GMCSD were created. Figure D-4 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure D-5 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, the District lies in the Extremely High FHSZ.

Figure D-4 GMCSD – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Figure D-5 GMCSD – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table D-10. No District area falls in the LRA; as such, no tabular analysis is presented here.

Table D-10 GMCSD – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Very High	1,297	100.0%	422	100.0%	875	100.0%
High	0	0.0%	0	0.0%	0	0.0%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland/Non-Urban	0	0.0%	0	0.0%	0	0.0%
Outside of Federal / State	0	0.0%	0	0.0%	0	0.0%

Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Responsibility Area						
Grand Total	**1,297**	**100.0%**	**422**	**100.0%**	**875**	**100.0%**

Source: CAL FIRE

* CAL FIRE's FHSZ SRA (FHSZSRA_23_3) released in April 2024. CAL FIRE's FHSZ FRA not updated as part of the new SRA release. The new data (SRA areas) and the old FRA areas were merged in GIS to provide countywide FRA/SRA coverage. Dataset does not include any LRA coverage nor does it include any old SRA coverage. The percentages in the table below are calculated by the total acreage of the FRA/SRA data coverage within each jurisdiction

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table D-11.

Table D-11 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

GMCSD Events

The District noted that there were the following events that affected the District:

July 22-29, 2024 – The Gold Complex Fire occurred, which was a major wildfire event adjacent to the community. It occurred on NFS and private forestry lands east of Hwy 89 and south of GMCSD. This was a most severe event resulting from lightning strikes in or near the community since inception in 1996. Collateral damage due to CSD's support providing water from our system. Drawdown resulted in a negative pressure situation and system contamination. The Community was evacuated, and Nakoma Resort shutdown had all their events cancelled. Loss of income was high, but no estimate were available. All CSD resources including personnel and fire apparatus dedicated to support firefighting efforts and providing water to supporting fire departments. Due to the Fire, Highway A15 and access to the Gold Mountain community was shut down for 4 days.

LIST ABNY OTHER PAST EVENTS AFFECTING THE DISTRICT. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

2024 Gold Complex Fire highlighted areas that need annual review and upgrades if needed. Heavy use of one fire Hydrant caused an area in the community to have no water for a few days until tank could refill. If heavy ground/ladder fuel exists around water tanks or booster stations, impact on water supply to the community could be negatively impacted. CSD would be unable to perform its obligation to supply potable water.

The GMCSD is charged with providing structural fire protection and emergency medical services to the Gold Mountain community. These services are provided through an agreement (annual contract) with the Beckwourth Fire District. The Nakoma community is a FireWise Community, which certifies the

community's efforts to reduce fire risk. The mission of the Nakoma Community Firewise Committee is to support and encourage activities which reduce hazardous fire fuel loads in our community.

OTHER VULNERABILITIES/CONCERNS/ISSUES SPECIFIC TO THE DISTRICT? CAN THE DISTRICT PROVIDE DETAILS ON THE WILDFIRE ISSUES THAT WOULD SUPPORT MITIGATION ACTION DEVELOPMENT?

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and District Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused, infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. INSERT ASSETS AT RISK FROM Table D-2

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water

quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the GMCSD include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.

- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional assets at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, District building codes are in effect and should continue to be updated as appropriate to reduce future impacts. ADD ANY FD ITEMS WHEN SENT

D.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

D.5.1. Regulatory Mitigation Capabilities

Table D-12 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the GMCSD. ***Fill out table and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well. We know much of this table does not apply to you, but fill out the areas that do.***

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table D-12 GMCSD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan		

Climate Change Adaptation Plan		
Community Wildfire Protection Plan		
Comprehensive/Master Plan		
Continuity of Operations Plan		
Economic Development Plan		
Land Use Plan		
Local Emergency Operations Plan		
Stormwater Management Plan		
Transportation Plan		
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use		
Building code		
Flood insurance rate maps		
Floodplain ordinance		
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)		
Subdivision ordinance		
Zoning ordinance		
Other		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: GMCSD

D.5.2. Administrative/Technical Mitigation Capabilities

Table D-13 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the GMCSD. ***Fill out table and make sure to address the notes (third) column and the last cell of the table. Much of this will not apply to you as the District. Fill out the areas that do apply to you. The final table cell needs to be filled out as well.***

Table D-13 GMCSD's Administrative and Technical Mitigation Capabilities

Administration	**In Place Y/N**	**Describe capability Is coordination effective?**

Staff		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official		
Civil Engineer, including dam and levee safety		
Community Planner		
Emergency Manager		
Floodplain Administrator		
GIS Coordinator		
Planning Commission		
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing		
Hazard data and information		
GIS analysis		
Mutual aid agreements		
Other		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: GMCSD

D.5.3. Fiscal Mitigation Capabilities

Table D-14 identifies financial tools or resources that the District could potentially use to help fund mitigation activities. ***Fill out table and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table D-14 GMCSD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Community Development Block Grant		
Federal funding programs (non-FEMA)		
Fees for water, sewer		
Capacity fees for new development		
State funding programs		

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Stormwater utility fee		
Other		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: GMCSD

D.5.4. Mitigation Education, Outreach, and Partnerships

Table D-15 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. ***Fill out table and make sure to address the notes (third) column and the last cell of the table. The final table cell needs to be filled out as well.***

Table D-15 GMCSD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters		
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)		
Local news		
Organizations that interact with underserved and vulnerable communities		
Social media		
How can these capabilities be expanded and improved to reduce risk?		
FILL OUT HOW CAPABILITIES CAN BE EXPANDED.		

Source: GMCSD

D.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

When GM was developed, only seven fire hydrants were required, all serving commercial uses. Over time the District has added 15 additional hydrants at strategic locations to cover the community. It is important to understand that the fire department uses the hydrants to fill their trucks, not to connect a hose to fight the fire. We work closely with our fire providers to identify the best location for hydrants to strategically cover the entire community and will continue to add additional hydrants as the community grows.

GMCSD maintains two 140,000 gallon water storage tanks to ensure we have adequate water supplies for firefighting. In addition, the CSD partnered with the Nakoma Resort to ensure its new 90,000 gallon recreational pool was equipped with hookups to make that additional water source available in the case of an emergency. Nakoma's golf course also includes a number of large holding ponds as part of its irrigation and landscape plans. Rural fire departments all include suction equipment to ensure such pools are also available as a water source in an emergency.

The CSD has partnered with the GM Homeowners Association (HOA) to develop a limited quick attack firefighting capability. Using a large pickup equipped with a water tank. Foam generators, and gasoline powered pump, we have created a Quick Attack Vehicle (QAV) to provide an initial response capability in the community. Each year the CSD's Fire Coordinator provide training to a cadre of community volunteers on this system, first aide, and basic wild land firefighting techniques. There have been a number of incidents where community volunteers using the QAV were first on scene to knock down small fires.

The GM CSD sponsors a highly recognized Firewise Committee that has received accolades at county and state levels for their aggressive and creative approach towards fire safety within the community. Committee holds regular awareness meetings year round, evacuation drills during the fire season, and a pancake breakfast as part of the annual owners meeting.

In conjunction with the Gold Mountain HOA, and in cooperation with the Firewise Committee, the District has been very active in developing and implementing a hazardous fuel treatment (HFT) program at Gold Mountain. Reducing the fuel load is a significant step towards ensuring our resilience to wildfire. Wildland fire protection is provided by the United States Forest Service and all local volunteer fire departments.

OTHER PAST HAZARD MITIGATION TYPE PROJECTS AND ACTIVITIES THAT HAVE BEEN IMPLEMENTED BY HAZARD. INCLUDE ANY NOTABLE HAZARD RISK REDUCTION MEASURES.

D.6 Mitigation Strategy

D.6.1. Mitigation Goals and Objectives

The GMCSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

D.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Some of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

D.6.3. Mitigation Actions

The Planning Team for the GMCSD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, , and timeline are also

included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Drought & Water Shortage
- Earthquake
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Severe Weather: High Winds and Tornado
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Climate Change
- Dam Failure
- Floods: 1%/0.2% annual chance
- Hazardous Materials Transport
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

NEED ACTIONS FOR EARTHQUAKE, EXTREME HEAT, AND EXTREME COLD

Action 1. Drought Impact on CSD Service

Hazards Addressed: Drought and water shortage (that may cause low potable water supplies, lack of or low water for hydrants-impacting fire protection), Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): GM CSD water district depends on ground/deep well water for supply of potable water to community. There are no alternatives for water supply to community. In the event of a fire, water usage for hydrants vs community may be an issue, as seen in Gold Complex fire of 2024.

Project Description: Identify cost and location for additional water tank. Prepare a plan to implement an effective wastewater capture system to help homeowners reduce potable water use. Identify non potable equipment for use in areas such as exterior irrigation systems and educate community on potable water conservation actions, such as during red flag days to request limited use of water.

Other Alternatives: Explore alternate water sources such as adjacent water rights owners, major rehabilitation of existing wells, add an additional well. Plan for additional water tank(s) to increase storage capacity. Plan for Wastewater Plant to aid in recapture of water and reuse accordingly. Update engineering plans based on current planned construction demands in the community. Develop Finance Strategy for next phase of capital projects based on Engineering Plans.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvements Plan

Responsible Office/Partners: Gold Mountain Community Services District

Benefits (Losses Avoided): Ability to provide water and septic services to Nakoma Community as required.

Potential Funding (Local Budgets, Grant Funds, etc.): None at this time other than GMCSD fees.

Timeline: 2025-2030

Project Priority (High, Medium, Low): High – Water tank, Booster Station; Medium –Wastewater Plant

Action 2. Flood/Landslide/High Wind Mitigation

Hazards Addressed: Flood, Localized Flood, Landslide, Severe Weather: Heavy Rain and Storms, and Severe Weather: High Winds potential impact on infrastructure of GM CSD water tanks, booster stations, pipes, and septic fields.

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): High Winds are a permanent factor in the weather impact on the Nakoma Community, and GMCSD facilities. High winds could cause trees to fall on a booster station, well system, water tank, causing reduction of services to community until repair is completed which could be weeks. Landslides could also cause same issues to impact on GM facilities, perhaps making access to the area or equipment limited for a longer time than just repair. Flooding (as well has heavy rains and localized flooding) could render leachfields useless, clog pipes and cause vegetation to fall on facilities and impact accessibility to CSD facilities for repair.

Project Description: Identify potential impact from low to high on CSD equipment such as water tanks, booster stations, water pipes, septic field and update both action and dollars needed to support, enhance or rectify any noted issues.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Annual survey and recommendations with help from outside professional sources if needed

Responsible Office/Partners: Gold Mountain Community Services District

Benefits (Losses Avoided): Prevent/reduce loss of GM CSD's ability to service community as required.

Potential Funding (Local Budgets, Grant Funds, etc.): As of 2025 is only through GM CSD budget and Community fees.

Timeline: 2025-2030

Project Priority (High, Medium, Low): High

Action 3. Fire Prevention Hazard and Impact on CSD Services

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): 2024 Gold Complex Fire highlighted areas that need annual review and upgrades if needed. Heavy use of one fire Hydrant caused an area in the community to have no water for a few days until tank could refill. If heavy ground/ladder fuel exists around water tanks or booster stations, impact on water supply to the community could be negatively impacted. CSD would be unable to perform its obligation to supply potable water.

Project Description: Identification of Fire Hazards and Impact in community near CSD facilities, water towers, booster stations, fire hydrants. Annual fire hazard identification for remediation plans, including the following:

- annual survey to map and identify all territories in GM that can create fire hazards
- annual identification and removal of fire hazards close to water towers, booster stations, CSD properties
- create and post updated signage on each fire hydrant in CSD district for flow rate, usage and map of additional nearby hydrants for First Responder usage.
- hold annual meeting with First Responders to ensure all are familiar with availability and location of fire hydrants, gate codes, community topography.
- continue Forest Management 8 zone mapping which will identify areas for remediation and help map out timing to best implement fuel reduction based on projected finances available.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: There is a 5 year Plan that identifies work and upgrades on water and well systems-total dollars identified is $6,077,936.98. CSD Board Meetings where Directors will vote on projects to be first acted upon based upon both ranking of probability hazard and dollars available vs. to be set aside from CSD fees to community.

Responsible Office/Partners: Gold Mountain CSD

Benefits (Losses Avoided): Infrastructures such as stable water tanks, potable well systems will allow CSD to perform its role to supply water and septic to community. There are no other options for Nakoma Community for water or septic access other than GMCSD

Potential Funding (Local Budgets, Grant Funds, etc.): As of this time, the only funding is through CSD fees to community which does not cover costs for action. Grant funds will be identified and sought.

Timeline: 5 year plan starting in 2025

Project Priority (High, Medium, Low): High

Annex E Indian Valley Community Services District

E.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Indian Valley Community Services District (IVSCD or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the IVCSD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

E.2 Planning Process

As described above, the IVCSD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table E-1. Additional details on Plan participation and District representatives are included in Appendix A. FILL OUT TABLE WITH WHO PARTICIPATED AND HOW.

Table E-1 IVCSD – Planning Team

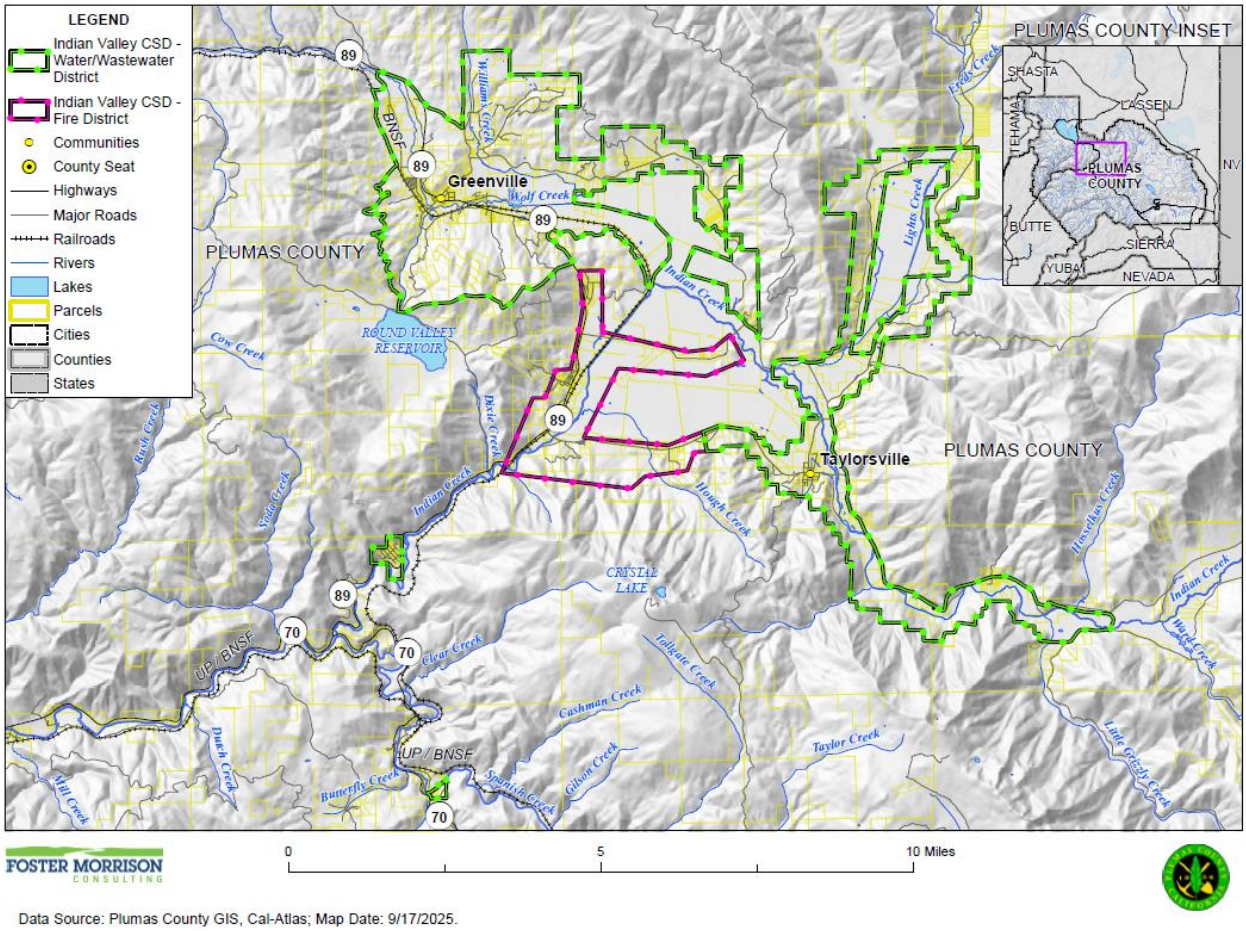
Name	Position/Title	How Participated
Jamie Little	Interim GM	Planning and coordination.
Charles Slagter	Operations Manager	Provided historical information.
Bob Orange	Previous fire chief and current community member	Provided historical information.

Source: IVCSD

E.3 District Profile

The community profile for the IVCSD is detailed in the following sections. Figure E-1 shows the location of the District in the County, as well as the parcels inside the District. This map shows both the Fire District and the Water/Wastewater District. Figure E-2 displays a District map and the elevations of IVCSD and the surrounding area.

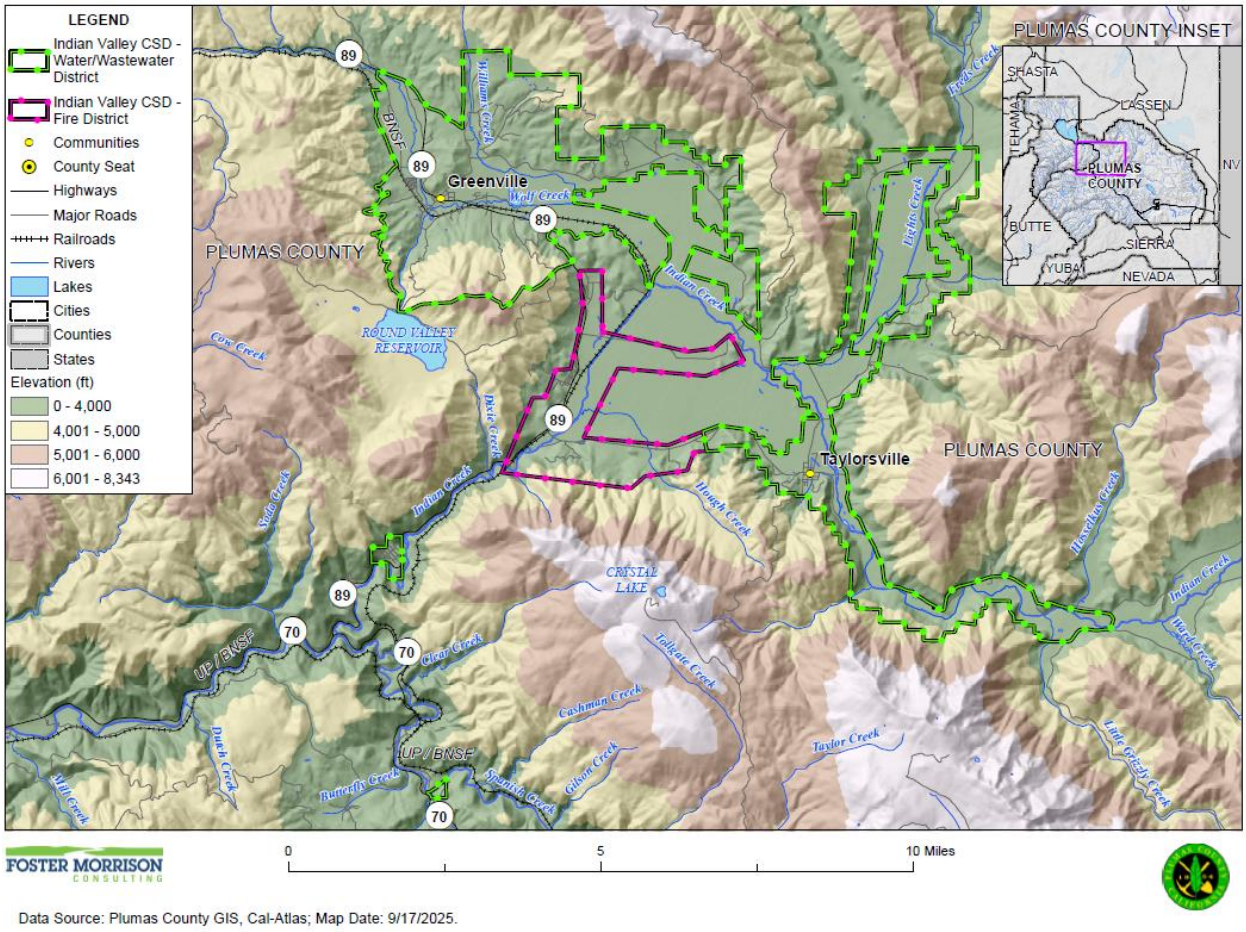
Figure E-1 IVCSD – Parcel Map



FOSTER MORRISON CONSULTING

Data Source: Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Figure E-2 IVCSD Elevation Map



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

E.3.1. Overview and Background

Indian Valley Community Services District (IVCSD) was formed in 1993 after a reorganization of Greenville Community Services District, Taylorsville Fire Protection District and Taylorsville County Service Area into a single district. The formation resolution does not identify which services the newly formed district is authorized to provide. The District continued providing services that were offered by its predecessor agencies.

The principal act that governs the District is the State of California Community Services District Law. CSDs may potentially provide a wide array of services, including water supply, wastewater, solid waste, police and fire protection, street lighting and landscaping; airport, recreation and parks; mosquito abatement, library services; street maintenance and drainage services; ambulance service, utility undergrounding, transportation, abate graffiti, flood protection, weed abatement, hydroelectric power, among various other services.

IVCSD is located in the middle of northern Plumas County and encompasses the communities of Greenville, Crescent Mills, and Taylorsville. The nearest providers of similar services are Crescent Mills Fire Protection District and Indian Valley Parks and Recreation District, both of which IVCSD overlaps.

IVCSD provides retail water, fire protection, emergency medical, lighting, park and recreation, and wastewater treatment and collection services. Additionally, the District provides contract general manager services to the Indian Valley Ambulance Service Association through a joint powers agreement.

The District covers an area of approximately 18.6 square miles and has undergone five annexations since its formation. The latest annexation, in 1999, expanded the District to include the North Valley and Diamond Mountain areas.

E.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The IVCSD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- E.4.1 Assets Inventory and Growth and Development Trends
- E.4.2 Hazard Identification
- E.4.3 Hazard Profiles and Vulnerability to Specific Hazards

E.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the IVCSD's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the IVCSD's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section E.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure

- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section E.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District. Due to the Dixie Fire in 2021, staffing levels dropped from 15 volunteers to 10 as a result of the destruction of homes and loss of jobs. Over the past three years, however, the number of volunteers has doubled to 20, including a paid part-time Chief. Along with this, IVCSD employs 9 people and contracts 1 general manager. In addition to District staff, the District provides services to around 1,600 residents.

The District did note that there are vulnerable and underserved populations in the District. For elderly and disabled residents, limited mobility raises challenges during evacuation. Hazards disrupt local supportive services for elderly, disabled, and low-income residents that they depend on. There are programs that provide resources during disasters but connectivity and isolation can prevent access. Mental and emotional health can be severely affected by a disaster and the stress of starting over for an elderly person can be immense. Low income and under employed residents face significant barriers to recovery after a disaster especially if many rental properties are destroyed. Many low-income residents lack the resources to secure new housing or replace belongings. Residents with limited resources may find it overwhelming to navigate the complex process of applying for disaster aid. Affordable housing options may become sparse due to a disaster.

The California Department of Water Resources (DWR) has developed a mapping tool to assist in determining which communities meet the disadvantaged community's median household income definition. DWR is not bound by the same law as the Plumas County Local Area Formation Commission (LAFCO) to define communities with a minimum threshold of 12 or more registered voters. Because income information is not available for this level of analysis, disadvantaged unincorporated communities with smaller populations that meet LAFCO's definition cannot be identified at this time. The DWR Mapping Tool is an interactive map application that allows users to overlay the following three US Census geographies as separate data layers—Census Place, Census Tract, and Census Block Group. The specific dataset used in the tool is the US Census American Community Survey Five-Year Data: 2016 - 2020. Only

those census geographies that meet the disadvantaged community (DAC) definition are shown on the map (i.e., only those with an annual median household income (MHI) that is less than 80 percent of the Statewide annual MHI). The statewide MHI for 2017-2021, according to Census Bureau data, is estimated at $84,097, and hence, the calculated threshold of $67,277 defines whether a community was identified as disadvantaged. Per the DWR Mapping Tool, the entirety of the IVCSD fire service area is considered a disadvantaged community.

Structures and Critical Facilities

This section considers the IVCSD's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table E-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. IVCSD's physical assets, valued at over $2.1 million, consist of structures and infrastructure to support the District's operations.

Table E-2 IVCSD Critical Facilities and Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
Water Plant (building only) Crescent Mills	Water	$29,247	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Water Plant Equipment Crescent Mills	Water	$93,589	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Storage tank	Water	$292,465	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
pumphouse	Water	$12,869	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Water treatment & equipment Greenville	Water	$250,000	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Concession stand & contents	Park	$35,096	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure

Name of Asset	Facility Type	Replacement Value	Hazard Info
Softball facility restrooms	Park	$52,000	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Community park	Park	$104,000	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Pump Station Greenville	Water	$81,890	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Pump station Greenville	Water	$70,192	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Lift station	Sewer	$87,740	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Leach field equipment	Sewer	$35,096	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Pool facility & contents	Park	$108,679	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Triangle park-small seating	Park	$4,679	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Sewer pond equipment	Sewer	$9,359	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Sewer pond equipment	Sewer	$23,397	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Lift station #1 Greenville	Sewer	$29,247	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Lift station #2 Greenville	Sewer	$40,945	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Lift station #3	Sewer	$29,247	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Office contents	Water/Sewer/Park	$11,699	Fire, earthquake, flood, landslide, mudslide debris flow
Water tank Greenville	Water	$100,000	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Round Valley Dam	Water	$100,000	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure

Name of Asset	Facility Type	Replacement Value	Hazard Info
APN 110330007 Greenville	Vacant lot	$0	Fire, earthquake, flood, landslide, mudslide debris flow
4290 Nelson Street Taylorsville	Fire Station	$391,537	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
6344 North Arm Road Taylorsville	North Arm Fire Station	$55,189	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
5497 Fir Fork Genesee	Genesee Fire Station	$58,803	Fire, earthquake, flood, landslide, mudslide debris flow, dam failure
Total		**$2,106,965.00**	

Source: IVCSD

Community Lifelines

Assessing the vulnerability of the IVCSD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the IVCSD to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

IVCSD has a variety of natural resources of value to the District. Specifically, there are critical water resources, abundant timber, and mineral deposits such as gold, limestone, copper, silver and iron within the boundaries of the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Historic and Cultural Resources

IVCSD has a variety of historic and cultural resources of value to the District. Specifically, Ancient trails, archaeological sites, ceremonial & story sites, as well as Maidu artifacts These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the IVCSD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

The Dixie Fire has led residents in various communities to mandatory evacuations and displacement of residents. Many have had to relocate to safer areas temporarily or permanently, impacting local population numbers and demographics. Communities within the CMFPD and IVCSD fire and EMS service boundaries, such as the town of Greenville and Indian Falls, are part of the communities that were forced to migrate. Therefore, the area may see minimal growth in the coming years, depending on the pace of recovery, housing availability, and economic opportunities.

Additionally, the Department of Finance (DOF) projects a 30 percent decline in Plumas County's population from 2024 (18,593) to 2060 (13,025). This represents an average annual growth rate (AAGR) of negative one percent, indicating an approximate one percent annual population decline from 2024 through 2060.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. The economy in the area has been reshaped by

the Dixie Fire. The economic future largely depends on rebuilding efforts, tourism, and recreation. The District is are currently rebuilding the Greenville fire station. This is being done after the station was destroyed in the 2021 Dixie Fire. The new facility will be both and IVCSD Fire Station and a County Sheriff Substation. The District has no control over where future development occurs, it reacts to the development by providing increase (or decreased) services.

E.4.2. Hazard Identification

The IVCSD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table E-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table E-3 IVCSD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Highly Likely	Limited	Low	Medium
Climate Change	Extensive	Likely	Critical	Low	–
Dam Failure	Extensive	Occasional	Critical	High	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake (w/subhazards)	Extensive	Likely	Catastrophic	High	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional	Catastrophic	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Hazardous Materials Transport	Significant	Occasional	Critical	Low	–
Landslide, Mudslide, Debris Flow	Significant	Likely	Limited	High	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Likely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Low	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Occasional	Limited	Medium	Medium
Volcano	Extensive	Unlikely	Catastrophic	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

E.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the IVCSD (as identified in the Significance column of Table E-3). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section E.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section E.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The District noted that there have been no Power Outages, including those associated with PSPS events, that have affected them.

Dam Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–Extremely High

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Bidwell Lake Dam impounds Round Valley Reservoir in Greenville, CA (Plumas County). It is owned by the Indian Valley Community Services District. The earthen dam was built in 1865. The dam is 325 feet long and 35 feet high. It impounds 5975 acre feet of water. It was repaired in 2018 as a result of the 2017 January-February flood event. The reservoir is used as the backup water system for the residents of the community of Greenville. The water from Bidwell Dam flows into North Creek, then Wolf Creek, then Indian Creek, and then the Feather River.

The spillway consists of two concrete walls that direct water over the crest of a concrete monolith built into bedrock. The spillway toe is 11.5 feet below its crest. The spillway flashboards are 20 inches long and aligned at an angle from the vertical plane. A valve in the spillway can be used to release water. The spillway capacity is estimated to be approximately 3,000 cfs when the water level in the reservoir is at the dam crest and the flashboards are not installed. There are no other outlets. The downstream channel capacity is approximately 257 cfs.

Per DSOD, there are no critical appurtenant structures. There are no upstream or downstream dams.

If the dam were to fail, the flood waters would follow Wolf Creek downhill to the city of Greenville, arriving in 30 minutes. The waters would spread out over the city and the downstream agricultural land at depths of mostly less than 5 feet. Within Greenville, the two schools and the Feather River Hospital would be inundated. Highway 89 would be flooded at two points

Location and Extent

An inventory map of dams located within Plumas County was shown in Section 4.3.8 in the Base Plan. Dams with an inundation area within the IVCSD are shown on Figure E-3. This includes 3 high hazard dams: Antelope, Bidwell Lake (owned by ICCSD), and Silver Lake.

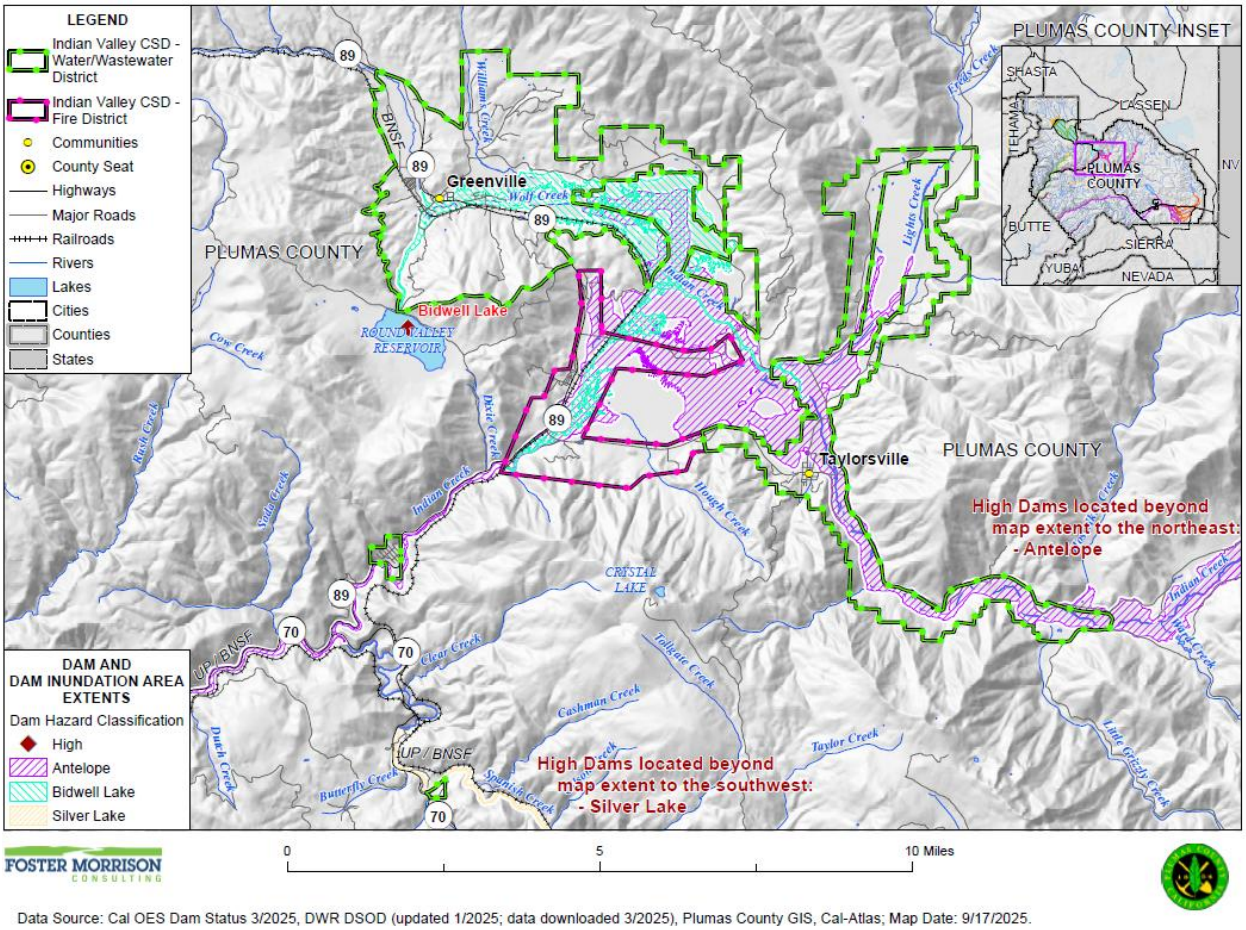
Note: There are no extremely high hazard dams that intersect the District. As such, no maps or tabular analysis is provide below.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.8 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is shown on Figure E-3, as well as in Table E-4 for both the Fire District and the Water/Wastewater District.

Figure E-3 IVCSD – High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 3/2025, DWR DSOD (updated 1/2025; data downloaded 3/2025), Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Table E-4 IVCSD – Dam Inundation Areas Geographical Extents

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Fire District						
Antelope	1,104	6%	188	3%	916	8%
Bidwell Lake	231	1%	50	1%	181	2%
Water/Wastewater District						
Antelope	1,951	13%	696	15%	1,254	13%
Bidwell Lake	1,227	8%	229	5%	998	10%
Silver Lake	2	0.02%	2	0.05%	-	0%

Source: Cal OES, DSOD, Plumas County GIS

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Plumas County.

NCDC Events

The NCDC does not contain any dam failure events for Plumas County.

IVCSD Events

There have been no past dam failure events in the District since its inception. There was an event in 2017 where the dam and reservoir were impacted. A FEMA grant helped to pay for repairs. That grant application noted that during the declared incident period, February 1 through 23, 2017, Plumas County, CA, experienced severe rainstorms and flooding. As a direct result of the incident, some of the large rocks from the IVCSD Bidwell Dam Round Valley Reservoir Spillway were washed out and a portion of the existing 4-in. HDPE water pipe (300 ft. long) was damaged.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the District can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Plumas County and the District.

Vulnerability to Dam Failure

The vulnerability of the District to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Dam failure is the foremost concern for the District. The Round Valley Reservoir is impounded by Bidwell Lake dam. The District owns this dam. There are concerns regarding earthquakes causing an already weak and aging dam to fail. There are additional concerns about the dam failing due to the age and condition of the dam. In the event of a dam failure, the community of Greenville could face significant flooding and catastrophic casualties. To mitigate this hazard, the District either needs to repair or rebuild this dam and make sure it is retrofitted and upgraded.

The Indian Valley Community Service District was critically impacted by the 2021 Dixie Fire. The building that housed their physical records of the dam was destroyed. The District also experienced staff turnover in the subsequent years, resulting in the loss of institutional knowledge.

Assets at Risk

Assets at risk from this hazard include people and populations ; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (including both District staff and District residents) located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

The District's ability to operate may be compromised during an event limiting their ability to provide services to the populations in their service area. For example, water and wastewater services may be cut off during and after an event until the District can get systems functioning and back on line.

Structures and Critical Facilities and Infrastructure

Many structures and critical facilities and infrastructure in the District have some measure of risk to dam failure. Dam failure flooding can affect the built environment of the District. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated. The District noted that the dam as well as most of the assets on Table E-2 would be at risk to dam failure.

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the District. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural

resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the District from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the District and Plumas County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the District to dam failure.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. Additional growth within the dam inundation areas of the District would place additional populations at risk to dam failure. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future dam failure events may occur in the District. Although new growth and development may fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area may continue to occur.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the secondary hazards of drought in the Plumas County Planning Area, that can also affect IVCSD, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Plumas County. This can be seen in Table E-5. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County since 2012.

Table E-5 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the District.

IVCSD Events

Based on historical information, the occurrence of drought in California, including the IVCSD, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years that likely affected the District. Drought has occurred in the past and will occur in the future.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the IVCSD to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Chief concerns are wildfire, water shortage and long-term ecosystem damage. Hazard mitigation measures can be implemented with extra water storage. There are significant number of large trees that were lost in recent drought years. This was primarily due to drought stress and the Dixie Fire. The economy in the area has been reshaped by the Dixie Fire. The economic future largely depends on rebuilding efforts, tourism, and recreation. Along with the cost of rebuilding, disasters disrupt the customer base. This impacts not only the rebuilding but also the replacement of aging infrastructure. These funding limitations are of high concern.

Ground water supply is source water for the Water District. The distribution system is fed by one main line into town from the treatment plant. Loss of electricity could affect redundancy to supply of maximum demands of system.

2019 Greenville Water System Planning Report noted that over recent years, the Greenville water system has struggled with efficiency in that the District only sells about 50% of the water that is produced. The 50% water loss is thought to be due to due to leaks io the distribution system and other inefficiencies such as meter inaccuracies.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

The District noted that drought will likely no directly affect District facilities, but the District is concerned about drought increasing the wildfire hazard. All of the facilities listed in Table E-2 with wildfire as a concern would possibly be affected by drought exacerbated wildfire.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the IVCSD include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Planning Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

The District has access to large quantities of water through its existing groundwater supplies. However, population growth in the District will add additional pressure to the District as a water company during periods of drought and water shortage.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–Extremely High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. The IVCSD, Plumas County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the District are shown in Section 4.3.10 of the Base Plan. These include the Almanor Fault, Butt Creek Fault Zone, the Mohawk Valley Fault, and others that traverse the County. The Indian Valley Fault is also considered an active fault located within the County. A significant seismic event on any of these major faults could cause damage in the IVCSD.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.10 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of some magnitude occur.. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Plumas County and the District fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Plumas County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

IVCSD Events

As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The District did note an earthquake at Lake Almanor May 11, 2023, affected a large portion of Northern California. The immediate area near Lake Almanor experienced the highest intensity such as Greenville & Chester. The foothills, greater Sacramento area, Chico, Susanville, & Nevada county also felt shaking. In the District, there was no major structural damage reported. Roads were damaged. Businesses had minor damage to inventory such as inventory falling from shelves and breaking.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. More urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Plumas County Planning Area, seismic hazard mapping indicates that the District has low to moderate seismic hazard potential. There is the potential for the District and Plumas County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

The whole of the District is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District is concerned about a dam failure being caused by an earthquake. The District has substantial above ground infrastructure that is well built, but would be at risk to a large earthquake. In addition, the District has below ground piping that would be at risk from earthquakes. The District noted that it can help mitigate by integrating seismic resilience in infrastructure, retrofitting existing infrastructure, such as the dam at Round Valley Reservoir and ensuring the community and the district are prepared.

The District also has concerns about other cascading issues from earthquake such as earthquake-induced landslides, liquefaction, and wildfire risk. If these other events were to occur, the operational resilience of an already stressed district would cause delays in emergency responses, additional trauma to residents impacted, and increased uncertainty.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those residing in the District Service Area) are at risk from earthquake shaking and associated hazards. The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County and District may be affected is included in Section 4.3.10 of the Base Plan.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the District are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Plumas County Planning Area show how structures may be affected. The District noted (in Table E-2) that all District assets are at risk from earthquake.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the IVCSD staff,

residents, and visitors. Other impacts to the District could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake. The District has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the IVCSD include the following:

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The District enforces the California Building Code, which mandates construction techniques that minimize seismic hazards. Future development in the District is subject to these building codes and land use planning.

Flood: 1%/0.2% Annual Chance (w/Levee Failure)

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

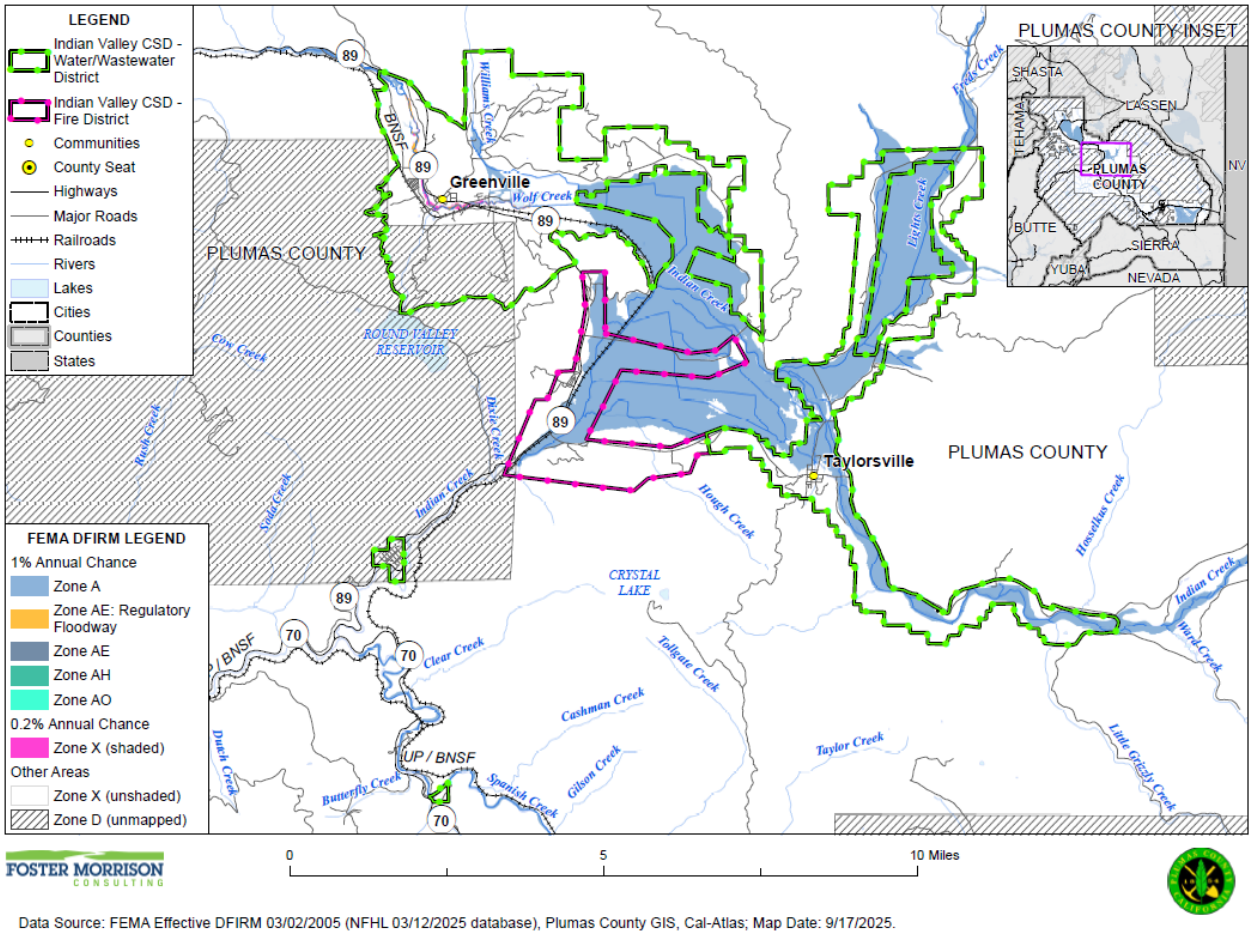
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the District and have caused damage in the past. Flooding can be a significant problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the District swell with heavy rainfall and snowmelt runoff. The District has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures (like levees) located throughout the Plumas County Planning Area and the IVCSD. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% annual chance floodplains and in other localized areas in the District. Levee failure flooding is also an issue in the District (though a minor one).

Location and Extent

The IVCSD has areas located in the 1% annual chance flood zone. This is seen in Figure E-4. The District also has a small area that is protected by a levee (though the levee is not certified by FEMA as protecting against the 1% annual chance flood). This can be seen in Figure E-5.

Figure E-4 IVCSD – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 03/02/2005 (NFHL 03/12/2025 database), Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Figure E-5 IVCSD – FEMA DFIRM Flood Zones with Leveed Area Inset Map

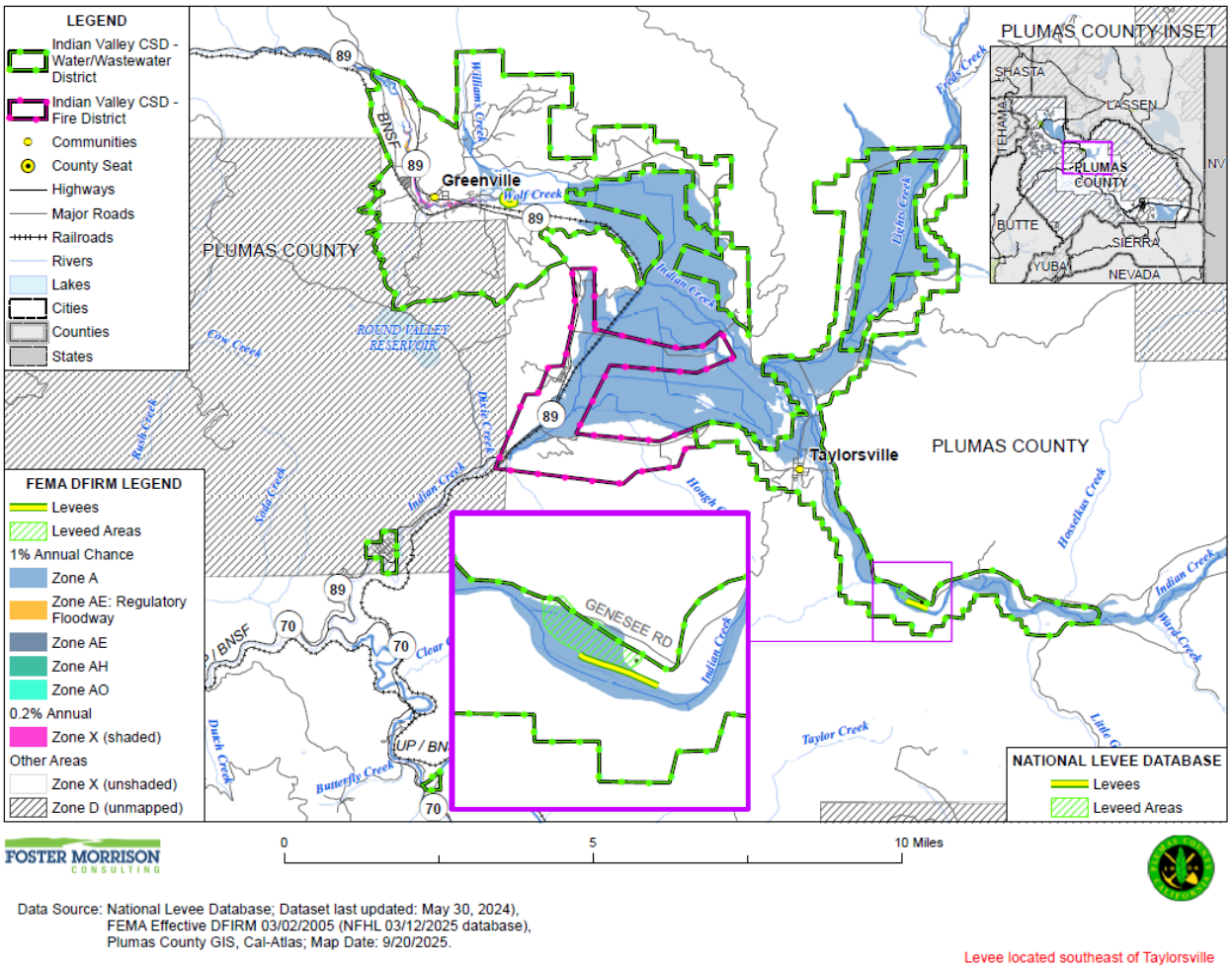


Table E-6 details the DFIRM mapped flood zones located within the District.

Table E-6 IVCSD – DFIRM Flood Hazard Zones

Flood Zone	Description	Present in District
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
Zone D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.	X

Flood Zone	Description	Present in District
X (unshaded)	Area of minimal flood hazard	X

Source: FEMA DFIRM 03/02/2005

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Geographical flood extents for the District from the FEMA DFIRMs are shown in Table E-7.

Table E-7 IVCSD – Geographical DFIRM Flood Zone Extents

Jurisdiction/ Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Fire District						
1% Annual Chance Flood Hazard	1,319	8%	254	5%	1,065	9%
0.2% Annual Chance Flood Hazard	0	0%	0	0%	0	0%
Other Areas	1,639	9%	565	10%	1,074	9%
Total	**2,958**	**17%**	**819**	**15%**	**2,139**	**18%**
Water/Wastewater District						
1% Annual Chance Flood Hazard	3,287	19%	1,360	25%	1,927	16%
0.2% Annual Chance Flood Hazard	30	0.2%	5	0.1%	25	0.2%
Other Areas	11,247	64%	3,306	60%	7,941	66%
Total	**14,564**	**83%**	**4,671**	**85%**	**9,893**	**82%**
Grand Total	**17,522**	**100%**	**5,490**	**100%**	**12,032**	**100%**

Source: FEMA DFIRM 03/02/2005

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Plumas County from flooding is shown on Table E-8. These events also likely affected the District to some degree.

Table E-8 Plumas County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storm)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA
*included a landslide component

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Plumas County has seen 15 events. Depending on the location, these events most likely had some impact on the District.

IVCSD Events

The District noted that the following events had affects or damages to the District:

January of 1997 – A flood and localized flood event occurred after rains on January 1,1997. This occurred throughout Plumas County, Feather River Watershed, Greenville, and the larger Central Valley. There was minimal property damage in the District. There was significant public infrastructure damage such as roads, bridges and culverts. Significant economic impact due to transportation disruptions and infrastructure damage. There was environmental & geological damage due to channels of local creeks and streams being significantly altered.

January 2017 – Plumas County experienced heavy rainfall and snowmelt during the incident period of January 3 - 12, 2017, which resulted in roadway flooding and washout, property flooding, and wastewater lift station damages. As a direct result of the storm, IVCSD sustained generator damages at two distinct lift stations. One lift station was part of the Greenville Sewer Wastewater system. The other station was part of the Taylorsville Sewer Wastewater facility. These damages were fixed using FEMA grant funds.

August 2020 – A heavy rain prompted a flash flood warning.

October 2021 – A bomb cyclone brought heavy rain to the region.

April 2023 – Spring snowmelt cased increased waterflow. The Indian Creek overflowed and various roads in the District became submerged.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Plumas County Planning Area, and the IVCSD. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the District. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the District is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

If the dam fails from heavy rains and storms, chief concerns would be the likelihood of a catastrophic flash flood. The rapid inundation of Indian Valley, destruction of infrastructure, and significant risk to human life. The flash flooding risk is compounded by the areas current vulnerability following the Dixie Fire. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

Along with dam failure, the District is concerned with aging infrastructure being affected by large flooding events. Also, cascading events such as wildfire burn areas increasing chance of floods & mudflow and existing flood maps may underestimate the risk of floods, especially with climate change possibly exacerbating weather events. The impact on property, residents, and various financial risks are of concern as well.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those in the Service Area) located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Populations served by the District can be the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. The District's ability to provide services to its populations during flood events is paramount.

Structures and Critical Facilities

Certain District structures are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. All District assets listed in Table E-2 would be at risk to flooding.

Flooding presents a threat to both critical facilities and infrastructure, as well as community lifelines. Critical infrastructure plays an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on water infrastructure for drinking water, wastewater service, and draining streets of rainwater. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California.

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure E-4 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can

be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the IVCSD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Some redevelopment of the areas of the District burned in the Dixie Fire may occur, but this will occur where previous development existed. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development in the District may be built in the floodplain, as long as it conforms to the standards of the floodplain ordinance. The County enforces their floodplain management ordinance on areas inside the District. More detail on the specifics of the floodplain ordinance can be found in Section 4.4.1 of the Base Plan. New District facilities and assets will be sited in such a way as to reduce the risk from flooding to District structures.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The IVCSD is subject to localized flooding throughout the District. This is discussed in Table E-9 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

IVCSD Events

Localized flooding occurs every year. The flooding of 1997 was the event that caused damages. This was discussed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance above.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the District has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of or inadequate drainage infrastructure in the District contributes to localized flooding issues.

The District is also concerned with rain on snow events, which can cause greater flooding in the District.

The District tracks localized flooding areas. Affected localized flood areas identified by the IVCSD are summarized in Table E-9.

Table E-9 IVCSD – List of Localized Flooding Problem Areas

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
All of Greenville if the dam breaks or there are extreme storms w/flash floods	X	X	X	X	X	X	X

Source: IVCSD

The District has concerns related to more extreme weather such as atmospheric rivers followed by severe drought increasing flash flood risk. Vulnerabilities stem from increased severe weather, the Feather River overflowing, mountainous terrain, and specific aftereffects of the Dixie Fire. Localized flood events can and do result in loss of service, which impacts the residents within the District's boundaries.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Many of the assets listed as being affected by flood in Table E-2 can also be affected by localized floods.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the

underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the IVCSD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development

traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the District will add to the drainage issues already faced by the District, unless adequate drainage facilities are installed in new development locations.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)

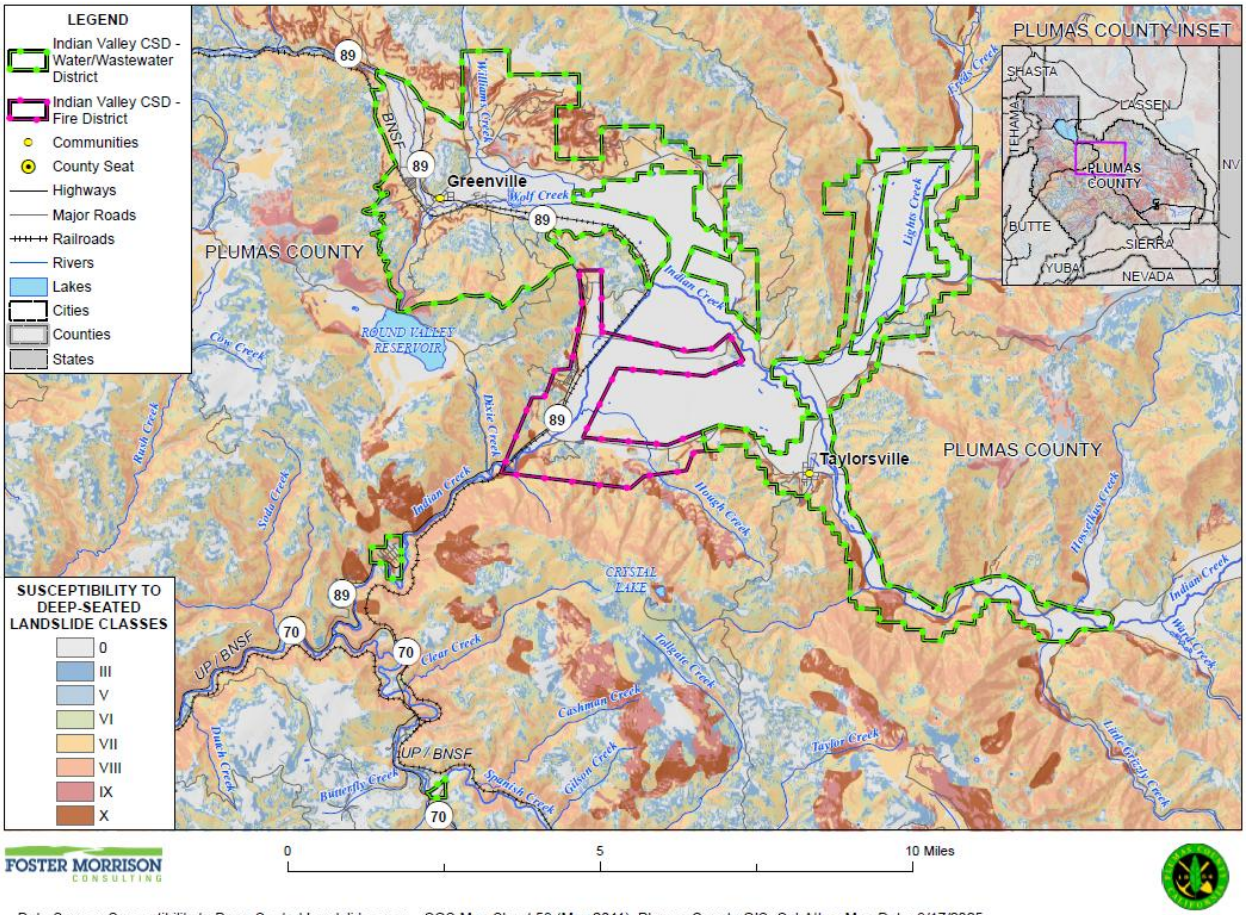
- Road building, excavation, and grading
- Earthquake

The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas bordering the District where the topography is characterized by rolling hills and ridges.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

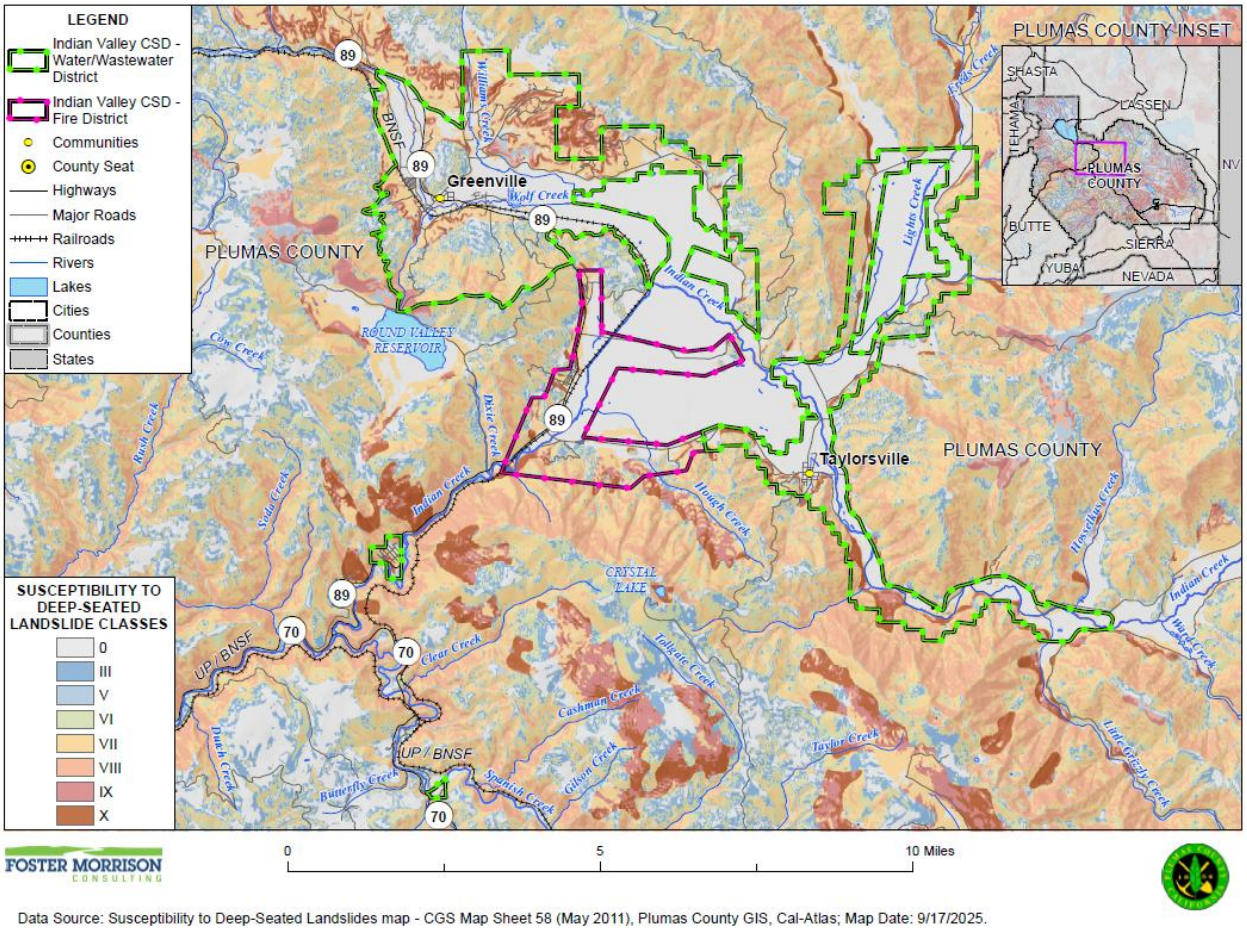
Figure E-6 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure E-6 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table E-10



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Table E-10. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the eastern portions of the District and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure E-6 IVCSD – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Table E-10 IVCSD – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Fire District						
0	1,581	9%	370	7%	1,211	10%

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
III	161	1%	55	1%	105.9	1%
V	-	0%	-	0%	-	0%
VI	199	1%	50	1%	149	1%
VII	677	4%	260	5%	416	3%
VIII	70	0.4%	5	0.1%	64	1%
IX	141	1%	36	1%	105	1%
X	130	1%	42	1%	88	1%
Total	2,958	17%	819	15%	2,139	18%
Water/Wastewater District						
0	6,505	37%	2,440	44%	4,064	34%
III	796	5%	176	3%	620	5%
V	60	0.3%	37	1%	23	0.2%
VI	962	5%	194	4%	768	6%
VII	4,257	24%	1,320	24%	2,937	24%
VIII	628	4%	81	1%	546	5%
IX	671	4%	214	4%	457	4%
X	686	4%	208	4%	478	4%
Total	**14,564**	**83%**	**4,671**	**85%**	**9,893**	**82%**
Grand Total	**17,522**	**100%**	**5,490**	**100%**	**12,032**	**100%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Plumas County; however, as shown in Table E-11, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table E-11 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993.

IVCSD Past Occurrences

The District experienced localized landslides, mudslides, and debris flow in early 2023. The area was especially susceptible to these events due to the Dixie Fire in 2021. Rain could not be absorbed into the ground and ran off quickly, overwhelming drainage systems. There were no roots from vegetation to hold the soil in place because of the devastation caused by the Dixie Fire. The debris flow & mudslides led to the closure of local highways (specifically, Highway 70 & 89). The area was still trying to rebuild from the Dixie Fire. The mudslides and flooding added another layer of challenges for the community. To mitigate these hazards, the District worked to establish drainage control, clear and maintain existing drainage, use sandbags and silt fences to create temporary barriers & redirect water, spread erosion control blankets and hydromulch on steep hillsides, install erosion barriers, create check dams from straw bales to slow and control runoff as much as possible. There were several road closures, and significant strain on local services such as Maintenance crews and emergency services.

There was also significant debris flow in October of 2021 due to storms. Roads were washed out, bridges were damaged, and culverts were damaged. Property damage was minimal. Transportation routes were primarily affected. Greenville was cut off from supplies, residents' ability to commute to work was impacted which impacted the local businesses and economy. Costs increased due to increased travel time. There was also environmental and geological damage due to the combination of the Dixie Fire and intense rainfall triggered erosion.

A grant application noted that during DR-4308 incident period of February 1, 2017 through February 23, 2017, IVSCD experienced severe winter storms, flooding which caused damage to Greenville Water Treatment Road. Heavy rains and high water flooding brought rock, silt, plants, and vegetative debris down the hillside which overwhelmed and damaged the drainage canal directly next to the road. The remaining debris and flood waters overwhelmed, clogged and damaged the upper division culvert completely washing out a section of the road. The culvert was damaged beyond repair.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the District are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. Post wildfire areas are also more prone to landslide events. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure

to landslide. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District is concerned both with physical damage to District property, as well as damage to transportation routes in the area. In addition, as the residents of the District have seen damages from the Dixie Fire, there is concern for landslides in fire burn scar areas.

After a fire has occurred, destabilized soil and erosion can occur within the burn scar, exacerbating the risks of landslide. A concern of the District is the fact that the risk of debris flow is not just immediately following wildfire, it can persist for years because of slow vegetation regrowth and continuous decay of soil. Along with those cascading effects, other events such as extreme weather & atmospheric rivers, rapid and destructive flows, threat to infrastructure and life, and water contamination are all impacts that the District is concerned about. Lack of early warning systems, financial burden, and ongoing road closures are impacts that the residents would be facing within the District. It can be challenging to discourage these residents from returning to an area affected by landslide, which can cause more issues, especially for emergency response services.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and District residents) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. Most vulnerable are those people working or residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in the District service areas as well as District staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Landslides can affect the built environment of the District and those structures and critical facilities located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The District noted that it is concerned that all assets listed in Table E-2 would have some risk to landslide.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure E-6 would be most vulnerable, as well as those in the run-out areas.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the District susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the District. Most, but not all, of the historic landslides in the District have been minor, localized events that are more of a nuisance than a disaster. However, with the Dixie Fire burn scar, this may change in the future. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the District to landslide.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the District. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the District would place additional values at risk to landslide. New District facilities will take landslide into account when siting new facilities.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the District.

Location and Extent

Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the District as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table E-9 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the District and Plumas County. Duration of severe storms in the District can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This contributes to many of the federal disaster declarations related to flooding.

Disaster declarations from flooding, including heavy rains and storms, are shown on Table E-12. IN addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table E-12 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

IVCSD Events

The District noted that heavy rains and storms are an annual occurrence often resulting in flooding. Events causing flood issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the IVCSD. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past.

Hail and lightning are rare in the District, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the District is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. A list of localized flooding problem areas are shown on Table E-9 above. The District is also concerned with rain on snow events, which can cause greater flooding in the District. The District is also concerned about increased debris flow and mudslide risk, localized flooding, water contamination, erosion, and landscape damage. Concerns for PSPS events are medical needs for residents that rely on electricity for medical devices and refrigerated medication, communication breakdowns, disruption of recovery, food and water security, and mental health impact.

Of concern to the District are cascading events, such as flash floods and debris flow, with increased risk on steep terrain downstream due to the Dixie Fire burn scar, and water contamination. These events can all cause increased infrastructure damage, service disruptions, increased costs, safety risks, isolation, access problems, rebuilding delays, and financial strain.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to heavy rains and storms. Those District employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the District have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

District facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be

more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the District. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

Heavy rains and storms that cause flooding would cause a risk to every District asset listed in Table E-2.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New District facilities follow state and local building codes which should reduce the risk to future development in the District from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the District.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the IVCSD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires

also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

Wildfire Smoke and Air Quality

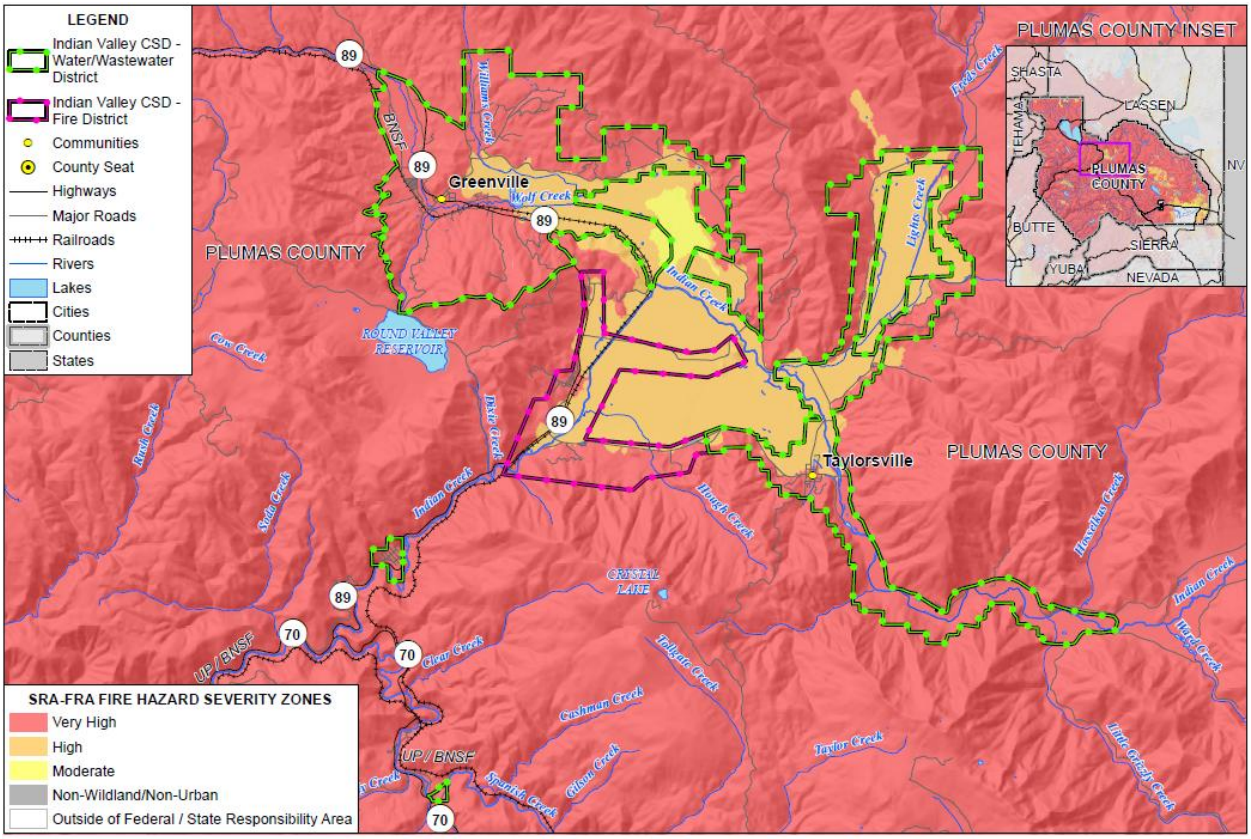
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the IVCSD were created. Figure E-7 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the map, FHSZs within the District range from Moderate to Very High. Figure E-8 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown, there is no LRA in the District; as such, no other tabular analysis of the LRA is provided in the sections below.

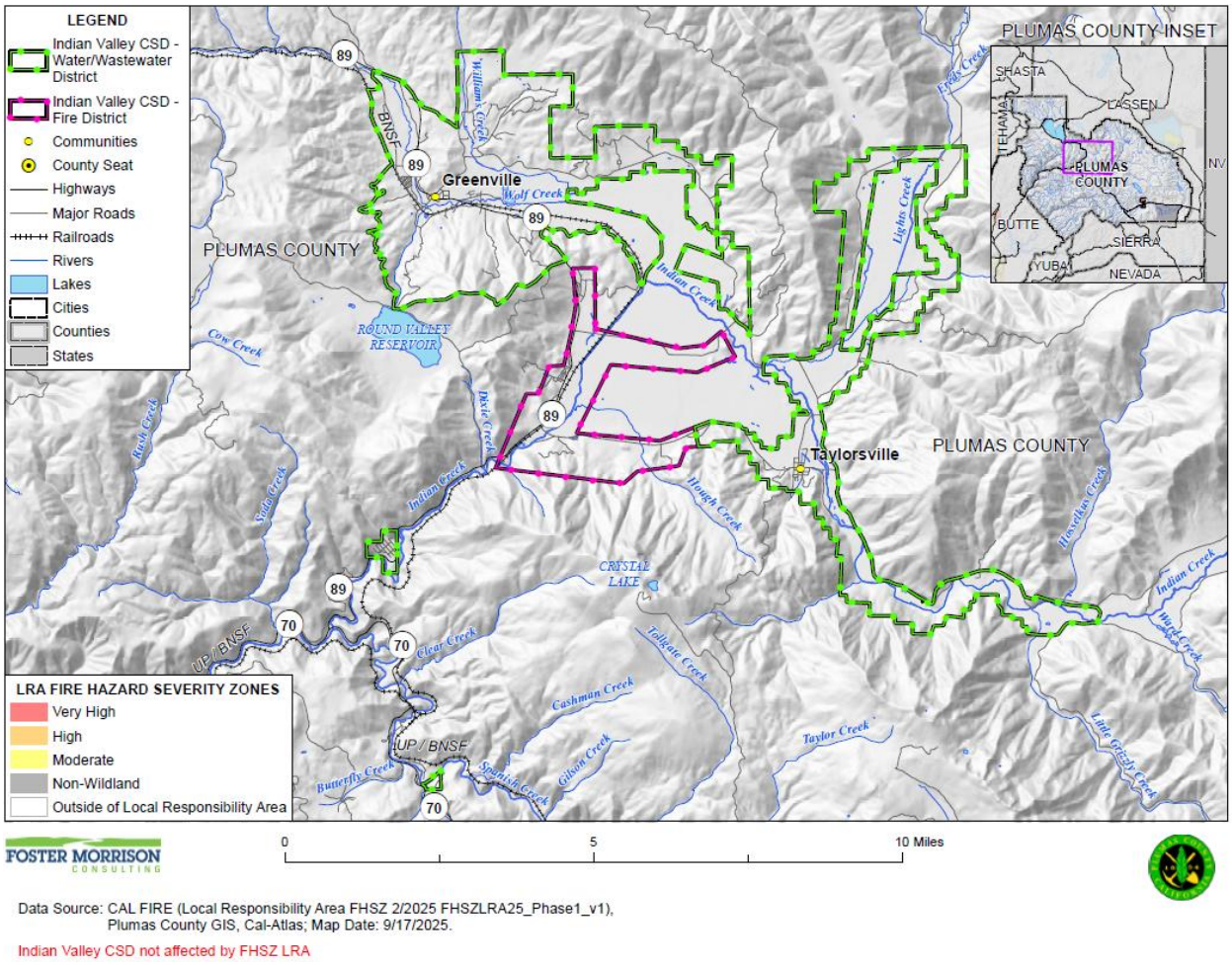
Figure E-7 IVCSD – CAL FIRE SRA/FRA Fire Hazard Severity Zones



FOSTER MORRISON CONSULTING

Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Figure E-8 IVCSD – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 9/17/2025.

Indian Valley CSD not affected by FHSZ LRA

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA for both the Fire District and the Water/Wastewater District are shown in Table E-13.

Table E-13 IVCSD – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Fire District						
Very High	1,418	8%	431	8%	987	8.2%
High	1,526	9%	387.7549	7%	1,138	9.5%
Non-Wildland/Non-Urban	14	0.1%	0	0%	14	0.1%

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Fire District Total	**2,958**	**17%**	**819**	**15%**	**2,139**	**17.8%**
Water/Wastewater District						
Very High	10,727	61%	3,324	61%	7,403	61.5%
High	3,715	21%	1,321	24%	2,395	19.9%
Moderate	114	1%	26	0.5%	89	0.7%
Non-Wildland/Non-Urban	7	0.04%	0	0%	7	0.1%
Water/Wastewater District Total	**14,564**	**83%**	**4,671**	**85%**	**9,893**	**82.2%**
Grand Total	**17,522**	**100%**	**5,490**	**100%**	**12,032**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table E-14.

Table E-14 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

IVCSD Events

The largest fire to affect the District was the Dixie Fire. The Dixie Fire burned from 7-13-2021 until 10-25-2021. It affected Butte, Plumas, Lassen, Shasta, and Tehama counties. There was 1 firefighter killed and several injuries reported. The damage to property, infrastructure, and the economy in the District was

severe. 75% of structures in Greenville were destroyed. This included the IVSCD Fire Station. It is likely that a wildfire of this magnitude could happen again in this area.

During this event, an estimated 5,000ft long, 12- inch diameter raw water supply line coming from the Round Valley Reservoir and ending at the Indian Valley Water Treatment Plant was damaged in spot locations by the Dixie wildfire. There is a location where the water supply line goes from a 12-inch diameter above ground metal line and connects to a 12-inch diameter PVC water line that was above ground in some locations and in other areas was put into an old shallow ditch that was once a wooden trough, the timbers of the trough were removed and the PVC pipe placed in the shallow ditch and the 4 x 12 rough cut timbers were cut into 4ft lengths and placed over the pipe, on an average 2ft on center. During the fire those timbers caught fire and melted the PVC supply line directly underneath them.

Additionally, flying embers from the Dixie Wildfire landed on a 267ft long section of 4 inch diameter welded HDPE raw water supply that was above ground which caused numerous pin hole size leaks in the line. The line start a the Round Valley Reservoir and ends at the meter box which feeds the Greenville Cemetery, there was no damage to the meter or the meter box.

During this fire, many of the IVCSD water meters, hydrants, meter boxes, valves, and valve boxes were damaged in the Greenville area. FEMA funds helped cover the damages and the District worked to repair the damages.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

It is likely that a wildfire of the magnitude of the Dixie Fire could happen again in this area. Much of the area the District served was damaged by that event. The area is still recovering today, and there is a question as to whether the rebuilding will reach the previous stock of buildings. To mitigate this hazard, the District is seeking to educate the public on how they can harden homes and businesses against embers, reduce fuel in and around the area, and preparing for this kind of disaster. The District can create defensible space, use noncombustible and fire resistant materials when building, and keep vegetation trimmed. Creating shaded fuel breaks, thinning and removal in the forest, dead tree removal, and keeping forests healthy will also reduce future wildfires. Prescribed burns can help also. Developing a community wildfire protection plan may also occur. The District continues to seek to educate the community, and seeks the ability to be housing workers that are carrying out mitigation projects.

The District received a FEMA grant for $7,000,000 for Greenville recovery and rebuilding costs resulting from the Dixie Fire.

The District noted key vulnerabilities include high property risk, potential loss of infrastructure, severe economic and social impacts. property and utility damage, impact on evacuation routes, contamination from burned materials, challenges in rebuilding and recovery; all of which are heightened by a longer dry season. These long dry seasons can weaken the water supply for firefighting, placing increased strain on fire department resources. Of concern during these dry periods are hazardous fuels and forest management.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused , infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. All District assets from Table E-2 are at risk to wildfire.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts to the District include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. Without backup electricity generation, water and wastewater cannot be conveyed. Water quality

will also suffer if water treatment functionality is compromised. The economic impact alone to the District including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the IVCSD include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. The area around Greenville may be rebuilt, but will most likely be built to the size of the previous development. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional assets at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, District building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

E.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

E.5.1. Regulatory Mitigation Capabilities

Table E-15 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the IVCSD.

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table E-15 IVCSD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	We will be creating one
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	County wide plan covers our area
General Plan/Comprehensive Plan/Master Plan	N	
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	Y	I have attached the ERP
Stormwater Management Plan	N	
Transportation Plan	N	
Other		

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?
Acquisition of land for open space and public recreation use	N	County
Building code	N	County
Flood insurance rate maps	N	County
Floodplain ordinance	N	County
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	County
Subdivision ordinance	N	County
Zoning ordinance	N	County
Other	N	County
How can these capabilities be expanded and improved to reduce risk?		
We need to develop a CIP and a master plan describing what the district does. They both need to be updated annually.		

Source: IVCSD

E.5.2. Administrative/Technical Mitigation Capabilities

Table E-16 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the IVCSD.

Table E-16 IVCSD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Plumas County, Michael Coelho
Civil Engineer, including dam and levee safety	N	N/A
Community Planner	Y	Plumas County Planning
Emergency Manager	Y	Plumas County office of emergency services
Floodplain Administrator	Y	Plumas County
GIS Coordinator	Y	Plumas County Planning
Planning Commission	Y	Plumas County Planning
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	N	unknown

Hazard data and information	Y	Plumas County, FEMA, State of CA
GIS analysis	Y	Plumas County Planning
Mutual aid agreements	Y	Chester PUD, Yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
Indian Valley CSD is in Greenville CA. Greenville is unincorporated so most of these resources come from Plumas County. Our jurisdiction needs improvement in every category. If we had more mutual aid agreements with surrounding districts, we would all have more resources to use for mitigation. If we had GIS we could have accurate mapping of our service area done and be more prepared for hazards and know exactly where our potential weak areas are. Historical hazard information would be helpful to have to study to help prepare and mitigate future hazards. Most of the grants we apply for are done by staff. If we had an experienced grant writer on staff, we might have better access to grants and spend less time on the applications which would save district resources.		

Source: IVCSD

E.5.3. Fiscal Mitigation Capabilities

Table E-17 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table E-17 IVCSD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	No. Yes could be used in future
Community Development Block Grant	N	No. Yesa could be used in future
Federal funding programs (non-FEMA)	Y	Yes. Rebuilding after Dixie Fire
Fees for water, sewer, gas, or electric services	Y	We charge the community for water & sewer
Impact fees for new development	N	No. Yes could be used in future
State funding programs	Y	We have received state funding for disaster recovery
Stormwater utility fee	N	Yes. Could be used in future
Other		
How can these capabilities be expanded and improved to reduce risk?		
Identify funding sources to develop CIP , identify funding sources for audits and other fiscal resources.		

Source: IVCSD

E.5.4. Mitigation Education, Outreach, and Partnerships

Table E-18 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table E-18 IVCSD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	We are working on a grant for transparency & community communication
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	N	
Local news	Y	We post on our website and in the Plumas Sun
Organizations that interact with underserved and vulnerable communities	Y	Outreach to veterans and low income community members
Social media	Y	Not updated regularly
How can these capabilities be expanded and improved to reduce risk?		
Educating the community on mitigation can help us prepare for hazards and possibly not have as devastating effect. All of the above items help with this. IVCSD is applying for a grant to help with communication with the community.		

Source: IVCSD

E.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

- Put a dam EAP together along with inundation mapping.
- Greenville Water System Planning Report was put together in 2019.
- The District has an Emergency Response Plan for the Greenville and Crescent Mills Water systems.
- Cutting trees and brush and debris clearing

Mitigation Strategy

E.5.6. Mitigation Goals and Objectives

The IVCSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

E.5.7. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Many of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

E.5.8. Mitigation Actions

The Planning Team for the IVCSD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, , and timeline are also

included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Dam Failure
- Drought & Water shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Climate Change
- Hazardous Materials Transport
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornado
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Public Outreach Project

Hazards Addressed: Multi-hazard (Dam Failure, Drought & Water shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning), Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Educating the public on potential hazards that effect our community is paramount. Actions taken in this area to enhance public knowledge will lead to greater mitigation efforts within the community as a whole.

Project Description: Partnering with local resources (Cal OES, Plumas County Sheriff's Office, and others), the project will offer a variety of public education outreach efforts. Public education including but not limited to:

- Potential hazards and high hazard areas
- Property owners personal mitigation measures related to natural hazards specific to community and personal property
- Local and Plumas County emergency evacuation plan
- Living with fire, fire safe requirements, home hardening, etc.
- Forecasting information
- Hazard warning notification
- Emergency shelter locations

Other Alternatives: No outreach.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None. We are working on a grant for public outreach and transparency.

Responsible Office/Partners: IVCSD

Benefits (Losses Avoided): Build trust & relationships among community members, empower residents to act, and facilitate long term resilience.

Potential Funding (Local Budgets, Grant Funds, etc.): Federal HMA funding, state and federal mitigation funds, HMA, HMGP

Timeline: 5 years

Project Priority (High, Medium, Low): high

Action 2. Dam Failure Mitigation and/or Replacement

Hazards Addressed: Dam failure

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): If the dam (which is owned by the District) fails at Bidwell Lake, the entire town of Greenville, CA could be under water in 17 minutes.

Project Description: repair/rebuild this dam and make sure it is retrofitted and upgraded.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District will need to do a study and implement the findings. There is an inundation map and inspection reports.

Responsible Office/Partners: IVCSD

Benefits (Losses Avoided): Reduced property damage, reduced injury & loss of life

Potential Funding (Local Budgets, Grant Funds, etc.): HHPD funding, Federal HMA funding, state and federal mitigation funds, HMA & HMGP

Timeline: 5 years

Project Priority (High, Medium, Low): High

Action 3. IVCSD Secondary Water Source Project and Storage

Hazards Addressed: Drought

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): IVCSD only has 1 water source. If anything goes wrong with the primary source, there is no backup. If there is a fire and the primary source is compromised, there is no easily accessible secondary source and not enough storage if there is a delay in repairing the primary source

Project Description: Drill a secondary well, additional water storage tanks and water treatment plant for backup water source for Greenville, CA.

Other Alternatives: Bidwell Lake could be a source for Ag water but there is no treatment plant for the water to be used for drinking water and we also need more water storage.

Existing Planning Mechanism(s) through which Action Will Be Implemented: We need to do a study and evaluate and implement the findings from the study

Responsible Office/Partners: Indian Valley Community Services District

Benefits (Losses Avoided): Fire mitigation, extra storage in case of a problem with wells. Improved resilience and ensuring a more reliable water supply. More on hand water storage would be invaluable during wildfire season. Increased resilience to infrastructure. Support for community growth and economic stability.

Potential Funding (Local Budgets, Grant Funds, etc.): Federal HMA funding, state and federal mitigation funds & HMA, HMGP

Timeline: 5-year plan beginning in 2026

Project Priority (High, Medium, Low): Medium

Action 4. Earthquake Mitigation

Hazards Addressed: Earthquakes

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): An earthquake could cause dam failure and flood Greenville.

Project Description: Retrofitting homes & businesses, public infrastructure strengthening such as retrofitting or rebuilding the dam

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: We need to conduct a study and implement the findings

Responsible Office/Partners: IVCSD

Benefits (Losses Avoided): Mitigate property damage, injuries and loss of life

Potential Funding (Local Budgets, Grant Funds, etc.): Federal HMS funding, state and federal mitigation funds, HMA & HMGP

Timeline: 5 years

Project Priority (High, Medium, Low): High

Action 5. Landslide, Mudslide, & Debris Flow Mitigation

Hazards Addressed: Landslides, mudslides, & debris flow

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Landslides, mudslides & debris flow significantly impact transportation and the economy. This occurred during the flooding in 2017.

Project Description: Post-fire erosion control, watershed and drainage management, Long term planning and community resilience will be sought.

Other Alternatives: Decentralized stormwater management such as micro-basins, wattles & fiber rolls

Existing Planning Mechanism(s) through which Action Will Be Implemented: We need to conduct a study and implement findings

Responsible Office/Partners: IVCSD

Benefits (Losses Avoided): Property damage, economic impact, injuries, loss of life

Potential Funding (Local Budgets, Grant Funds, etc.): Federal HMA funding, state and federal mitigation funds, HMA, HMGP

Timeline: 5 years

Project Priority (High, Medium, Low): high

Action 6. Severe Weather Mitigation

Hazards Addressed: Severe Weather: Heavy Rains & Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Infrastructure is damaged & overwhelmed by heavy rains and storms. Areas of the District are subject to localized flooding and increased erosion and landslide risk during these times.

Project Description: Erosion and soil stabilization, stormwater and drainage management, watershed and river restoration, community and property resilience

Other Alternatives: Building elevation and retrofitting

Existing Planning Mechanism(s) through which Action Will Be Implemented: The District desires to do a study and implement the findings.

Responsible Office/Partners: IVCSD

Benefits (Losses Avoided): Property damage, injuries, loss of life.

Potential Funding (Local Budgets, Grant Funds, etc.): Federal HMA funding, state and federal mitigation funds, HMA & HMGP

Timeline: 5 years

Project Priority (High, Medium, Low): medium

Action 7. Wildfire Mitigation

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The Dixie fire significantly impacted the businesses, economy, and entire way of life for residents in Greenville CA

Project Description: Immediate post-fire hazard reduction, resilient rebuilding & hardening

Other Alternatives: Post fire watershed restoration, integrated fuels management, prescribed burns, strategic grazing

Existing Planning Mechanism(s) through which Action Will Be Implemented: We need to conduct a study and implement findings

Responsible Office/Partners: IVCSD

Benefits (Losses Avoided): Property damage, total loss of property, injuries, loss of life

Potential Funding (Local Budgets, Grant Funds, etc.): Federal HMA funding, state and federal mitigation funds, HMA, HMGP

Timeline: 5 years

Project Priority (High, Medium, Low): high

Annex F Plumas Corp (Plumas County Fire Safe Council)

F.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Plumas Corporation/Plumas County Fire Safe Council (PC/PCFSC or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the PC/PCFSC, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

F.2 Planning Process

As described above, the PC/PCFSC followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table F-1. Additional details on Plan participation and District representatives are included in Appendix A.

Table F-1 PC/PCFSC – Planning Team

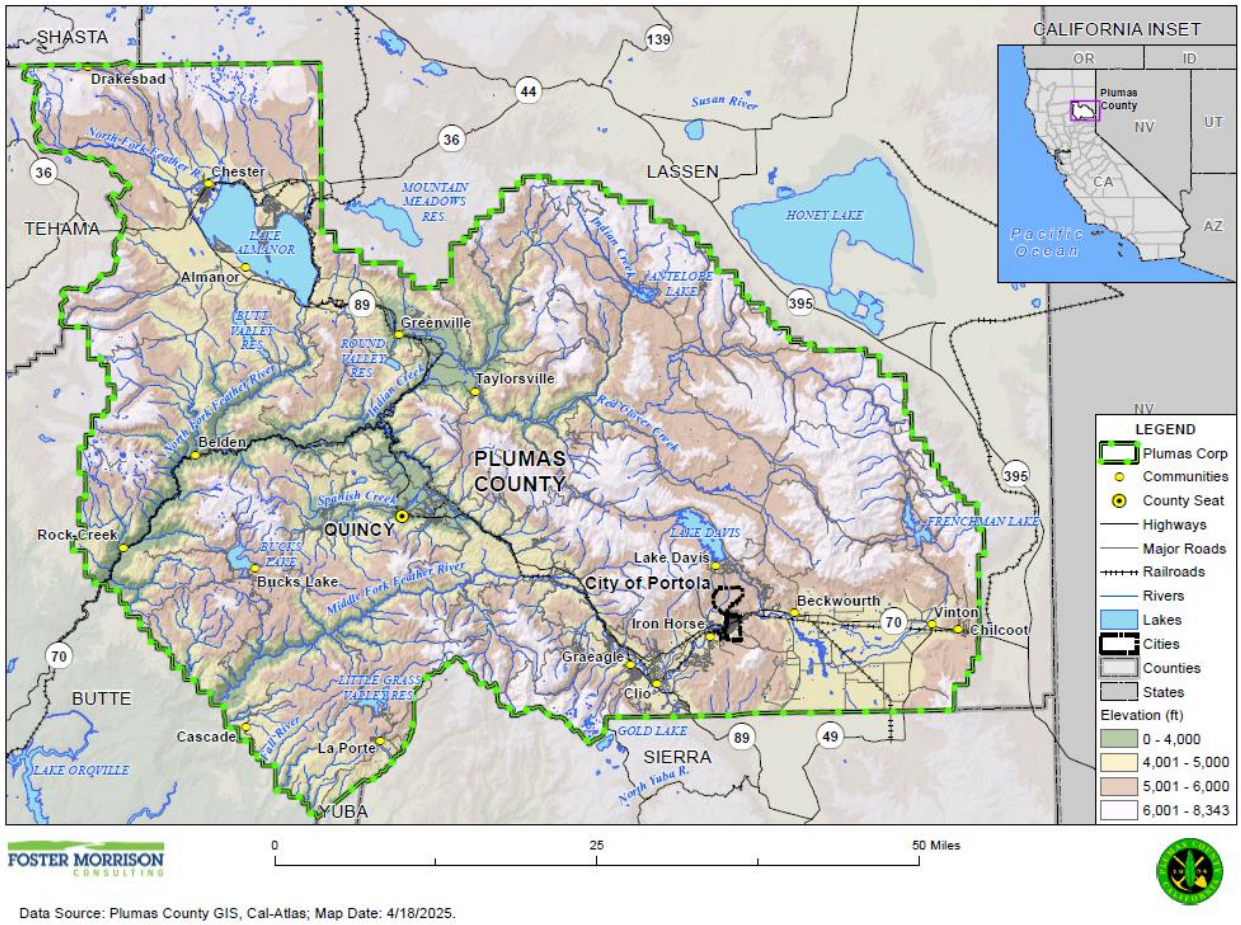
Name	Position/Title	How Participated
Gia Martynn	Executive Director, Plumas Corporation	Led overall planning effort for the District, coordinated District responses for hazard identification and mitigation actions
Matt West	Program Director, PC Fire Safe Council	Coordinated PCFSC-related District responses for hazard identification and mitigation actions
Jim Wilcox	Senior Executive Advisor, Plumas Corporation	Provided historical hazards to the LHMC, assisted in developing PC-related District responses for hazard identification and mitigation actions
Tommy Brenzovich	Program Manager, PCFSC Senior & Disabled & Home-hardening Programs	Developed PCFSC-related District responses for hazard identification and mitigation actions

Source: PC/PCFSC

F.3 District Profile

The community profile for the PC/PCFSC is detailed in the following sections. Figure F-1 displays a District map and the location of PC/PCFSC within Plumas County. As shown, the District's boundaries are the same as the County's.

Figure F-1 PC/PCFSC



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

F.3.1. Overview and Background

Originally chartered in 1983 as a private, non-profit, public benefit organization. Plumas Corporation's 1983 mission was to "promote the orderly and beneficial expansion of the economic base of Plumas County for the common good and general welfare of the residents". Now, the primary mission of Plumas Corporation has evolved from a focus on traditional economic development to watershed restoration and health as a key element of a prosperous community.

In 1992, the organization contracted with Plumas County to carry out tourism and promotional activities, as part of their economic development program. In addition, Plumas Corporation was asked to provide fiscal sponsorship for the activities of the Feather River Coordinated Resources Management group (FRCRM), the Quincy Library Group (QLG), and the Plumas County Fire Safe Council (PCFSC). Budget

constraints in 2011 led Plumas County to terminate their tourism contract, resulting in the Corporation being unable to sustain its traditional economic development program. The Corporation downsized to focus on the FRCRM and PCFSC programs.

The FRCRM created a legacy of watershed stewardship that is commensurate with national, regional, and state-wide watershed management goals and strategies outlined in the National Fish and Wildlife Foundation's Sierra Nevada Meadow Restoration Business Plan, the Upper Feather River Integrated Regional Water Management Plan (IRWMP), and California's Water Action Plan. With the FRCRM's new focus, Plumas Corporation's project base now encompasses all of the Sierra Nevada and is available to provide watershed restoration services throughout the western United States.

Since the PC/PCFSC boundaries are the same as the County, the climate and geography of the District are the same as those in the Base Plan.

F.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The PC/PCFSC risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- F.4.1 Assets Inventory and Growth and Development Trends
- 0 Hazard Identification
- F.4.3 Hazard Profiles and Vulnerability to Specific Hazards

F.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the PC/PCFSC's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the PC/PCFSC's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section F.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section F.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District. The District has 18 staff. In addition to District staff, the District provides services to the entire Plumas County Planning Area, which was discussed in greater detail in Chapter 4 (including discussion on vulnerable populations). Specifically, the District noted the following special and vulnerable populations in the District:

> ***There are vulnerable and underserved individuals/populations scattered throughout the District. Communications and services for these populations can be problematic due to limited transportation routes during hazardous events. Often, landline telephones and unreliable internet are the only mode of communication away from community hubs.***
>
> ***Plumas County has a significantly older population, with seniors making up 33% of the total population, well above the state's average of 16.2% (U.S. Census Bureau, 2021). Additionally, 12.5% of individuals under the age of 65 in Plumas County live with a disability, compared to the state average of 7.3% (California Department of Public Health, 2020). These populations are particularly vulnerable during wildfires, often due to mobility issues that necessitate specially equipped vehicles for evacuation. Many elderly and disabled individuals rely heavily on friends, family, or public transportation, making wildfire evacuations especially challenging (American Red***

Cross, 2022). Furthermore, these individuals may live in homes more susceptible to wildfire damage, as they often lack the physical ability or financial resources to implement adequate wildfire mitigation measures. Creating defensible space and performing home hardening in line with California Public Resources Code 4291 and building code requirements can be a significant barrier (California Department of Forestry and Fire Protection [CAL FIRE], 2021).

For 2023, the median household income in Plumas County was $64,946, well below the state's median of $96,334 (California Economic Development Department, 2023). Additionally, approximately 12.7% of Plumas County residents live below the poverty line, further limiting their ability to invest in fire preparedness and recovery measures (U.S. Census Bureau, 2021).

Structures and Critical Facilities

This section considers the PC/PCFSC's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table F-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. PC/PCFSC's physical assets, valued at over $5 million, consist of structures and infrastructure to support the District's operations.

Table F-2 PC/PCFSC Critical Facilities and Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Building – 424 N. Mill Creek Rd/47 Trilogy Lane	Office space for Plumas Corp, PCFSC, and other community organizations	$5,000,000	Fire and Localized Flooding
Total		**$5,000,000**	

Source: PC/PCFSC

Community Lifelines

Assessing the vulnerability of the PC/PCFSC to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential

to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the PC/PCFSC to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

PC/PCFSC has a variety of natural resources of value to the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Historic and Cultural Resources

PC/PCFSC has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the PC/PCFSC to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District. In addition, the District noted that:

> ***The economy of Plumas County is strongly anchored in its forest-based sectors, with logging as the dominant force. Two major sawmills—Sierra Pacific Industries in Quincy and Collins Pine in Chester—lead the way, collectively processing over 250 million board feet of timber annually and employing hundreds of local residents in tasks ranging from harvesting and milling to trucking. Sierra Pacific Industries alone runs two Quincy mills staffed by approximately 300 employees and manages over 2.4 million acres across California, Oregon, and Washington. Concurrently, Collins Pine, with its Chester mill, employs around 122 people and sustainably manages 135,000 acres using uneven-aged forestry—which helps ensure long-term productivity through selective harvesting***
>
> ***The health of Plumas County's forests directly influences the timber industry's longevity. Salvage logging of fire-damaged timber is economically viable only within about two years post-fire, before rot and insect infestation significantly reduce wood quality.***

Therefore, maintaining healthy, unburned or "responsibly" burned forest stands is essential not just for immediate production, but for future timber supply. Timely fire prevention, rapid response, and sustainable forest management are crucial to preserving the industry's economic base in Plumas County.

Ranching and associated agricultural endeavors play a vital role in the economy of Plumas County, relying on essential resources such as clean water, adequate grazing land, and healthy air quality to sustain livestock operations. The region's ranching industry is especially dependent on water quality, as much of the local agriculture relies on access to natural water sources for irrigation and livestock consumption. Recent wildfires have had significant impacts on these resources, particularly affecting water quality by introducing contaminants such as ash and sediment into local rivers and streams. Furthermore, fires have disrupted grazing areas on public lands, reducing the availability of affordable pasture for ranchers. These effects are compounded by the challenges of post-fire restoration, as public lands managed by federal and state agencies often require extensive recovery efforts before they can be reopened for grazing. It's not just the immediate loss of grazing, but the long-term impact on soil health and water availability that has the biggest impact on this local industry.

Recreation is another significant contributor to the economy of Plumas County, attracting thousands of visitors each year. The region's diverse landscape—featuring expansive forests, mountain lakes, and scenic rivers—provides year-round opportunities for outdoor activities such as hiking, fishing, boating, and skiing. Plumas County's natural beauty draws eco-tourists, outdoor enthusiasts, and sports lovers, directly benefiting local businesses, tourism services, and infrastructure. Notable recreational hotspots like the numerous lakes in the area, the Feather River, the Lakes Basin Recreation area, Plumas Eureka State Park offer a range of activities, while the county's extensive trail systems and campgrounds support both day-trippers and overnight visitors (Plumas County Tourism, 2021). There are a number of large cycling events that are attended by thousands of participants each year. The economic impact of recreation extends beyond the spending in sectors like hospitality, retail, and transportation; it also supports significant employment in tourism-related fields, such as guiding services, hospitality management, and park services (California Economic Development Department, 2022). According to a report from the Outdoor Industry Association, outdoor recreation generates over $28 billion in consumer spending each year in California, underscoring the sector's role in driving local economies in rural areas like Plumas (Outdoor Industry Association, 2020).

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community

Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

General growth in the District parallels that of the Plumas County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

The District's growth has been relatively flat for a number of years. Most new home construction is in existing approved areas with the highest concentration being in the town of Greenville which was all but lost during the 2021 Dixie Fire. One possible project is the Moonlight-Superior Project, envisioned as an open-pit copper mine in the headwaters of Lights Creek. There is considerable community concern related to ground and surface water quality and flood hazards.

The District noted that it has no control over future development in areas the District provides services in.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past

occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.

- ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section F.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section F.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

F.4.2. Hazard Identification

The PC/PCFSC identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table F-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table F-3 PC/PCFSC—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather / Insects/Pests	Extensive	Highly Likely	Critical	Medium	Medium
Climate Change (adaptation)	Extensive	Likely	Limited	Medium	Low
Dam Failure					
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake					
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Occasional/Unlikely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
HazMat Transportation					
Landslide, Mudslide, and Debris Flow					
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)					
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Low
Volcano					
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

F.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the PC/PCFSC (as identified in the Significance column of Table F-3). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

Power outages, planned and unplanned, are frequent in the District. Some of the more isolated communities/locales in the District are more prone to unplanned and/or extended outages related to weather events, equipment failure, or wildfire. A high percentage of homes are on domestic water wells, so lack of water supplies during extended outages is a major concern, as well as food spoilage. Due to the foregoing, many individual homes and businesses have installed permanent backup generation, predominately using propane fuel. However, many community members lack the resources (~$10,000) for backup generators. In addition, outages can affect communications, cutting off community members access to potentially critical emergency information and services.

Agricultural Hazards (Severe Weather/Pests/Invasive Species)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Farming and related agricultural industries are not only important to Plumas County's economy, but they also play a central role in the way of life of County residents and help define the character of the County. Agriculture has always been an integral part of Plumas County and has continually grown and changed along with the County. Agriculture in the County can be affected by a variety of natural hazards. This Agricultural Hazard focuses on severe weather, as well as native and invasive species (insects, pests and weeds), all which can significantly affect the agricultural industry in the County. This hazard does not address pest and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Agricultural losses occur on an annual basis and are often associated with severe weather events, including heavy rains, floods, heat, and drought and issues associated with insects, pests, agricultural diseases, and invasive species. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

Location and Extent

Agricultural hazards, including issues associated with severe weather as well as nuisance insects, pests and weeds, occur throughout the County where lands are used for farming, grazing, timber production, and other agricultural uses. The larger County has large swaths of agricultural lands. Areas of the County, such as the City of Portola and higher elevations of the County, contain fewer agricultural lands, and are thus not as greatly affected by agricultural hazards. While the City and special districts may not always be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the District and County is at risk to many hazards: severe weather, as well as native and invasive insects, pests and weeds. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Agricultural hazards like nuisance pests and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

Disaster Declaration History

There are no state or federal disaster declarations issued by Cal OES or FEMA. There have been 17 USDA Secretarial Disaster Declarations for the County since 2012 (as shown in the Past Occurrences in Section 4.3.6 of the Base Plan). 13 were from drought, 3 were from freeze, and 1 was from other severe weather events.

NCDC Events

The NCDC does not track agricultural events.

PC/PCFSC Events

The District noted that flooding occurred in 1986, 1997, and 2017. These affected agriculture in the District. The District also noted that Emergency Watershed Protection (EWP) work was undertaken in numerous locations in Plumas County after the 1986 & 1997 floods to rebuild streambanks, informal levees, and irrigation infrastructure throughout the District.

Climate Change and Agricultural Hazards

According to the 2021 CAS (as well as the 2024 Draft CAS), addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

The 2023 California State Hazard Mitigation Plan noted that California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. It also noted that change in climate can directly impact crop growth through new temperature patterns and northward shifts of pests and disease. Additionally, longer growing seasons may enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Finally, the 2023 State Plan noted that temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the life cycles of many insects, suggesting that pest problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed.

Vulnerability to Agricultural Hazards (Severe Weather/Pests/Invasive Species)

According to historical hazard data, both severe weather affecting agriculture, and insects, pests, and weeds are an annual occurrence in the District. If left unchecked, severe weather, and agricultural pests and weeds can threaten native species, biodiversity, ecosystem services, recreation, water resources, agricultural and forest production, cultural resources, economies and property values, public safety, and infrastructure.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to the PC/PCFSC. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard. This includes:

- Flood related damage to fields, fences and irrigation infrastructure occurs throughout the District. Flooding can bring benefits to agricultural lands. Reducing flood magnitudes and organic/mineral debris loads while flood proofing infrastructure can mitigate negatives.
- Grasshoppers are a nearly annual problem somewhere in the District.
- Gray wolves have become a major concern to livestock producers.
- Star thistle is a concern for the District and the County. Star thistle thrives in disturbed lands. Restoring natural hydrologic and vegetative resilience can drown/crowd out star thistle.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations in the District include both District staff and workers as well as those populations located within District boundaries and served by the District. Agricultural hazards have a minimal effect on people and populations in the District, including District staff and vulnerable populations. However, damage to crops from both severe weather and invasive and nuisance insects, pests, and weeds can cause significant increases in food prices and food insecurity among low-income communities.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District, including their owned assets, may be affected by agricultural hazards. Regarding nuisance species, some species can impact vegetation and can result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly causing foundation issues for nearby structures. If species cause trees and other vegetation to die, there is an increased risk of damage to roadways, powerlines, and buildings, and increased risk to wildfire. Some nuisance plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other nuisance plant species have been known to clog culverts and streams, increasing flooding risk. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

According to Table F-2, the District's facility is not at risk to agricultural hazards.

Natural, Historic, and Cultural Resources

Natural resources can be affected by agricultural hazards. Negative impacts of severe weather and nuisance species to natural resources include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat.

Natural, historic, and cultural resources and the severe weather that affect agriculture in the County are discussed further in other sections of this Annex.

Impacts from Agricultural Hazards: (Severe Weather/Pests/Invasive Species)

The consequences of agricultural disasters to the District and larger Plumas County include ruined plant crops, loss of grazing lands, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products).

Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community, the PC/PCFSC, and the entire Plumas County Planning Area. They can also cause significant increases in food prices to the consumer due to shortages. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PC/PCFSC include the following:

- Climate change is likely to exacerbate future agricultural hazards and associated impacts and vulnerability of the District.
- Population projections for the area served by the District show anticipated population loss, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect agricultural hazards in the District's service territory. PC/PCFSC planning efforts are in effect to reduce this risk and should be updated as necessary to continue to address future agricultural hazard conditions.

Future Development

The District noted it has no control over future development in the areas served by the District. Since the District shares the same boundaries as the unincorporated County, future conditions in the District regarding land use, migration, population changes, and climate change are the same as those in Section 4.3.7 of the Base Plan. Future development in the District is not likely to have an impact on agricultural hazards in Plumas County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The District falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the PC/PCFSC, the Plumas County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

PC/PCFSC Events

The District noted that the change in precipitation type from snow to rain and earlier snowmelt have begun affecting forest health/fire susceptibility, while also changing water supply reliability and the character of stream channels. Climate change has led to longer periods of elevated wildfire risk and paved the way for "Mega-fires" such as the North Complex in 2020 and the Dixie Fire in 2021, which significantly impacted

Plumas County. Across the western states and particularly California these mega fires are becoming more frequent and costly due to the suppression costs as well as the overall damage to infrastructure and personal property.

Vulnerability to Climate Change

The whole of the District is at some measure of vulnerability to climate change. The District Planning Team has concerns that the vulnerability of the District to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the District's assets at risk, and impacts to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard. Specifically, the District is concerned that:

- The principal ongoing climate change effects across the District entail a higher elevation permanent snow line, an earlier snow melt, a longer growing season for all plants, and warmer, particularly night-time, temperatures. This creates a greater demand (scarcity) on the finite natural soil water supply.
- The above climate change effects will exacerbate wildfire and tree mortality risks in the remaining unburned forest in the District.
- The above climate change effects will make forest recovery process more complicated due to the fuel type conversion that often occurs within the footprint of large, devastating fires.
- Without mitigation, areas that were once rich in mature and developing forests may become permanent, more flammable brush fields.
- Areas that were once rich in mature and developing timber often become brushfields.
- Loss of ecosystem resilience and its profound effects on all aspects of community health and stability.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time.

While all populations (District staff and those served by the District) can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section F.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these

extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities and Infrastructure

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, any structures in the District are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the District support rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the District are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the extreme heat and drought hazard, areas of wetlands in the District may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the District is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.

- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As climate change continues to accelerate over time, climate related impacts to the District will continue to increase.
- Population projections for the area served by the District show shrinking populations, which should reduce the affect of this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect climate change impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Climate change can influence future development in the District over time. The District could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the District, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the secondary hazards of drought in the Plumas County Planning Area, that can also affect PC/PCFSC, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Plumas County. This can be seen in Table F-4. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County since 2012.

Table F-4 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the District.

PC/PCFSC Events

Based on historical information, the occurrence of drought in California, including the PC/PCFSC, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years that likely affected the District. Drought has occurred in the past and will occur in the future.

Recently, between 2020 and 2023 Plumas County experienced drought conditions that ranged from abnormally dry to extreme drought conditions with some areas experiencing exceptional drought conditions. These drought conditions exacerbated wildfire risk and were a major contributing factor to the destructive nature of the North Complex in 2020 as well as the Beckwourth Complex and Dixie Fire in 2021 (see discussions in the Wildfire hazard below). Fuels on the ground were tinder dry much earlier in the fire season than normal and fuel moistures remained low longer into the fall months causing the fire season to begin much earlier and run longer with no true break in fire season from one year to the next.

This drought period had a significant impact on overall forest health. Many trees succumbed to the lack of moisture and tree mortality increased. Bark beetle populations expanded during this time as well due to the trees inability to produce enough pitch to defend themselves from beetle infestation. This was another contributing factor to expanding tree mortality across the county. This mortality contributes to the fuel loading of the forest as well as creating areas with significant vertical continuity to wildland fuels which create added challenges for suppression activities.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the PC/PCFSC to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

As mentioned above, drought conditions elevate wildfire risks and add to the destructive nature of the fires in this area. Suppression efforts become more challenging due to the increased fire activity and more complex tactics required for firefighters to safely engage. Fuels reduction operations are also affected by drought due to the elevated project activity levels (PAL) on federal lands which limit operations in the forest based on environmental conditions such as temperature, winds, relative humidity, and fuel moisture. PALs are a metric used to limit operations in the forest based on environmental conditions such as temperature, winds, relative humidity, and fuel moisture. These PALs can have an impact on the operations and productivity of the Plumas County Firesafe Council's Hazardous Fuels Reduction program which implements projects on private and public lands.

The District noted that other local concerns include: domestic well failures, extremely low fuel moisture leading to extreme fire behavior, shortage of agricultural and environmental water, and accelerated tree mortality.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water-depending resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

According to Table F-2, the District's facility is not at direct risk from drought and water shortage. This District noted that drought does exacerbate wildfire. As such, their facility is at risk from drought induced wildfires.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock.

Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PC/PCFSC include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Planning Area, it merely reacts to them by providing additional (or reduced) services.

- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

The County has access to large quantities of water through its groundwater supply. Though not currently planned or expected, any population growth in the District will add additional pressure to the local water companies during periods of drought and water shortage.

Flood: 1%/0.2% Annual Chance (w/Levee Failure)

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

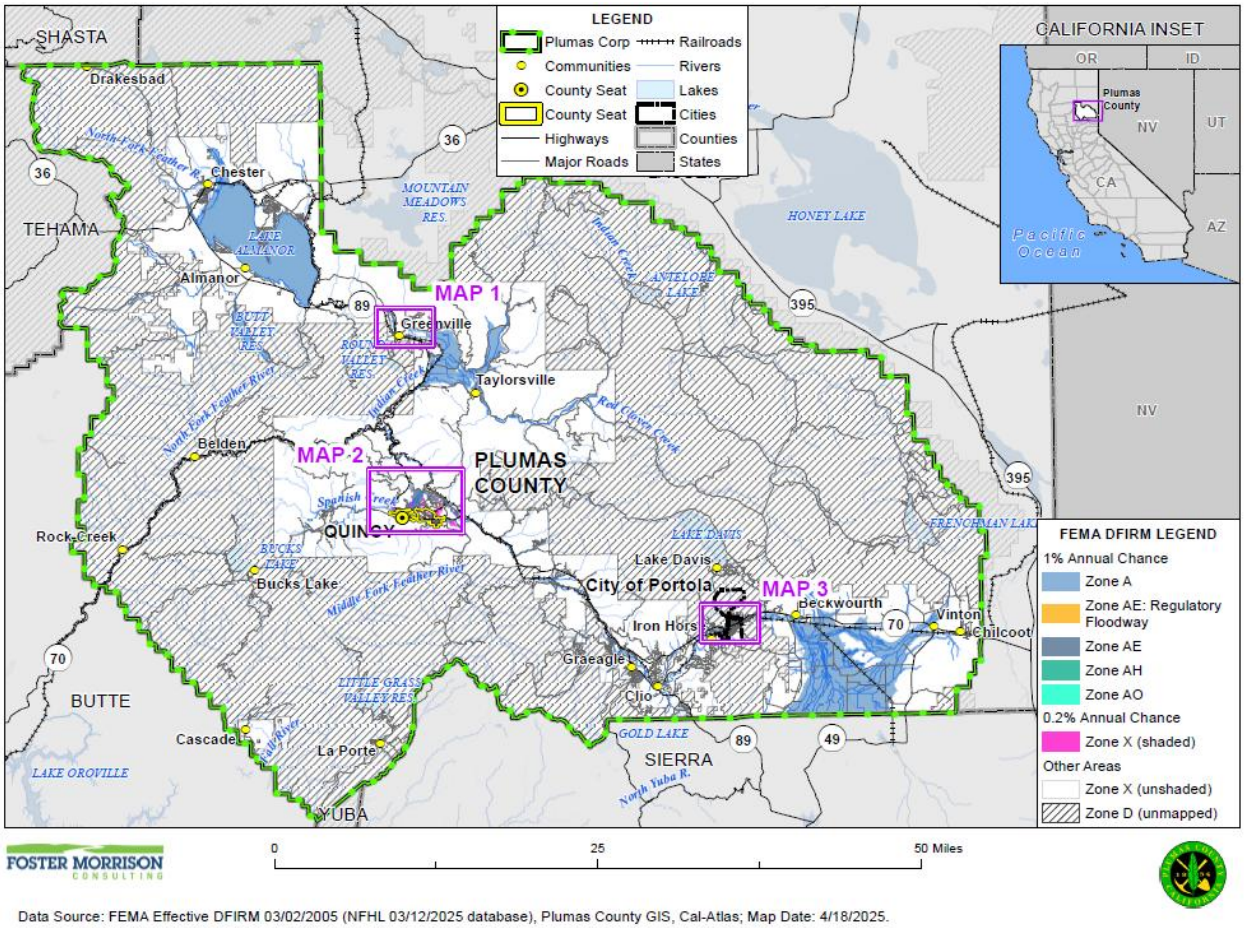
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the District and have caused damage in the past. Flooding can be a significant problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the District swell with heavy rainfall and snowmelt runoff. The District has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures (like levees) located throughout the Plumas County Planning Area and the PC/PCFSC. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas in the District. Levee failure flooding is also an issue in the District.

Location and Extent

The PC/PCFSC has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure F-2.

Figure F-2 PC/PCFSC – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 03/02/2005 (NFHL 03/12/2025 database), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Table F-5 details the DFIRM mapped flood zones located within the District.

Table F-5 PC/PCFSC– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in District
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X (unshaded)	Area of minimal flood hazard	X

Source: FEMA DFIRM 03/02/2005

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Geographical flood extents for the District from the FEMA DFIRMs are shown in Table F-6.

Table F-6 PC/PCFSC – Geographical DFIRM Flood Zone Extents

Jurisdiction / Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
1% Annual Chance Flood Hazard	168	0.01%	10	0.01%	157	0.01%
0.2% Annual Chance Flood Hazard	1	0.0001%	0.1	0.0001%	0.7	0.00005%
Other Areas	3,323	0.2%	2,227	2.4%	1,096	0.1%
City of Portola Total	**3,491**	**0.2%**	**2,237**	**2.4%**	**1,254**	**0.1%**
Unincorporated Plumas County						
1% Annual Chance Flood Hazard	84,609	5.1%	23,036	24.8%	61,573	3.9%
0.2% Annual Chance Flood Hazard	1,431	0.1%	667	0.7%	764	0.05%
Other Areas	1,582,631	94.6%	67,072	72.1%	1,515,559	96.0%
Unincorporated Plumas County Total	1,668,671	99.8%	90,775	97.6%	1,577,896	99.9%
Grand Total	**1,672,162**	**100.0%**	**93,013**	**100.0%**	**1,579,150**	**100.0%**

Source: FEMA DFIRM 03/02/2005

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Plumas County from flooding is shown on Table F-7. These events also likely affected the District to some degree.

Table F-7 Plumas County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storm)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA
*included a landslide component

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Plumas County has seen 15 events. Depending on the location, these events most likely had some impact on the District.

PC/PCFSC Events

The District noted that the following events had affects or damages to the District:

1955 Flood – anecdotal accounts speak of profound changes in the condition of many stream channels throughout the District. Many of the original county bridges were lost. Deleterious effects of some post-flood channel repairs and "modifications" still persist.

1986 Flood – long duration high intensity rain on snow. Flood of record (36,200 cfs) on Indian Creek at that time. Extensive damage to county road and bridges, Hwy 70 in Feather River Cyn and Union Pacific railroad line severely damaged.

1997 Flood – long duration rain on snow event with high antecedent moisture. Currently stands as flood of record on Indian Creek since 1906 (42,000- 44,000 cfs). Despite higher flows, there was less local infrastructure damage. Feather River Cyn Hwy 70 & railroad severely damaged again.

2017 Flood – long duration rain event with high antecedent moisture. Solidly between the '86 & '97 floods in stage and volume. Feather River Cyn Hwy 70 & railroad severely damaged for 3rd time.

Other NCDC flood events – events from the early 1960's and 1990's were similar to the 1955 flood in magnitude (±25,000 cfs at Arlington Bridge), but far less in effects. Effects would be more localized.

Indian Creek at the exit from Indian Valley was gaged by the USGS from 1906 to 1993, with notable later events back-calculated by USGS or Plumas Corp. It serves as a magnitude surrogate for discussions here. Discharge volume in the 1986 was 30% greater than any previous flood in the period of record. 1997 was 15% greater than 1986, with the 2017 flood volume solidly in between.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Plumas County Planning Area, and the PC/PCFSC. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the District. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the District is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard. The principal large flood hazard water bodies are Middle Fork Feather River (Sierra Valley/Portola), Spanish Creek (Quincy area), Indian Creek (Indian Valley/Genesee) and North Fork Feather River (Chester/Canyon).

Generalized flooding of communities has not been a significant issue in the District, historically. Of more concern is community isolation due to flooded roads, washed out bridges/culverts and/or debris blockages. Again, using Indian Valley/Indian Creek as examples: at 10,000 cfs North Valley Road (Cassity Corner) and the west bridge on Stampfli Lane are flooded, folks south of those points can still exit via Arlington Bridge; at 25,000 cfs Arlington Bridge is overtopped, as is Deadfall Bridge, leaving Taylorsville, North Arm and Genesee isolated from medical and other services; at the same stage Genesee Road at Rocky Point floods isolating Genesee from Taylorsville, Ward Creek Road floods isolating residents on the south side of Genesee Valley. Similar scenarios occur in each of the principal inhabited valleys in the District. The 204 square mile Last Chance Creek watershed is one of two large sub watersheds to Indian Creek. Indian

Creek flows through Genesee and Indian valleys where flooding and channel instability are current hazards to the populace.

The Last Chance Creek watershed contains one of the longest contiguous meadow floodplain systems in the Sierra Nevada Mountains. Last Chance Creek is severely down cut (incised) throughout the 36 miles of meadow floodplain. Principal stressors were logging railroad grades built in the low gradient meadow in the 1930s & '40s, channel modification, livestock grazing, and roads. These incised channels funnel all flows downstream, rapidly draining out this headwater basin into the populated Genesee and Indian valleys.

Loss of floodplain function and the rapid drainage of these headwater basins reduces the meadow's ability to capture and store springtime snowmelt and rain as shallow groundwater. Sixty percent of California's water supply originates in the Sierra Nevada, and meadows are a key component of that supply, helping to regulate water flow, temperature, and quality. As the headwaters of the State Water Project, the Feather River Watershed provides water to over 26 million Californians. Although wet meadows are less than one percent of the overall landscape in Plumas County, meadows' unique hydrologic and ecological functions are recognized as being vital to watershed health and are valued for the ecosystem goods and services they provide, such as crucial habitat for many endemic and special status wildlife species. Known as biological diversity hot spots, healthy meadows provide refugia for wildlife during droughts and wildfire. Wet and moist meadows sequester carbon in the soil, where it isn't susceptible to being lost in a wildfire. In addition, functioning meadow floodplains provide natural fire breaks reducing fire intensities and rate of spread.

Over 6,000 acres of meadow surface are available for flood attenuation along Last Chance and its tributaries. From 1995 to 2007, 9 miles and 800 acres of floodplain has been restored by Plumas Corporation. The work restored the hydraulic base level of Last Chance and tributaries back to the historic meadow level, recovering crucial floodplain function. The larger Last Chance Creek project was originally divided into Phase 1, Phase 2, and Phase 3. Phase 1 is primarily complete representing the abovementioned accomplishments. Phase 2 has been designed; funds to complete NEPA/CEQA, permits and implementation are needed. Phase 3 awaits planning funds.

The District is also concerned with rain on snow events, which can cause greater flooding in the District. Loss of headwater floodplains accelerates the movement of floodwaters originating from rain-on-snow events. Such events are expected to occur with more frequency with climate change.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those in the Service Area) located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Populations served by the District can be the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. The District's ability to provide services to its populations during flood events is paramount.

Structures and Critical Facilities

Certain District structures are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. None of the District assets listed in Table F-2 would be at risk to flooding.

Flooding presents a threat to both critical facilities and infrastructure, as well as community lifelines. Critical infrastructure plays an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on water infrastructure for drinking water, wastewater service, and draining streets of rainwater. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California.

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure F-2 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of

governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PC/PCFSC include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development in the District may be built in the floodplain, as long as it conforms to the standards of the floodplain ordinance. The County and Portola enforce their floodplain management ordinance on areas inside the District. More detail on the specifics of the floodplain ordinance can be found in Section 4.4.1 of the Base Plan and in Section A.5.1 of the City of Portola annex. New District facilities and assets will be sited in such a way as to reduce the risk from flooding to District structures.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The PC/PCFSC is subject to localized flooding throughout the District. This is discussed in the Localized Stormwater Flooding section below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

PC/PCFSC Events

Localized flooding in the District has generally been of a stochastic nature, from transient causes; not recurring events. Typically, localized flooding occurs with high intensity rain on saturated soils/snowmelt generating mineral and organic debris loads, temporary debris jams, beaver dams, etc., often enhanced by recent wildfire effects. This occurs yearly.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the District has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of, or inadequate, drainage of built infrastructure in the District contributes to localized flooding issues. Impervious services in the district will also exacerbate rain on snow events flooding.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

The District's only asset (as shown in Table F-2) is at risk to localized flooding. Plumas Corp owns property that is adjacent to elevated water holding ponds that are used to store run-off from the Sierra Pacific Industries mill. This water is utilized to spray log stock to minimize checking and splitting of logs prior to milling operations. During periods of heavy rainfall the ponds can reach capacity and on occasion have overflowed. Additionally, due to the earthen construction of the containment walls small breaches have been witnessed during heavy rain events. Large pumps are regularly utilized to manage water levels and mitigate overflow risks. The combined risk of overflowing and potential breaches pose a threat of flooding to Plumas Corp assets particularly due to the reliance on mechanized equipment to mitigate the hazard.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PC/PCFSC include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the District will add to the drainage issues already faced by the District, unless adequate drainage facilities are installed in new development locations.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the District. Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues.

Location and Extent

Extreme heat events occur on a regional basis. Extreme heat can occur in any location of the District. Extreme heat occurs throughout the District primarily during the summer months.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 7 extreme heat incidents for Plumas County since 1993, some of which likely affected the District.

PC/PCFSC Events

The District noted that extreme heat is a yearly event. Past damages from extreme heat only could not be recalled.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Plumas County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Plumas County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the District. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the District is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted that extreme heat occurs every year, and that the greatest risk from this hazard is the cascading effects of dry temperatures and increased wildfire risk.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to extreme heat. Those District employees that work outdoors or inside facilities without proper cooling systems are likely to be most affected by extreme heat conditions.

Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues. All populations served by the District are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers (like District staff); individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures and Critical Facilities and Infrastructure

Extreme heat normally does not generally impact structures and critical facilities and Infrastructure, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The District noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

PC/PCFSC noted that extreme heat will not directly affect its owned asset, but a wildfire that is exacerbated by extreme heat could affect the structure shown in Table F-2.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in District, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the District that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The District experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the District may see an increase in dry fuels contributing to the wildfire hazard. Extreme heat can damage agricultural assets in the District service territory. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heat and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development in the District will take extreme heat into account. In the event of grid-tied power outages, a reliable backup power source must be included in development plans. Additionally, implementing energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in

excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the District.

Location and Extent

Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the District as discussed below (with problem flooding areas associated with heavy rains and storms discussed in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the District and Plumas County. Duration of severe storms in the District can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table F-8. In addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table F-8 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

PC/PCFSC Events

The District noted that heavy rains and storms are an annual occurrence often resulting in flooding. Events causing flood issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the PC/PCFSC. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the District is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. Heavy rains and storms have a significant relationship with flooding risks, as well as, impacting water quality and agricultural infrastructure. The District is also concerned with rain on snow events, which can cause greater flooding in the District. Specific waterbodies, locations, event magnitudes and damages have been discussed under Vulnerability to Flood: 1% and 0.2% Annual Chance.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to heavy rains and storms. Those District employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the District have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

District facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the District. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

The District noted that heavy rains may bring on floods that can affect the structures in Table F-2.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New District facilities follow state and local building codes which should reduce the risk to future development in the District from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the District.

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

High winds, can cause power outages, and when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the District.

Portions of the District are also located in or near a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. These types of winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Another special type of wind event can occur in the District. Microbursts have occurred in the County. According to the National Weather Service, a microburst is a downdraft (sinking air) in a thunderstorm that is less than 2.5 miles in scale. Some microbursts can pose a threat to life and property, but all microbursts pose a significant threat to aviation. Although microbursts are not as widely recognized as tornadoes, they can cause comparable, and in some cases, worse damage than some tornadoes produce. In fact, wind speeds as high as 150 mph are possible in extreme microburst cases.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare in Plumas County, can affect areas of the District, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire District is subject to significant, non-tornadic (straight-line), winds (both straight line and microburst). Each area of the District is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the District. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

NCDC Events

The NCDC data recorded 94 high wind and 0 tornado incidents for Plumas County since 1950. Many of these wind events likely affected the District.

PC/PCFSC Past Occurrences

The District noted no past events of high winds and tornados.

Climate Change and High Winds and Tornado

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The District is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the District is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District is in or adjacent to a special wind hazard region, which is a result of foehn winds. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds.

High winds can cause rapid wildfire growth as well as long range spotting due to extended ember transport distances. This situation requires adjusting suppression tactics that result in larger areas being burned due to the inability in many cases to work directly on the edge of the fire.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include the unsheltered, those with access and functional needs, the medically fragile experiencing power outages as a result of wind events, and those working or caught outdoors during a wind or tornado event.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the District have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all District facilities in the tornado touchdown path. During a wind or tornado event, power lines in the District can be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole communities, as seen in recent wildfire events in the West.

PC/PCFSC noted that its structures are at minimal risk to wind, but wind driven fires could affect the structures listed in Table F-2.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to high winds. Increased streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Winds and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. District facilities may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity in the District.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the County. Climate change is not likely to affect future tornado conditions.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Building codes in the County ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the County from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

Future Development

The District relies on the County to enforce the local building codes which includes standards for new development to minimize damage from windstorms. New District facilities are built to state and local codes. New critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

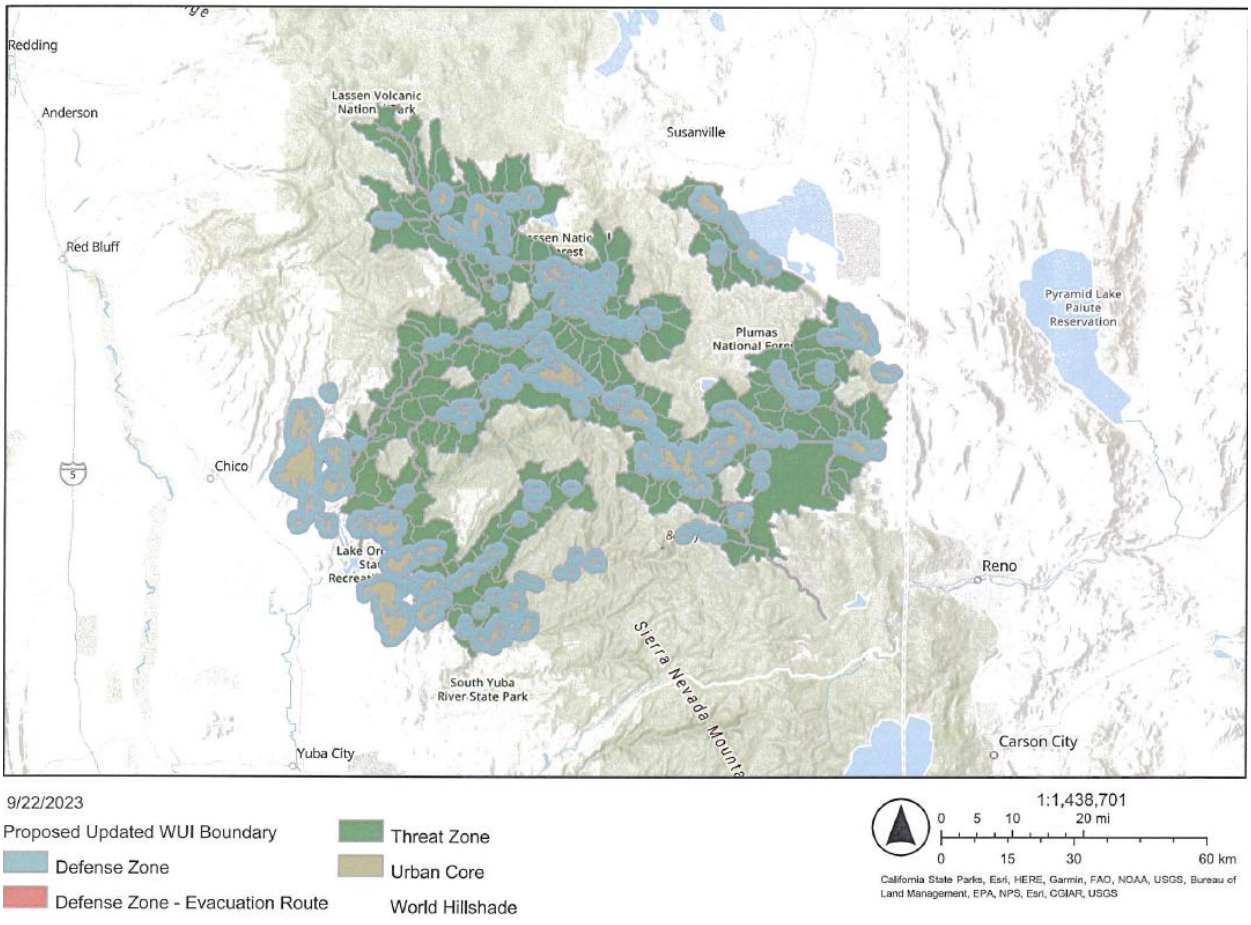
Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the PC/PCFSC. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

The WUI for the PC/PCFSC is shown on Figure F-3.

Figure F-3 WUI for Plumas County and the PC/PCFSC Planning Area



Wildfire Smoke and Air Quality

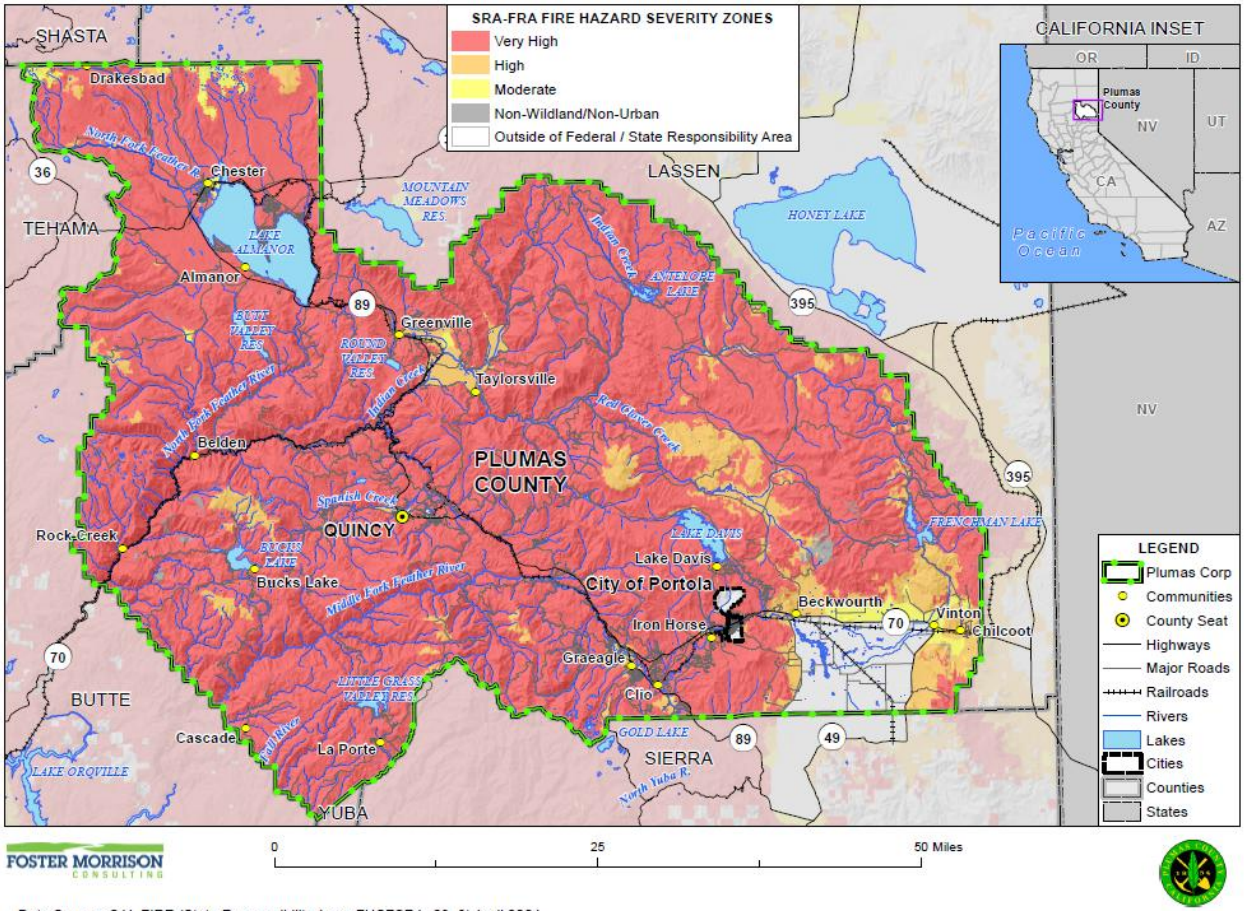
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

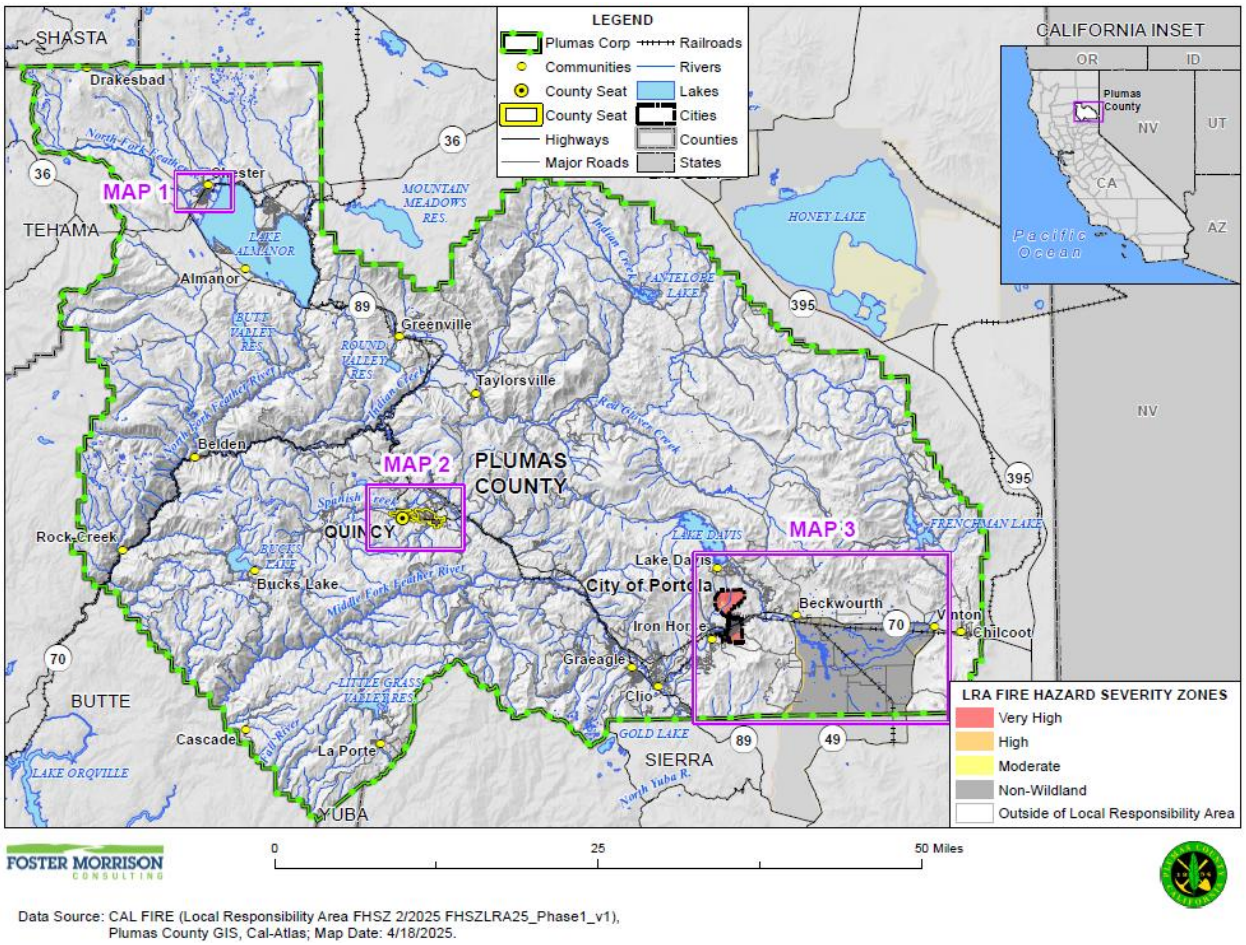
Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the PC/PCFSC were created. Figure F-4 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure F-5 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Moderate to Very High.

Figure F-4 PC/PCFSC – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Figure F-5 PC/PCFSC – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 4/18/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table F-9, while extents in the LRA are shown on Table F-10.

Table F-9 PC/PCFSC – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
Very High	5	0.0003%	3	0.003%	2	0.0002%
High	5	0.0003%	0.0001	0.0000001%	5	0.0003%
Moderate	-		-		-	

Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Non-Wildland/Non-Urban	-		-		-	
Outside of Federal / State Responsibility Area	3,481	0.2%	2,234	2.4%	1,246	0.1%
City of Portola Total	**3,491**	**0.2%**	**2,237**	**2.4%**	**1,254**	**0.1%**
Unincorporated Plumas County						
Very High	1,454,532	87.0%	40,739	43.8%	1,413,793	89.5%
High	116,705	7.0%	19,400	20.9%	97,305	6.2%
Moderate	39,004	2.3%	6,405	6.9%	32,599	2.1%
Non-Wildland/Non-Urban	13,602	0.8%	0.01	0.00001%	13,602	0.9%
Outside of Federal / State Responsibility Area	44,775	2.7%	24,214	26.0%	20,560	1.3%
Unincorporated Plumas County Total	**1,668,618**	**99.8%**	**90,759**	**97.6%**	**1,577,859**	**99.9%**
Grand Total	**1,672,109**	**100.0%**	**92,996**	**100.0%**	**1,579,113**	**100.0%**

Source: CAL FIRE

Table F-10 PC/PCFSC – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Portola						
Very High	3,235	0.2%	2,016	2.2%	1,219	0.1%
High	250	0.01%	221	0.2%	28	0.002%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland	0	0.0%	0	0.0%	0	0.0%
Outside of Local Responsibility Area	6	0.0004%	0.002	0.000002%	6	0.0004%
City of Portola Total	**3,491**	**0.2%**	**2,237**	**2.4%**	**1,254**	**0.1%**

Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Unincorporated Plumas County						
Very High	1,400	0.1%	742	0.8%	658	0.04%
High	1,279	0.1%	588	0.6%	690	0.04%
Moderate	488	0.03%	258	0.28%	230	0.01%
Non-Wildland	41,625	2.5%	22,641	24.3%	18,984	1.2%
Outside of Local Responsibility Area	1,623,211	97.1%	66,542	71.5%	1,556,670	98.6%
Unincorporated Plumas County Total	**1,668,003**	**99.8%**	**90,771**	**97.6%**	**1,577,231**	**99.9%**
Grand Total	**1,671,494**	**100%**	**93,009**	**100%**	**1,578,485**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table F-11.

Table F-11 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

PC/PCFSC Events

The District noted the following events:

2020 – The North Complex Fire was a massive wildfire complex that burned in the Plumas National Forest in Northern California in the counties of Plumas and Butte. Twenty-one fires were started by lightning on

August 17, 2020; by September 5, all the individual fires had been put out with the exception of the Claremont and Bear Fires, which merged on that date, and the Sheep Fire, which was then designated a separate incident. On September 8, strong northeast winds caused the Bear/Claremont Fire to explode in size, rapidly spreading to the southwest. On September 8, 2020, the towns of Berry Creek and Feather Falls were immediately evacuated at 3:15 p.m. PDT with no prior warning. By September 9, 2020, the towns of Berry Creek and Feather Falls in Butte County had been leveled, with few homes left standing. The fire threatened the city of Oroville, before its westward spread was stopped. The fire killed 16 people and injured more than 100. The complex burned an estimated 318,935 acres (uncertain how many acres were in Plumas County specifically), and was 100% contained on December 3. The fire was managed by the U.S. Forest Service in conjunction with Cal Fire, with the primary incident base in Quincy. At the time, the North Complex Fire was the eighth-largest in California's history and was the deadliest fire in the 2020 California wildfire season.

Smoke from the fire created extremely unhealthy air conditions in Quincy and nearby communities for several weeks. After the fire grew explosively in size on September 9, smoke reached the Sacramento Valley and the San Francisco Bay area (where the effects of the smoke led to the day being referred to as Orange Skies Day) with ash falling from the sky between Danville, San Jose, and San Francisco.

From a forestry standpoint a great many of the acres of timber may be considered as a crop due to the cyclic harvesting practices and ongoing management techniques employed by the local lumber companies. Additionally, the US Forest Service in the area employs very similar forest management techniques to provide additional harvest opportunities for local lumber companies.

The District also noted the following impacts from the fire:

- Greater than 100 injuries to firefighters and public between Plumas and Butte Counties
- 16 (14 residents of Berry Creek and 2 residents of Feather Falls, both communities are in Butte county.)
- Approximately 2,471 structures were destroyed, including homes and businesses.
- The towns of Brush Creek and Berry Creek were nearly completely destroyed.
- Significant damage to above ground power transmission and distribution infrastructure. Significant damage to roads and associated drainage features from falling trees, rock slides and post rain debris flows.
- Roads and bridges suffered structural damage due to the intense heat.
- The fire posed a significant threat to the Oroville Dam.
- Significant business/economic impacts due to widespread evacuations for extended periods of time. Additionally, economic impacts were realized from National Forest closures that halted timber harvest operations across the county on Federal lands. Recreation is a large part of the economy of the local area., Forest closures and unhealthy/unsafe environmental conditions halted the flow of people to the area which ultimately impacted the earnings of local businesses.
- Roads were closed into evacuated areas during the incident. Post incident activities created significant impacts on traffic flow through affected areas.
- The fire caused long-term environmental damage, leading to erosion concerns, water quality issues, and habitat destruction.
- Wildlife displacement and destruction of ecological zones in Plumas National Forest.
- Approximately $450 million in damages.

2021 – The Dixie Fire ignited on July 13, 2021, in Butte County, California and soon spread across Plumas, Lassen, Tehama, and Shasta counties. It became the largest single (non-complex) wildfire in California history, burning 963,309 acres before full containment on October 25, 2021. Due to extreme fire behavior, including recurring pyrocumulus cloud formation and ember spotting up to a mile ahead, suppression efforts were extremely challenging. Originating in Butte County spreading to Plumas, Lassen, Tehama, and Shasta counties. The fire started on July 13, 2021, and was declared 100% contained on October 25, 2021.

From a forestry standpoint a great many of the acres of timber may be considered as a crop due to the cyclic harvesting practices and ongoing management techniques employed by the local lumber companies like Collins Pines and Sierra Pacific Industries. Additionally, the US Forest Service in the area employs very similar forest management techniques to provide additional harvest opportunities for local lumber companies.

The Dixie Fire destroyed approximately 1,300 structures and damaged 94 others. Many homes within the Dixie footprint survived the fire, but had significant impacts to the surrounding vegetation around the property and associated infrastructure such as water supply and solar power generation.

The town of Greenville suffered catastrophic losses, with most of its historic downtown area burned to the ground. A hotel, a restaurant, 2 gas/service stations, the local library branch, a pharmacy, several storefronts, a fire station with apparatus, a local tribal resource center with medical and dental clinics, and the post office were all lost during the fire. The community of Canyon Dam which was located 10 miles north of Greenville was razed by the fire as well. There was also fire related damage on the outskirts of Chester.

The following infrastructure damage occurred:

- Power infrastructure: Extensive damage to Pacific Gas & Electric (PG&E) transmission lines and utility poles, leading to widespread power outages. These power outages resulted in entire communities relying on generator supplied electricity for a full year or more after the incident.
- Water supply systems: Local water infrastructure was contaminated due to burned plastic pipes and exposure to hazardous debris. The water system within Greenville effectively collapsed due to the elevated demands from the firefighting resources.
- Telecommunications: Disruptions occurred as cell towers, fiber-optic lines, and electrical lines supplying the communication sites were impacted, affecting emergency communications.
- Highway closures: Portions of Highways 70, 36, and 44 were shut down due to fire activity, fallen trees, and hazardous conditions. Following the incident, closures highway and road closures were widespread in order to mitigate hazards associated with the post fire hazard tree removal, road corridor stabilization
- Transportation networks: Roads, bridges, and highways sustained damage from intense heat, falling trees, and rockslides.

The District also noted the following impacts from the fire:

- The Greenville Library, post office, businesses, and historic buildings were completely destroyed.
- Severe air quality degradation occurred across Northern California, Nevada, and Oregon, with smoke plumes reaching as far as the East Coast.

- Soil erosion and watershed contamination from fire retardants and burned vegetation threatened local water sources.
- Damages were estimated at $1.15 billion, with further uninsured losses significantly adding to the financial burden.

PG&E announced a $45 million settlement with counties affected by the fire.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Plumas County includes 29 recognized Communities at Risk (CAR): Almanor, Beckwourth, Belden, Blairsden, Bucks Lake, Canyon Dam, Caribou, Chester, Clio, Crescent Mills, Cromberg, Delleker, Genesee, Graeagle, Greenville, Hamilton Branch, Indian Falls, Johnsville, Keddie, La Porte, Meadow Valley, Mohawk, Paxton, Portola, Prattville, Quincy-East Quincy, Seneca, Taylorsville, and Twain. Plumas County has a higher risk of wildfires than 98% of the other counties in the United States. In addition, the

State's Fire Hazard Severity Zone map identifies the majority of the communities in Plumas County as "Very High Severity" (76.2%), with few in the "High" (19.1%) and "Moderate" (4.7%) categories.

In 2020 and 2021, a collective 947,632 acres within Plumas County were burned by the Dixie, North Complex, and other large wildfires. This area totals a startling 57% of the County. During the Dixie Fire of 2021, Plumas County lost the towns of Greenville, Indian Falls, Warner Valley, and Canyon Dam destroying nearly all of these town's infrastructure and decimating the surrounding forests. Without their homes, forest, and basic infrastructure, most of these communities' populations were displaced, contributing to an ongoing housing crisis in Plumas County. It is critically important to strategically protect the remaining "green" corridor in Plumas County, recover fire-impacted communities, and implement parcel-specific hazard mitigation with a long-term vision for resiliency.

The North Complex Fire and Dixie Fire underscore the urgent need for increased wildfire mitigation efforts, including:

- Forest thinning and controlled burns to reduce fuel loads.
- Improved evacuation planning and emergency communication systems.
- Hardening of infrastructure such as underground power lines and fire-resistant building materials.
- Greater investment in home hardening and defensible space programs for homeowners in high-risk areas.

The likelihood of another large-scale wildfire in Plumas County remains extremely high due to the following factors:

- Drought conditions: Persistent dry weather has left forests vulnerable to ignition and rapid spread.
- Fuel accumulation: Dead and drought-stressed trees provide excessive fuel for future fires.
- Climate change: Rising temperatures and prolonged fire seasons increase the risk of extreme wildfires.

The District does not have data on smoke impacts or air quality issues, however the PCFSC maintains an air purifier loan program that is utilized during fire season by residents with respiratory issues.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused, infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. District facilities at risk from wildfire were shown in Table F-2.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area

residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PC/PCFSC include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional assets at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, District building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

F.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

F.5.1. Regulatory Mitigation Capabilities

Table F-12 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PC/PCFSC. ***The final table cell needs to be filled out as well.***

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table F-12 PC/PCFSC's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	Y	Plan addresses hazards and can be used to carry out mitigation actions. Was last updated in 2019.
Comprehensive/Master Plan	N	
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	N	
Stormwater Management Plan	N	
Transportation Plan	N	
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N/A	
Building code	N/A	
Flood insurance rate maps	N/A	

Floodplain ordinance	N/A	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N/A	
Subdivision ordinance	N/A	
Zoning ordinance	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
CWPP will continue to be updated and Firewise communities will continue to be sought. The wildfire mapping from CAL FIRE for SRA and LRA will be adapted and used in the next CWPP. The Fire Safe Council will continue to work with the County on any ordinances related to wildfire.		

Source: PC/PCFSC

F.5.2. Administrative/Technical Mitigation Capabilities

Table F-13 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the PC/PCFSC.

Table F-13 PC/PCFSC's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official		
Civil Engineer, including dam and levee safety		
Community Planner		
Emergency Manager		
Floodplain Administrator		
GIS Coordinator		
Planning Commission		
Other	Y	Multi-jurisdiction Project Managers; conceptual project development
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	Has been used in past.
Hazard data and information	Y	Has been used in past.
GIS analysis		
Mutual aid agreements		
Other	Y	Yes, grant & project administration

How can these capabilities be expanded and improved to reduce risk?
Administrative and technical mitigation capabilities can be expanded by leveraging inter-organizational partnerships to minimize redundant efforts and increase consistency of technical data utilized for mitigation practices. Targeted recruitment of district staff members can further enhance the administrative and technical capacity of the district by matching future staff knowledge, skills, and abilities with organizational needs. Emphasizing professional development can further expand the overall administrative and technical mitigation capabilities by combining existing corporate knowledge with new or enhanced skills of existing staff.

Source: PC/PCFSC

F.5.3. Fiscal Mitigation Capabilities

Table F-14 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table F-14 PC/PCFSC's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Community Development Block Grant		
Federal funding programs (non-FEMA)	Y	Plumas Corp and PCFSC has managed numerous projects that are funded through the USFS, USBOR
Fees for water, sewer		
Capacity fees for new development		
State funding programs	Y	Plumas Corp and PCFSC has received funding from CAL FIRE and other state agencies for several of its programs including community chipping, senior disabled defensible space assistance, larger scale hazardous fuels reduction work, and stream and meadow restoration.
Stormwater utility fee		
Other	Y	Plumas Corp funding from numerous private non-governmental organizations for restoration projects that offer multiple benefits, including mitigating some of above hazards.
How can these capabilities be expanded and improved to reduce risk?		
Additional funding opportunities would perpetuate existing programs and allow them to grow in scale to more closely match the needs of the communities we serve.		

Source: PC/PCFSC

F.5.4. Mitigation Education, Outreach, and Partnerships

Table F-15 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table F-15 PC/PCFSC's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	PCFSC distributes a monthly newsletter to almost 2000 community members.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Plumas County hosts around 30 Firewise communities. During May, which is Wildfire Preparedness month, the PCFSC puts on a wildfire preparedness fair in conjunction with a children's fair which is very well attended.
Local news	N	
Organizations that interact with underserved and vulnerable communities	N	
Social media	Y	The PCFSC maintains a daily robust social media presence informing the public about various tips, reminders, alerts, events, etc. pertaining to wildfire safety/preparedness.
How can these capabilities be expanded and improved to reduce risk?		
Continued growth of newsletter mailing list and increased social media followership.		

Source: PC/PCFSC

F.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

- Most of Plumas Corporation/FireSafe Council projects are considered climate adaptation activities, loosely following the Feather River Watershed Management Strategy (2004). Restoring stream/floodplain connectivity with meadow restoration promotes significant watershed resilience against floods and drought exacerbated by climate change. To date, over 70 miles of channel and 5,600 acres of floodplain have been restored in the District.
- After the 1997 flood, the Indian Valley Flood Management Study (CH2MHill, 1997), was done for the Plumas County Dept. of Public Works. The Study identified and surgically evaluated a number of flood mitigation measures. Meadow & floodplain restoration in the upper watershed was determined to be one of the more feasible and effective measures. Upper watershed work has the potential to lower flood stages 1- 3 feet by attenuating peak inflows to the valley, depending on the spatial extent of that restoration work. To date, Plumas Corporation has implemented restoration work on over 2,800 acres of meadow floodplain in the Indian Creek basin. Varying levels of meadow floodplain work has also been implemented in the Middle Fork, North Fork and Spanish Creek watersheds since 1995.
- The PCFSC's Senior/Disabled Defensible Space Program assists senior and disabled residents of Plumas County in creating and maintaining defensible space around their homes to make them more resilient from wildfire threats. This program has been operating for 20 years and is set to treat nearly 300 homes in 2025, nearly doubling the number from just five years ago from the 2021 field season. More than 80% of the participants have low to moderate incomes.

- The Community Chipping Program is open to all residents of Plumas County and many participants are also in the Senior Disabled Defensible Space Program. Over the past 5 years the Chipping program has been utilized by 1,532 residents of the county, chipping an estimated 9,000 cubic yards of material. Without the program the material would have otherwise been left on the property, sent to the landfill, or burned by the property owner which comes with some inherent wildfire risk and impacts to air quality.
- The Hazardous Fuels Reduction Program managed by the PCFSC treats larger pieces of property to enhance wildfire resilience. Annually the program treats an average of 2,400 acres of both private and public lands utilizing a variety of methods. These methods include mastication, timber sales, and hand thinning, piling, and burning. These treatments expand the bubble of protection around the community and help to enhance the safety of fire personnel who may need to engage in suppression activities in the treated area.
- The PCFSC offers mentorship and technical assistance for the 30 Firewise USA communities in Plumas county. This Firewise status identifies community level involvement to enhance wildfire safety, and can often be a mechanism to receive discounts on homeowners insurance premiums. Over 300 Fire Safe Home Visits have occurred across the county. These visits provide the homeowner with a detailed report that helps guide them towards enhancing their homes wildfire resiliency by prioritizing defensible space and home hardening activities.

F.6 Mitigation Strategy

F.6.1. Mitigation Goals and Objectives

The PC/PCFSC adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

F.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. A few of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

F.6.3. Mitigation Actions

The Planning Team for the PC/PCFSC identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Climate Change
- Drought & Water shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat

- Severe Weather: High Winds and Tornado
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Dam Failure
- Drought & Water shortage
- Earthquake
- Hazardous Materials Transport
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Update the Plumas County Communities Wildfire Protection Plan

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Planning for wildfire has significantly changed since the last CWPP was prepared in 2019. Catastrophic megafires across California and within Plumas County have triggered major changes to the way that we understand, analyze, respond to, and recover from wildfire. These changes have resulted in new laws and regulations that impact every level of planning and preparedness. In addition, there are several aspects of geography, history, and culture that present unique challenges in planning, education, and effective outreach in Plumas County.

Most recently, the catastrophic wildfires in 2019, 2020, and 2021 impacted communities and people across the entire county and at all levels of organizations that provide public safety, planning, and mitigation support. Many homes, businesses, recreational assets, and natural resources were lost as a result of the Walker, North Complex, Dixie, and Beckwourth fires, and this had an immediate impact on the larger community's social, economic, and cultural fabric. In addition to the displacement during these fires and in

the immediate aftermath, the concurrent impacts from the Covid19 pandemic created a deep disruption that we have not yet recovered from. In the context of wildfire planning and response, this disruption caused a large number of people to move or leave their jobs as they sought to cope with the fire impacts. The CWPP update project seeks to build back from those losses and fill some of the information, planning, and capacity gaps we are currently faced with.

Project Description: Plumas County Fire Safe Council (PCFSC) will facilitate a major update to the Plumas County Communities Wildfire Protection Plan (CWPP) to address fundamental changes to our fire geography and communities after successive catastrophic wildfires. The update will be supported by an independent Hazardous Fuels Assessment that is currently in progress, and it will continue to integrate the goals of the National Forest and Range Lands Action Plan (2014) and Strategic State Fire Plan (2018). The update will bring the plan into conformance with key plans that have been updated or created since 2019, including the multi-jurisdictional Plumas County Local Hazard Mitigation Plan update (currently in progress), the CalFire LMU Strategic Fire Plan (2025), and the Wildfire and Forest Resilience Action Plan Implementation Strategy (2022). The CWPP Toolkit (2024) and other best practices will be used to make the update a collaborative document reflective of the organizations, government entities, and people of Plumas County.

An additional objective of this project is to support the County of Plumas, City of Portola, and three fire protection districts in planning to implement Chapter 7(a) building codes and defensible space programs for high and very high severity wildfire zones in Local Responsibility Areas within Plumas County. Community safety, housing affordability and insurance access are primary factors in program implementation. In 2025, PCFSC established a role to coordinate among fire protection districts, acting in coordination with the Plumas County Fire Chiefs Association who will serve a key role.

With the CWPP Toolkit as a starting point, we are implementing an outreach and education program that is informed by the intensive work we have been engaging in since 2021 to build up our Firewise Communities and provide accurate and unbiased information across communication channels. PCFSC Outreach Coordinator, Amber Hughes, leverages the independent spirit of Plumas County to educate newcomers, challenge old-timers, and activate people to have agency to make their homes and communities safer.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: PCFSC is primarily using the CWPP Toolkit published in 2024 to organize and implement the planning, education, and outreach activities for this project.

Responsible Office/Partners: Plumas Fire Safe Council. Key collaborators for this project include Plumas County Planning Department, Plumas County Office of Emergency Services, Plumas County Fire Chiefs Association, USDA Forest Service, USDA Bureau of Land Management, CalFire, and Feather River Stewardship Coalition. Collaborators will participate in training and working group sessions to craft various elements of the plan update, and they will also serve a key function in representing a broad range of stakeholders across the county.

Benefits (Losses Avoided): Catastrophic wildfire has already impacted large areas of Plumas County, with demonstrated losses to every category of investment, including infrastructure, timber, water, commercial and residential properties, county and other government facilities. The 2021 Dixie Fire, the largest of recent wildfires to impact Plumas County, cost $637.4 million for suppression activities, with losses estimated at least $1.15 billion USD. Increasing global temperatures and the impact on the hydroclimate cycle, fuels, and wind events in California are projected to increase the level of wildfire risk to Plumas County and its residents over the next 10 years.

Potential Funding (Local Budgets, Grant Funds, etc.): PCFSC is using an existing County Coordinator grant from CalFire (through the California Fire Safe Council) along with self-funded work with the Plumas Fire Chiefs Association to fund the update. In addition, PCFSC is seeking grant funds from several other sources to complete its funding needs for this project.

Timeline: 2026-2027

Project Priority (High, Medium, Low): High

Action 2. Firewise Program Promotion and Public Education

Hazards Addressed: Wildfire, Drought, Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornadoes

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas County is home to 30 recognized Firewise USA® communities, each built on the principle of neighbors helping neighbors to reduce wildfire risk. Firewise is entirely volunteer-based, and residents make a substantial commitment of time, resources, and effort to maintain their status. This includes organizing neighbors, purchasing materials, carrying out small-scale mitigation projects, and documenting progress.

One of the most important requirements is that all Firewise sites complete five-year risk assessments and three-year action plans. These documents guide local mitigation work and will be formally incorporated into the 2026 Community Wildfire Protection Plan (CWPP) update. This means the volunteer work done by Firewise communities directly shapes countywide priorities and state and federal mitigation strategies in Plumas County.

Despite this impact, Firewise communities often struggle to sustain themselves. Because Firewise USA® is a program framework and not a 501(c)(3), local sites cannot apply for grants directly. Without organizational support, it is difficult for them to secure resources or implement their action plans. PCFSC fills this gap by providing technical assistance, collecting and managing Firewise data, and serving as the administrative backbone that creates potential access to grants and external resources.

Project Description:

- Increasing awareness of Firewise Communities throughout Plumas County.
- Providing technical assistance and resources to support the 30 existing Firewise sites.

- Mentoring and assisting new neighborhoods seeking Firewise recognition.
- Supporting Firewise leaders in completing required five-year risk assessments and three-year action plans and preparing them for integration into the 2026 CWPP.
- Incorporating equity-focused outreach to ensure vulnerable populations can participate in Firewise activities.
- Delivering public education activities that highlight defensible space, home hardening, and community-wide survivability strategies.
- Acting as the administrative backbone for Firewise sites, navigating logistics, managing data, and creating potential grant access to sustain community projects and capacity-building.

Other Alternatives:

- Limit promotion to passive outreach. Relying on flyers, websites, or word-of-mouth without active support would not provide the technical assistance or data collection required for Firewise communities to meet their obligations.
- Leave Firewise promotion entirely to NFPA or CAL FIRE. While these organizations provide program oversight, they do not have the local capacity to mentor communities, track progress, or integrate Firewise work into the CWPP.
- Focus only on parcel-level treatments. Defensible space and home hardening are critical, but funding is increasingly directed toward landscape-scale or community-based projects. Without Firewise, parcel-level work remains isolated, provides limited collective impact, and is less competitive for potential grant funding.
- Do nothing. Firewise growth would stall, existing sites would lose support, and required risk assessments/action plans would not be integrated into the 2026 CWPP, weakening both local resilience and countywide mitigation planning.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Wildfire Protection Plan (CWPP), Plumas County Local Hazard Mitigation Plan (LHMP), Firewise USA® program framework (NFPA), PCFSC outreach and pre-fire education programs, Local Fire Protection District community outreach and support programs, Plumas County OES, social services, and public health initiatives, UC Cooperative Extension and school-based education partnerships, VOAD (Voluntary Organizations Active in Disaster) and other stakeholder networks.

Responsible Office/Partners: PCFSC (lead), Firewise site leaders and neighborhood coordinators, Local Fire Protection Districts, CAL FIRE, USDA Forest Service, Plumas County OES, social services, and public health, UC Cooperative Extension and VOAD partners

Benefits (Losses Avoided): Expanded participation in Firewise USA® program across Plumas County. Stronger capacity in existing Firewise communities, leading to improved survivability. Reduced wildfire ignition potential and spread through coordinated community action. Greater equity in outreach, ensuring marginalized households are included. Cost savings from reduced suppression needs and property loss. Enhanced intergenerational awareness through youth and family participation in Firewise activities. Creation of potential grant access for Firewise sites through PCFSC sponsorship, increasing opportunities for resources and capacity-building. Regular five-year risk assessments and three-year action plans completed and integrated into the CWPP, ensuring Firewise communities shape countywide wildfire strategies. Amplification of volunteer commitment, ensuring local efforts influence state and federal mitigation work in Plumas County.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Assistance (HMGP, BRIC) — potential access through PCFSC sponsorship, CAL FIRE Fire Prevention Grants — potential access through PCFSC sponsorship, USDA Forest Service partnerships, USDA CWDG, Stevens, and RAC Grants — potential access through PCFSC sponsorship, PG&E Resilience Grants, Sierra Nevada Conservancy, OCO–AIM and other philanthropic or regional community foundation grants, Local allocations and community in-kind support.

Timeline: Short-term (1–3 years / initial grant cycles):

- Expand Firewise promotion and develop educational materials.
- Deliver equity-focused public education activities.
- Provide direct technical assistance to Firewise site leaders in completing risk assessments and action plans.
- Support communities in identifying potential grant opportunities with PCFSC acting as sponsor.

Strategic Outcome: Strengthen visibility and participation in Firewise across Plumas County, while ensuring local planning documents are produced and positioned for integration into countywide wildfire strategy.

Medium-term (3–5 years / CWPP implementation phase):

- Deepen capacity-building within the 30 existing Firewise communities while also supporting enrollment of new sites.
- Strengthen partnerships with local fire districts, OES, social services, public health, CAL FIRE, and USFS.
- Expand collaboration with schools, UC Cooperative Extension, and VOAD networks.
- Collect and organize risk assessments and action plans from Firewise communities to align with the 2026 CWPP.
- Continue to create potential access to funding through PCFSC sponsorship and data-driven support.

Strategic Outcome: Position Firewise communities as core contributors to the 2026 CWPP, ensuring neighborhood-level risk reduction efforts are integrated into countywide wildfire planning.

Long-term (5+ years / sustained funding and program maturity):

- Secure recurring, diversified funding streams to sustain and expand capacity.
- Institutionalize Firewise promotion and technical assistance as a core PCFSC program.
- Advance Firewise sustainability by maintaining strong capacity in existing communities and mentoring new sites toward long-term self-sufficiency.
- Ensure that risk assessments and action plans are consistently integrated into CWPP updates and used to guide long-term mitigation priorities.

Strategic Outcome: Establish PCFSC as the permanent organizational backbone for Firewise communities, supporting volunteers, creating potential grant access, and ensuring all residents are Prepared & Aware.

Project Priority (High, Medium, Low): Low

Action 3. WUI Map Project: Implementation of Fire Hazard Severity Zone, Insurance Rating, and Other Classification Systems for Wildfire Risk Management and Identification of Wildland Urban Interface Areas

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Within the State of California, the State Fire Marshal is charged with assigning fire hazard severity zones (FHSZ) for all areas within the State Responsibility (SRA) and for medium, high, and very high FHSZ areas within Local Responsibility Areas (LRA). Federal responsibility areas are not within the scope of this program. The State Fire Marshal completed major updates to the FHSZ for SRA in 2024 and for the LRA in 2025. These changes significantly impacted areas within the county that fall within the scope of State wildland urban interface (State WUI) lands. This includes the application of regulations for land use development, building siting, setbacks, fuel modifications, and building design and construction for new development in all areas of the SRA and Very High FHSZ in the LRA.. For existing development and structures, these changes significantly increase the number of homes and properties within Plumas County that are required to meet defensible space, home hardening and retrofit, and real estate disclosure requirements that apply to all properties within the SRA and both Very High and High FHSZ within the LRA.

Plumas County is among a few California counties where the proportion of federally managed land significantly impacts the overall approach to wildland fire risk identification and management. This configuration has led the county to develop a County WUI designation and map that integrates hazards and risks associated with all land types within Plumas County. This WUI map was formally adopted by the Board of Supervisors in 2023.

These risk categories and assignments to properties within Plumas County tend to be correlated with the lack of availability and cost for obtaining casualty insurance.

Project Description: For this project, the State WUI map and the Plumas County WUI map will be incorporated into CWPP hazard, risk, and mitigation analyses. These maps will also be used to provide context for datasets that include insurance coverage rates for properties in Plumas County along with premium cost and affordability analysis. Because insurance ratings, coverage, certifications, and discounts are changing so quickly, updates to this analysis may be required more frequently than the 5-year CWPP update cycle.

Other Alternatives: Let residents, property owners, and others make their own interpretations using a range of federal, state, and local sources to piece together how WUI designations affect their property management.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Communities Wildfire Protection Plan Update (2026)

Responsible Office/Partners: Plumas County Planning Department, PCFSC, Plumas County Office of Emergency Services, California Department of Insurance, CalFire / California Fire Marshal, US Forest Service

Benefits (Losses Avoided): Clear delineations and communication of what is defined as Wildland Urban Interface is critical for residents and property owners in Plumas County understanding how various regulations apply, including costs associated with compliance and insurance.

Potential Funding (Local Budgets, Grant Funds, etc.): This project is projected to be completed as part of the CWPP update, with ongoing communication and data availability coordinated between the PCFSC, Plumas County, and City of Portola.

Timeline: 2026 and ongoing throughout the duration of the plan

Project Priority (High, Medium, Low): Medium

Action 4. Biomass Management and Utilization Program

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Plumas County faces a growing challenge in managing excess forest biomass generated by fuels reduction projects, wildfire recovery efforts, and defensible space maintenance on both public and private lands. Without reliable outlets, biomass accumulates on the landscape, increasing wildfire risk, threatening air quality, and creating significant disposal challenges for landowners and agencies. Currently, most material is either left in place, chipped on-site, or piled and burned—methods that are costly, labor-intensive, and not always sustainable.

Project Description: Develop and implement a countywide Biomass Management and Utilization Program that creates sustainable and cost-effective pathways for handling excess forest biomass and community-generated green waste. This action provides an umbrella framework for a variety of project types, including but not limited to:

- Establishing permanent and/or seasonal biomass collection and disposal sites.
- Expanding community chipping and hauling programs.
- Partnering with biomass utilization facilities (e.g., bioenergy production, biochar, wood products, compost, mulch).
- Developing small-scale, distributed bioenergy or gasification facilities.
- Supporting pilot projects for innovative biomass uses (e.g., erosion control, carbon sequestration, soil enhancement).
- Conducting public outreach to encourage community participation in biomass reduction efforts
- Reduce hazardous fuel loads across the county.
- Support defensible space compliance and fuels reduction projects.
- Decrease wildfire ignition potential and spread.
- Promote sustainable and environmentally sound biomass utilization.

- Improve air quality by reducing pile burning.
- Create local jobs and economic opportunities through forest product markets.

Other Alternatives:

- Alternatives could include Wood products – Dimensional lumber, engineered wood, particleboard, plywood, and oriented strand board (OSB). Mulch and soil amendments
- Chipped biomass used for landscaping, erosion control, or improving soil health.
- Compost – Blending biomass with organic waste streams to create nutrient-rich soil products.
- Fiber products – Paper, cardboard, packaging, and textiles.
- Land & Ecosystem Benefits
- Erosion control & slope stabilization – Using chipped biomass as ground cover.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CAL FIRE Vegetation Treatment Program (VTP) and Calif. Forest improvement Program (CFIP)

Responsible Office/Partners: Plumas County Fire Safe Council, USDA Forest Service: Plumas National Forest, CAL FIRE, UC Cooperative Extension, and Feather River Resource Conservation District

Benefits (Losses Avoided):

- Reduction of hazardous forest fuels and vegetative debris, lowering wildfire intensity and spread.
- Decreased risk of structure loss, property damage, and threats to life safety during wildfire events.
- Lower suppression costs by reducing available fuel loads across landscapes and communities.
- Reduced reliance on pile burning, improving air quality and avoiding public health impacts from smoke exposure.
- Increased community compliance with defensible space regulations, reducing vulnerability of individual homes and neighborhoods.
- Avoided long-term economic losses by protecting critical infrastructure, businesses, and tourism resources from wildfire impacts.
- Creation of local markets for biomass utilization, providing jobs and diversifying the rural economy.
- Enhanced resilience of forested watersheds, reducing post-fire erosion, flooding, and water quality impacts.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMGP), CAL FIRE Fire Prevention and Wood Products Grants, USDA Forest Service partnerships and agreements, Sierra Nevada Conservancy grants, State of California Climate and Carbon Reduction Programs (e.g., Cap-and-Trade funds), County funds and private sector investments

Timeline:

- Short-term (1–3 years): Expand existing chipping programs, organize community green waste events, identify potential biomass markets.
- Medium-term (3–5 years): Establish collection infrastructure, develop public–private partnerships for utilization projects.
- Long-term (5–10 years): Construct or support local biomass utilization facilities, create sustainable program funding sources, expand regional biomass economy.

Project Priority (High, Medium, Low): High

Action 5. Community Encompassing Firelines and Shaded Fuel Breaks

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Communities in Plumas County face increasing wildfire risks due to heavy fuel loads, changing climate conditions, and the proximity of wildland vegetation to neighborhoods. Current suppression efforts are challenged by the lack of strategically placed and maintained firelines that can safely support firefighting operations and enable the use of prescribed fire for fuels management. Without pre-established, community-scale firelines and shaded fuel breaks, suppression resources are limited in their ability to safely anchor operations and protect life, property, and natural resources.

Project Description: This project will develop and maintain community-encompassing firelines designed for dual use in wildfire suppression and prescribed fire operations. Firelines will consist of a combination of constructed lines, shaded fuel breaks, and the integration of existing natural or built features such as greenbelts, parks, irrigated landscapes, and fire-hardened recreation trails. These linear features will be strategically placed around and through communities to:

- Provide safe access and anchor points for firefighting resources.
- Serve as containment lines for prescribed burning and fuel reduction.
- Enhance community defensible space at a landscape scale.
- Connect to existing roads, rivers, ridges, and other natural fire breaks to create a more resilient network.

Other Alternatives:

- Continue reliance on emergency dozer line construction during active wildfire incidents (less strategic, greater environmental impact).
- Focus solely on parcel-level defensible space and fuel reduction treatments without landscape-scale connectivity (limited effectiveness for large fire events).

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Community Wildfire Protection Plan (CWPP), Local Hazard Mitigation Plan (LHMP), U.S. Forest Service and CAL FIRE cooperative agreements, Community Parks and Recreation Master Plans, Sierra Buttes Trail Stewardship Connected Communities Master Plan.

Responsible Office/Partners: Plumas County Fire Safe Council (lead), CAL FIRE, U.S. Forest Service (Plumas National Forest), Local Fire Protection Districts, Plumas County Planning & Recreation Departments, and Sierra Buttes Trail Stewardship

Benefits (Losses Avoided):

- Reduced risk of wildfire spread into communities.
- Increased safety and tactical options for firefighters.

- Protection of critical infrastructure, homes, and recreation resources.
- Expanded opportunities for prescribed fire, reducing hazardous fuels in a controlled setting.
- Enhanced recreation assets (fire-hardened trails, parks) that double as fire protection features.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Assistance (HMA) grants, CAL FIRE Fire Prevention and Forest Health grants, USDA Forest Service funding programs, PG&E Community Resilience Grants, and Local government allocations and in-kind support

Timeline: 5 years or more

Project Priority (High, Medium, Low): High

Action 6. Continue and Promote Defensible Space (PRC 4291) Projects including Assistance Efforts for Senior and Disabled Residents.

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Plumas County's communities are entirely within the Wildland Urban Interface (WUI) and are primarily defined as Very High Hazard Severity Zones. In recent years Plumas County residents have been regularly impacted by wildfire in the form of poor air quality, power outages, loss of access to public lands, loss of infrastructure, contamination of water, and, in some cases, personal property losses. A growing number of residents are aware of their responsibility to create defensible space.

The county's population over 65 years of age is 29.8%, far outpacing the State's estimated 16.2%. According to the California Census, 21.3% of Plumas County residents have a disability (as compared with the State's 11.7%). These populations have been shown to be the most vulnerable in wildfire situations. They are also the least likely to have the physical or financial ability to comply with Public Resources Code (PRC) 4291 hazardous fuel reduction requirements. Recently the CAL FIRE Lassen-Modoc Unit has had difficulty hiring Defensible Space Inspectors, making a locally-administered incentive program an even more vital resource to Plumas County residents

Project Description: For twenty years the Plumas County Fire Safe Council's Defensible Space program has been assisting senior and disabled residents to create and maintain defensible space and thereby comply with the public resources code. The program reduces fuels 100 feet surrounding habitable structures and removes litter accumulations on roofs, gutters, and decks. The program manager provides Home Ignition Zone consultations with each participant, sharing additional ways that residents can harden their home. A licensed and insured defensible space operator is contracted to complete necessary fuel reduction work. Final inspections for PRC 4291 compliance are conducted by the program manager. Generally residences treated through the program have passed subsequent CAL FIRE Defensible Space inspections.

In addition, multiple organizations and agencies work to promote defensible space to the general public through site visits, informational workshops, Firewise outreach, and distribution of digital and print materials.

Other Alternatives: Alternatives include:

- Providing an incentive program to all Plumas County residents. The Fire Safe Council does not currently have the capacity to administer a program available to 18,000+ residents. Additionally, the Council board has on multiple occasions declined to expand the program beyond those with physical and financial limitations.
- Provide Defensible Space services to residences that are strategically located regardless of age or disability. More contiguous treatments adjacent to existing hazardous fuels reduction projects could serve as part of a more fortified barrier to wildfire moving through a community.
- Not providing an assistance program. Participation in the existing program continues to grow. Over the past four years the program has more than doubled the number of clients served. Ceasing the program would leave many residences out of compliance with PRC 4291 and at high risk in wildfire situations.

Existing Planning Mechanism(s) through which Action Will Be Implemented: California PRC 4291, California SB 190, California AB 38

Responsible Office/Partners: Plumas County Fire Safe Council (education, implementation and outreach), CAL FIRE (funding, education, and outreach), USDA Forest Service (funding and outreach), Plumas County Office of Emergency Services (outreach)

Benefits (Losses Avoided): The defensible space assistance program reduces the risk of wildfire by reducing the likelihood that a residential ignition source (such as a pile burn) will lead to a wildfire or threaten a structure. The program reduces the potential impact of wildfire by creating defensible space that allows for more successful suppression efforts as well as reduced potential for fire to carry through a community particularly in the case of strategically located contiguous treatments.. In conjunction these factors have the ability to significantly reduce the amount of greenhouse gasses released from wildfires.

Potential Funding (Local Budgets, Grant Funds, etc.): Various federal and state grant sources

Timeline: Ongoing

Project Priority (High, Medium, Low): High

Action 7. Improve Local Plumas County Fire Department Capacity and Response Capabilities

Hazards Addressed: Ag Hazards, Climate Change, Drought and Water Shortage, Flood, Localized Flood, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornadoes, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Plumas County Fire Departments are the first responders and at the front lines of all hazards, including structure and wildland fire, hazardous materials incidents, and any other disaster response. With 14 individual fire departments that are spread across the county they cover 95% of the population. These rural departments are often the first on scene, have the most local knowledge

and public awareness, but lack the funding, personnel, equipment, training and resources to most effectively suppress or respond to these hazards. Each of these districts are funded by a small share of property taxes, supplemented in some cases by voter-approved special assessments. This limited funding is not enough to meet the staffing requirements, state mandated firefighter safety gear and training, station and apparatus replacement and repair, that are required to effectively and efficiently respond to these incidents. In addition, the majority of the department staffing relies on volunteers which has become increasingly difficult to adequately recruit and retain.

One of the duties of Plumas County Fire Departments is wildfire protection, and Wildfire Hazard ranks as one of the top hazard risks for the county as it is extensive geographically, and it is highly likely to occur with a catastrophic potential of outcome. In addition in 2025, CAL FIRE released an updated Fire Hazard Severity Zones (FHSZ) map that puts 93% of Plumas County Local Responsibility Area (LRA) parcels within a FHSZ ranging from moderate to very high. This updated mapping requires homeowners to meet state requirements and the presiding fire districts to make the assessments. This is an increase in the responsibilities of local departments which will further stretch these underfunded departments.

Project Description: Plumas County Fire Departments are in strategic positions throughout the county to be the front line on mitigation efforts. This project will:

- Create a long-term plan for comprehensive wildfire response and coverage. Provide additional training, equipment, personnel, and funding to improve response capacity through grants or other funding sources. Find more ways to collaborate on mitigation efforts. Update technology including communication equipment, CAD, radio towers, dispatch, mapping, preplanning.
- Assist districts in developing volunteer recruitment and retention strategies to improve response team numbers and stability.
- Improve ability for community education and outreach.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas Fire Safe Council has a Plumas County Fire Chiefs Association Support Specialist that is a liaison between the Fire Chiefs, Fire Safe Council, Sheriff's Office (who handles county emergency dispatching), CAL FIRE, USFS, and Plumas County to align and coordinate collaborative efforts to implement

Responsible Office/Partners: PCFSC, Plumas County Fire Chiefs Association, Plumas County, Sheriff's Office, USFS, PCOES

Benefits (Losses Avoided): A quicker and more effective response limits the spread and impact of hazards, reducing the total cost of initial damage and reduces the cost of recovery efforts including cleanup, repairs, and rebuilding.

Potential Funding (Local Budgets, Grant Funds, etc.): Increased Property Taxes, expanding districts to include parcels not currently covered. Grants through Cal Fire, USDA, US Gov, or California

Timeline: Ongoing

Project Priority (High, Medium, Low): High

Action 8. Countywide Green Waste Disposal and Utilization Program

Hazards Addressed: Wildfire, Hazardous fuels

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Plumas County experiences high wildfire risk due to the accumulation of hazardous vegetative fuels around homes, businesses, and communities. As residents work to meet California's Defensible Space requirements, they generate large amounts of green waste. Currently, disposal options are limited to pile burning (which contributes to air quality issues and is not feasible for all residents) or hauling to County transfer stations at personal expense. This lack of accessible, affordable disposal options contributes to non-compliance with defensible space regulations and increases wildfire vulnerability.

Project Description: Develop and implement a countywide Green Waste Program that provides safe, legal, and cost-effective disposal options for residents and landowners. Program components may include:

- Establishment of designated green waste drop-off sites across the county.
- Development of partnerships with biomass utilization facilities (e.g., bioenergy, mulch, compost, or erosion control products).
- Public outreach and education on defensible space, fire-safe landscaping, and proper disposal methods.

Other Alternatives:

- County Climate Action Plan / Sustainability Plan
  - ✓ If the County has or develops one, biomass diversion and green waste management support greenhouse gas reduction and carbon sequestration goals.
- Air Quality Management District Programs
  - ✓ Aligns with strategies to reduce pile burning and improve air quality.
- Public Health & Safety Programs
  - ✓ Green waste reduction contributes to healthier communities by lowering smoke exposure and wildfire risk.
- Public Works Capital Improvement Plan (CIP)
  - ✓ If the County invests in permanent green waste sites or biomass infrastructure, it can be incorporated into the CIP.
- State-Level Programs
  - ✓ California's SB 1383 (Organic Waste Diversion Law) and CalRecycle programs require jurisdictions to reduce disposal of organic materials. Your action could be tied into compliance.
- Regional or Interagency Collaboratives
  - ✓ Sierra Nevada Conservancy or similar regional initiatives that fund forest and biomass projects.
  - ✓ Cooperative fire protection agreements with CAL FIRE or USFS.
- Local Firewise USA® Communities Plans
  - ✓ Green waste disposal services can directly support neighborhood-level mitigation actions adopted in Firewise assessments.
- Watershed or Resource Conservation District Plans

- ✓ If you partner with RCDs or watershed groups, green waste can be reused for erosion control, soil stabilization, or habitat restoration.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This action will be implemented through the Plumas County Local Hazard Mitigation Plan, Community Wildfire Protection Plan, General Plan Safety Element, County Solid Waste Management programs, Fire Safe Council initiatives, and CAL FIRE defensible space compliance programs.

Responsible Office/Partners: Plumas County Fire Safe Council, Plumas County Office of Emergency Services, Local Fire Protection Districts, U.S. Forest Service / CAL FIRE, Plumas County Public Works / Transfer Stations, Private contractors and biomass facility operators

Benefits (Losses Avoided):

- Reduce hazardous fuel loads around homes and communities.
- Increase participation in defensible space and fuels reduction projects.
- Improve public safety, air quality, and community resilience.
- Support long-term sustainable biomass utilization opportunities.
- Significant reduction in hazardous vegetative fuels near homes and communities.
- Decreased wildfire ignition potential and spread.
- Increased community participation in defensible space compliance.
- Improved air quality due to reduced pile burning.
- Creation of local economic opportunities through biomass utilization.

Potential Funding (Local Budgets, Grant Funds, etc.):

- FEMA Hazard Mitigation Grant Program (HMGP)
- CAL FIRE Fire Prevention Grants
- USDA Forest Service partnerships
- County general funds and tipping fee revenues
- Private sector and community contributions

Timeline:

- Short-term (1–3 years): Expand community chipping program and establish seasonal green waste collection events.
- Medium-term (3–5 years): Develop permanent green waste drop-off infrastructure and create contracts with biomass utilization facilities.
- Long-term (5–10 years): Sustain and expand program through diversified funding sources and integrated countywide participation

Project Priority (High, Medium, Low): High

Action 9. Hazardous Fuels Reduction – Implementation, Monitoring, and Maintenance

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Plumas County faces significant wildfire risk due to overgrown forest conditions, drought-stressed vegetation, extensive tree mortality from bark beetle infestations, and the wildland-urban interface (WUI) where homes and infrastructure are adjacent to wildland fuels. In recent years, there has been intensified fire weather conditions, creating longer fire seasons and more extreme fire behavior. Dense forest conditions create dangerous fuel loads that threaten public safety, critical infrastructure, evacuation routes, and community assets. Without proactive hazardous fuels reduction, the county remains vulnerable to catastrophic wildfires that could result in loss of life, property damage, and environmental degradation.

Project Description: Implement comprehensive hazardous fuels reduction treatments including mechanical thinning, mastication, hand thinning, prescribed burning, and strategic placement of fuel breaks throughout high-risk areas of Plumas County. Focus on protecting evacuation routes, defensible space around structures, critical infrastructure corridors, and municipal water supplies. Create, monitor, and maintain fuel breaks to slow fire spread and provide safe zones for firefighting operations. Coordinate treatments across jurisdictional boundaries to create landscape-scale fire resilience.

Other Alternatives:

- No action - Accept existing wildfire risk with reactive suppression response only
- Structure-focused approach only - Limit activities to defensible space around individual properties
- Suppression-only strategy - Rely entirely on firefighting resources without proactive fuel reduction
- Regulatory approach only - Implement stricter building codes and vegetation management ordinances without active treatment

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Community Wildfire Protection Plan (CWPP), 2025 Hazardous Fuels Assessment - Deer Creek Resources, LLC, Local Hazard Mitigation Plan (LHMP), CAL FIRE , U.S. Forest Service Forest Health and Restoration programs

Responsible Office/Partners:

- Plumas County Fire Safe Council
- Plumas Corporation
- CAL FIRE
- U.S. Forest Service (Forest Health Protection, Plumas National Forest and Lassen National Forest)
- Feather River Resource Conservation District
- Plumas County Planning and Public Works Departments
- Local Fire Protection Districts
- Utility companies (hazard tree management along powerlines)

Benefits (Losses Avoided):

- Reduced hazardous fuel loads
- Improved firefighter and public safety along evacuation routes and public spaces.

- Enhanced forest health and resilience to drought and pests.
- Protection of homes, infrastructure, and utilities from wildfire spread.
- Increased availability of biomass and wood products as beneficial by-products of removal.

Potential Funding (Local Budgets, Grant Funds, etc.): Local, state, federal, and private grant sources. Cost-effective partnerships with local timberland owners (lower per acre rates). CAL FIRE grants, FEMA HMGP, USDA Forest Service grants, California Climate Investments, streamlined EPP permitting

Timeline: Ongoing

Project Priority (High, Medium, Low): High

Action 10. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Many of the homes in Plumas County are in the Wildland urban intermix which poses challenges for wildfire suppression in terms of community fire protection and structure triage. In addition, many of these homes and subdivisions were built prior 2008 when current fire standards were enacted. As a consequence, a large majority of homes in Plumas County may not meet current fire code and may be in need of structure retrofits to improve resistance to fire.

Project Description: The Plumas County Fire Safe Council is well known throughout the county for its public outreach, support of NFPA Firewise USA Sites, and direct fuel reduction assistance programs to landowners – many of which focus on defensible space. This proposal intends to build on existing organizational strengths to add additional capacity to develop technical assistance for home ignition zone assessments and developing home hardening/retrofitting programs as envisioned in State assembly bill AB38. This project would include collaboration between, Plumas County Fire Safe Council, local fire departments, the planning department, and support from UC Cooperative Extension.

This Project proposes two phases of implementation.

The first phase is providing outreach, education, and technical assistance for home ignition zone assessment of homes, commercial structures, and community infrastructure. This includes developing outreach materials about wildfire and the built environment, providing workshops and educational offerings to educate residents about home hardening and preparedness, and developing programs to provide site specific home consultations on the home ignition zone to help residents identify, assess, and prioritize home hardening retrofits to make their home more resistant to wildfire. This outreach effort would be well paired with defensible space programs already being delivered to Plumas county residents.

The second phase is to provide home retrofitting assistance program to improve structural resistance to wildfire, or to improve community infrastructure for wildfire preparedness as described in Calif. Assembly Bill AB38. This would include developing and implementing cost-share, grant funded, or incentive based

projects and programs to help residents with projects that improve home resistance to fire and enhance community wildfire preparedness and protection. Home retrofit projects may include replacement of out of code structure vents, installing fire resistant roofing, siding or windows, and/or installing snow protectors on propane regulators. Community wildfire preparedness and protection projects may include installation of secondary water supplies, developing community water supplies, developing community safety zones or temporary areas of last resort refuge, or improving fire safety of power, communications, and road infrastructure. These implementation efforts would likely need to be implemented in a phased manner.

Other Alternatives: Currently, there are no other alternative programs such that the de facto alternative is not providing residents home hardening support.

Existing Planning Mechanism(s) through which Action Will Be Implemented: State Assembly Bill AB38 provides state level direction and guidance to develop programs to mitigate fire hazard and support communities by delivering programs that improve wildfire preparedness. Home hardening & retrofitting is included in these activities.

Responsible Office/Partners: County Agencies (OES, Building & Planning Departments); Plumas County Fire Safe Council, UC Cooperative Extension,

Benefits (Losses Avoided): Reduced risk to people and property from wildfire.

Potential Funding (Local Budgets, Grant Funds, etc.):

- Phase 1: $150- $200K to develop the staffing, materials and outreach programs for a two-three year period. This would fund staffing for a Home ignition zone assessment consultation, preferably a candidate with professional forestry or wildland fire fighting skillset who can also assess defensible space as well as the home ignition zone.
- Phase 2: First phase of implementation could be $500K-$1million

Timeline: Two – Three year timeline would be necessary for phase 1 outreach and development. With the last year implementing an initial stage of phase 2.

Project Priority (High, Medium, Low): High

Action 11. Last Chance Creek Watershed Floodplain Restoration Project

Hazards Addressed: Ag Hazard: Severe Weather; Climate Change; Drought & Water Shortage (w/tree mortality; Flood (1%/0.2% annual chance and Localized Stormwater); Severe Weather: Extreme Heat, Heavy Rains and Storms; Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The 204 square mile Last Chance Creek watershed is one of two large sub watersheds to Indian Creek. Indian Creek flows through Genesee and Indian valleys where flooding and channel instability are current hazards to the populace. The Last Chance Creek watershed contains one of the longest contiguous meadow floodplain systems in the Sierra Nevada Mountains. Last

Chance Creek is severely downcut (incised) throughout the 36 miles of meadow floodplain. Principal stressors were logging railroad grades built in the low gradient meadow in the 1930s & '40s, channel modification, livestock grazing, and roads. These incised channels funnel all flows downstream, rapidly draining out this headwater basin into the populated Genesee and Indian valleys.

Loss of floodplain function and the rapid drainage of these headwater basins reduces the meadow's ability to capture and store springtime snowmelt and rain as shallow groundwater. Sixty percent of California's water supply originates in the Sierra Nevada, and meadows are a key component of that supply, helping to regulate water flow, temperature, and quality. As the headwaters of the State Water Project, the Feather River Watershed provides water to over 26 million Californians. Although wet meadows are a less than one percent of the overall landscape in Plumas County, meadows' unique hydrologic and ecological functions are recognized as being vital to watershed health and are valued for the ecosystem goods and services they provide, such as crucial habitat for many endemic and special status wildlife species. Known as biological diversity hot spots, healthy meadows provide refugia for wildlife during droughts and wildfire. Wet and moist meadows sequester carbon in the soil, where it isn't susceptible to being lost in a wildfire. In addition, functioning meadow floodplains provide natural fire breaks reducing fire intensities and rate of spread.

Over 6,000 acres of meadow surface are available for flood attenuation along Last Chance and its tributaries. From 1995 to 2007, 9 miles and 800 acres of floodplain has been restored by Plumas Corporation. The work restored the hydraulic base level of Last Chance and tributaries back to the historic meadow level, recovering crucial floodplain function. The larger Last Chance Creek project was originally divided into Phase 1, Phase 2, and Phase 3. Phase 1 is primarily complete representing the abovementioned accomplishments. Phase 2 has been designed; funds to complete NEPA/CEQA, permits and implementation are needed. Phase 3 awaits planning funds.

Project Description: The project is primarily located on public lands managed by USDA Forest Service-Plumas National Forest. The principal objective of the restoration work is to raise the hydraulic base level of the channel/floodplain system back to the historic meadow surface. This typically allows normal stream flows to access pre-existing remnant channels, while flood flows spread across the expansive floodplain surface. Longer residence times allows for enhanced infiltration to shallow and deeper groundwater basins, while filtering sediment and nutrients into the meadow ecosystem. This longer residence time in a functional floodplain reduces the pulse in flows downstream by allowing water to spread out and discharge downstream more slowly. Restoring floodplain function may be accomplished utilizing a variety of techniques, including complete and partial channel fill, raised riffles, and use of process-based channel structures (i.e., beaver dam analogs and post-assisted log structures), to name a few. Treatments would be specific to individual site conditions and constraints.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Feather River Watershed Strategy (2004), Upper Feather River Integrated Regional Water Management Plan (2016), Tributaries Forest Recovery Project Environmental Assessment & Decision Notice (2025), California State Water Action Plan (2014), Sierra Nevada Conservancy 2024-2029 Strategic Plan (2024)

Responsible Office/Partners: Plumas Corporation, Plumas National Forest, Plumas County, private landowners

Benefits (Losses Avoided): Reduction in flood stage in Genesee and Indian valleys, avoiding damage/loss to agricultural productivity, ranch/farm infrastructure, and residential homes; Reduction in sediment supply downstream, improving water quality for aquatic resources, recreation, and agricultural irrigation; Reduction in water temperatures, improving water quality for aquatic species and recreation; Increased surface water residence time extending surface water availability for wildlife and vegetation, and allowing for enhanced infiltration to shallow and deeper groundwater basins mitigating impacts from drought and water shortage, climate change, and wildfire.

Potential Funding (Local Budgets, Grant Funds, etc.): Estimated costs- $12,000,000. Grants- State grant programs via CA Wildlife Conservation Board and Sierra Nevada Conservancy; Plumas National Forest Dixie Fire funds; Corporate Investments- Microsoft, Coca-Cola, Disney, Proctor and Gamble, etc.

Timeline: 2026-2035

Project Priority (High, Medium, Low): High

Action 12. Mountain Meadows Watershed Floodplain Restoration Project

Hazards Addressed: Ag Hazard: Severe Weather; Climate Change; Drought & Water Shortage (w/tree mortality; Flood (1%/0.2% annual chance and Localized Stormwater); Severe Weather: Extreme Heat, Heavy Rains and Storms; Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The 153 mi^2 Mountain Meadows watershed is the northeastern headwaters of the North Fork Feather River. The Mountain Meadows basin is located in southwestern Lassen County, but drains immediately into Plumas County. There are 7,500 acres of meadow in the basin, of which 1016 acres of floodplain have been or is being restored, and ~1070 additional acres are in planning. The unrestored sections of Goodrich Creek, McKenzie Creek, Duffy Creek and Robbers Creek are severely downcut (incised). Principal stressors were logging railroad grades built in the low gradient meadow in the 1910's & '20's, channel modification, livestock grazing, and roads. These incised channels capture and contain all flows, rapidly draining out of the basin into Plumas County.

Loss of floodplain function and the rapid drainage of these headwater basins reduces the meadows' ability to capture and store springtime snowmelt and rain as shallow groundwater. Sixty percent of California's water supply originates in the Sierra Nevada, and meadows are a key component of that supply, helping to regulate water flow, temperature, and quality. As the headwaters of the State Water Project, the Feather River Watershed provides water to over 26 million Californians. Although wet meadows are a less than one percent of the overall landscape in the Sierra Nevada mountains, meadows' unique hydrologic and ecological functions are recognized as being vital to watershed health and are valued for the ecosystem goods and services they provide, such as crucial habitat for many endemic and special status wildlife species. Known as biological diversity hot spots, healthy meadows provide refugia for wildlife during droughts and wildfire. Wet and moist meadows sequester carbon in the soil, where it isn't susceptible to

being lost in a wildfire. In addition, functioning meadow floodplains provide natural fire breaks reducing fire intensities and rate of spread.

From 2016 to 2023, 5 miles and 804 acres of floodplain has been restored by Plumas Corporation. The work restored the hydraulic base level of Greenville Creek, East Creek, Upper Goodrich Creek, and Mountain Meadows Creek back to the historic meadow level, recovering crucial floodplain function. The next project in the queue is McKenzie Meadow- Phase 1, a 212-acre project beginning construction in Sept. 2025. The 492-acre McKenzie Meadow- Phase 2 is currently in the design phase. Implementation funding is being sought. The 579-acre Lower Goodrich/Moonlight Road Project is also in the design, CEQA/NEPA review and permitting phase. Implementation funding is being sought for implementation in 2026.

Project Description: The project occurs on private lands owned by Sierra Pacific Industries, Collins Pine, and Red River Forests. The principal objective of the restoration work is to raise the hydraulic base level of the channel/floodplain system back to the historic meadow surface. This typically allows normal stream flows to access pre-existing remnant channels, while flood flows spread across the expansive floodplain surface. Longer residence times allows for enhanced infiltration to shallow and deeper groundwater basins, while filtering sediment and nutrients into the meadow ecosystem. This longer residence time in a functional floodplain reduces the pulse in flows downstream by allowing water to spread out and discharge downstream more slowly. Restoring floodplain function may be accomplished utilizing a variety of techniques, including complete and partial channel fill, raised riffles, and use of process-based channel structures (i.e., beaver dam analogs and post-assisted log structures), to name a few. Treatments would be specific to individual site conditions and constraints.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Upper Feather River Integrated Regional Water Management Plan (2016), Mountain Meadows Watershed Restoration Action Plan (2013), California State Water Action Plan (2014), Sierra Nevada Conservancy 2024-2029 Strategic Plan (2024)

Responsible Office/Partners: Plumas Corporation, private landowners

Benefits (Losses Avoided): Reduction in flood stage into Lake Almanor, avoiding damage/loss to recreational infrastructure, residential homes, agricultural productivity, ranch/farm infrastructure, and reducing stress on dam infrastructure; Reduction in sediment supply downstream, improving water quality for aquatic resources, recreation, and agricultural irrigation; Reduction in water temperatures, improving water quality for aquatic species and recreation; Increased surface water residence time extending surface water availability for wildlife and vegetation, and allowing for enhanced infiltration to shallow and deeper groundwater basins mitigating impacts from drought and water shortage, climate change, and wildfire.

Potential Funding (Local Budgets, Grant Funds, etc.): Estimated costs- $5,000,000. Grants- State grant programs via CA Wildlife Conservation Board and Sierra Nevada Conservancy; Plumas National Forest Dixie Fire funds; Corporate Investments- Microsoft, Coca-Cola, Disney, Proctor and Gamble, etc.

Timeline: 2026-2035

Project Priority (High, Medium, Low): High

Action 13. Upper Feather River Watershed Post-Fire Water Quality Monitoring Project

Hazards Addressed: Flood (1%/0.2% annual chance and Localized Stormwater, Severe Weather: Heavy Rains and Storms; Wildfire (w/ smoke and air quality)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): California's variable climate frequently creates a pattern of cascading hazards in which multiple drought years can be followed by extreme heat and wildfire and subsequent wet years. Wildfires leave behind a hydrophobic soil surface layer that increases surface runoff; when combined with precipitation or extreme rainfall events, surface runoff can be significantly degraded by ash, nutrients, metals, combustion byproducts from anthropogenic sources, debris torrents, and sediment. Many beneficial uses of receiving surface waters can be impaired, including human health/drinking water, recreation, fish consumption, and wildlife/ecosystems. A ready-to-deploy water quality monitoring program can be implemented during storm events post-fire to detect the threats to beneficial uses that can be used to tailor the type and location of remediation and restoration actions.

Project Description: Plumas Corporation has been conducting monitoring at key locations in the Upper Feather River watershed for more than 25 years. A post-fire water quality surveillance program will be developed during a fire that tiers to this program and can be supplemented by existing long-term data. As the rainy season approaches post-fire, incoming weather systems will be closely tracked to implement sampling during the first precipitation events that are expected to produce surface runoff. The monitoring plan will identify sample locations based on the extent/intensity of the wildfire, quality assurance/quality control (QA/QC) procedures, chain of custody requirements, the selected independent laboratory for analysis, and frequency of sampling. Constituents sampled will vary based on the degree of wildland-urban interface (WUI) in the watershed impacted by the wildfire, but will be selected from the following broad categories: field measurements (e.g., conductivity, temperature, etc.); minerals and solids (e.g., alkalinity, total suspended solids, E. coli, etc.), nutrients (ammonia, phosphorus, total organic carbon (TOC), etc.), total and dissolved metals (e.g., aluminum, arsenic, nickel, etc.), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Feather River Watershed Working Group – Northern California, Feather River Watershed Strategy (2004), Upper Feather River Integrated Regional Water Management Plan (2016), California State Water Action Plan (2014)

Responsible Office/Partners: Plumas Corporation, Plumas National Forest, Plumas County, private landowners, Central Valley Regional Water Quality Control Board, California Department of Water Resources

Benefits (Losses Avoided): Mitigating damage/loss to cold and warmwater fish habitats; preventing human health impacts due to water quality impairment (from drinking water, contact recreation, and fish consumption).

Potential Funding (Local Budgets, Grant Funds, etc.): Estimated costs - $250K; Grants: CA Wildlife Conservation Board Streamflow Enhancement & Forest Restoration programs; Secure Rural Schools Title II Funds; other grant sources and fire emergency funds as available.

Timeline: 2026-2035 (focusing on a one- to two-year window post-fire)

Project Priority (High, Medium, Low): High

Action 14. Red Clover Creek Watershed Floodplain Restoration Project

Hazards Addressed: Ag Hazard: Severe Weather; Climate Change; Drought & Water Shortage (w/tree mortality; Flood (1%/0.2% annual chance and Localized Stormwater); Severe Weather: Extreme Heat, Heavy Rains and Storms; Wildfire (w/smoke and air quality)

Issue/Background (Problem Statement): The 119 mi2 Red Clover Creek watershed is one of two large sub watersheds to Indian Creek. Indian Creek flows through Genesee and Indian valleys where flooding and channel instability are current hazards to the populace. Red Clover Valley contains more than 2,000 acres of restored floodplain, with ~2,000 additional acres in planning. The unrestored sections of Red Clover Creek, Dixie Creek, Crocker Creek and McReynolds Creek are severely downcut (incised). Principal stressors were logging railroad grades built in the low gradient meadow in the 1930s & '40s, channel modification, livestock grazing, and roads. These incised channels capture all flows, rapidly draining out of the basin into the populated Genesee and Indian valleys downstream.

Loss of floodplain function and the rapid drainage of these headwater basins reduces the meadow's ability to capture and store springtime snowmelt and rain as shallow groundwater. Sixty percent of California's water supply originates in the Sierra Nevada, and meadows are a key component of that supply, helping to regulate water flow, temperature, and quality. As the headwaters of the State Water Project, the Feather River Watershed provides water to over 26 million Californians. Although wet meadows are a less than one percent of the overall landscape in Plumas County, meadows' unique hydrologic and ecological functions are recognized as being vital to watershed health and are valued for the ecosystem goods and services they provide, such as crucial habitat for many endemic and special status wildlife species. Known as biological diversity hot spots, healthy meadows provide refugia for wildlife during droughts and wildfire. Wet and moist meadows sequester carbon in the soil, where it isn't susceptible to being lost in a wildfire. In addition, functioning meadow floodplains provide natural fire breaks reducing fire intensities and rate of spread.

From 2006 to 2022, 9 miles and 880 acres floodplain has been restored by Plumas Corporation, primarily on Plumas National Forest and Goodwin Family Ranch lands. The work restored the hydraulic base level of Red Clover and tributaries back to the historic meadow level, recovering crucial floodplain function. The next project in the queue is McReynolds Valley, a 750-acre project currently in the design, CEQA/NEPA review and permitting phase. Implementation funding is being sought.

Project Description: The project is located on both private and public lands. The principal objective of the restoration work is to raise the hydraulic base level of the channel/floodplain system back to the historic meadow surface. This typically allows normal stream flows to access pre-existing remnant channels, while flood flows spread across the expansive floodplain surface. Longer residence times allows for enhanced

infiltration to shallow and deeper groundwater basins, while filtering sediment and nutrients into the meadow ecosystem. This longer residence time in a functional floodplain reduces the pulse in flows downstream by allowing water to spread out and discharge downstream more slowly. Restoring floodplain function may be accomplished utilizing a variety of techniques, including complete and partial channel fill, raised riffles, and use of process-based channel structures (i.e., beaver dam analogs and post-assisted log structures), to name a few. Treatments would be specific to individual site conditions and constraints.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Feather River Watershed Strategy (2004), Upper Feather River Integrated Regional Water Management Plan (2016), Tributaries Forest Recovery Project Environmental Assessment & Decision Notice (2025), California State Water Action Plan (2014), Sierra Nevada Conservancy 2024-2029 Strategic Plan (2024)

Responsible Office/Partners: Plumas Corporation, Plumas National Forest, Plumas County, private landowners

Benefits (Losses Avoided): Reduction in flood stage in Genesee and Indian valleys, avoiding damage/loss to agricultural productivity, ranch/farm infrastructure, and residential homes; Reduction in sediment supply downstream, improving water quality for aquatic resources, recreation, and agricultural irrigation; Reduction in water temperatures, improving water quality for aquatic species and recreation; Increased surface water residence time extending surface water availability for wildlife and vegetation, and allowing for enhanced infiltration to shallow and deeper groundwater basins mitigating impacts from drought and water shortage, climate change, and wildfire.

Potential Funding (Local Budgets, Grant Funds, etc.): Estimated costs- $8,000,000. Grants- State grant programs via CA Wildlife Conservation Board and Sierra Nevada Conservancy; Plumas National Forest Dixie Fire funds; Corporate Investments- Microsoft, Coca-Cola, Disney, Proctor and Gamble, etc.

Timeline: 2026-2035

Project Priority (High, Medium, Low): High

Action 15. Tree Mortality Action Plan – Monitoring, Prevention, and Mitigation

Hazards Addressed: Wildfire, Climate Change, Drought

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Tree mortality in Plumas County has increased significantly due to drought stress, bark beetle infestations, and wildfire damage. Dead and dying trees create dangerous fuel loading conditions, elevate the risk of crown fire, and threaten public safety by increasing hazards along roads, recreation areas, and near homes. Without a coordinated action plan, tree mortality will continue to outpace response efforts, reducing forest health, weakening community resilience, and increasing long-term suppression costs.

Project Description: This project will promote and develop a county-wide Tree Mortality Action Plan to provide a framework for monitoring, prevention, and mitigation activities. The plan will:

- Establish protocols for monitoring and early detection of insect infestation and drought stress.
- Identify priority treatment zones based on risk to communities, infrastructure, and evacuation routes.
- Support removal and safe utilization of dead and dying trees through biomass and wood product markets.
- Promote reforestation with climate-resilient and fire-adapted native species.
- Coordinate with landowners, agencies, and utilities to ensure effective and consistent implementation.
- Incorporate public education on tree health, defensible space, and long-term forest stewardship.

Other Alternatives:

- Address tree mortality on a parcel-by-parcel basis without a coordinated county strategy (inefficient and costly).
- Rely solely on emergency hazard tree removal during wildfire response or post-disaster recovery (reactive rather than proactive).

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Community Wildfire Protection Plan (CWPP), Local Hazard Mitigation Plan (LHMP), CAL FIRE Tree Mortality Task Force guidelines, U.S. Forest Service Forest Health and Restoration programs

Responsible Office/Partners: Plumas County Fire Safe Council, CAL FIRE, U.S. Forest Service (Forest Health Protection, Plumas National Forest), Feather River Resource Conservation District, Plumas County Planning and Public Works Departments, Local Fire Protection Districts, Utility companies (hazard tree management along powerlines)

Benefits (Losses Avoided):

- Reduced hazardous fuel loads from dead and dying trees.
- Improved firefighter and public safety along evacuation routes and public spaces.
- Enhanced forest health and resilience to drought and pests.
- Protection of homes, infrastructure, and utilities from falling hazard trees and wildfire spread.
- Increased availability of biomass and wood products as beneficial by-products of removal.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Assistance (HMA) grants, CAL FIRE Forest Health and Fire Prevention grants, USDA Forest Service Forest Health Protection funding, PG&E Vegetation Management Programs, Local government and community cost-share initiatives

Timeline: Ongoing

Project Priority (High, Medium, Low): Medium

Action 16. Tributaries Forest Recovery Project

Hazards Addressed: Ag Hazard: Severe Weather; Climate Change; Drought & Water Shortage (w/tree mortality; Flood (1%/0.2% annual chance and Localized Stormwater); Severe Weather: Extreme Heat, Heavy Rains and Storms; Wildfire (w/smoke and air quality)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The Tributaries project encompasses a large portion of the major tributaries to Indian Creek. Indian Creek flows through Genesee and Indian valleys where flooding and channel instability are current hazards to the populace and agricultural operations. Over 60% of the Tributaries project area sustained high severity fire, with near complete loss of forest structure. Additionally, many of the headwater streams within the project area lost all large wood and vegetative channel structure, resulting in repeated debris flows. These events were most notable in July 2020, October 2021 and June 2023, damaging or destroying County and Federal forest road infrastructure. These debris torrents are loading up the mainstem stream channels with sediments poised to be mobilized in the next major flood event, potentially impacting populated areas long after the "emergency" is over. Many of the degraded mainstem and headwater meadows were also severely impacted by fire severity, adversely affecting their ability to store and meter these sediments. 226 road crossings were surveyed in the Tributaries project area. 187 crossings were deemed to be at risk of failure, with further risk of damaging sediment loads released into the Indian Creek system.

Furthermore, to forestall the potential for the Feather River watershed to convert to a fire-dominated chaparral ecosystem, both reforestation and commercial/pre-commercial thinning of residual green stands are significant activities in the Tributaries project. Creating a more fire resilient forest structure will also mitigate flood, debris flow and drought conditions in the future.

Project Description: Plumas Corporation is the lead partner assisting the Plumas National Forest with planning and implementation of the 163,000-acre Tributaries Forest Recovery Project (Tributaries). Tributaries is an all-hands, all-lands project to accelerate recovery of all forest values in the Dixie (2021) and Walker (2019) fire footprints. The proposed actions in the Tributaries project represent a suite of the following activities to replace lost forest conditions, while incorporating the predicted effects of climate change: conduct site preparation and conifer planting in strategic locations; improve the resilience of remaining green forest stands to future wildfire by fuel reduction and thinning from below; restore and enhance wildlife and botany with an emphasis on elk, California spotted owl (CSOW) and aquatic resources; identify, assess and develop treatments for road crossings that are impairing water quality, impacting downstream sediment supplies and/or are barriers to aquatic organism passage; develop restoration alternatives to restore meadow function for multiple benefits; and develop a suite of maintenance activities to ensure the investment in the recovery of forest values is sustained.

The project has completed CEQA review, with the NEPA process planned for completion by the end of the 2025 calendar year.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Tributaries Forest Recovery Project Environmental Assessment & Decision Notice (2025), California's Wildfire and Forest Resilience Action Plan (2021), USDA Forest Service Wildfire Crisis Strategy (2022), Feather River Watershed Strategy (2004), Upper Feather River Integrated Regional Water Management Plan (2016), California State Water Action Plan (2014), Sierra Nevada Conservancy 2024-2029 Strategic Plan (2024)

Responsible Office/Partners: Plumas Corporation, Plumas National Forest, Plumas County, Trout Unlimited, Maidu Summit Consortium

Benefits (Losses Avoided): Reduction in flood stage in Genesee and Indian valleys, avoiding damage/loss to agricultural productivity, ranch/farm infrastructure, and residential homes; Reduction in sediment supply downstream, improving water quality for aquatic resources, recreation, and agricultural irrigation; Reduction in water temperatures, improving water quality for aquatic species and recreation; Increased surface water residence time extending surface water availability for wildlife and vegetation, and allowing for enhanced infiltration to shallow and deeper groundwater basins mitigating impacts from drought and water shortage, climate change, and wildfire; Reduction in forest fuel loads, creating forest stands that are more resilient to wildfire and burn at lower intensity creating less smoke and reducing impacts on air quality.

Potential Funding (Local Budgets, Grant Funds, etc.): Estimated costs- $125,000,000. Grants- State grant programs via CA Wildlife Conservation Board, Sierra Nevada Conservancy, and CalFire; Plumas National Forest Dixie Fire funds; Corporate Investments- Microsoft, Coca-Cola, Disney, Proctor and Gamble, etc.

Timeline: 2026-2035

Project Priority (High, Medium, Low): High

Action 17. Prescribed burning projects and Plumas Underburn Cooperative programs

Hazards Addressed: Wildfire

Issue/Background (Problem Statement): Wildfire proves a threat to Plumas County communities as proven by losses from many high-intensity fires of recent memory (2021 Dixie Fire, 2021 Beckwourth Complex, and 2020 North Complex to name a few). High-intensity wildfires in the Wildland-Urban Interface will continue to threaten lives, infrastructure, and natural resources as our forests at the elevation of 3,000 to 4,000 feet (where many communities are located) historically burned every 3-5 years. By strategically treating areas around communities with prescribed fire we can mimic historic (pre-colonization) low-intensity wildfires to minimize losses to communities and restore forest health.

Not only is prescribed fire a tool utilized by agencies and organizations, it is a common tool for landowners managing small-acre private lands. Resources on how to properly implement prescribed fire on private lands been inadequate until a few years ago, leading to pile burns "escaping" and turning into wildfires. The Plumas Underburn Cooperative (PUC), a program of PCFSC and Feather River Resource Conservation District, started in 2019 to increase education related to prescribed burning within the County. PUC is a prescribed burn association

Project Description: The Plumas County Fire Safe Council, along with partners and contractors will plan, prepare, and implement prescribed burning across different scales within Plumas County. With projects across public and private lands, the main goal of this project is community protection (mitigating wildfire hazards), with the added benefits of forest restoration and community education. This can include utilizing firefighters, contractors, and natural resource specialists to do burning at a large scale, volunteers and community members at a small scale, or any mix of personnel and objectives. Project preparation includes fireline construction/improvement (utilizing handlines, roads, and/or dozer line, etc.) and fuels rearranging (logging, mastication, hand thinning/piling, hand thinning/scattering, hand thinning/chipping, and/or other mechanical fuels reduction methods). Prescribed burning implementation follows preparation; where a pile burn or a broadcast burn will take place. Community engagement is key in every step of this process, ensuring the public is aware of all activities to keep them safe and informed.

The Plumas Underburn Cooperative (PUC) has proved to be a great tool for accomplishing many small goals around the community. This includes educating landowners and neighbors about how and why to do forest treatments around their property, with the goal of emphasizing prescribed fire, and how to burn safely. From participating in the program, community members are helping each other create a safer community, working with Firewise Communities and other community organizations. PUC is a strong program, giving community members resources to accomplish hazard mitigation goals at a low cost to the community and the grantor (historically the funding needs for the program are for Program Manager(s), equipment, and other small programmatic costs). Through educating the community about prescribed fire using PUC as the tool, there will be more community members supportive of larger-scale prescribed burning and other hazard mitigation projects.

Although there are many tools that can be utilized in hazardous fuels reduction projects to rearrange ladder fuels (chipping, scattering, and masticating), burning is an ideal solution because it eliminates the fuel source entirely. The only other comparable solution is to haul debris off-site to a landfill/transfer site or greenwaste facility utilizing trucks, which can be more time intensive, labor intensive, and expensive.

Other Alternatives:

1. Thinning and leaving material on-site. This would consist of other types of hazardous fuels reduction projects without prescribed fire (mastication, hand thinning and chipping, or hand thinning and scattering).
2. Thinning and transporting material off-site. This would consist of hand thinning and placing chips or whole/partial amounts of vegetation into trucks and hauling to transfer site, landfill, greenwaste facility, or other. Logging would be another example of this.
3. No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: CA SB 310 (civil liability, cultural burns), CA SB 926 (prescribed fire claims fund), CA Standardized Prescribed Fire Plan, Plumas County Community Wildfire Protection Plan (CWPP), 2025 Plumas County Hazardous Fuels Assessment - Deer Creek Resources, LLC, Plumas County Local Hazard Mitigation Plan (LHMP), CAL FIRE Burn Permitting (as required), NSAQMD Air Pollution Permitting (as required), Other planning mechanisms.

Responsible Office/Partners: Plumas County Fire Safe Council (education, implementation, and outreach), Feather River Resource Conservation District (implementation and outreach), CAL FIRE (funding, implementation, and outreach), USDA Forest Service (funding, implementation, and outreach), Feather River College (education and outreach), The Watershed Research and Training Center (education, implementation, outreach),Plumas Prescribed Fire Training Exchange partners (education and implementation), Other partners as opportunities arise.

Benefits (Losses Avoided): Prescribed burning projects benefit the community by reducing the risk of losing lives, infrastructure, and natural resources by moderating fire behavior during high-severity wildfires. This moderated fire behavior increases the chances of flammable infrastructure (i.e. homes, businesses, outbuildings) catching on fire and allows fire suppression resources (i.e. fire crews and fire engines) to safely engage and defend communities.

Furthermore, educating the community on safe residential burning practices can benefit the community by reducing wildfires started by improper residential burning practices.

Potential Funding (Local Budgets, Grant Funds, etc.): Grant opportunities: CAL FIRE, USDA Forest Service, Sierra Nevada Conservancy, Other state, federal, and private grant programs

Timeline: Starting at the beginning of this plan and then ongoing

Project Priority (High, Medium, Low): High

Annex G Plumas Eureka Community Services District

G.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Plumas Eureka Community Services District (PECSD or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the PECSD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

G.2 Planning Process

As described above, the PECSD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table G-1. Additional details on Plan participation and District representatives are included in Appendix A.

Table G-1 Plumas Eureka Community Services District– Planning Team

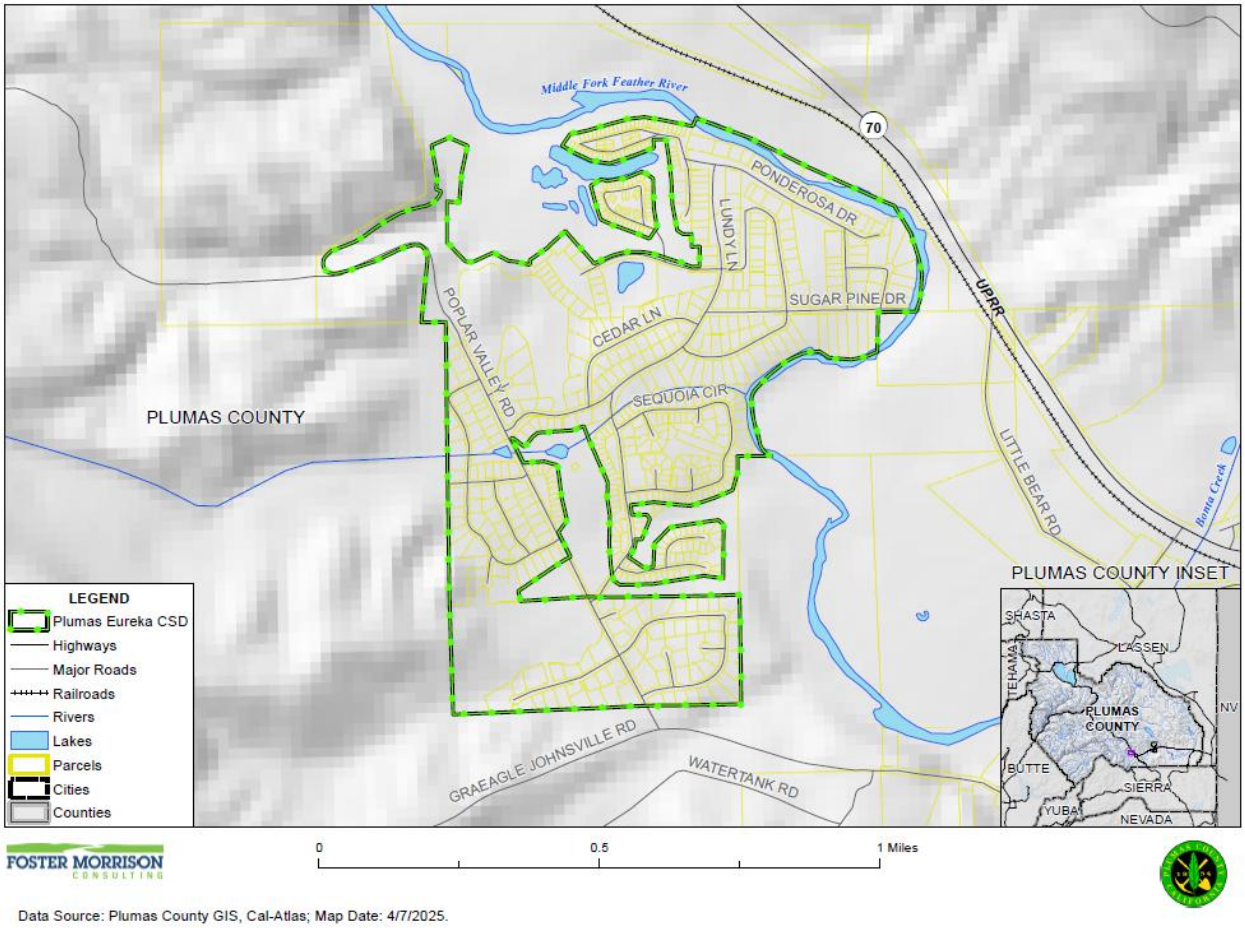
Name	Position/Title	How Participated
Jamar Tate	General Manager	Attend meetings, review previous plan, provide plan updates
John Rowden	Extra help	Consultation

Source: PECSD

G.3 District Profile

The community profile for the PECSD is detailed in the following sections. Figure G-1 displays a District map and the location of PECSD within Plumas County. Figure G-2 shows the parcels inside the District, as well as the location of water and the golf course.

Figure G-1 Plumas Eureka Community Services District



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Figure G-2 Plumas Eureka Community Services District – Parcels Map

Source: PECSD

G.3.1. Overview and Background

PECSD provides fire suppression, emergency medical, water, wastewater, snow removal and road maintenance services. PECSD was formed in 1993 as an independent special district. The area was originally served by County Service Area (CSA) 8, until 1989 when the CSA was dissolved. Following the dissolution, the Board of Directors (County Board of Supervisors) of the dissolved CSA formed the CSD to continue providing services formerly provided by the CSA to the residents and land owners of Plumas-Eureka Estates and Eureka Springs Subdivision, such as water and wastewater. In addition, the newly formed CSD took on the responsibility of fire services, which had been operating under the direction of the developer of the community with cooperation from Plumas County since 1981. The District currently provides the same services as when it was formed. PECSD is considering adding parks and recreation to the list of its services. A piece of land was donated to PECSD in 2010, and the District is now planning to turn it into either a dog park or a picnic area.

The PECSD boundary is entirely within Plumas County. The District's boundaries encompass approximately half of a square mile. There has been one annexation to and no detachments from the District since its formation. In 1994, the District annexed Eureka Springs Subdivision, which encompassed 62 acres or 0.1 square miles. Now the District consists of the Plumas Eureka Estates, the Eureka Springs Subdivision, and the Village of Plumas Pines Subdivision, and surrounds the Plumas Pines golf course. Many of the residential homes are located adjacent to the golf course.

Through an informal agreement with the Sheriff's Office, which is discussed in more detail in the Fire Service Section, the District responds outside of its boundaries. The District's fire service area extends beyond its boundaries to the east and south and includes an area of 20 square miles compared to half a mile of boundary area. PECSD provides fire protection services to two property owners in the community of Johnsville. The District provides extra-territorial fire services to the communities of Blairsden, Graeagle, Clio and Whitehawk under a joint automatic aid dispatch with GFPD. It also has informal mutual aid agreements with all other fire service providers in Eastern Plumas County. The District does not provide any extra-territorial water and wastewater services.

G.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The PECSD risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- G.4.1 Assets Inventory and Growth and Development Trends
- G.4.2 Hazard Identification
- G.4.3 Hazard Profiles and Vulnerability to Specific Hazards

G.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the PECSD's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the PECSD's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section G.4.3 Hazard Profiles and Vulnerability to Specific Hazards.

- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section G.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District. The District has four full-time staff members, not including the volunteer fire department. In addition to District staff, the District provides services to 320 year-round residents and 1,000 seasonal.

The median age in Plumas Eureka, according to census data is 67.5 years of age, accounting for 57.3% of the population. This age demographic is considered elderly. In the event of wildfire or other catastrophic event, evacuation of this population may be difficult.

Structures and Critical Facilities

This section considers the PECSD's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in***

severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table G-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. PECSD's physical assets, valued at over $18 million, consist of structures and infrastructure to support the District's operations.

Table G-2 PECSD Critical Facilities and Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Fire Station/CSD Offices	Emergency response, administrative	$704,680	Wildfire, high winds, earthquake
Wastewater Treatment Plant #6	Wastewater treatment	$480,737	Wildfire, high winds, flooding, earthquake
Wastewater Treatment Plant #7	Wastewater Treatment	$ 1,857,242	Wildfire, high winds, earthquake
Well 1b	Potable Water Supply	$88,276	Wildfire, high winds, earthquake, drought
Well 2	Potable Water Supply	$88,276	Wildfire, high winds, drought, earthquake
Water Distribution System	Water Supply Infrastructure	$10,000,000	Earthquake
Wastewater Collection System	Wastewater Conveyance Infrastructure	$3,000,000	Earthquake
Water Storage Tanks	Potable Water Supply/Storage	$1,800,000	Earthquake, Wildfire
Sequoia Lift Station	Pump Station- Raw Sewer	$80,000	Earthquake
Tank House	Effluent Storage	$84,148	Earthquake, high winds,
Lift Station- Poplar Valley Road	Pump Station	$157,614	Earthquake
Total		**$18,340,973**	

Source: PECSD

Community Lifelines

Assessing the vulnerability of the PECSD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.

- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the PECSD to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.

- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

PECSD has a variety of natural resources of value to the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. Specifically, the District values its groundwater, surface water & riparian corridors, wetlands, timber/mixed conifer forests, as well as the wild & scenic river (Feather River).

Historic and Cultural Resources

PECSD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. PECSD does not have any unique historical or cultural resources within District boundaries but there are resources adjacent to the District such as Plumas-Eureka State Park, historic mining town of Johnsville, and Johnsville Historic Ski Bowl.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the PECSD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

The primary economic asset in Plumas Eureka is the golf resort of Plumas Pines. Plumas Pines is the major employer in our jurisdiction, employing approximately 20-30 people seasonally, including the Longboards Restaurant. Resort events include numerous golf tournaments, weddings, reunions, prom, and other special events. Rental properties are another economic asset in Plumas Eureka, many homes are rented during the peak golf season, bringing an increase in population to the jurisdiction. Hazard events would impact these economic drivers and assets by limiting accessibility of patrons to these businesses and homes. A catastrophic event would hinder the income of the golf resort and potential cause closure if the hazard event damage was significant.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community

Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

Currently, there is no expected growth or development areas within District boundaries. Like the rest of the County, the District expects population to be flat or slowly shrink. The District noted that it has no control over future populations it serves, it only reacts to population changes by providing additional (or reduced) services.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. While there is no expected growth or development areas within District boundaries, PECSD is currently in the design process for a water treatment facility. It is anticipated that this facility will be completed within 2-3 years and will be designed to meet the standards for arsenic, iron, and manganese.

G.4.2. Hazard Identification

The PECSD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table G-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table G-3 PECSD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Likely	Critical	Low	Medium
Climate Change	Limited	Unlikely	Limited	Medium	--
Dam Failure	Extensive	Likely	Limited	Low	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Occasional	Catastrophic	High	High
Earthquake (w/subhazards)	Significant	Likely	Limited	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Likely	Limited	Low	Medium
Floods: Localized Stormwater	Significant	Occasional	Limited	Medium	Medium
Hazardous Materials Transport	Limited	Unlikely	Negligible	Low	--
Landslide, Mudslide, Debris Flow	Extensive	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Significant	Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Negligible	Low	Medium
Volcano	Extensive	Unlikely	Limited	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

G.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the PECSD (as identified in the Significance column of Table G-3). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section G.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section G.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

PECSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment. The District noted that there have been no Power Outages, including those associated with PSPS events, that have affected them.

Plumas Eureka CSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The District falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the PECSD, the Plumas County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

PECSD Events

The District noted that climate change is occurring, but could recall no events related directly to climate change.

Vulnerability to Climate Change

The whole of the District is at some measure of vulnerability to climate change. The District Planning Team has concerns that the vulnerability of the District to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the District's assets at risk, and impacts to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Prolonged periods of heat and dryness that contribute to drought and water shortages are of major concern to the District. This impacts their aquifer levels and contributes to tree mortality which is a large issue for PECSD. The District has seen an increase in tree mortality due to drought related issues. Specifically, the invasive species, bark beetles. In addition, climate change can be linked to other hazards the District is concerned about.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time.

While all populations (District staff and those served by the District) can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people,

people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section G.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities and Infrastructure

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the District are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the District support rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the District are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the extreme heat and drought hazard, areas of wetlands in the District may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the District is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.

- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

PECSD faces a tighter, more volatile operating environment as climate change shifts snowmelt earlier, lengthens dry seasons, and raises summer peaks—reducing late-season groundwater and stressing wells just as demand climbs. Heavier downpours and rain-on-snow events elevate localized flooding, erosion, and access issues, and a longer wildfire season drives smoke exposure, PSPS power outages, and tree mortality.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As climate change continues to accelerate over time, climate related impacts to the District will continue to increase.
- Population projections for the area served by the District show shrinking populations, which should reduce the affect of this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect climate change impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Climate change can influence future development in the District over time. The District could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are

currently no formal studies of specific migration patterns expected to impact the District, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the secondary hazards of drought in the Plumas County Planning Area, that can also affect PECSD, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Plumas County. This can be seen in Table G-4. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County since 2012.

Table G-4 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the District.

PECSD Events

Based on historical information, the occurrence of drought in California, including the PECSD, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years that likely affected the District. Drought has occurred in the past and will occur in the future.

In 2024, PECSD spent $8,200 for the removal of large Ponderosa Pine trees that required the use of crane due to the location of the surrounding homes and underground infrastructure. Trees on District property are being removed yearly due to tree mortality. Drought is an annual occurrence in the District.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California

must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the PECSD to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Chief concern with drought for the District is the recovery of ground water aquifers over an extended period of drought. The District noted that, so far, this has not been an issue of urgency but will be monitored. PECSD does have two groundwater wells but has not experienced any water shortage. Water levels in the wells have monitoring equipment and recover after use, especially in the "off season" for irrigation. Summer months see an increase in water demand due to irrigation practices. PECSD has water conservation measures in place during the summer months to reduce the misuse of water.

The District's water supply is vulnerable to recurring droughts and long-term climate variability, which threaten water reliability for both residential and community needs. Current water demand for non-potable uses such as irrigation places unnecessary strain on potable supplies. Without diversifying supply and reducing reliance on potable water for irrigation and landscaping, the District faces increased risk of water shortages during extended dry periods.

In recent years our District has seen an increase in tree mortality. In 2024, PECSD spent $8,200 for the removal of large Ponderosa Pine trees that required the use of crane due to the location of the surrounding homes and underground infrastructure. Trees on District property are being removed yearly due to tree

mortality. Also, as precautionary measures, Plumas-Sierra Rural Electric Co-Op has been removing dead or dying trees yearly that pose a risk to overhead powerlines in the area. Approximately 5-7 trees were removed by PSREC within District boundaries in 2024.

There are no relevant plans in place for drought, the District has water conservation measures in place to address misuse of water. The District does not have a plan in place to address the tree mortality issue, invasive insects such as the bark beetle have wreaked havoc on the tree population due to the drought conditions. It is difficult to anticipate which trees will be affected from year to year.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities. The District noted the following assets in Table G-5 at risk from drought.

Table G-5 PECSD Assets at Risk from Drought

Name of Asset	Facility Type	Replacement Value
Well 1b	Potable Water Supply	$88,276
Well 2	Potable Water Supply	$88,276

Source: PECSD

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, golf course watering, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PECSD include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Planning Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

The District's water supply is vulnerable to recurring droughts and long-term climate variability, which threaten water reliability for both residential and community needs. Current water demand for non-potable uses such as irrigation places unnecessary strain on potable supplies. Without diversifying supply and reducing reliance on potable water for irrigation and landscaping, the District faces increased risk of water shortages during extended dry periods.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–Extremely High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. The PECSD, Plumas County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the District are shown in Section 4.3.10 of the Base Plan. These include the Almanor Fault,

Butt Creek Fault Zone, the Mohawk Valley Fault, and others that traverse the County. The Indian Valley Fault is also considered an active fault located within the County. A significant seismic event on any of these major faults could cause damage in the PECSD.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.10 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of some magnitude occur.. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Plumas County and the District fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Plumas County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

PECSD Events

Plumas County has numerous small seismic events per year, some are felt within the jurisdiction, while others are not. In May of 2023, a 5.5 magnitude earthquake in the Lake Almonor area was felt throughout the County including Plumas Eureka. As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The HMPC noted no past occurrences of earthquakes that affected the District in any meaningful way.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. More urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Plumas County Planning Area,

seismic hazard mapping indicates that the District has low to moderate seismic hazard potential. There is the potential for the District and Plumas County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

The whole of the District is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The biggest concerns in an earthquake are damage to critical facilities and infrastructure. In a significant seismic event, PECSD's water distribution system and sewer collection would be vulnerable. PECSD operates welded/bolted steel ground storage tanks that predate modern seismic standards. This vulnerability was identified in a Preliminary Engineering Report (PER) by Stantec Engineering in 2016. A significant earthquake could cause tank shell buckling, roof/shell failures, piping breaks, or foundation distress—resulting in major water loss, service outages, contamination risk, and inability to provide required fire flows to the community. Seismic retrofits or replacement are needed to maintain life-safety functions and continuity of operations.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those residing in the District Service Area) are at risk from earthquake shaking and associated hazards. The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County and District may be affected is included in Section 4.3.10 of the Base Plan.

Structures and Critical Facilities and Infrastructure

Many structures and critical facilities and infrastructure in the District are vulnerable to earthquakes, depending on the severity and location of the event. These can be seen in Table G-6. The Hazus scenarios conducted for the entire Plumas County Planning Area show how structures may be affected.

Table G-6 PECSD Assets at Risk to Earthquake

Name of Asset	Facility Type	Replacement Value
Fire Station/CSD Offices	Emergency response, administrative	$704,680
Wastewater Treatment Plant #6	Wastewater treatment	$480,737
Wastewater Treatment Plant #7	Wastewater Treatment	$ 1,857,242
Well 1b	Potable Water Supply	$88,276
Well 2	Potable Water Supply	$88,276
Water Distribution System	Water Supply Infrastructure	$10,000,000
Wastewater Collection System	Wastewater Conveyance Infrastructure	$3,000,000
Water Storage Tanks	Potable Water Supply/Storage	$1,800,000
Sequoia Lift Station	Pump Station- Raw Sewer	$80,000
Tank House	Effluent Storage	$84,148
Lift Station- Poplar Valley Road	Pump Station	$157,614
Total		**$18,340,973**

Source: PECSD

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the PECSD staff, residents, and visitors. Other impacts to the District could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake. The District has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PECSD include the following:

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. A new water treatment facility is in the design process currently for the District and will follow and enforce the California Building Code, which mandates construction techniques that minimize seismic hazards. Future development in the District is subject to these building codes and land use planning.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The PECSD is subject to localized flooding throughout the District. This is discussed in Table G-7 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

PECSD Events

PECSD noted an event in January 2017 where localized flooding was an issue in the District. Heavy rains caused localized flooding. The wastewater collection system was inundated with flood water, damaging sewer pumps. There was erosion to roads and water main right of way. The District saw costs from the removal of debris from fallen trees. Golf course is the major business in this area, it was closed at the time of the event, but golf course did incur cost for repairs from the damage. Damage to Golf course fairways and greens, requiring clean-up and repair. Extensive damage to Golf Course drainage system located near maintenance shop, requiring major repairs.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Due to homes and critical facilities being located near and around the Middle Fork Feather River, localized flooding can cause major damage. Historically, the District has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of or inadequate drainage infrastructure in the District contributes to localized flooding issues.

The District tracks localized flooding areas. Affected localized flood areas identified by the PECSD are summarized in Table G-7.

Table G-7 PECSD – List of Localized Flooding Problem Areas

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Ponderosa Drive	X		X	X		X	X
Sugar Pine Drive	X			X		X	
Sugar Pine Ct.	X					X	

Source: PECSD

The District noted that evacuation routes are not currently clearly identified or communicated to residents, which could result in confusion and delays during an emergency. Additionally, the District lacks a coordinated notification system to quickly alert residents of evacuation orders and emergency updates. This gap creates a significant risk to public safety during hazard events. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

Wastewater Treatment Plant 6 (WWTP6) is in an area subject to seasonal flooding during periods of heavy rainfall and snowmelt. Flooding has the potential to overwhelm treatment facilities, damage mechanical/electrical components, contaminate effluent discharge, and create public health hazards. The facility's location and lack of protective flood control infrastructure increase operational risks.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the

underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PECSD include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development

traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the District, such as the water treatment plant, will add to the drainage issues already faced by the District, unless adequate drainage facilities are installed in new development locations.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)

- Road building, excavation, and grading
- Earthquake

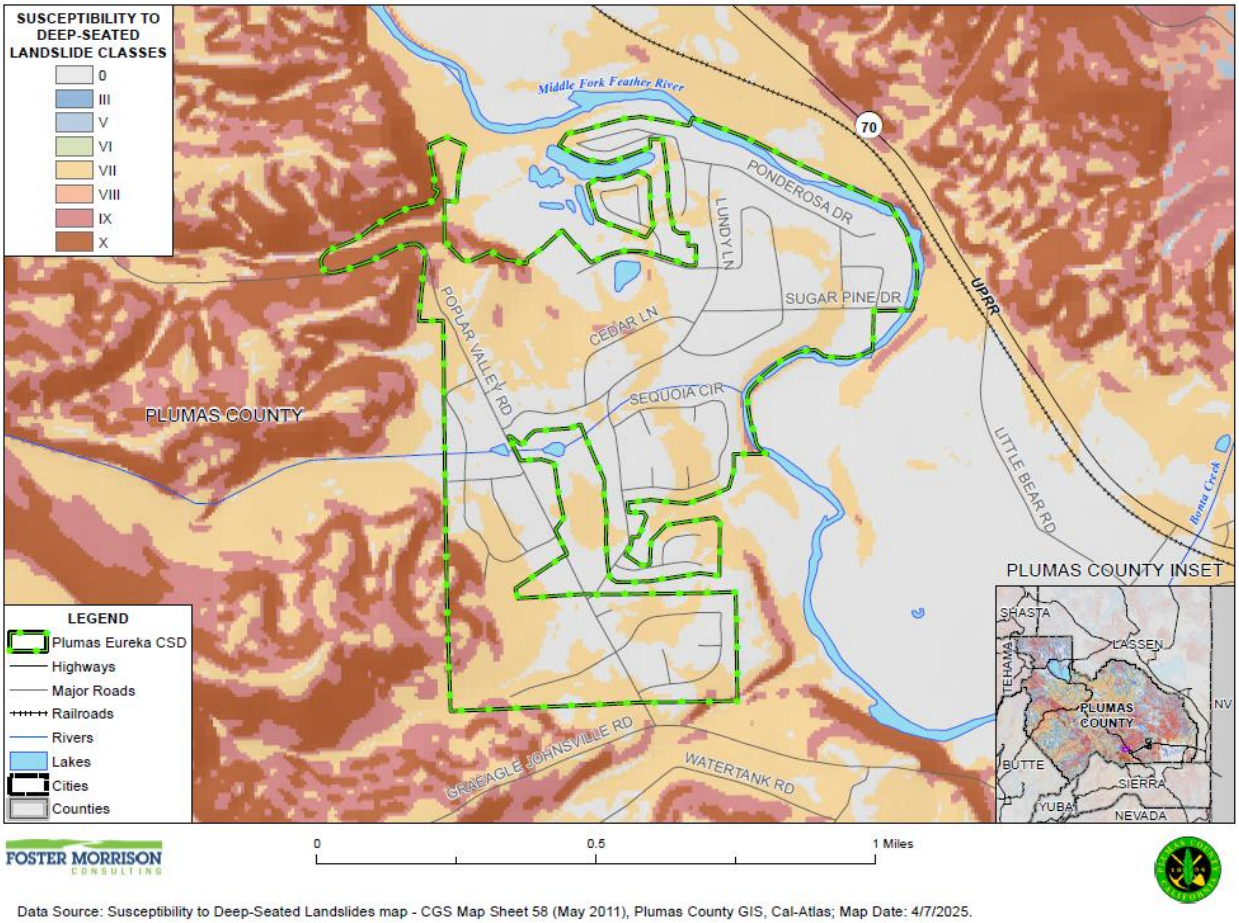
The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas bordering the District mainly to the west and partially to the east where the topography is characterized by rolling hills and ridges.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

Figure G-3 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure G-3 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table G-8. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the western portions of the District and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure G-3 PECSD – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Table G-8 PECSD – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Jurisdiction/ Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	207	59.7%	103	61.7%	104	57.7%
III	0	0%	0	0%	0	0%
V	0	0%	0	0%	0	0%
VI	0	0%	0	0%	0	0%
VII	118	33.9%	52	31.0%	66	36.6%
VIII	0	0%	0	0%	0	0%
IX	11	3.2%	4	2.6%	7	3.7%
X	11	3.2%	8	4.7%	3	1.9%
Grand Total	**348**	**100.0%**	**168**	**100.0%**	**180**	**100.0%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Plumas County; however, as shown in Table G-9, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table G-9 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993.

PECSD Past Occurrences

In 2017, there was damage to the District from erosion. Fortunately, a full landslide did not occur from the erosion. The District's main water transmission line, an eight inch PVC pipe that conveys water from the source wells to the storage tanks, was left exposed by erosion that removed cover from where the line crossed the creek. Options for protecting the water line included

- Boring under the creek and reburying the water line.
- Boring under the creek, encapsulating the water line and reburying the line under the creek
- Rerouting the water line so it does not go under the creek.

A very preliminary cost estimate was done for the first option of $50,000.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the District are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. Post wildfire areas are also more prone to landslide events. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure

to landslide. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

During landslide, transportation routes may be cut off. Currently, evacuation routes are not clearly identified or communicated to residents, which could result in confusion and delays during an emergency. Additionally, the District lacks a coordinated notification system to quickly alert residents of evacuation orders and emergency updates. This gap creates a significant risk to public safety during hazard events.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and District residents) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. Most vulnerable are those people working or residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in the District service areas as well as District staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Landslides can affect the built environment of the District and those structures and critical facilities located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure G-3 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area District, since most of this occurs in the less developed areas of the District.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the District susceptible to landslide. Based on the risk assessment, there is potential for significant landslides to occur in the District. Most, but not all, of the historic landslides in the District have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the District to landslide.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the District. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the District would place additional values at risk to landslide. New District facilities will take landslide into account when siting new facilities.

Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Excess snow can cause avalanches to occur. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are some of the most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to agricultural industry.

Location and Extent

Extreme cold and freeze events occur on a regional basis. Due to the elevation of the District, the winter months can see temperatures dip as low as 17ºF as the average high with sub-zero temperatures possible in the evenings. There is no scale for extreme cold and freeze other than temperatures below 32°F. Extreme cold and freeze have a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Extreme cold can occur in any location of the City. All portions of the District and County are at risk to extreme cold and freeze.

Snowfall can affect almost all areas of the County and the District. Average annual snowfall can be up to 54” with an average of 13” throughout the District. Depending on the elevation of any given area, severe snowstorms are some of the most common extreme weather events that occur in the City and Plumas County. There is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of snowfall other than snow depths. Heavy snow has a slow to moderate onset and can generally be predicted in advance for the County. Snow events can last for hours or for days, and snow can stay on the ground for weeks to months at a time.

Avalanche affects only certain areas of the County and the District. PECSD is at a moderate to high risk for avalanches during winter due to heavy snowfall, steep terrain, and cold climate conducive to unstable snowpack. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement to create an avalanching episode. Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This scale can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for extreme cold and freeze. There were no disasters from snow or from avalanche. Table G-10 shows the dates of the disaster declarations. There have been USDA disaster declarations (2016, twice in 2022, 2023) from freeze since 2012.

Table G-10 Plumas County – Federal and State Disaster Declarations for Freeze 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	2007	0	–

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 549 extreme cold, freeze, and snow incidents for Plumas County since 1993, some of which likely affected the District.

PECSD Events

The District noted no known past events that have caused lasting impacts.

Climate Change and Extreme Cold, Freeze, and Snow (w/avalanche)

According to the 2021 CAS (as well as the 2024 Draft CAS), freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow (w/avalanche)

Extreme cold and freeze events happen in the District each year. Snow occurs regularly and can contribute to avalanches occurring in sloped areas. Cold, freeze, snow, and avalanche can impact both structures and populations in the Planning Area and in extreme conditions, may affect the ability of the District to operate. The whole of the District and County Planning Area has some measure of vulnerability to extreme cold, freeze, and snow, including avalanches.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to District. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Vulnerable populations in the District, specifically the elderly, are a high concern to PECSD. If a power outage were to occur from extreme cold or freeze, loss of heat sources could be deadly. Along with this, heavy snow could cause problems for emergency services, decreasing response time and causing apparatus to be immobile if roads have not yet been plowed.

The District is also concerned with rain on snow events, which can cause greater flooding in the District.

PECSD's key vulnerabilities include single-point dependencies (single access routes to facilities), power and communications exposure (PSPS/outages, SCADA/cellular interruptions), winter road/access constraints, and small-staff call-out depth. Extreme cold and freeze events can immobilize service lines, sampling lines, valves, hydrants, and tank appurtenances. Heavy snow and ice routinely bury hydrants and valves, block access to wells, tanks, and leach-field boxes, and disrupt power/telecom; priority actions include a dedicated facility snow route with on-call plowing, road/gate, hydrant staking, clearing access to hydrants, pre-winter preparation of facilities.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations the District serve are at some vulnerability to extreme cold, freeze, and snow, as well as avalanches. Some employees may face a risk while working outdoors. All populations served by the District are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside (including District staff). Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Snow has an effect on buildings, but its effect on people and populations are minimal. Avalanche can affect populations, though the District has few developed areas at risk to avalanche.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur and can be heavy enough to damage structures. Transportation networks, communications, and utilities

infrastructure are the most vulnerable physical assets in the District. Infrastructure such as roads, highways, and bridges can become slippery or blocked by large snow events, causing accidents and road closures. Buildings in the upper elevations of the District can be affected directly by avalanche events. Most of these events occur away from structures in the District.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the District may be affected. During periods of freeze, trees in the District may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the District. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the District can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

One of the most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur during extended periods of snow when new snow is deposited on the existing snow pack causing stress on the layers beneath and triggering a collapse resulting in an avalanche. Avalanches can also be triggered by severe weather such as high winds and unusually warm weather and even earthquake events. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the District include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow (and avalanche) and their associated impacts to the District.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District area are expected to be limited in the near future and thus are not likely to affect extreme cold and freeze and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current State of California and Plumas County codes provide such provisions for new construction. New wells and appurtenances will be built inside insulated buildings, reducing the risk of loss of potable water due to frozen pipes.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought

can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the District. Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues.

Location and Extent

Extreme heat events occur on a regional basis. In a higher elevation climate, the District typically has mild summers, however, can still experience periods of significant heat. The temperature average is around 80ºF but can get as high as 90ºF and even more rare, 95ºF. Extreme heat can occur in any location of the District. Extreme heat occurs throughout the District primarily during the summer months.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 7 extreme heat incidents for Plumas County since 1993, some of which likely affected the District.

PECSD Events

The District could not recall any past events of note.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Plumas County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Plumas County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the District. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the District is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The elderly are at a higher vulnerability to extreme heat, but all individuals can experience heat related illnesses, which is of high concern for the District. In addition, the District is concerned that heat may stress drought damaged trees, increasing the risk of wildfires.

Extreme heat drives higher peak demand (especially irrigation) just as groundwater performance can dip, stressing wells and storage. Water quality is harder to maintain: higher demand results in increased level of constituents such as arsenic, iron and manganese. Equipment—VFDs, motors, control panels—runs hotter, increasing over-temperature trips without added ventilation or shading. Regional heat waves also elevate grid outage/PSPS risk, while generators run harder and consume more fuel. Finally, worker safety is impacted: heat illness risk shortens safe field windows and slows responses, especially when smoke + heat occur together.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to extreme heat. Those District employees that work outdoors or inside facilities without proper cooling systems are likely to be most affected by extreme heat conditions.

Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues. All populations served by the District are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers (like District staff); individuals that lack the resources to afford heat; and the young, old, or medically fragile

individuals are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures and Critical Facilities and Infrastructure

Extreme heat normally does not generally impact structures and critical facilities and Infrastructure, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The District noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in District, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the District that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The District experiences temperatures in excess of 90°F during the summer and fall months. The temperature moves to 95°F in rather extreme situations. During these times, drought conditions may worsen, and the District may see an increase in dry fuels contributing to the wildfire hazard. Extreme heat can damage agricultural assets in the District service territory. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heat and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development in the District will take extreme heat into account. In the event of grid-tied power outages, a reliable backup power source must be included in development plans. Additionally, implementing energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the District occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the District falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the District.

Location and Extent

Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the District as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table G-7 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the District and Plumas County. Duration of severe storms in the District can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table G-11. IN addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table G-11 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

PECSD Events

A severe weather event in 2017 with heavy rains, snow and high winds causing flooding, erosion and fallen trees. Private property damage occurred and the total of insured losses is unknown. On January 8, high surface and ground water levels resulted in extraordinary infiltration into the District's two sewage collection systems. The System at WWTP #6 overflowed inside the sewer plant flooding three pumps described in project 5 and resulting in a brief spill outside the plant. WWTP#7 also flooded internally, but did not damage any equipment. The two District system operators were required to work overtime to contain the problems at both facilities.

On February 9, 2017, the Middle Fork of the Feather River inundated condominiums by the flooding River. The manholes on Ponderosa Drive were flooded. The Wastewater treatment plant that is located in the area and serves the area was monitored through the evening hours and shutdown. The Volunteer fire department was asked to help to notify and evacuate residents.

Over the period of repetitive storms during January and February, the Driveway leading to Wastewater Treatment Plant #7 at 245 Sequoia Circle sustained heavy damage due to erosion. The driveway had never sustained this level of damage in the past. Based on two bids, the estimated repair cost is $4500.

In addition to this, the District noted that heavy rains and storms are an annual occurrence often resulting in flooding. Events causing flood issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the PECSD. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the District is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Heavy rains on top of snow have caused flooding in the District in the past and is a major concern for the private structures and critical facilities. The District also noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. A list of localized flooding problem areas are shown on Table G-7 above. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to heavy rains and storms. Those District employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the District have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

District facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the District. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New District facilities follow state and local building codes which should reduce the risk to future development in the District from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the District.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the PECSD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

Wildfire Smoke and Air Quality

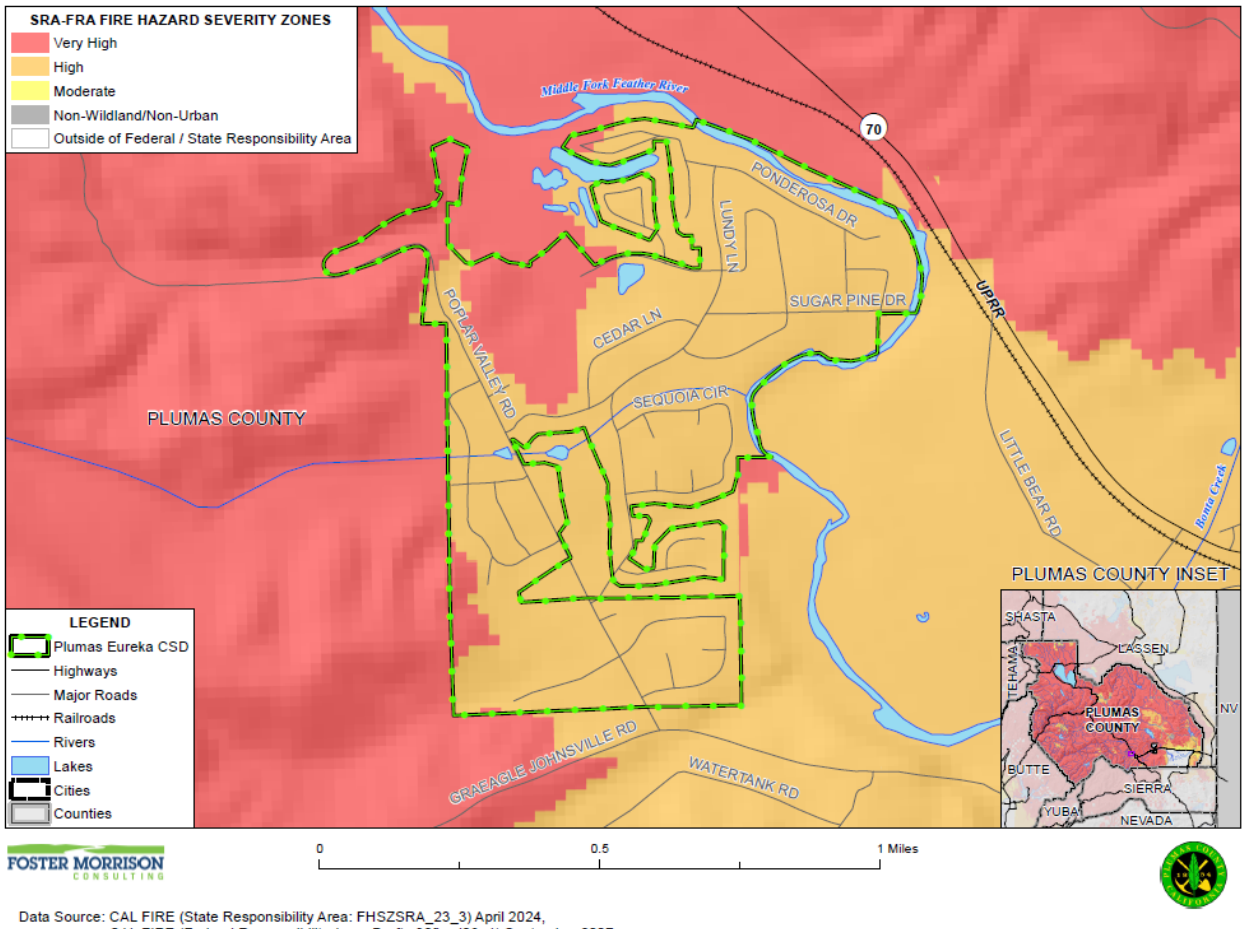
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the PECSD were created. Figure G-4 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure G-5 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Moderate to Very High.

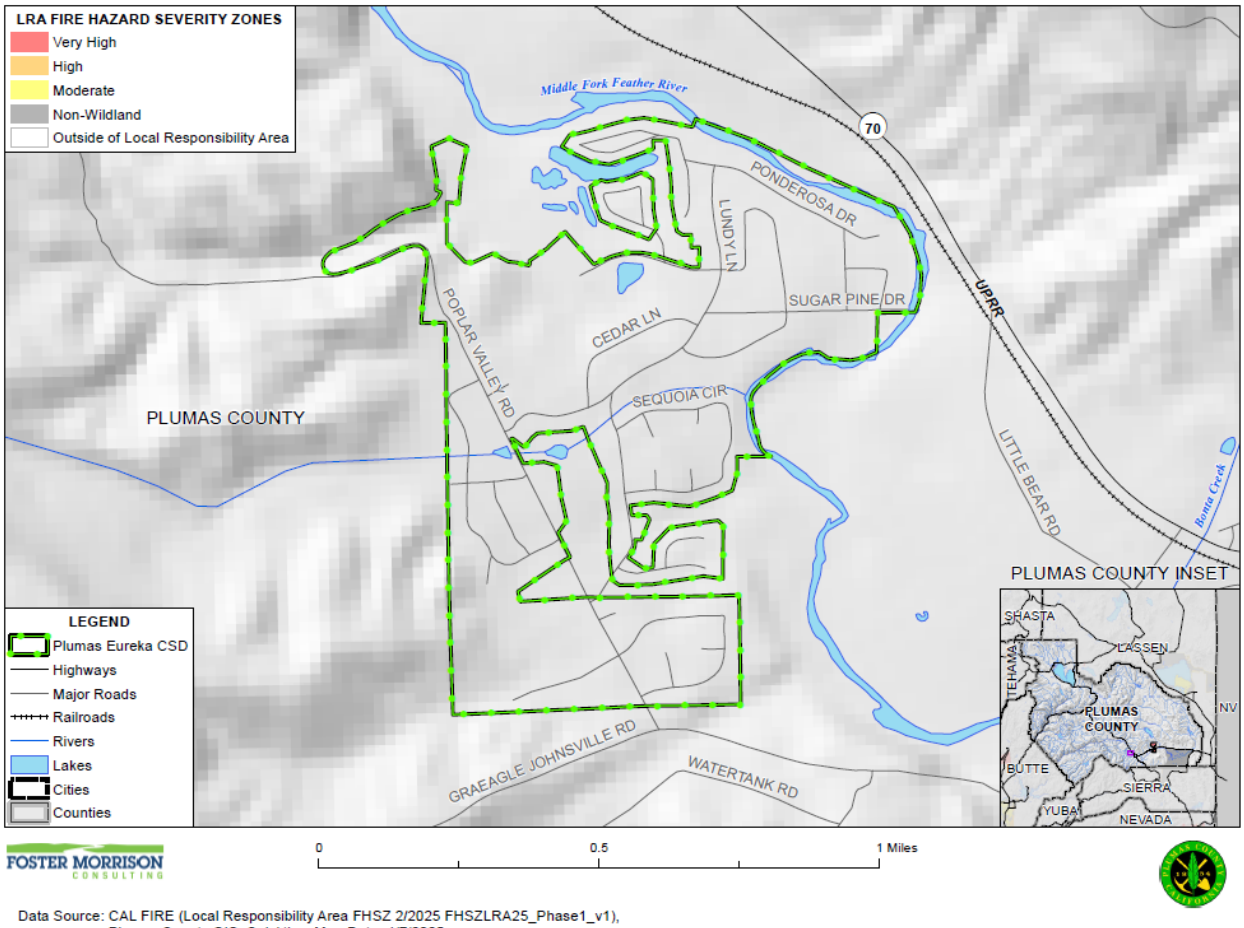
Figure G-4 PECSD – CAL FIRE SRA/FRA Fire Hazard Severity Zones



FOSTER MORRISON CONSULTING

Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Figure G-5 PECSD – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table G-12, while extents in the LRA are shown on Table G-13.

Table G-12 PECSD – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	52	15.0%	23	13.6%	30	16.4%
High	295	85.0%	145	86.4%	150	83.6%
Moderate	0	0%	0	0%	0	0%
Non-Wildland/Non-Urban	0	0%	0	0%	0	0%
Outside of Federal / State	0	0%	0	0%	0	0%

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Responsibility Area						
Grand Total	**348**	**100.0%**	**168**	**100.0%**	**180**	**100.0%**

Source: CAL FIRE

Table G-13 PECSD – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0%	0	0%	0	0%
High	0	0%	0	0%	0	0%
Moderate	0	0%	0	0%	0	0%
Non-Wildland	0	0%	0	0%	0	0%
Outside of Local Responsibility Area	348	100.0%	168	100.0%	180	100.0%
Grand Total	**348**	**100.0%**	**168**	**100.0%**	**180**	**100.0%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table G-14.

Table G-14 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

PECSD Events

In 2021, the Dixie Fire caused poor air quality in the District due to heavy smoke. Other fires have caused air quality issues as well. The District noted no fires that have directly affected them.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Plumas Eureka is surrounded by Plumas National Forest. In the event of a wildfire, egress from the District could be challenging depending on the location of the fire. The main ingress and egress route for the District is E. Poplar Valley that intersects Johnsville Road. The west end of Poplar Valley Road within the District leads into forested areas. With an elderly population in the District, evacuation efforts could be challenging. The District is also concerned about their facilities being burned by wildfires.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused, infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. The District is most concerned with the assets listed in Table G-15.

Table G-15 PECSD – Assets at Risk to Wildfire

Name of Asset	Facility Type	Replacement Value
Fire Station/CSD Offices	Emergency response, administrative	$704,680
Wastewater Treatment Plant #6	Wastewater treatment	$480,737
Wastewater Treatment Plant #7	Wastewater Treatment	$ 1,857,242
Well 1b	Potable Water Supply	$88,276
Well 2	Potable Water Supply	$88,276
Water Storage Tanks	Potable Water Supply/Storage	$1,800,000

Source: PECSD

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause

short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts to the District include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. Plumas Eureka CSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment. Without backup electricity generation, water and wastewater could not be conveyed. Water quality will also suffer if water treatment functionality is compromised. The economic impact alone to the District including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the PECSD include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional assets at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, District building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

G.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

G.5.1. Regulatory Mitigation Capabilities

Table G-16 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PECSD.

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will

conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table G-16 PECSD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Does not address hazards, used to identify infrastructure improvements.
Climate Change Adaptation Plan		
Community Wildfire Protection Plan		
General Plan/Comprehensive Plan/Master Plan		
Continuity of Operations Plan		
Economic Development Plan		
Land Use Plan		
Local Emergency Operations Plan		
Stormwater Management Plan		
Transportation Plan		
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use		
Building code		
Flood insurance rate maps		
Floodplain ordinance		
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)		
Subdivision ordinance		
Zoning ordinance		
Other		
How can these capabilities be expanded and improved to reduce risk?		
The creation of a continuity of operations plan will help PECSD by providing guidance of how to continue operations of the District's critical infrastructure, including administrative functions during disaster event. This plan should identify the potential hazards and a plan of operation should the hazard impact the community.		

Source: PECSD

G.5.2. Administrative/Technical Mitigation Capabilities

Table G-17 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the PECSD.

Table G-17 PECSD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N/A	
Civil Engineer, including dam and levee safety	N/A	
Community Planner	N/A	
Emergency Manager	N/A	
Floodplain Administrator	N/A	
GIS Coordinator	N/A	
Planning Commission	N/A	
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	Grants have been used to obtain standby power for facilities and purchase of fire equipment
Hazard data and information	N/A	
GIS analysis	N/A	
Mutual aid agreements	Y	Fire Department has mutual aid agreements with neighboring Departments. District is also registered with CalWarn mutual aid for water systems.
Other		
How can these capabilities be expanded and improved to reduce risk?		
An area of improvement that the District is currently working on is GIS of the community to provide accurate mapping and tracking of assets. PECSD has many critical facilities that are vital public health and safety. Another area for improvements is hazard data and information to identify and track hazard events in the District. Participating in the LHMP is a positive step to help the District in this area.		

Source: PECSD

G.5.3. Fiscal Mitigation Capabilities

Table G-18 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table G-18 PECSD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Resource has been used to fund various infrastructure improvement projects.
Community Development Block Grant		
Federal funding programs (non-FEMA)		
Fees for water, sewer, gas, or electric services	Y	Funding of operations & maintenance activities. These funds are allocated to water and sewer enterprise activities.
Impact fees for new development		
State funding programs	Y	State Revolving Fund (SRF) used as loan for the planning of a water treatment facility.
Stormwater utility fee		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Pursue funding sources through grants or other resources to address and mitigate hazards to the community.		

Source: PECSD

G.5.4. Mitigation Education, Outreach, and Partnerships

Table G-19 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table G-19 PECSD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	Semi-annual distribution to all customers.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Firewise meets multiple times per year. Updates to Firewise activities are included in newsletter.
Local news		
Organizations that interact with underserved and vulnerable communities		
Social media		
How can these capabilities be expanded and improved to reduce risk?		
Continue to educate the community of the hazards and risks through the newsletter, website, and community events.		

Source: PECSD

G.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

- There has been an increase in dead trees due to the invasive bark beetle. Dozens of dead or dying trees are removed yearly from both District and private property. The biggest impact is the costs associated with tree removal, in 2024 the District spent $8,200 for the removal of two very large Ponderosa Pine trees requiring the use of a crane.
- The District does have evacuation plan pamphlets that are distributed to new homeowners/customers. These pamphlets are also distributed to Fire Department related function such as Pancake Breakfast on Memorial Weekend and Labor Day BBQ. PECSD also worked with Feather River Resource Conservation in 2022 to reduce fuels on District owned properties.
- Plumas Eureka CSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment.

G.6 Mitigation Strategy

G.6.1. Mitigation Goals and Objectives

The PECSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

G.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Some of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

G.6.3. Mitigation Actions

The Planning Team for the PECSD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Dam Failure
- Floods: 1%/0.2% annual chance
- Hazardous Materials Transport
- Severe Weather: High Winds and Tornado
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Establishment of Evacuation Routes and Resident Notification System

Hazards Addressed: Earthquake, Localized Flood, Landslide, Severe Winter Storms, and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas Eureka CSD is located in a high-risk wildfire area and is also subject to hazards such as winter storms, flooding, and seismic activity. Currently, evacuation routes are not clearly identified or communicated to residents, which could result in confusion and delays during an emergency. Additionally, the District lacks a coordinated notification system to quickly alert residents of evacuation orders and emergency updates. This gap creates a significant risk to public safety during hazard events.

Project Description: The District will develop and implement a comprehensive evacuation planning and notification program. Project components include:

- Identification and mapping of primary and secondary evacuation routes for the community
- Installation of signage and wayfinding indicators along evacuation routes
- Development of an emergency notification system using multiple platforms (reverse 911, text/email alerts, sirens, and community bulletin boards)
- Coordination with Plumas County Office of Emergency Services, local fire agencies, and law enforcement to ensure consistent procedures
- Conducting community outreach, education workshops, and evacuation drills to familiarize residents with routes and protocols

- Integration of evacuation planning into the District's Emergency Operations Plan (EOP) and Local Hazard Mitigation Plan (LHMP)

Other Alternatives: Rely on county-wide evacuation procedures without PECSD-specific planning. Use door-to-door notification only, which is time-intensive and may not reach all residents in a timely manner.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Local Hazard Mitigation Plan (LHMP), Plumas County Emergency Response and Evacuation Plan, Coordination with CAL FIRE and local fire department response plans

Responsible Office/Partners: Plumas Eureka Community Services District (PECSD), Plumas County Office of Emergency Services, Plumas Eureka Fire Department, Plumas County Sheriff's Office, Local community groups and homeowner associations

Benefits (Losses Avoided): Improved life safety by reducing confusion and delays during evacuation. Faster and more reliable communication with residents during emergencies. Reduced burden on first responders through proactive planning and community preparedness. Increased resilience and confidence among community members

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMGP), FEMA Pre-Disaster Mitigation (PDM) program, California Office of Emergency Services (Cal OES) funding opportunities, Local District funds and partnerships with homeowner associations, USDA Rural Development emergency preparedness grants

Timeline: Route mapping and planning: 6–12 months. Notification system development and implementation: 1–2 years. Community education and ongoing drills: Continuous/Annual

Project Priority (High, Medium, Low): High

Action 2. Flood Risk Reduction for Wastewater Treatment Plant 6 (WWTP6)

Hazards Addressed: Localized Flooding, Severe Weather: Heavy Rains and Storms, Infrastructure Vulnerability

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Wastewater Treatment Plant 6 (WWTP6) is in an area subject to seasonal flooding during periods of heavy rainfall and snowmelt. Flooding has the potential to overwhelm treatment facilities, damage mechanical/electrical components, contaminate effluent discharge, and create public health hazards. The facility's location and lack of protective flood control infrastructure increase operational risks.

Project Description: This project will assess and implement measures to reduce flooding risks at WWTP6. The project will include:

- Completion of a hydrologic and hydraulic (H&H) flood study to evaluate flood risk, flow patterns, and site-specific vulnerabilities.
- Topographic survey and mapping of flood-prone areas around WWTP6.
- Evaluation of climate change projections for increased rainfall intensity and snowmelt impacts.
- Feasibility study of flood protection measures such as berms, floodwalls, or site grading.
- Development of an emergency response and flood monitoring plan for WWTP6 operations.
- Implementation of selected protective actions (e.g., constructing berms, improving site drainage, elevating equipment, installing floodproof electrical controls).

Other Alternatives: Relocate WWTP6 to a less flood-prone area – Cost prohibitive. Rely on sandbagging and temporary emergency measures – Not reliable or sustainable for long-term resilience. Do nothing – Continues exposure to flood risk and potential regulatory violations.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PECSD Capital Improvement Plan (CIP), Plumas County Local Hazard Mitigation Plan (LHMP), Wastewater Operations & Maintenance Plan

Responsible Office/Partners: Plumas Eureka Community Services District (PECSD), Consulting Engineers (DOWL, Bastian Engineering, ProWest, etc.), Plumas County Office of Emergency Services, California State Water Resources Control Board

Benefits (Losses Avoided): Protection of critical wastewater infrastructure from flood damage. Prevention of untreated wastewater release into waterways. Reduction of regulatory and environmental liability. Improved community safety and resilience. Reduced costs of emergency response and system repairs.

Potential Funding (Local Budgets, Grant Funds, etc.): State Revolving Fund (SRF) Loan/Grant Programs, FEMA Hazard Mitigation Grant Program (HMGP), USDA Rural Development (RD), Local PECSD Capital Reserves

Timeline: Flood study and vulnerability assessment: 12 months. Design of protective measures: 12 months. Construction/implementation: 18–24 months. Total estimated project duration: 3–4 years

Project Priority (High, Medium, Low): High

Action 3. Recycled Water Use

Hazards Addressed: Drought, Water Supply Shortages, Extreme Heat, Climate Change Impacts

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The District's water supply is vulnerable to recurring droughts and long-term climate variability, which threaten water reliability for both residential and community needs. Current water demand for non-potable uses such as irrigation places unnecessary strain on potable supplies. Without diversifying supply and reducing reliance on potable water for irrigation and landscaping, the District faces increased risk of water shortages during extended dry periods.

Project Description: The District will implement a recycled water use program by developing infrastructure to capture, treat, and distribute treated wastewater effluent for non-potable applications such as irrigation of public parks, golf courses, and landscaping around public facilities. Project components include:

- Feasibility study and engineering design for recycled water distribution system
- Construction of storage, treatment, and pumping facilities for recycled water
- Installation of purple pipe distribution lines to identified non-potable use areas
- Development of public education and outreach on recycled water benefits
- Integration of monitoring and reporting mechanisms to ensure compliance with state regulations

Other Alternatives: Continue reliance on potable water for irrigation, increasing vulnerability during drought.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Local Hazard Mitigation Plan (LHMP), Capital Improvement Plan (CIP), State and Regional Water Board permits and approvals

Responsible Office/Partners: Plumas Eureka Community Services District (PECSD), California Regional Water Quality Control Board, Engineering consultants and contractors

Benefits (Losses Avoided): Reduced demand on potable water supplies during drought conditions. Cost savings over the long term by reducing potable water treatment and pumping for irrigation. Enhanced drought resilience and climate change adaptation. Increased community awareness and acceptance of sustainable water practices

Potential Funding (Local Budgets, Grant Funds, etc.): State Revolving Fund (SRF) for water recycling projects, FEMA Hazard Mitigation Grant Program (HMGP), Potential federal infrastructure grants, Local District capital improvement funds

Timeline: Planning and design: 1–2 years. Construction: 2–4 years. Full implementation and monitoring: 5 years

Project Priority (High, Medium, Low): High

Action 4. Water Storage Tank Retrofit or Replacement

Hazards Addressed: Earthquake and Wildfire (loss of water service and fire flow)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): PECSD operates welded/bolted steel ground storage tanks that predate modern seismic standards. This vulnerability was identified in a Preliminary Engineering Report (PER) by Stantec Engineering in 2016. A significant earthquake could cause tank shell buckling, roof/shell failures, piping breaks, or foundation distress—resulting in major water loss, service outages,

contamination risk, and inability to provide required fire flows to the community. Seismic retrofits or replacement are needed to maintain life-safety functions and continuity of operations.

Project Description: Retain a licensed hydrogeologist and structural engineer to complete a phased program.

The project will replace PECSD's existing water storage tanks with new, code-compliant steel reservoirs designed to current seismic standards (e.g., AWWA D100 and ASCE 7) to ensure post-earthquake service and fire flow. Work includes geotechnical evaluation and upgraded foundation, tank procurement and construction with adequate freeboard and internal baffles (as needed), seismically robust anchorage and shell/roof details, and modernization of appurtenances (vents, overflows, hatches, level instruments, ladders, cathodic protection). Piping will be reconfigured with flexible couplings/seismic joints, thrust restraint, and seismically actuated isolation where appropriate. The project provides temporary bypassing to maintain service during construction, followed by demolition of the old tanks, site restoration, integration with SCADA, commissioning, and as-built documentation. This retrofit/replacement will reduce the risk of catastrophic tank failure, minimize outage and water-quality impacts, and improve system resilience and fire protection.

Other Alternatives: No action (accept service interruption and damage risk). Intertie with neighboring systems to provide emergency supply only.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PECSD Capital Improvement Plan; PECSD Emergency Response Plan; Plumas County LHMP

Responsible Office/Partners: PECSD General Manager (lead); PECSD Operations Staff; Consulting Hydrogeologist; Structural Engineer; Geotechnical Engineer

Benefits (Losses Avoided): Maintains potable supply and fire flow post-earthquake; reduces risk of catastrophic tank failure, water loss, environmental release, boil water notices, extended outages, costly emergency repairs, and regulatory violations; improves community resilience and life safety.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Assistance (BRIC, HMGP), Cal OES Hazard Mitigation, California SRF (planning/construction), USDA RD Water & Waste Disposal, CDBG, local capital reserves.

Timeline: Planning/assessment/design: 9–12 months; Permitting/bid: 3–6 months; Construction: 6–12 months. Total: ~18–30 months from notice-to-proceed.

Project Priority (High, Medium, Low): High

Annex H South Feather Water and Power Agency

H.1 Introduction

This Annex details the hazard mitigation planning elements specific to the South Feather Water and Power (SFWPA or Agency), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the Agency. This Annex provides information specific to the SFWPA, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

H.2 Planning Process

As described above, the SFWPA followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the Agency formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table H-1. Additional details on Plan participation and Agency representatives are included in Appendix A. FILL OUT TABLE WITH WHO PARTICIPATED AND HOW.

Table H-1 SFWPA – Planning Team

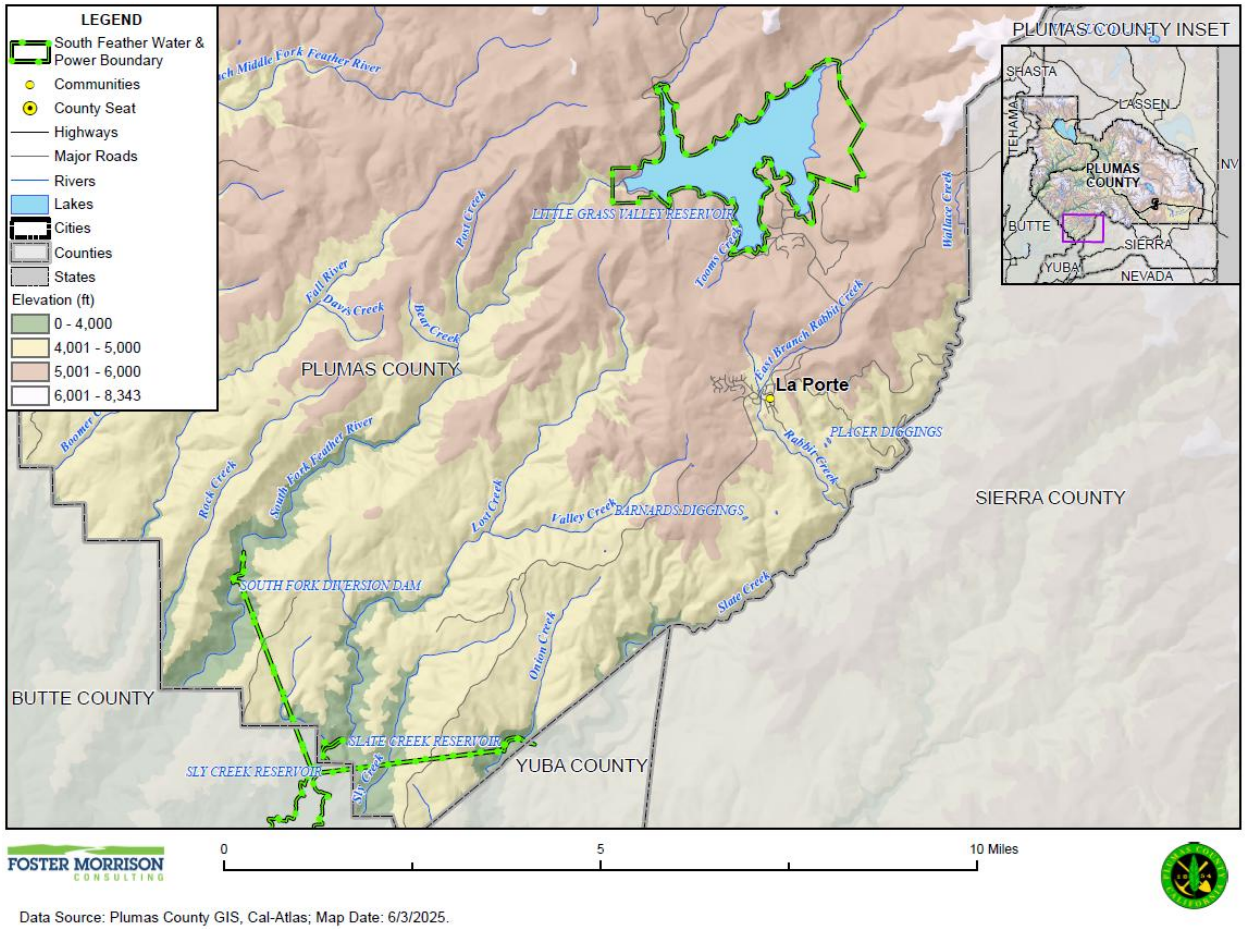
Name	Position/Title	How Participated
Kristen McKillop	Regulatory Compliance Manager	Attended every coordination meeting hosted by PC OES. Provided Agency details, hazard identification, hazard input, developed mitigation project, and provided document review and comments.
Hunter Doyle	Power Division Manager	Worked to develop mitigation strategies and provided document review and comments.

Source: SFWPA

H.3 Agency Profile

The community profile for the SFWPA is detailed in the following sections. Figure H-1 displays a Agency map and the location of SFWPA within Plumas County.

Figure H-1 SFWPA



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 6/3/2025.

H.3.1. Overview and Background

South Feather Water and Power Agency – originally named Oroville Wyandotte Irrigation District ("OWID") – has roots extending back to the California gold rush. The ditch system utilized by the Agency today to distribute its irrigation water is a modification and expansion of the ditch network constructed by early miners who diverted water from tributaries of the Feather River to their mining claims.

OWID was organized on November 17, 1919, and included 16,800 acres of land. The District was formed by assuming the old water rights from the South Feather Land and Water Company and the Palermo Land and Water Company. The residential growth rate within the District was greatly accelerated by the housing demands associated with the construction of the Oroville Dam in the early 1960's. By 1962, OWID served approximately 4,800 acres of agricultural land, with 8,000 AF of irrigation water delivered by the District. In addition to irrigation service, the district furnished water to approximately 2,500 residences.

As a result of the concern for an adequate water supply and for a revenue source to fund the District's expanding infrastructure, the District's board of directors proposed the construction of the South Feather Power Project (originally named South Fork Project, FERC License No. 2088). The Agency's hydropower

project is located in Butte, Plumas and Yuba counties on the South Fork of the Feather River and Slate Creek, a tributary to the North Fork Yuba River, and mostly within the Plumas National Forest.

The project lies within the Middle Fork Feather hydrologic unit (1802023), and water is supplied to the project from two watersheds; the South Fork Feather River watershed and the North Fork Yuba River watershed. The United States Forest Service has managed up to 1,146,000 acres of scenic mountain lands designated as the Plumas National Forest in the northern Sierra Nevada since the Forest was established in 1905. The SFPP lies within the boundaries of the Plumas National Forest, includes a small piece situated on federal lands administered by the Bureau of Land Management, and the balance is on SFWPA owned lands, or private property. Project facilities are located on the South Fork Feather River; on Lost Creek, a tributary to the South Fork Feather River; and on Slate Creek, a tributary to the North Yuba River. The highest elevation facility, Little Grass Valley Dam is located at about 5,050 feet above sea level, while the lowest elevation facility, Kelly Ridge Powerhouse, is located at about 225 feet above sea level.

The power project facilities include eight dams, seven tunnels, four powerhouses, and an open conduit that includes elevated flume and siphon sections. There are a series of reservoirs owned and operated by SFWPA; Little Grass Valley, Sly Creek, Lost Creek, Ponderosa and Miners Ranch which have a combined storage of 164,577 acre-feet. Irrigation and treated water is supplied to customers of South Feather Water and Power Agency in Butte County and North Yuba Water District in Yuba County. Water not consumed by the customers of these two organizations is released via the Kelly Ridge Powerhouse into the Thermalito Diversion Pool, owned and operated by the California Department of Water Resources as part of the California State Water Project.

The mission of SFWPA is to deliver a dependable supply of safe, quality drinking water to its current and future customers, and a dependable supply of water for irrigation and agricultural users, in an economical, efficient and publicly responsible manner for the benefit of the entire district. Hydroelectric generation facilities shall be utilized to optimize revenue from power generation, consistent with providing adequate and dependable water supplies to customers. SFWPA is also committed to providing its employees a safe work environment and encouraging personal growth and attainment of goals. The Agency service area is located 70 miles north of Sacramento on the east side of California's Sacramento Valley in the Sierra foothills of southeast Butte County. The 33,718-acre (52.68) service area, including the west side of Butte County and the areas south of Lake Oroville and east of downtown Oroville.

SFWPA is an independent special district formed under the Irrigation Code of the State of California. It is governed by a five-member elected board of directors. The Agency provides treated water service to the communities of Oroville, Palermo and Bangor in southeast Butte County. In addition to water delivery, power generation, and agricultural irrigation, SFWPA provides a multitude of recreational opportunities for the local communities and visitors and provides habitat for many fish and wildlife species.

H.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The SFWPA risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the Agency's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Agency Profile above, a risk assessment was performed for the Agency. This includes the following sections:

- H.4.1 Assets Inventory and Growth and Development Trends
- H.4.2 Hazard Identification
- H.4.3 Hazard Profiles and Vulnerability to Specific Hazards

H.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the SFWPA's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the SFWPA's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the Agency, potentially at risk to identified hazards as discussed in Section H.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the Agency, both current and future, is presented.

Assets Inventory

The Agency's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section H.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations served by the Agency include both Agency staff as well as those populations located within Agency boundaries. This section includes an inventory of past and current populations of the Agency and also discusses vulnerable populations and underserved communities as a

subsection of people and populations located within the Agency and potentially at risk to hazards. Information from the Agency and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the Agency. The Agency's Sphere of Influence (SOI) is almost twice the size of its boundary. The SOI includes 11,853 parcels, which is slightly more parcels than the 11,127 parcels within the boundary. SFWPA currently serves just over 6,900 households with treated domestic water and 500 irrigation customers with raw water. This equates to roughly 16,900 total customers served. In addition, the Agency employs 55 staff.

According to the DWR DAC mapping tool, Census blocks where the median income is less that 80 percent of the state median income, almost the entire service area qualifies as a disadvantaged community .

Structures and Critical Facilities

This section considers the SFWPA's assets at risk, with a focus on key Agency assets such as critical facilities and infrastructure, and other Agency assets and their values. With respect to Agency assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities: (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities.

Table H-2 lists critical facilities and other Agency assets identified by the Agency Planning Team as important to protect in the event of a disaster. SFWPA's physical assets, valued at over $128 million, consist of structures and infrastructure to support the Agency's operations.

Table H-2 SFWPA Critical Facilities and Infrastructure, and Other Agency Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Little Grass Valley Dam (and related infrastructure like gates, spillways, and buildings)	Dam	$50,093,499.30	Climate Change, Dam Failure, Earthquake, Landslide, Heavy Rains and Storms, Wildfire
South Fork Diversion Dam (and related infrastructure like gates, spillways, and buildings)	Dam	$37,458,903.87	Climate Change, Dam Failure, Earthquake, Landslide, Heavy Rains and Storms, Wildfire
Slate Creek Diversion Dam (and related infrastructure like gates, spillways, and buildings)	Dam	$40,956,799.34	Climate Change, Dam Failure, Earthquake, Landslide, Heavy Rains and Storms, Wildfire

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Total		**$128,509,203**	

Source: SFWPA

Community Lifelines

Assessing the vulnerability of the SFWPA to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the Agency's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the Agency. As such, specific information on these community lifelines in the Agency and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the SFWPA to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

SFWPA has a variety of natural resources of value to the Agency. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan.

SFWPA's reservoirs provide opportunities for mountain biking, horseback riding, skiing, fishing, boating, snowmobiling, camping, swimming, picnicking, and hiking within the scenic Plumas National Forest. Two developed recreation areas are located within the South Feather Power Project's boundaries: the Sly Creek Reservoir Recreation Area, operated and maintained by SFWPA, and the little Grass Valley Reservoir Recreation Area, operated and maintained by the US Forest Service. There are 16 developed recreational facilities associated with the Little Grass Valley Reservoir Recreation Area.

Historic and Cultural Resources

SFWPA has a variety of historic and cultural resources of value to the Agency. Many of these historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. The Agency noted specific historical and cultural resources. The South Feather Power Project is largely located in the traditional territory of the Native American communities known collectively as the Koncow. The Koncow are one of three main groups representing the Maidu language family.

Figure H-2 Historical and Archeological Sites of Note

South Feather Water and Power Agency
South Feather Power Project
FERC Project No. 2088

TABLE E6.4-2
Historical and Archeological Sites within the APE Identified By South Feather Water and Power Agency during Its Relicensing Surveys.

Resource Identification #	*Type*
SLY CREEK DEVELOPMENT (Little Grass Valley Reservoir)	
PA-04-100	The site consists of a scatter of prehistoric and historic period artifacts. Approximately 100 basalt debitage fragments created during the manufacture and maintenance of lithic tools were discovered as was an applied lip whiskey bottle fragment.
PA-04-101	The site consists of a scatter of prehistoric and historic period artifacts. Approximately 250 basalt debitage fragments created during the manufacture and maintenance of lithic tools were discovered.
PA-04-102	The site consists of a scatter of prehistoric and historic period artifacts. Approximately 150 basalt debitage fragments created during the manufacture and maintenance of lithic tools were discovered as was a circular-shaped depression that may represent the remains of a prehistoric period shelter.
PA-04-103	The site consists of a large boulder with possible prehistoric period rock art inscriptions. At least two panels of the prominent boulder possess faint traces of what may be prehistoric period scratches. Modern graffiti is also present on other portions of the boulder.
PA-04-104	The site consists of a scatter of prehistoric period artifacts associated with the exploitation of a natural outcrop of basalt. Approximately 500 basalt debitage fragments, cores, and hammerstones were discovered as was one obsidian debitage fragment.
PA-04-105	The site consists of two bedrock outcrops that contain three shallow mortar cups.
PA-04-106	The site consists of a bedrock outcrop with one shallow mortar cup.
IF-04-20	This isolated stone artifact, a core, was discovered along a south facing shoreline of Little Grass Valley Reservoir.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the SFWPA to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the Agency.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the Agency.

As discussed in the Future Development section below, the South Fork Power Project heavily subsidizes the Agency's water rates, and therefore anything that happens at the headwaters of the system (and potentially inducing cascading failure of more than one dam and impacting two powerhouses along the South Fork of the Feather River) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

Community Activities of Value

Inventorying economic assets in the Agency and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring

money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the Agency.

Growth and Development Trends

As part of the planning process, the Agency looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

Much like the rest of the County, the Agency is expecting to see a slowly shrinking population over time.

Future Development Areas

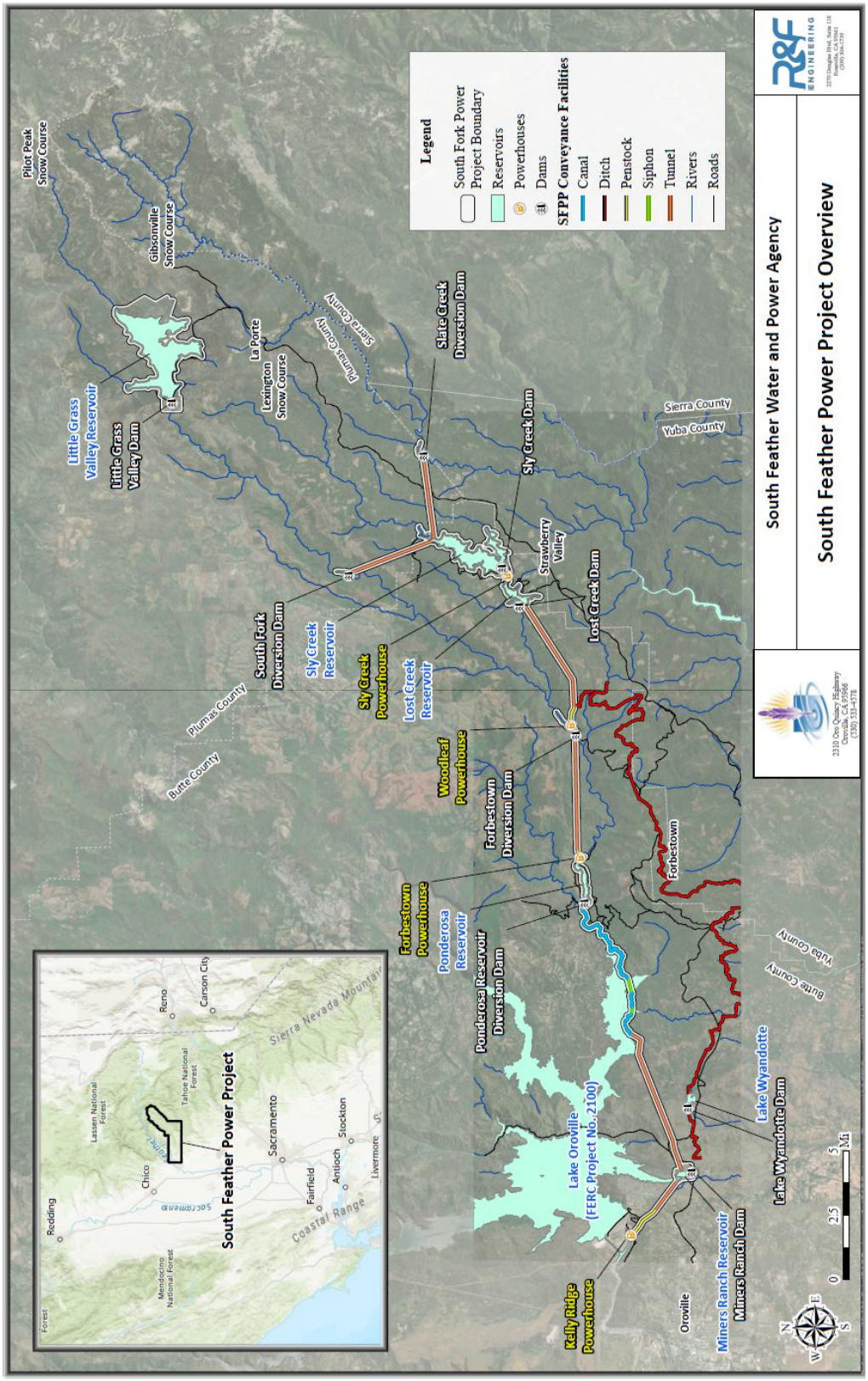
It is important to review future development plans for the Agency. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

On March 26, 2007, the South Feather Water and Power Agency (SFWPA or Licensee) filed with the Federal Energy Regulatory Commission (FERC or Commission) an application to relicense its 117.3-megawatt (MW) South Feather Power Project, FERC Project Number 2088. Since the initial license expired, SFWPA has operated the Project under annual licenses from FERC and is expected to continue to do so until a new license is issued. The Agency has no certain timeline on when the new license may be issued.

The SFWPA Project 2088 and the United States Department of Agriculture, Forest Service (Forest Service) have developed a Recreation Facilities Plan (Plan) to comply with the Forest Service's Federal Power Act (FPA) final Section (§) 4(e) terms and conditions for the Agency as a component of the new license. The overall purpose of the Plan is to provide appropriate protection, mitigation, and enhancement recreation measures for the Project by incorporating the information from SFWPA's relicensing recreation studies and the Forest Service's Final § 4(e) terms and conditions related to recreation. This Plan addresses both existing Facilities, including improvements and new Facilities, to be constructed as part of the new license. This Plan includes the requirements for major rehabilitation of existing, and development of proposed facilities at Little Grass Valley Reservoir in Plumas County. Projects will address road improvements, parking, campsite spurs, boat ramps, trail systems, public signage, toilet buildings and wastewater systems, water systems, campground and picnic sites spelled out in Chapter 3 of the Plan. It is expected that Planning, Design and Construction will begin within the first five years following license issuance.

This can be seen on Figure H-3. Additionally, the Power Project heavily subsidizes water rates, and therefore anything that happened at the top of the system (and potentially inducing failure of more than one dam and impacting two powerhouses along the South Fork of the Feather River) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities. Revenue associated with power generation by the South Feather Power Project is used to subsidize water rates for SFWPA's domestic water customers and to fund expanding infrastructure that ensure and adequate water supply. The revenue shortage that would result from the loss of a single powerhouse would have immediate consequences for SFWPA's ability to provide domestic water to its customers.

Figure H-3 SFWPA – Power Project Overview Map



Source: SFWPA

H.4.2. Hazard Identification

The SFWPA identified the hazards that affect the Agency and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the Agency.

Those hazards identified as a high or medium significance in Table H-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the Agency were determined to be of low significance and not considered a priority hazard to the Agency. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the Agency to focus resources where they are most needed.

WE NOTICED YOU MOVED DROUGHT TO A MEDIUM SIGNIFICANCE HAZARD, WILL YOU HAVE AN ACCOMPANYING MITIGATION ACTION FOR IT?

Table H-3 SFWPA—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather/ Pests/Weeds	Extensive	Highly Likely	Critical	Low	Low
Climate Change	Extensive	Likely	Limited	Medium	Medium
Dam Failure	Extensive	Unlikely	Critical	Medium	--
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Low	Medium
Earthquake	Extensive	Unlikely/Occasional	Catastrophic	Medium	Medium
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Occasional/Unlikely	Critical	Low	Low
Flood: Localized Stormwater	Significant	Highly Likely	Negligible	Low	Medium
Haz Mat Transportation	Significant	Occasional	Critical	Low	Medium
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Significant	Likely	Negligible	Low	Medium
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Low	Medium
Volcano	Extensive	Unlikely	Limited	Low	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	Medium	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

H.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the SFWPA (as identified in the Significance column of Table H-3). This section focuses on where and how the Agency is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the Agency that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the Agency follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the Agency to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes Agency provided information on how the Agency is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section H.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section H.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the Agency, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new Agency assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The Agency noted that there have been PSPS events that have impacted them, however, all power division/hydropower project assets requiring power have backup generators. The last PSPS event that could be recalled was October 2020. Transmission and distribution was temporarily affected, but the powerhouses have the ability to self-supply during these outages.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The Agency falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the SFWPA, the Plumas County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

SFWPA Events

While the SFWPA Planning Team noted no past occurrences of climate change , the Agency works in support of local Climate Action Plans to protect resources and prepare for changing precipitation patterns, reduced water supply and increased hazards such as flooding, heat waves and wildfire. While the Agency has not adopted any internal procedures to this risk, they continue to monitor the weather trends and the potential issues associated with this risk for all agency purposes.

Vulnerability to Climate Change

The whole of the Agency is at some measure of vulnerability to climate change. The Agency Planning Team has concerns that the vulnerability of the Agency to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the Agency's assets at risk, and impacts to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency is concerned that reduced snowpack or rains could cause stored water volumes in the Agency reservoirs (impounded by both Low and High Hazard dams in Plumas) to be reduced, which would lead to reduced income from power generation along with reduced ability to provide clean energy to the grid. In addition, the Agency is concerned that climate change could exacerbate wildfire in and around the Agency's dams. Not only could this damage structures, but the burn scar could cause landslides above Agency dams.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time.

While all populations (Agency staff and those served by the Agency) can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section H.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities and Infrastructure

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the Agency are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the Agency support rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the Agency are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the extreme heat and drought hazard, areas of wetlands in the Agency may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the Agency is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.

- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- As climate change continues to accelerate over time, climate related impacts to the Agency will continue to increase.
- Population projections for the area served by the Agency show shrinking populations, which should reduce the affect of this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect climate change impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Climate change can influence future development in the Agency over time. The Agency could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the Agency, climate-induced

migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

The Agency's SFP Project 2088 is not thought to be directly affected by climate change, but if climate change exacerbates the hazards in the discussions below, Project 2088 could be indirectly affected. Additionally, the Power Project heavily subsidizes water rates, any damage inducing hazard that happened at the headwaters of the system (and potentially inducing failure of more than one dam and impacting two powerhouses along the South Fork of the Feather River) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Extremely High

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

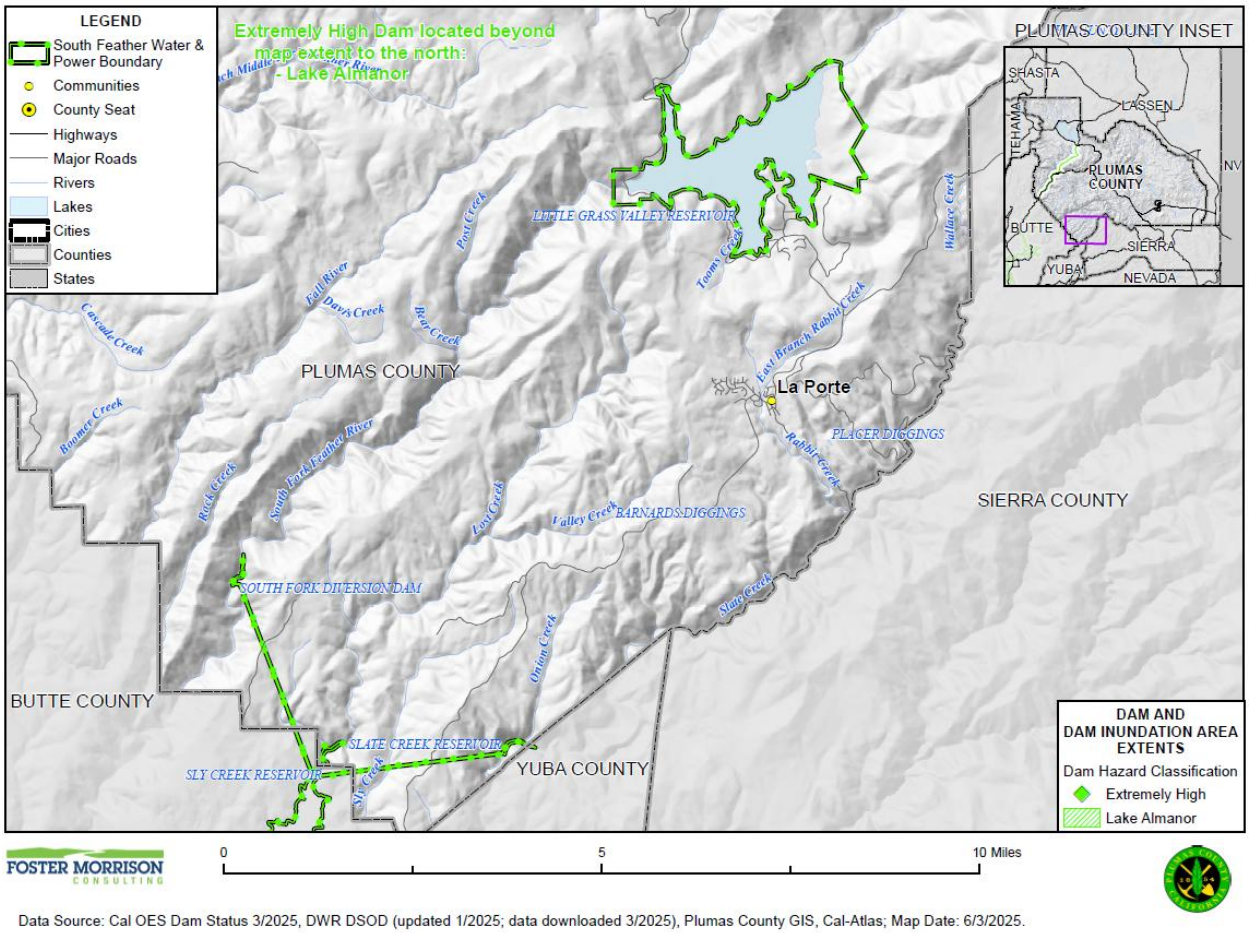
An inventory map of dams located within Plumas County was shown in Section 4.3.8 in the Base Plan. Dams with an inundation area within the SFWPA are shown on Figure H-5. This includes the Little Grass Valley Dam. In addition to this dam, the Agency is concerned with the South Fork Diversion Dam and the Slate Creek Diversion Dam. These are both owned by the Agency. These are not shown on the maps below, but are shown on Figure H-3 above.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.8 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The Agency would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is shown on Figure H-4 and Figure H-5, as well as in Table H-4. As shown, the Agency does not have any areas affected by extremely high hazard dams. As such, no tabular analysis for extents are shown.

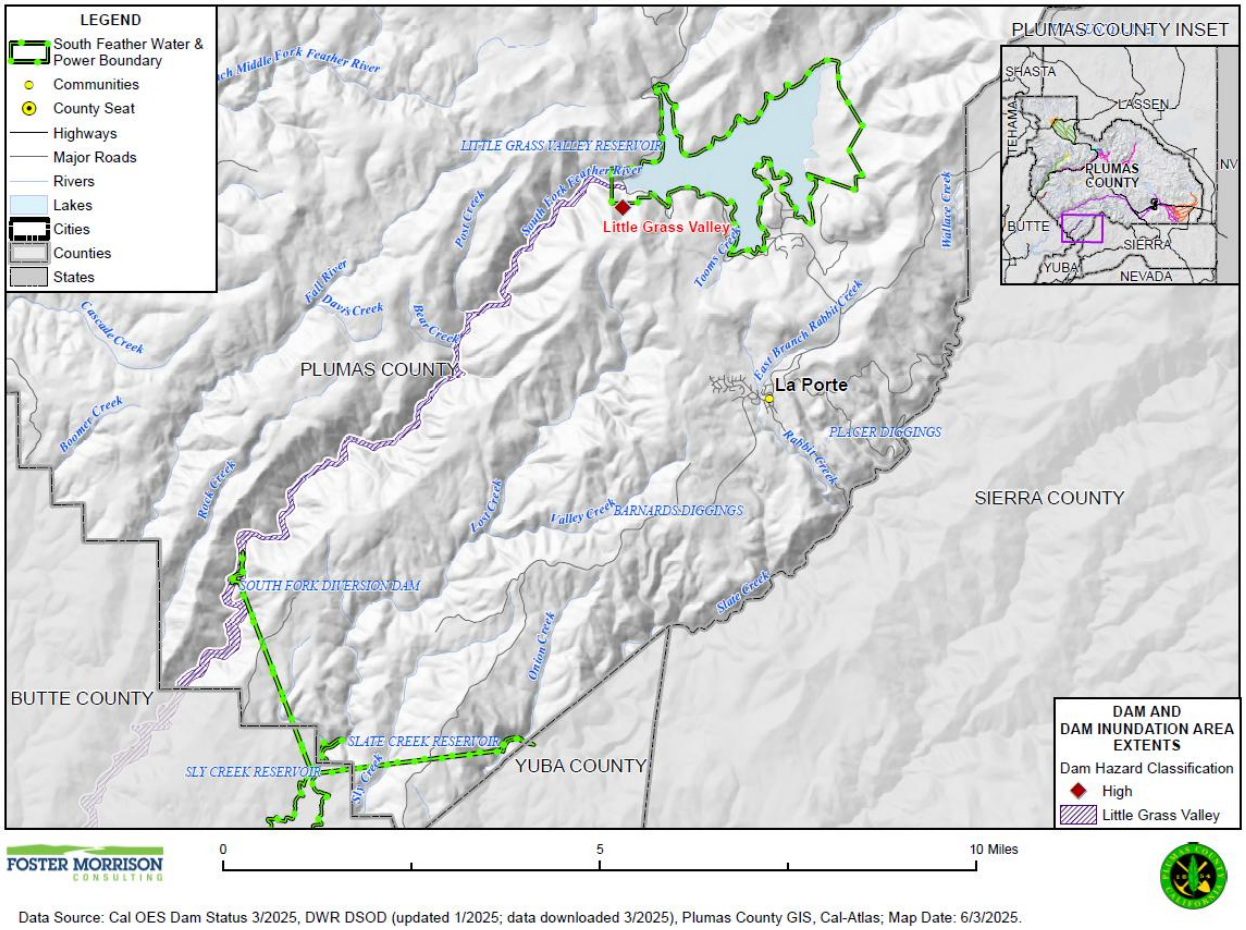
Figure H-4 SFWPA – Extremely High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 3/2025, DWR DSOD (updated 1/2025; data downloaded 3/2025), Plumas County GIS, Cal-Atlas; Map Date: 6/3/2025.

NOTE: SFWP is entirely Outside of the EH inundation area.

Figure H-5 SFWPA – High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 3/2025, DWR DSOD (updated 1/2025; data downloaded 3/2025), Plumas County GIS, Cal-Atlas; Map Date: 6/3/2025.

Table H-4 SFWPA – Dam Inundation Areas Geographical Extents

Jurisdiction / Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Little Grass Valley						
Agricultural	7	0.3%	0	0%	7	0.3%
Commercial	0	0%	0	0%	0	0.0%
Federal Lands	1,305	57%	0	0%	1,305	58%
Government	0	0%	0	0%	0	0.0%
Miscellaneous	34	2%	0	0%	34	2%
Residential	0	0%	0	0%	0	0.0%
Little Grass Valley Total	**1,346**	**59%**	**0**	**0%**	**1,346**	**59%**

Source: Cal OES, DSOD, Plumas County GIS

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Plumas County.

NCDC Events

The NCDC does not contain any dam failure events for Plumas County.

SFWPA Events

There have been no past dam failures in the Agency.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the Agency can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases grom Agency assets located in Plumas County.

Vulnerability to Dam Failure

The vulnerability of the Agency to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency maintains operational compliance with Dam Safety, Public Safety and Security guidelines set forth by FERC and DSOD in order to reduce vulnerability to dam failure events. In addition to those requirements, the Power Division team is well-versed in monitoring, documenting, and maintaining their dam and spillway structures to recognize any vulnerabilities.

Impacts to the SFWPA from dam failure include damage to property and critical facilities. Costs to repair dams that fail would also fall to the SFWPA for any Agency owned dams.

While there are no houses in the inundation pathway, there is one cabin below Lost Creek that the Agency just had an elevation cert survey done on to potentially remove it from modeling as a downstream risk. Golden Trout Campground, owned and operated by the USFS is the biggest downstream risk. The bridge connecting two sides of the campground is higher than the peak inundation flow, but should massive debris come down the river along with the inundation, in its current condition, there is not a guarantee that it couldn't be damaged enough to not be usable. It was noted that this has happened in the past due to high flows, was repaired by a private timber company, and is slated for replacement by USFS.

Assets at Risk

Assets at risk from this hazard include people and populations ; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (including both Agency staff and Agency residents) located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area. Agency residents that live in these dam inundation areas are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events.

Structures and Critical Facilities and Infrastructure

Most structures and critical facilities and infrastructure in the Agency have some measure of risk to dam failure. Dam failure flooding can affect the built environment of the Agency. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated. All Agency assets (listed in Table H-2) would be at risk to dam failure flooding

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the Agency. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the Agency from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Levees within the Agency and surrounding areas may also be damaged or destroyed contributing to the flood waters. Additionally, mass evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the Agency and Plumas County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the Agency to dam failure.
- Population projections for the area served by the Agency show the population to be shrinking, which limits additional impacts to the Agency. The Agency may add staff, but this number would be small. Additional growth within the dam inundation areas of the Agency would place additional populations at risk to dam failure. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the Agency to this hazard.

Future Development

Dam owners always face the potential of future dam failure events, and that is why regulatory oversight exists, and dam safety requirements are in place. The Agency may have dam failure events happen in the future on the South Feather Power Project. Future development in the Agency's inundation areas will be limited due to the remote nature of the South Fork Power Project. Private parcels are few and far between, with recreation improvements on USFS land being the most likely developments. The Agency's SFWPA Project 2088 would be directly affected by dam failure. Additionally, the Power Project heavily subsidizes water rates, and therefore anything that happened at the headwaters of the system (and potentially inducing failure of more than one dam and impacting two powerhouses along the South Fork of the Feather River) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–Extremely High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

The Agency is highly concerned about earthquakes and earthquake liquefaction. Because of this, The Agency actively monitors seismic activity in and around Project-2088.

Location and Extent

Since earthquakes are regional events, the whole of the Agency is at risk to earthquake. The SFWPA, Plumas County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the Agency are shown in Section 4.3.10 of the Base Plan. These include the Almanor Fault, Butt Creek Fault Zone, the Mohawk Valley Fault, the Dogwood Peak Fault, and others that traverse the County. The Indian Valley Fault is also considered an active fault located within the County. A significant seismic event on any of these major faults could cause damage to assets owned by SFWPA.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as

discussed in Section 4.3.10 of the Base Plan. The Agency maintains Standard Operating Procedures for Post-Earthquake inspections of assets based on the magnitude and proximity to structures.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The Agency is located in an area where earthquakes of some magnitude occur.. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Plumas County and the Agency fall within a low to moderate shake risk.

The Little Grass Valley Dam is situated in the foothills of the Sierra Nevada, on the western slope of the northern Sierra Nevada Mountain range in Plumas County, California. Basement rocks are mainly metavolcanic rocks of the early Jurassic-age Slate Creek Complex and are overlain by abundant Tertiary-age volcanic deposits, including the Miocene Lovejoy Basalt and Miocene-Pliocene age andesitic volcaniclastic deposits (STID, 2024). The dam is located about 800 feet west of the Dogwood Peak fault, a Mesozoic-age fault/suture zone, and east of the Camel Peak fault, another Mesozoic-age fault/suture zone, five miles downstream of the dam.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Plumas County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

SFWPA Events

As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The Agency Planning Team searched their records, including official board meeting minutes from the Agency. These did not indicate that there was any damage to agency infrastructure as a result of the Oroville earthquake. The HMPC noted no other past occurrences of earthquakes or liquefaction that affected the Agency. in any meaningful way.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. More urban areas in high seismic hazard zones

are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Plumas County Planning Area, seismic hazard mapping indicates that the Agency has low to moderate seismic hazard potential. There is the potential for the Agency and Plumas County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are limited areas in and near the Agency prone to liquefaction.

The whole of the Agency is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

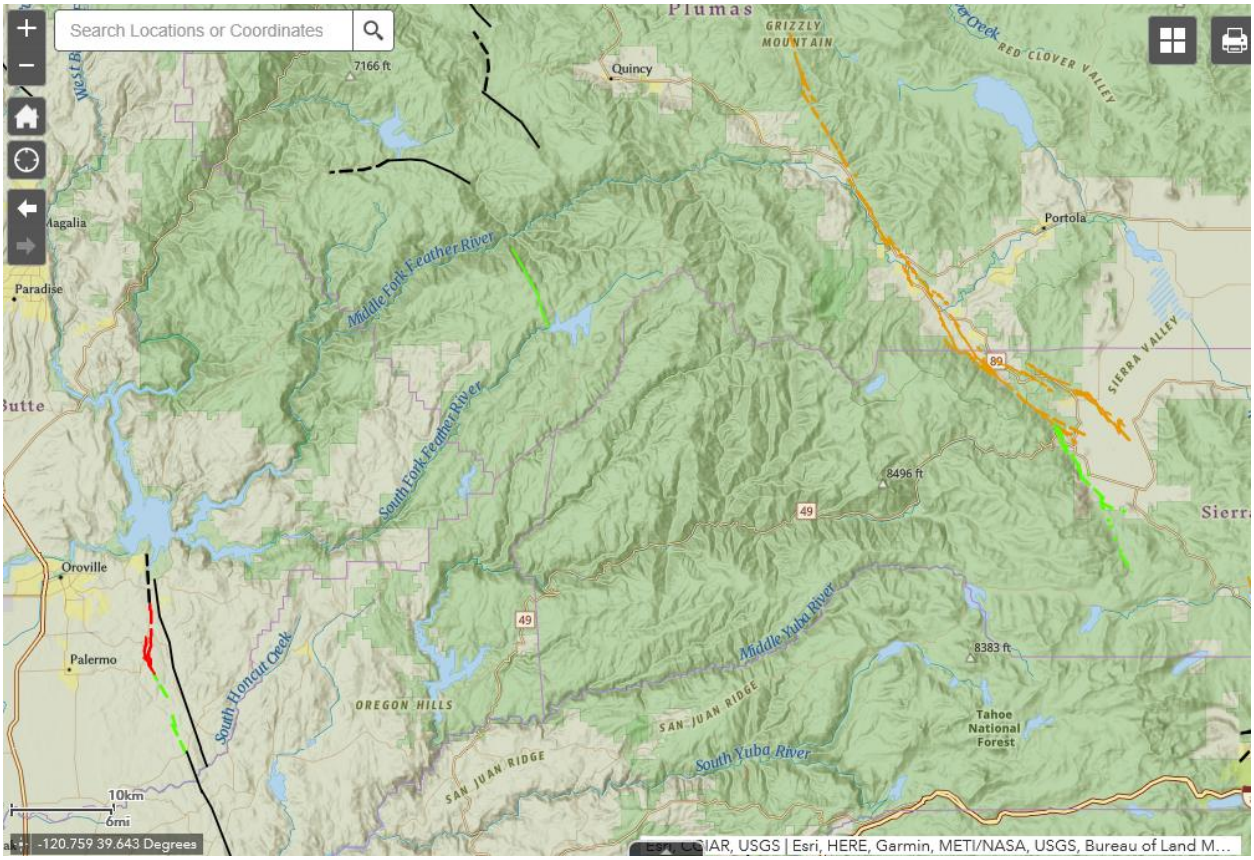
Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The SFWPA is within Zone 3.

The Agency is aware of the local fault lines and recognizes the potential risks associated with a seismic event. The distant span and varying topography for the Agency's assets are a concern for both the Power and Water Division respectfully. The green line in the middle of Figure H-6 is the Little Grass Valley fault, which is the start of the Agency's power project and water conveyance in Plumas County. Also note the green, black, and red fault lines towards the bottom left corner of the map that displays the Foothills Fault system that runs through a portion of the Agency's water distribution systems (both domestic and irrigation).

Figure H-6 Faults in or near Agency Boundaries



https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both Agency staff and those residing in the Agency Service Area) are at risk from earthquake shaking and associated hazards. The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County and District may be affected is included in Section 4.3.10 of the Base Plan.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the Agency are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Plumas County Planning Area show how structures may be affected. All Agency assets from Table H-2 would be at risk to earthquake.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the SFWPA staff, residents, and visitors. Other impacts to the Agency could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake. The Agency has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the SFWPA include the following:

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- Population projections for the area served by the Agency show the population to be shrinking, which limits additional impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The Agency is subject to the California Building Code, which mandates construction techniques that minimize seismic hazards. Future development in the Agency is subject to these building codes and land use planning.

Based on today's environmental and political climates, the Agency doesn't believe the SFWPA Project 2088 would expand in the ways of additional dams or power houses. In terms of domestic and irrigation water service, the Agency does not anticipate any major operational changes, unless a predictability curve suggested the Agency take additional precautions. Additionally, the Power Project heavily subsidizes water rates, and therefore anything that happened at the headwaters of the system (and potentially inducing failure of more than one dam and impacting two powerhouses along the South Fork of the Feather River) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based

on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas inside the Agency's boundaries.

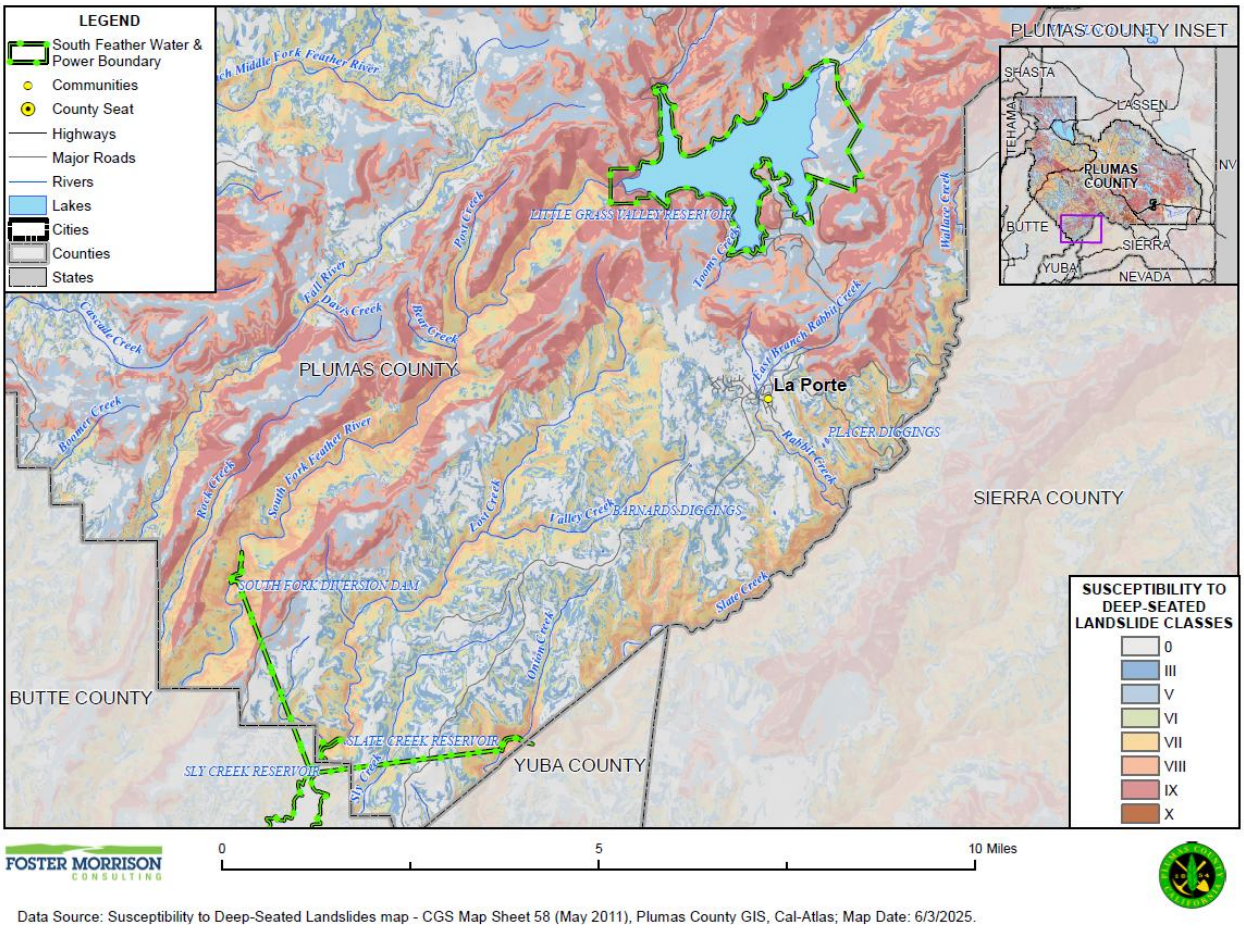
Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

Figure H-7 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure H-7 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table H-5. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the eastern portions of the Agency and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors.

The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure H-7 SFWPA – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 6/3/2025.

Table H-5 SFWPA – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	39	2%	0	0%	39	2%
V	2	0.1%	2	32%	0.3	0.01%
VI	1	0.04%	0	0%	1	0.04%
VIII	233	10%	0	7%	232	10%
IX	1,995	88%	4	61%	1,991	88%
Grand Total	**2,270**	**100%**	**6**	**100%**	**2,263**	**100%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Plumas County; however, as shown in Table H-6, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table H-6 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993. These were not known to affect the Agency.

SFWPA Past Occurrences

The Agency noted that there are no documented landslide past occurrences with impacts to Agency assets.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the Agency are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. Post wildfire areas are also more prone to landslide events. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Following the North Complex Fire, the Agency is concerned with landslides that occur in the burn scar areas above Agency dams. These can cause rockfall that damage dams, critical appurtenant structures, and spillways (see small example in Figure H-10). Agency buildings may be damaged as well. Landslides can also cause excess sedimentation in the dams, reducing capacities.

In May of 2024 , there was a significant rockfall event that originated in North Complex burn scar above the USFS Road 21N11Y, which entirely blocked sole ingress/egress to South Fork Diversion Dam. Emergency repairs by a specialty contractor included services to drill and split the rock, heavy equipment to haul and dispose of rock, and repair of the damaged section of roadway.

Figure H-8 Rockslide Debris Slides Blocking Roadway to Dam

Figure H-9 Rockslide Debris Slides Blocking Roadway to Dam – Alternate view

Figure H-10 Debris Slides Post North Complex Fire Above Little Grass Valley Dam

Figure H-11 Debris Slides Post North Complex Fire Above Little Grass Valley Dam – Alternate view

Source: SFWPA

AN LGVR SPILLWAY NORTH WALL COMMENT WAS LEFT IN THE DOCUMENT SENT TO US. WHAT DOES THIS MEAN OR WHAT WOULD THIS ENTAIL?

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both Agency staff and Agency residents) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. Most vulnerable are those people working or residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in the Agency service areas as well as Agency staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Landslides can affect the built environment of the Agency and those structures and critical facilities located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. This includes all Agency assets listed in Table H-2.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure H-7 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area of the Agency, since most of this occurs in the less developed areas of the Agency.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the Agency susceptible to landslide. Based on the risk assessment, there is potential for significant landslides to occur in the Agency. However, most (but not all) of the historic landslides in the Agency have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the Agency to landslide.
- Population projections for the area served by the Agency show the population to be shrinking, which limits additional impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the Agency. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the Agency would place additional values at risk to landslide. New Agency facilities will take landslide into account when siting new facilities. The Agency's SFWPA Project 2088 may affected by landslide in the burn scar areas. Additionally, the Power Project heavily subsidizes water rates, and therefore anything that happened at the headwaters of the system (and potentially inducing failure of more than one dam and impacting two powerhouses along the South Fork of the Feather River) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the Agency occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it

contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Agency falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the Agency.

Location and Extent

Rains and storms can occur in any location of the Agency. All portions of the Agency are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the Agency as discussed below. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the Agency and Plumas County. Duration of severe storms in the Agency can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the Agency. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table H-7. IN addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table H-7 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

SFWPA Events

The Agency noted that heavy rains and storms are an annual occurrence often resulting in flooding.

LIST PAST EVENTS AFFECTING THE AGENCY. INCLUDE INFORMATION ON IMPACTS AND DAMAGES AS AVAILABLE? IF NO PAST EVENTS, PLEASE STATE THAT.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the SFWPA. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the Agency. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the Agency, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the Agency is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. The Agency is also concerned with rain on snow events, which can cause greater flooding in the Agency. In addition, the Agency is concerned that heavy rains and storms in the burn scar areas could cause erosion, landslide, or debris flow.

Impacts from these storm events of great concern following the North Complex Fire, as multiple Project assets are subject to burn scar debris flow. Impacts are primarily from debris flow that could potentially create dam safety issues if not monitored and mitigated. These impacts can include large logs on concrete arch dam ogee sections can alter flow concentrations below, and cause impacts on the below scour pad, or debris can fall and cause damage to valving present on the downstream side of the dam.

Rain on snow events require ongoing monitoring for the duration, and assets are inspected after high flow events. Heavy rain and runoff can absolutely cause a dam safety event at LGVR especially during the spring months when the spillway gates are down. Improved access would help mitigate issues for the Agency and its assets.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All Agency staff and the populations served by the Agency are at some vulnerability to heavy rains and storms. Those Agency employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the Agency have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

Agency facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the Agency. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

All Agency assets in Table H-2 would be at risk to heavy rains and storms, if flooding from them caused a dam event to occur.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the Agency show the population to be shrinking, which limits additional impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New Agency facilities follow state and local building codes, also requiring approval from FERC, DSOD, and USFS, which should reduce the risk to future development in the Agency from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. The Agency's SFWPA Project 2088 may affected by landslide in the burn scar areas. Additionally, the Power

Project heavily subsidizes water rates, and therefore anything that happened at the top of the system (and potentially inducing cascading failure through the system) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the SFWPA. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the Agency. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the Agency.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

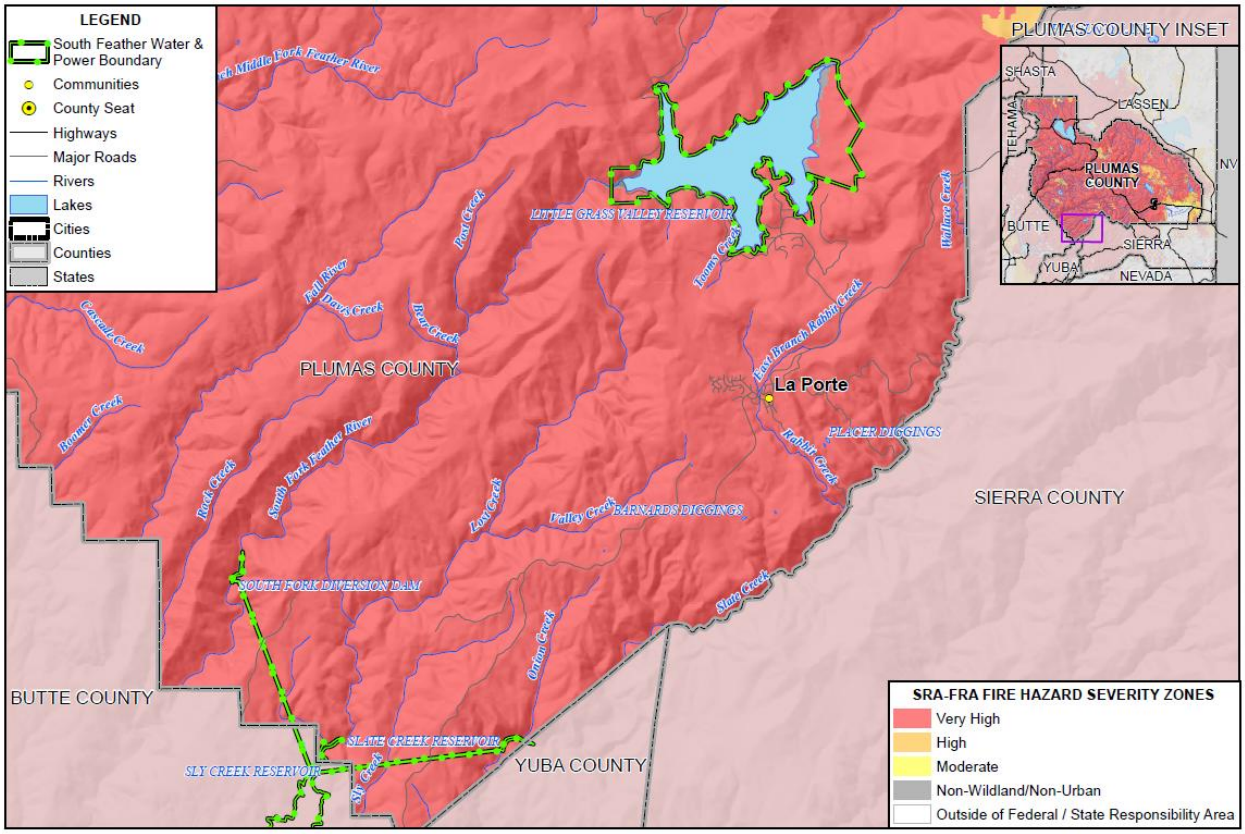
Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

Wildfire can affect all areas of the Agency. CAL FIRE has estimated that the risk varies across the Agency and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of

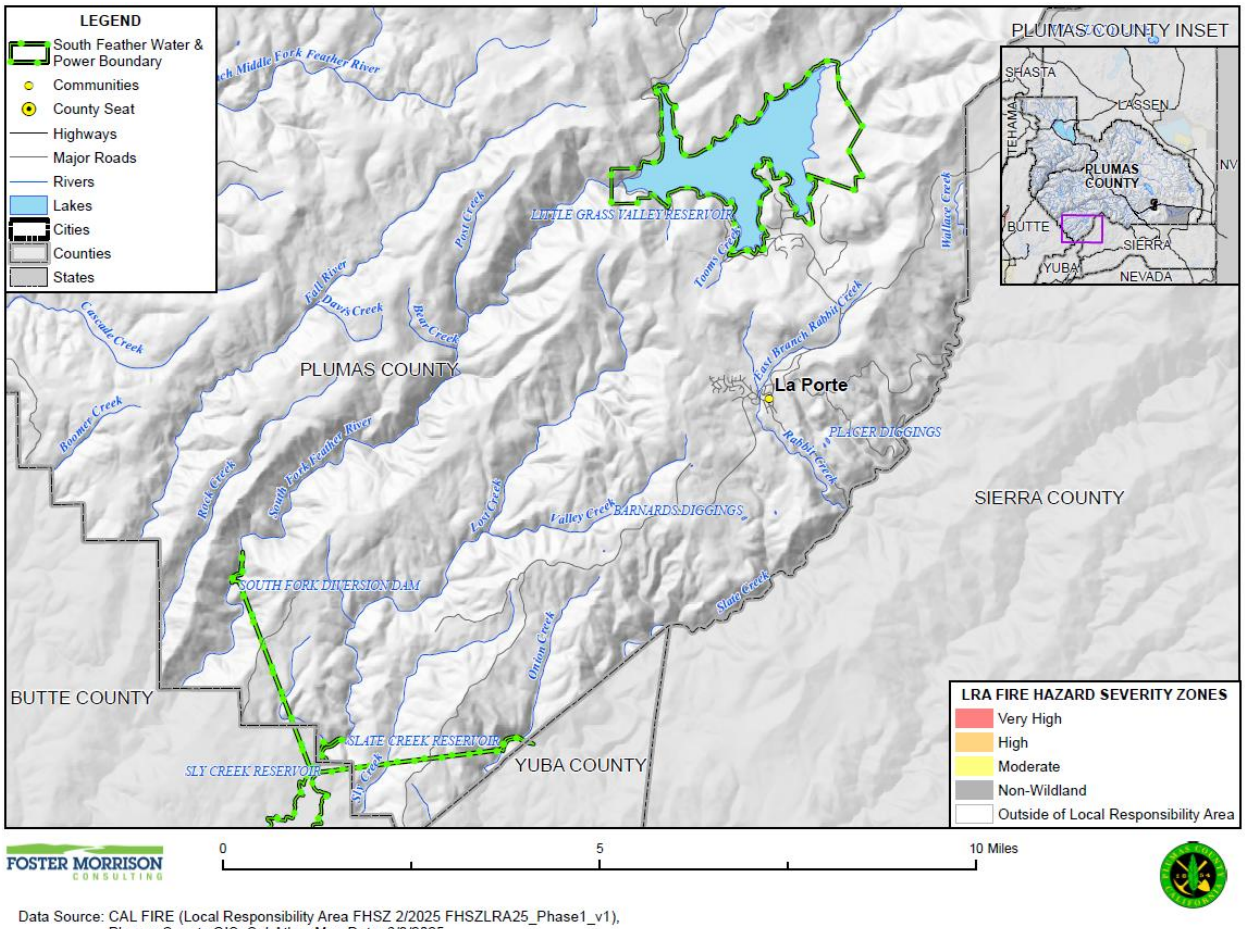
the Base Plan, wildfire maps for the SFWPA were created. Figure H-12 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the Agency. Figure H-13 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the Agency. The Agency falls only in the SRA/FRA, as such no LRA tabular analysis was performed. As shown on the maps, FHSZs within the Agency is Very High.

Figure H-12 SFWPA – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 6/3/2025.

Figure H-13 SFWPA – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 6/3/2025.

NOTE: SFWP is entirely Outside of the Local Responsibility Area

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table H-8, while extents in the LRA are not shown in table format since the District is not in the LRA..

Table H-8 SFWPA – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	2,270	100%	6	100%	2,263	100%
Grand Total	**2,270**	**100%**	**6**	**100%**	**2,263**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table H-9.

Table H-9 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

SFWPA Events

The 2020 North Complex Fire threatened the entire upper sections of the Agency's Power Project, including the Power Division Headquarters located in Forbestown. The fire burned adjacent to SFWPA facilities from Little Grass Valley Dam & Reservoir to South Fork Diversion Dam and impoundment in Plumas County. South Fork Diversion Dam had safety and debris buoys burned (required replacement). The most hazardous trees burned in the fire had to be removed in order to avoid impacts to the tunnel control building. The Agency is still dealing with tree mortality on the road into the dam (see Figure H-15). Significant debris flow began immediately following the fire, and continues today. An example of this can be seen on Figure H-16.

Figure H-14 Burns on Piping from North Complex Fire

Source: SFWPA

Figure H-15 Tree Mortality around SFWPA – USFS Road to South Fork Diversion Dam

Source: SFWPA

Figure H-16 Transported North Complex Fire Debris on Dam After Storm Event

Source: SFWPA

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the Agency from wildfire is of significant concern. Wildfires that occur in the Agency occur from a variety of both natural and manmade causes. The Agency can be affected both by fires that start on or near Agency lands as well as those that start elsewhere and move into the Agency. In addition to burning large areas of land, air quality can be affected in the Agency by smoke from fires occurring inside the Agency as well as those from many miles away.

The whole of the Agency is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency noted that, with the exception of Kelly Powerhouse, the entire Power Division is located in the very high hazard portion of the map provided above. In addition to power generation assets, the hillsides surrounding the Miners Ranch Canal are also extremely vulnerable to wildfire risks, which then cause soil erosion issues during the winter months.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both Agency staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused , infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like Agency staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the Agency have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. This includes all Agency assets in Table H-2.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the Agency, the impacts to natural, historic and cultural resources could be extensive

and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the Agency. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the Agency. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the Agency by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the Agency; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the Agency, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. Agency residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the SFWPA include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the Agency to wildfire.
- Population projections for the area served by the Agency show the population to be shrinking, which limits additional impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus would have possible associated wildfire impacts to the Agency. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. With adherence to development standards, future losses to new development should be minimal.

The Agency will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the Agency would place additional assets at risk to wildfire. However, Agency building codes are in effect and should continue to be updated as appropriate to reduce future impacts. The Agency's SFWPA Project 2088 is in areas affected by wildfire. Additionally, the Power Project heavily subsidizes water rates, and therefore anything that happened at the top of the system (and potentially inducing cascading failure through the system) would have a catastrophic economic impact to the Agency by modifying/losing maximum power generation capabilities.

H.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

H.5.1. Regulatory Mitigation Capabilities

Table H-10 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the SFWPA.

Note: The Agency does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the Agency's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the Agency is located.

Table H-10 SFWPA's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Available funds are distributed for operational upgrades that vary from IT to Safety Equipment
Climate Change Adaptation Plan		
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	Y	General Operational Guidelines that support both Power and Water Divisions
Continuity of Operations Plan	Y	Miners Ranch Treatment Plant and the Water Division for domestic water distribution
Economic Development Plan	N	
Land Use Plan		
Local Emergency Operations Plan	Y	Emergency Action Plans are written for both Water and Power Divisions
Stormwater Management Plan	N	
Transportation Plan	N	
Other (describe)		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	Plumas County
Building code	N	Plumas County
Flood insurance rate maps	N	Plumas County
Floodplain ordinance	N	Plumas County
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	Plumas County
Subdivision ordinance	N	Plumas County

Zoning ordinance	N	Plumas County
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continue to monitor various grants opportunities available to improve dam infrastructure.		

Source: SFWPA

Language in the Plumas County Municipal Code Regarding SFWPA

CHAPTER 2. - OROVILLE-WYANDOTTE IRRIGATION DISTRICT WATERS AND LANDS

Sec. 10-2.01. - Project area.

The water surface of any lake owned by the Oroville-Wyandotte Irrigation District and lying within the County and any portion of land owned by the Oroville-Wyandotte Irrigation District and inundated by such reservoir surface lying within the County shall be subject to the provisions of this chapter. This chapter shall further apply to any land owned by the Oroville-Wyandotte Irrigation District located within the boundaries of the Federal Power Commission License for the South Fork Project, Federal Power Commission License No. 2088, and located in the County. All of such area is referred to in this chapter as the "project area". (§ 1, Ord. 78-268, eff. June 6, 1978)

H.5.2. Administrative/Technical Mitigation Capabilities

Table H-11 identifies the Agency department(s) responsible for activities related to mitigation and loss prevention in the SFWPA.

Table H-11 SFWPA's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N	Plumas County
Civil Engineer, including dam and levee safety	Y	Power Division Manager, Chief Dam Safety Engineer, Chief Dam Safety Coordinator
Community Planner	N	Plumas County
Emergency Manager	Y	Power Division Manager, Chief Dam Safety Engineer, Emergency Action Plan Coordinator
Floodplain Administrator	N	Plumas County
GIS Coordinator	N	Plumas County
Planning Commission	N	Plumas County
Other		

Technical	Y/N	Has capability been used to assess/mitigate risk in the past?
Grant writing	N	
Hazard data and information	N	
GIS analysis		
Mutual aid agreements	Y	Plumas County
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
The agency would continue to promote our e-mail system and provide the customers that sign-up with the most current and accurate information possible, especially in the event of an emergency or outage. Again, continue to grow the coordination of efforts with other local jurisdictions.		

Source: SFWPA

H.5.3. Fiscal Mitigation Capabilities

Table H-12 identifies financial tools or resources that the Agency could potentially use to help fund mitigation activities. ***Prefilled this table from the SFWPA Butte Annex and swapped out County language. Check over the entire table, including the last cell.***

Table H-12 SFWPA's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Infrastructure Upgrades for both Water and Power Divisions
Community Development Block Grant	N	
Federal funding programs (non-FEMA)	Y	Reviewing all available options for grant funding to increase water service capabilities
Fees for water, sewer, gas, or electric services	Y	Operational expenses to provide domestic and irrigation water to customers
Impact fees for new development	Y	System Capacity Fees
State funding programs	Y	Reviewing all available options for grant funding to increase water service capabilities
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continue to apply for various grants to improve infrastructure and better serve our customer base. Projects would also include limiting risks to our agency assets that would potentially cause an outage to our customer base.		

Source: SFWPA

H.5.4. Mitigation Education, Outreach, and Partnerships

Table H-13 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table H-13 SFWPA's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters		
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)		
Local news		
Organizations that interact with underserved and vulnerable communities		
Social media		
Other	Yes	The Agency website includes Dam Safety content with public safety materials specific to the SFPP for viewing and printing. The Agency maintains a Public Safety Plan specific to the SFPP assets.
How can these capabilities be expanded and improved to reduce risk?		
The Agency will continue to provide Dam Safety content to the public on the website, at monthly Board of Directors meetings, and through enhanced safety signage throughout the Project.		

Source: SFWPA

H.5.5. Other Mitigation Efforts

The Agency has many other completed or ongoing mitigation projects/efforts that include the following:

- Emergency Action Plans, Hazardous Waste Plans, Environmental Studies, and Security plans are maintained and updated as needed by the Agency.

H.6 Mitigation Strategy

H.6.1. Mitigation Goals and Objectives

The SFWPA adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

H.6.2. NFIP Mitigation Strategy

The Agency does not participate in the NFIP, as it is not an eligible participant. Many of the Agency's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

H.6.3. Mitigation Actions

The Planning Team for the SFWPA identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, , and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Climate Change
- Dam Failure
- Earthquake
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Drought & Water shortage
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Hazardous Materials Transport
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornado
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Little Grass Valley Dam Spillway Northern Slope Stabilization and Rockfall Protection Project

Hazards Addressed: Climate Change, Dam Failure, Landslide, Mudslide, and Debris Flow, Heavy Rains and Storms, Earthquake, Wildfire

Issue/Background (Problem Statement): The spillway at Little Grass Valley Dam was constructed by excavation of volcanic rock material of intrinsically high specimen strength. The mass strength properties of the rock is fundamentally degraded by preexisting, adversely oriented, persistent, intersecting planar rock defects – joints and sheer surfaces oriented adversely with respect to the exposed cute faces of the spillway and road. The spillway is at risk from landslide, heavy rains and storms, earthquake, and wildfires (exacerbated by climate change), as each can cause:

1. Rockfall into spillway damaging spillway gates trunnion arm, allowing for uncontrolled release of reservoir.

2. Rockfall and debris falls into the spillway and the blocking leads to overtopping of the dam, allowing for uncontrolled release of the reservoir.

These failure modes could potentially be initiated during a significant enough seismic or severe storm event.

Project Description: The Little Grass Valley Dam Slope Stabilization and Rockfall Protection Project will require further engineering review of recently completed geological assessments in order to determine the most appropriate mitigation strategies. South Feather Water & Power Agency is currently under contract to conduct further field investigations and develop fully engineered design plans and specifications. The purpose of the mitigation measures will be to reduce the risk of damage to the spillway structure due to rock fall events. Possible mitigation measures could include rock scaling, minor excavations, rock anchors and rock fall netting designed to conform to the existing slope face and reduce the risk of erosion and sediment accumulation within the spillway.

Other Alternatives: Other alternatives such as soil nails and/or shotcrete application are not being considered at this time due to cost.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The engineering review and project design is being funded out of the Agency's budget. The Agency will explore all options for funding to construct the mitigation project.

Responsible Office/Partners: South Feather Water & Power Agency

Benefits (Losses Avoided): The Little Grass Valley Dam Slope Stabilization and Rockfall Protection Project will prevent rockfall into the spillway that could damage spillway gates trunnion arm, allowing for uncontrolled release of reservoir, and/or prevent rockfall and debris into the spillway and creating damage or blockage leading to overtopping of the dam, allowing for uncontrolled release of the reservoir

Potential Funding (Local Budgets, Grant Funds, etc.): South Feather Water & Power Agency budgets. Any applicable and available grant opportunities will be explored.

Timeline: October 2025 through January 2030

Project Priority (High, Medium, Low): Medium

Appendix A Planning Process

A.1 Lists of HMPC Invites/Stakeholders

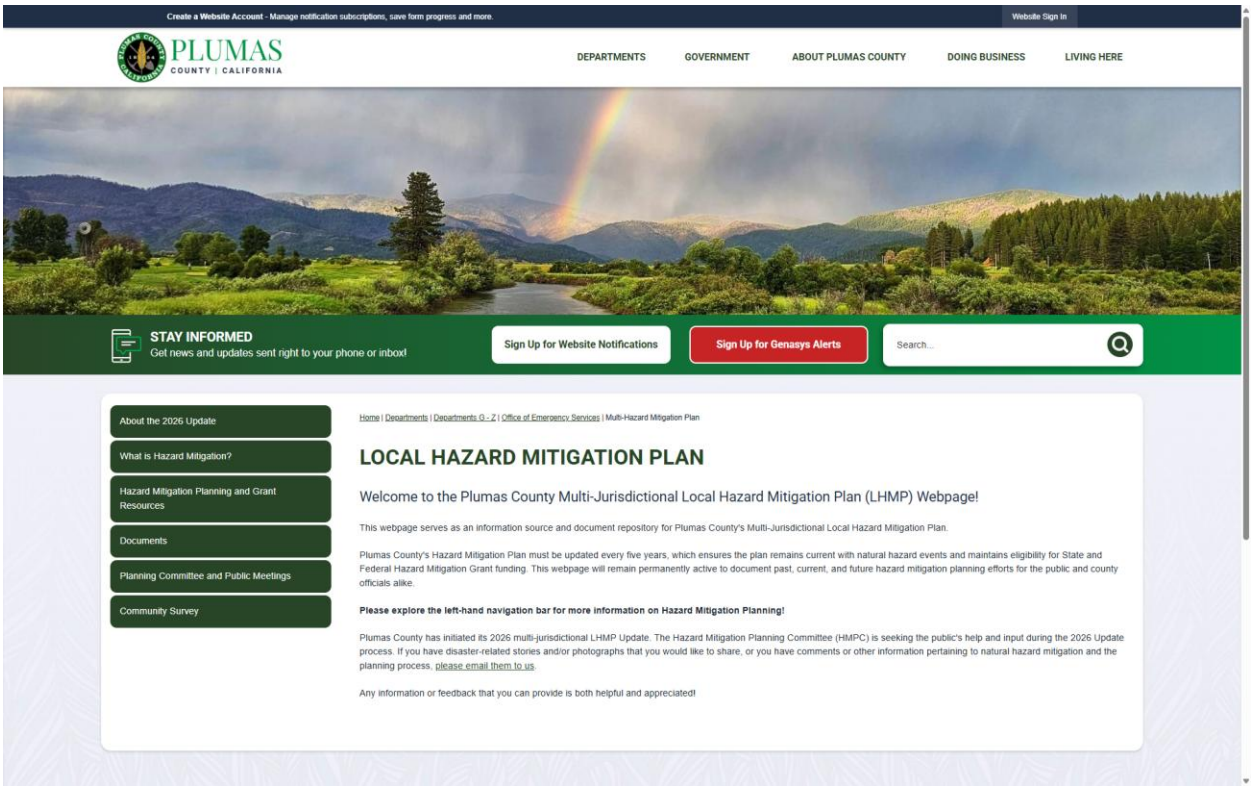
A.1.1. LHMP Invite List

INSERT AT END OF PROCESS

A.1.2. HMPC Participant List

INSERT AT END OF PROCESS

A.2 Website for Hazard Mitigation Plan: Project Website



A.3 HMPC Meeting #1: Kickoff Meeting

A.3.1. Kickoff Meeting Invite to HMPC and Stakeholders

From: Pini, Lori <loripini@countyofplumas.com>
Sent: Friday, December 20, 2024 12:12 PM
To: Pini, Lori; Adam Cox (adam@sectaris.partners); Allen Homme (cpud@frontiernet.net); Amber Hughes (amber@plumasfiresafe.org); Amber Marshall (amber.marshall@usda.gov); Annie Adcock; Anthony Warndorf (awarndorf@frc.edu); Osborn, Becky; Bill Powers (bpowers96122@gmail.com); Bill Wickman (bod@pdh.org); BJ Laustalot (william.laustalot@caloes.ca.gov); Bob Marshall (bob.marshall@psrec.com); Bob Orange (boborange@frontiernet.net); Brad Underwood (bunderwood@frrcd.org); Brady Haynes (bhaynes@senecahospital.org); Brandon Pitlock (1bpitlock@gmail.com); Brenda Narayan (brenda.narayan@pge.com); Brian West (bwest@collinsco.com); Bryan Alexander (bryan.alexander@usda.gov); Carlos Espana (cespana1304@gmail.com); quincyrecdept@outlook.com; chermann@pcso.net; Chandler Peay; Cheryl Johnson (cjohnson@chesterpud.org); Chester Chamber of Commerce; Chris Carlton (Christopher.Carlton@usda.gov); Chris Durkin (wamwco@yahoo.com); Chris Morrison; plancom1; Christopher Woodward (christopher.woodward@dot.ca.gov); Chuck Bowman (chbowman@prodigy.net); Clayton Beck (clayton.beck@usda.gov); Clint Burkenpas (clint.burkenpas@dot.ca.gov); Dale; Dan Gustafson (dgustafson@blm.com); Dan Litchfield (dlitchfield@plumasruralservices.org); Danielle Berry (dberry@sierrainstitute.us); Danny Manning (dmanning@greenvillerancheria.com); Darrell Webster (darrell@plumasfiresafe.org); DeeDee Clark; Darren Beatty (dbeatty@pdh.org); david@beskeen.net; David Hawks (duhv@pge.com); David Ornelas (dornelas@sierrainstitute.us); David Schmid (dschmid@qfd.ca.gov); David Stewart (david.stewart@cpuc.ca.gov); Destiny Bloxham (dbloxham@indianvalleycsd.com); Duncan Cameron (9500sierravalleyfire@gmail.com); Dwight Cerasola (ceresolasuper1@yahoo.com); Ed Ward (edwardw9200@gmail.com); Eliza Fletcher; Emily Compton (ecompton@psrec.coop); Eric Ewing (eric.ewing@fire.ca.gov); Erik Egide (EEgide@chp.ca.gov); Frank Carey (fcarey@qfd.ca.gov); Gary Parque (gary@plumasfiresafe.org); Gold Lake Lodge (Reservations@goldlakelodge.com); Greenhorn CSD (gcsd96103@yahoo.com); Hagwood, Greg; Greg Kinne (kgkinnes@gmail.com); Grizzly Lake CSD (glcsddelleker@gmail.com); Grizzly Water District (jenniferlacy@digitalpath.net); Hannah Hepner (hannah@thewatershedcenter.com); Harvey West (harvey@playgraeagle.com); plancom5; Heather Reineking (hreineking@sierrainstitute.us); Holly Coons; Ian James (ijames@collinsco.com); Indian Valley Park & Recreation District (info.ivrpd@gmail.com); Ingrid Burke (ingrid@plumasfiresafe.org); Isabella Bledsoe (ibledsoe@sierrainstitute.us); J. Lundquist (jlundquistgis@gmail.com); plancom3; Jamar Tate (jtate@digitalpath.net); James “Bull” Asher (svv8213@gmail.com); James Shipp (recdept@psln.com); Jan Hammill (bjhammill@frontiernet.net); Jas Shaw (jas.shaw@fire.ca.gov); Jason Harston (jason.harston@PSREC.com); Jason Moghaddas (Jmoghaddas@sig-gis.com); Jeanie Hinds (jeanie@plumascorp.org); Jeanine Foster; Engel, Jeff; Jeff Rosevear (chiefrosevear@beckpeakfpd.com); Jeff St. Clair (jstclair01@fs.fed.us); Langston, Jennifer; Jennifer Leighty; sierravalleygmd@sbcglobal.net; jbeatley@pcso.net; Jerri Nielsen (jlvnielsen1@gmail.com); Jill Harris (jharris@pacificforest.org); Graham, Jim; Jim Stockdale (jim.stockdale@graeaglefire.org); Jim Wilcox (jim@plumascorporation.org); Jodee Read (jread@pdh.org); Blackwell, Joe; Joe Fish (office@myairdistrict.com); Joe Walton (Joe.Walton@fire.ca.gov); Joe Waterman (joe.waterman.jw@gmail.com); Joel Bronk (joel.bronk@usda.gov); John Amis (john.amis@fildlife.ca.gov); John Parks (johnparksiii@gmail.com); John Reynolds (john@reynolds-family.us); John Rowden (john.rowden@digitalpath.net); John Rowden (projectmanager.pecsd@gmail.com); Steffanic, John; Joleen Cline (jcline@whitehawkranch.org); Jonathan Bruno (jbruno@chp.ca.gov); Jonathan Pangburn (jonathan.pangburn@fire.ca.gov); Joseph Rudeen (joseph.rudeen@dss.ca.gov); Brechtel, Josh; Joshua Dixon (joshua.dixon@dot.ca.gov); Julie Hunter (julieh@myairdistrict.com); Julie Ruiz (julie@myairdistrict.com); Karen Downs (kdowns@manhard.com); Karrie White (kwhite@qfd.ca.gov); Kate Beth Kalinosky (kate.kalinosky@bnsf.com); Kate Rahmeyer (kate@pcirc.com); Kathy Kogge (kathy.kogge@gmail.com);

Katie Nunn (katie@americanvalleycsd.com); Katie Quinn (katie@plumasfiresafe.org); Katie Reid-Harris (katiereid7@gmail.com); Allred, Keevin; Ken Donnell (kdd@frontiernet.net); Goss, Kevin; Kevin Schmidt (kschmidt@usgs.gov); Kevin Trutna (KTrutna@frc.edu); Kristen Mckillop (kmckillop@southfeather.com); Kyle Felker (mapit400@gmail.com); Kyle Kroll (kyle.kroll@wildlife.ca.gov); Kyle Merrian (kmerriam@fs.fed.us); Lacey Carney (lacey.carney@chp.ca.gov); Lafe Alexander (callmelafe@aol.com); Laura Adkins (lauraadkins@countyofplumas.com); Leana Weissberg (jstarr@spi-ind.com); Lee Kiolbasa (Leonard.Kiolbasa@libertyutilities.com); Leon Jefferies (leon.jeffrey@usda.gov); Leslie Edlund (leslie.edlund@usda.gov); LeTina Vanetti; Liam Galleher (liam@plumasfiresafe.org); liam@plumascorporation.org; Linda McCurdy; Linda VanDahlen (lisdink52@gmail.com); Marcelino Marci Gonzalez (marcelino.gonzalez@dot.ca.gov); Velazquez, Marco; Mark Thomas (mthomas@norcalems.org); Martin Janolo (martin.janolo@water.ca.gov); Marty Senter; Marty Walters; mattbeatley@pcso.net; Matt Taborski (mjtaborski@spi-ind.com); westalmanorfd@citlink.net; Matt West (mfwest82@gmail.com); Matthew West (matt@plumascorporation.org); Meadow Valley Fire Protection District (meadowvalleyfiredepartment@gmail.com); Megan McCrorey (meganmccrorey89@gmail.com); Melissa Klundby (melissak@myairdistrict.com); Michael Algots; Coelho, Michael; Michael Hall (mhall@frrcd.org); Michelle Fulton (michelle.fulton@sbcglobal.net); Mike Flanigan (mike-flanigan@leavitt.com); Mike Loew (mloew@norcalems.org); Mike Saitone (hbcsd@frontier.com); Mike Yost (msyost@frontiernet.net); Mikki Brown (mikkib@myairdistrict.com); Mimi Garner (gardnerpcsda@gmail.com); Mimi Garner (mimithegolfgal@gmail.com); plancom2; Nancy Presser (npresser@plumasruralservices.org); Naveed Paydar (Naveed.Paydar@cpuc.ca.gov); Nick Bunch (nbunch@fs.fed.us); Nick Collins (nickcollins@countyofplumas.com); Reinert, Nicole; Pat Morton (patmorton786@gmail.com); Patrick Callahan; Patrick Martinez (patrick.martinez@ephc.org); Patty Clawson (patty.clawson@ephc.org); Paul Mrowczynsk (pmrow@jps.net); Paul Russell (pcmresearch@psln.com); Paul Violett (pviolett@sopherwheeler.com); Peggy Ygbuhay (pygbuhay@up.com); Phillip Rader (prader@plumascharterschool.org); plancom4; Quincy Fire (quincyfire@sbcglobal.net); Rachel Hutchinson (rachel.hutchinson@usda.gov); Rebecca Herrin (rebecca@greenhorncsd.com); Remy Gill (Remy.Gill@water.ca.gov); Rich Sonsteng (rsonsteng@chesterpud.org); Richard Stockton (richard.stockton.g1ee@statefarm.com); Riley duPont (rileydupont28@gmail.com); Robinette, Rob; Thorman, Rob; Robert Bavier (rjbavier@up.com); Robert Curry (Robert.curry@water.ca.gov); hambranchfire@yahoo.com; Andrew; Robin Daun (rdaun@pcoe.k12.ca.us); Roger Diefendorf (rdiefendorf@plumascdc.org); Ron Heinbockel (ron1942mv@gmail.com); Roy Carter (roycarter@greenhorncsd.org); Royce Raker (rraker@senecahospital.org); Russell Nickerson (russell.nickerson@usda.gov); citymanager@cityofportola.com; Ryan McKillop (rmckillop@sopherwheeler.com); Ryan Pedersen (rpedersen@chp.ca.gov); Sally McGowan (sallymtemp53@gmail.com); Sam Blesse; Scott Corey (scott@plumascorporation.org); Scott Packwood (scott.packwood@fire.ca.gov); spreston@chp.ca.gov; Shawna Mayo (Shawna.Mayo@libertyutilities.com); Silas Rojas (srojas@co.lassen.ca.us); Stan Peiler (stan.peiler@ephc.org); Steve Best (sbest@fs.fed.us); Steve Burroughs (laportefire@yahoo.com); Steve DeBonis (sdebonis@spi-ind.com); Steve Janovick (steve.pecsd@gmail.com); Steve McDowell (cromberg588@gmail.com); Steve Munsen (smunsen@sbcglobal.net); speay@pcso.net; taletha@plumascharterschool.org; Taylorsville Cemetery (kathnpop@gmail.com); Thomas Grubbs (thomas.grubbs@usda.gov); Evans, Tim; Tim McCrink (shmp@conservation.ca.gov); Venable, Tina; Todd Johns; Todd Roberts (t.roberts@ci.portola.ca.us); McGowan, Tom; Tom Vannoy (tvannoy@whitehawkranch.org); Tommy Brenzovich (tommy@plumasfiresafe.org); Ferguson, Tracey; Tracy Schohr (tkschohr@ucanr.edu); Goings, Travis; Trina Cunningham (trina@maidusummit.org); Tyson Rael (Tyson@GreenhornCSD.com); Victoria Fisher (sierravalleyrcd@gmail.com); Warren Grandall (wgrandall@gmail.com); Vieira, Willo; Zoe

Subject: Plumas County 2026 LHMP Update: Kickoff meeting invite

When: Tuesday, January 14, 2025 1:00 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Quincy Branch Library (445 Jackson St, Quincy, CA 95971)

Hello:

Plumas County is partnering with the City of Portola and five special districts, Grizzly Lake Community Services District, Indian Valley Community Services District, Plumas-Eureka Community Servies District, Chester Public Utility District, and Feather River Resource Conservation District, to develop a Local Hazard Mitigation Plan (LHMP) Update to the County's 2020 and the City's 2019 LHMPs. The purpose of the hazard mitigation planning process is to help reduce the impacts of natural hazards to the citizens, property, critical facilities and infrastructure, and other key assets in the County. In addition, the Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments have a FEMA-approved LHMP in place to be eligible for certain pre- and post-disaster mitigation funding to protect communities from future disaster-related losses.

You are receiving this email because we are inviting you to take part in this LHMP Update as a member of the Hazard Mitigation Planning Committee (HMPC).

County, city, district, agency, and public and private stakeholder participation and coordination is a requirement of an approved plan, as is the inclusion of any hazard data, information, and mitigation projects your department or agency considers important to the development of the LHMP. Thus, your input will be critical to the success of this project. Participation includes:

- Attending and participating in the HMPC meetings (6 anticipated over the next 12 months)
- Providing available data/information requested of the HMPC
- Reviewing and providing comments on the plan drafts

Plumas County, Office of Emergency Services, is taking the lead on coordinating this project for the County. A project kickoff meeting of the HMPC will be held at the following time and location:

HMPC Meeting
January 14, 2025 (Tuesday) 1:00 – 4:00 pm
Plumas County Library
445 Jackson St., Quincy 95971

The kickoff meeting will explain the LHMP development process and how you can be involved. A public stakeholder meeting will also be held the evening of the same day of the kickoff meeting. Details on the public meeting will be forthcoming.

Please RSVP and plan on attending or delegating attendance to this important meeting.

Thank you.

Lori Pini, Manager

A.3.2. HMPC #1: Kickoff Meeting Agenda

AGENDA

PLUMAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Kickoff Meeting #1

Tuesday January 14, 2025
1:00 - 4:00 pm
Quincy Branch Library | Quincy, California

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1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC): Participating Jurisdictions and Stakeholders
4. Coordinating with Other Agencies and Stakeholders
5. Hazard Identification
6. Data Needs
7. LHMP Update Schedule
8. Planning for Public Input
9. Questions?

A.3.3. HMPC #1: Kickoff Meeting Sign-in Sheet

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
January 14, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Lori Pini, Manager	loripini@countyofplumas.com	530-283-7438	Plumas County OES
TRAVIS GOINGS DIRECTOR	TRAVISGOINGS@COUNTYOFPLUMAS.COM	530-283 6469	PLUMAS CO. OES
Marty Walters, Resident	marty.walters@recoveryrisk.com	530-394-0787	Recovery Risk
David Hawks, Public Safety Specialist	david.hawks@pge.com	(916) 838-0210	PG&E
Brenda Narayan, Local Govt Affairs	brenda.narayan@pge.com	(530) 351-5722	PG&E
Marty Senter, Acting Fire chief	martin.senter@usda.gov	530-927-9894	USFS - Plumas NF
Sally McGowan	sallymtemp53@gmail.com	530 258 4747	PCFSC
Pat Morrison, Rotella. D.C.	patmorrison786@gmail.com	530-832-5880	Rotella
Celeste Gauna	celeste.gauna@rcac.org	530-770-1980	RCAC
Jerri Dielsen, Board President	jlvnielsen1@gmail.com	925-324-4186	Seneca
Charles Schramm	charlesschramm1@county..	6457	PCPHA
Billy Dawes	Seneca877@gmail		Seneca F.W.

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
January 14, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Joe WATERMAN	joe.waterman.jw@gmail.com	(530) 310-4208	RFFA
JAMIE TATE	JTATE@DIGITALPLAN.NET	(530) 836-1953	PECSD
Larry Smith	gmsmith.grcsd@gmail.com	918-770-4776	GRCSD
Tina Venable	tinavenable@countyofplumas.com	530-249-3679	PC Public Health
Ryan Mank	citymanager@cityofportola	530-832-6800	City of Portola
Josh Dixon	Joshua.Dixon@dot.ca.gov	(530)949-6778	Cal-Trans
Remy Gill	Remy.gill@water.ca.gov	916 937-5790	DWR
Rob Robinette	RobRobinette@countyofplumas	530 283 6593	Plumas Emergency Services
Zoella Stancer	ZStancer@PDH.ORG	530-283-7963	PDH
Zach Browning	Zbrowning@sierrainstitute.us		Sierra Institute
Tommy Brazovich	tommy@plumasfiresafe.org	530-927-5334	PCFSC
Kane Russell	kwrussell@ucanr.edu	530-616-8831	UC Cooperative Extension

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
January 14, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Kristen McKillop Regulatory Compliance Mgr.	kmckillop@southfeather.com	530-532-1388	SFWPA
Liner Mccurdy Seneca Disaster Coor	lmccurdy@senecahospital.org	530-310-6401	Seneca
JOHN REYNOLDS	JOHN@REYNOLDS-FAMILY.US	510-~~604~~-8591	PCFSC
TRACEY FERGUSON	traceyferguson@countyofplumas.com	530-283-6214	COUNTY PLANNING
DeeDee Clark	dclark@ophc.org	530-832-6510	Eastern Plumas Health Care
Willo Vieira	willovieira@countyofplumas.com	530-283-6126	Ag Dept.
Amber Hughs	amber@plumasfiresafe.org		PCFSC
NINA Peay	npeay@~~PRS~~plumasruralservices.ORG	530-394-7672	Plumas Rural Services
Mimi Hall	mimihall@countyofplumas.com		Plumas Co. Supervisor

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
January 14, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
GERD EBELING	QOH637@GMAIL.COM		FIREWISE
Bob Gray	PeninsulaFire00@Gmail	831 332 8865	Peninsula/Chester Fire Dept
Paul Mroczynski	pmroc@psln.net	5307833099	Dixie Institute Indian Falls Firewise Meadow Valley
Terri Simon-Jackson	tsimonjackson72@gmail.com		Public

A.4 HMPC #2: Risk Assessment Meeting

A.4.1. Emailed Invite to Risk Assessment Meeting

From: Pini, Lori <loripini@countyofplumas.com>
Sent: Friday, April 4, 2025 3:09 PM
To: Pini, Lori; adam@sectaris.partners; Allen Homme (ahomme@chesterpud.org); Allred, Keevin; Amber Marshall (amber.marshall@usda.gov); amber@plumasfiresafe.org; Annie Adcock; Atkins, Laura; awarndorf@frc.edu; Bill Powers (bpowers96122@gmail.com); Billy Davies; Bob Marshall (bob.marshall@psrec.com); boborange@frontiernet.net; bod@pdh.org; Brad Underwood (bunderwood@frrcd.org); Brady Haynes (bhaynes@senecahospital.org); Brechtel, Josh; brenda.narayan@pge.com; Bryan Alexander (bryan.alexander@usda.gov); Celesta Gauna; Chandler Peay; chbowman@prodigy.net; chermann@pcso.net; Chester Chamber of Commerce; Chris Morrison; Christopher Woodward (christopher.woodward@dot.ca.gov); cjohnson@chesterpud.org; Clayton Beck (clayton.beck@usda.gov); Clint Burkenpas (clint.burkenpas@dot.ca.gov); Coelho, Michael; Cynthia M. (cynthiam@myairdistrict.com); Dale; Dan Litchfield (dlitchfield@plumasruralservices.org); Danielle Berry (dberry@sierrainstitute.us); darrell@plumasfiresafe.org; david.stewart@cpuc.ca.gov; david@beskeen.net; dbeatty@pdh.org; dbloxham@indianvalleycsd.com; DeeDee Clark; dmanning@greenvillerancheria.com; dornelas@sierrainstitute.us; dschmid@qfd.ca.gov; duhv@pge.com; Duncan Cameron (9500sierravalleyfire@gmail.com); Dwight Cerasola (ceresolasuper1@yahoo.com); ecompton@psrec.coop; edwardw9200@gmail.com; Eliza Fletcher; Eric Ewing (eric.ewing@fire.ca.gov); Erik Egide (EEgide@chp.ca.gov); Frank Carey (fcarey@qfd.ca.gov); Gary Parque (gary@plumasfiresafe.org); Gerd Ebeling; Gold Lake Lodge (Reservations@goldlakelodge.com); Goss, Kevin; Greenhorn CSD (gcsd96103@yahoo.com); Greg Kinne (kgkinnes@gmail.com); Grizzly Water District (jenniferlacy@digitalpath.net); Hannah Hepner (hannah@thewatershedcenter.com); Harvey West (harvey@playgraeagle.com); plancom5; Heather Reineking (hreineking@sierrainstitute.us); Holly Coons; Ian James (ijames@collinsco.com); Indian Valley Park & Recreation District (info.ivrpd@gmail.com); Inge Houck; Isabella Bledsoe (ibledsoe@sierrainstitute.us); plancom3; Jamar Tate (jtate@digitalpath.net); James “Bull” Asher (svv8213@gmail.com); James Shipp (recdept@psln.com); Jan Hammill (bjhammill@frontiernet.net); Jas Shaw (jas.shaw@fire.ca.gov); Jason Harston (jason.harston@PSREC.com); Jason Moghaddas (Jmoghaddas@sig-gis.com); Jeanie Hinds (jeanie@plumascorp.org); Jeanine Foster; Engel, Jeff; Jeff Rosevear (chiefrosevear@beckpeakfpd.com); Langston, Jennifer; Jennifer Leighty; jennifer@pcateam.com; sierravalleygmd@sbcglobal.net; jbeatley@pcso.net; Jerri Nielsen (jlvnielsen1@gmail.com); Graham, Jim; Jim Stockdale (jim.stockdale@graeaglefire.org); Jim Wilcox (jim@plumascorporation.org); Jodee Read (jread@pdh.org); Blackwell, Joe; Joe Fish (office@myairdistrict.com); Joe Walton (Joe.Walton@fire.ca.gov); Joe Waterman (joe.waterman.jw@gmail.com); Joel Bronk (joel.bronk@usda.gov); John Parks (johnparksiii@gmail.com); John Reynolds (john@reynolds-family.us); John Rowden (john.rowden@digitalpath.net); John Rowden (projectmanager.pecsd@gmail.com); Steffanic, John; Joleen Cline (jcline@whitehawkranch.org); Jonathan Bruno (jbruno@chp.ca.gov); Jonathan Pangburn (jonathan.pangburn@fire.ca.gov); Joseph Rudeen (joseph.rudeen@dss.ca.gov); joshua.dixon@dot.ca.gov; jstarr@spi-ind.com; Julie Hunter (julieh@myairdistrict.com); Kai Walters; Kane Russell; Karrie White (kwhite@qfd.ca.gov); Kate Rahmeyer (kate@pcirc.com); kathy.kogge@gmail.com; Katie Reid-Harris (katiereid7@gmail.com); katie@americanvalleycsd.com; katie@plumasfiresafe.org; kdd@frontiernet.net; kdowns@manhard.com; kmckillop@southfeather.com; kschmidt@usgs.gov; KTrutna@frc.edu; Kyle Felker (mapit400@gmail.com); kyle.kroll@wildlife.ca.gov; lacey.carney@chp.ca.gov; Lafe Alexander (callmelafe@aol.com); Larry Smith; Lee Kiolbasa (Leonard.Kiolbasa@libertyutilities.com); Leslie Edlund (leslie.edlund@usda.gov); LeTina Vanetti; liam@plumascorporation.org; liam@plumasfiresafe.org; Linda McCurdy; Mark Thomas (mthomas@norcalems.org); martin.janolo@water.ca.gov; Marty Senter; Marty Walters; Matt West (mfwest82@gmail.com); mattbeatley@pcso.net; Matthew West; meadowvalleyfiredepartment@gmail.com; meganmccrorey89@gmail.com;

melissak@myairdistrict.com; mhall@frrcd.org; Michael Algots; michelle.fulton@sbcglobal.net; Mike Flanigan (mike-flanigan@leavitt.com); Mike Loew (mloew@norcalems.org); Mike Saitone (hbcsd@frontier.com); Mike Yost (msyost@frontiernet.net); Mikki Brown (mikkib@myairdistrict.com); Mimi Garner (mimithegolfgal@gmail.com); mjtaborski@spi-ind.com; plancom2; Nancy Presser (npresser@plumasruralservices.org); Naveed Paydar (Naveed.Paydar@cpuc.ca.gov); Collin, Nick; Osborn, Becky; plancom1; quincyrecdept@outlook.com; Schrammel, Charles; Velazquez, Marco; wamwco@yahoo.com; westalmanorfd@citlink.net; william.laustalot@caloes.ca.gov; Ben Huffer; caitlin.ostomel@usda.gov; citymanager@cityofportola.com; Corey Pargee; coutland@senecahospital.org; cromberg588@gmail.com; Doug McCoy; Dwyer, Jennifer (Consultant)@DWR; Evans, Tim; Ferguson, Tracey; Galen Smith; Goings, Travis; Hall, Mimi; Howard Hughes; janie.ackley@usda.gov; kself@greenvillerancheria.com; laportefire@yahoo.com; Mario Klip; McGowan, Tom; Nils Lunder; npeay; Pat Morton (patmorton786@gmail.com); Patrick Callahan; pcmresearch@psln.com; plancom4; pmrow@jps.net; pygbuhay@up.com; Quincy Fire (quincyfire@sbcglobal.net); rachel.birkey@usda.gov; rachel.hutchinson@usda.gov; rbunzel@spi-ind.com; rdaun@pcoe.k12.ca.us; rdiefendorf@plumascdc.org; rebecca@greenhorncsd.com; Reinert, Nicole; Remy.Gill@water.ca.gov; richard.stockton.g1ee@statefarm.com; Riley duPont (rileydupont28@gmail.com); Robert Bavier (rjbavier@up.com); Robert Gray (peninsulafire00@gmail.com); Robert Hosea; Robinette, Rob; ron1942mv@gmail.com; Royce Raker (rraker@senecahospital.org); rpedersen@chp.ca.gov; rsonsteng@chesterpud.org; russell.nickerson@usda.gov; sallymtemp53@gmail.com; Sam Blesse (sblesse@REMSA-CF.com); Scott Corey (scott@plumascorporation.org); sdebonis@spi-ind.com; Shawn McKenzie; Shelton Douthit; shmp@conservation.ca.gov; sierravalleyrcd@gmail.com; Silas Rojas (srojas@co.lassen.ca.us); smunsen@sbcglobal.net; speay@pcso.net; spreston@chp.ca.gov; Stan Peiler (stan.peiler@ephc.org); steve.pecsd@gmail.com; Susan Espana; suzie@myairdistrict.com; svgmd@sierravalleygmd.org; t.roberts@ci.portola.ca.us; taletha@plumascharterschool.org; Taylorsville Cemetery (kathnpop@gmail.com); Terri Simon-Jackson; Thomas Grubbs (thomas.grubbs@usda.gov); Thorman, Rob; Tim Jones; Tina Hopkins; tkschohr@ucanr.edu; Todd Johns; tommy@plumasfiresafe.org; Trina Cunningham (trina@maidusummit.org); Tyson@GreenhornCSD.com; Venable, Tina; Vieira, Willo; Wally Bird; wgrandall@gmail.com; Zach Browning; Zoe Stancer; Bob Howell; Grizzly Lake CSD (glcsddelleker@gmail.com); bill@terrafuego.com
Subject: Plumas County LHMP Update
When: Thursday, May 8, 2025 1:00 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Quincy Branch Library (445 Jackson St, Quincy, CA 95971)

Good afternoon,

In January, we kicked off the **Plumas County Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) Update project**. That meeting provided an overview of the project and resulted in an updated list of hazards to include in the 2026 LHMP Update. Since then, Foster Morrison Consulting and the project team have been collecting data as part of the updated risk assessment for the plan. The resulting risk assessment will consist of a written profile and analysis of each identified hazard, supported by technical, historical, and local data. The risk assessment will become a part of the updated LHMP.

Please join us for our second Hazard Mitigation Planning Committee (HMPC) Meeting for the Risk Assessment. The purpose of this working meeting of the planning committee is to share draft risk assessment materials – including mapping, data, and other information – and invite your feedback. See attached agenda.

What: HMPC Risk Assessment Meeting
When: May 8, 2025 (Thursday), 1:00 - 4:00 pm
Where: Quincy Branch Library Building, 445 Jackson Street, Quincy, CA 95971

A public stakeholder meeting will also be held the evening of the same day of the HMPC meeting.
**Please note that the Public are welcome at the 1:00 PM Meeting for input also:

What: Public Risk Assessment Meeting
When: May 8, 2025 (Thursday), 5:30 - 7:30 pm
Where: Quincy Branch Library Building, 445 Jackson Street, Quincy, CA 95971

If you plan on attending, please RSVP.

Questions? Please feel free to reach out to myself or Jeanine Foster, Foster Morrison Consulting, at 303 717-7171 or jeanine.foster@fostermorrison.com.
For more information about the project, visit: Local Hazard Mitigation Plan | Plumas County, CA - Official Website

Hope to see you there.

Thank you,

Lori Pini, Manager
Plumas County Office of Emergency Services
1446 East Main Street
Quincy, California 95971
(530) 283-7438 Office
(530) 616-1899 Cell
loripini@countyofplumas.com

A.4.2. HMPC #2: Risk Assessment Meeting Agenda

AGENDA

PLUMAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC) Meeting #2
Risk Assessment

Thursday May 8, 2025
1:00 - 4:00 pm
Quincy Branch Library | Quincy, California

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1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment (PowerPoint)
4. Open Discussion and Input on the Risk Assessment (Handout)
5. Review of Data Needs
6. Next Steps
7. Questions?

A.4.3. HMPC #2: Risk Assessment Meeting Sign in Sheet

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2: Risk Assessment
May 8, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Bob Howell GM	bobhow41@GMAIL.com	530-280-0608	Grizzly Lake CSD
Travis Goings OES	TRAVISGOINGS@countyofPlumas.com	530-283-6469	Plumas Co. OES
Brady Haynes COO SHD	bhaynes@senecahospital.org	530-624-3148	Seneca Healthcare District
Jamie Hale/Gm	jtate@digitalpath.net	530-836-195	Plumas Eureka CSD
Tina Venable	tinavenable@countyofplumas.com	530-249-3679	P.C. Public Health
Jimi Wilcox	jimi@plumascorp.org	530 283-3739	P.O. Box 3880, Quincy
Kyle Felker	mapit4000@gmail.com	530 251-6112	
Lori Beatley	lori.beatley@countyofplumas.com	283-6588	PCPHA
Kristen McMillan	kmckillop@southfeather.com	530-532-1348	South Feather Water & Power
Josh Brechtel	joshbrechtel@countyofplumas.com	530-314-7760	Plumas County Counsel
Rob Robinette	RobRobinette@countyofplumas.com	530 283-6593	Plumas Env Health Director
Ryan Trank	citymanager@cityofportola.com	530-832-6800	City of Portola

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2: Risk Assessment
May 8, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Marty Senter / Fire Chief	martin.senter@usda.gov	530-927-9894	USFS - Plumas NF
Erik Hansen / Fire Captain	erik.hansen@fire.ca.gov	(530) 250 7753	CAL FIRE / LMU
Bill Jacks / ED, TFRF	bill@Terrafuego.org	530-249-6000	Terra Fuego Resource Foundation
KATHY KEGGE / DIR, GOLDHN CSD	Kathy.Kegge@gmail.com	917-655-7411	Director GHCSD / Director PCFSC
Willo Vieira / CAC	willovieira@countyofplumas.com	530-283-6365	Ag Dept
Rob Thorman, Director	robthorman@countyofplumas.com	530-283-6495	PC Public Works
Gia Martynn, Exec. Dir.	gia@plumascorp.org	530-283-3739	Plumas Corporation
TRACEY FERGUSON, Dir.	Traceyferguson@countyofplumas.com	530-283-6214	PLUMAS COUNTY PLANNING DEPT.
Michael Hall District Manager	mhall@ftrcd.org	530 9275291	Feather River RCD
Tommy Brenzovich Mitigation Assistance Program manager	tommy@plumasfiresafe.org	530-927-5334	Plumas Co. Fire Safe council
Darrell Webster Biomass project manager	Darrell@Plumasfiresafe.org	530 214 3888	Plumas County Firesafe Council
Celeste Gauna	Celeste.gauna@rcac.org	530-770-1980	RCAC

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2: Risk Assessment
May 8, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Marty Walters	marty.walters@recoveryrisk.com		Recovery Risk
Lori Pini	loripini@countyofplumas.com		Plumas OES
Chris Morrison	Chris.Morrison@fostermorrison.com	701-318-4646	Foster Morrison
Jeanne Foster	jeanne.foster@fostmorrison.com	303 717-717	Foster Morrison
Online:			
Laura Atkins	lauraatkins@countyofplumas.com		Dept of Social Svs Director
Mimi Hall	mimihall@countyofplumas.com		Plumas Co. BOS
Jessica Santos	jessica.santos@dot.ca.gov		Caltrans Dist. 2

A.5 HMPC #3 & #4: Mitigation Strategy Meetings

A.5.1. Email Invites to Mitigation Strategy Meetings

From: Pini, Lori <loripini@countyofplumas.com>
Sent: Tuesday, July 15, 2025 11:55 AM
To: Pini, Lori; adam@sectaris.partners; Allen Homme (ahomme@chesterpud.org); Allred, Keevin; Amber Marshall (amber.marshall@usda.gov); amber@plumasfiresafe.org; Annie Adcock; Atkins, Laura; awarndorf@frc.edu; bpowers96122@gmail.com; Billy Davies; Bob Marshall (bob.marshall@psrec.com); boborange@frontiernet.net; bod@pdh.org; Brad Underwood (bunderwood@frrcd.org); Brady Haynes (bhaynes@senecahospital.org); Brechtel, Josh; brenda.narayan@pge.com; Bryan Alexander (bryan.alexander@usda.gov); Celesta Gauna; chbowman@prodigy.net; chermann@pcso.net; Chester Chamber of Commerce; Chris Morrison; Christopher Woodward (christopher.woodward@dot.ca.gov); cjohnson@chesterpud.org; Clayton Beck (clayton.beck@usda.gov); Clint Burkenpas (clint.burkenpas@dot.ca.gov); Coelho, Michael; Cynthia M. (cynthiam@myairdistrict.com); Dale; Dan Litchfield (dlitchfield@plumasruralservices.org); Danielle Berry (dberry@sierrainstitute.us); darrell@plumasfiresafe.org; david.stewart@cpuc.ca.gov; david@beskeen.net; dbeatty@pdh.org; dbloxham@indianvalleycsd.com; DeeDee Clark; dmanning@greenvillerancheria.com; dornelas@sierrainstitute.us; dschmid@qfd.ca.gov; duhv@pge.com; Duncan Cameron (9500sierravalleyfire@gmail.com); ceresolasuper1@yahoo.com; ecompton@psrec.coop; edwardw9200@gmail.com; Eliza Fletcher; Eric Ewing (eric.ewing@fire.ca.gov); Erik Egide (EEgide@chp.ca.gov); Frank Carey (fcarey@qfd.ca.gov); Gary Parque (gary@plumasfiresafe.org); Gerd Ebeling; Gold Lake Lodge (Reservations@goldlakelodge.com); Goss, Kevin; Greenhorn CSD (gcsd96103@yahoo.com); Greg Kinne (kgkinnes@gmail.com); Grizzly Water District (jenniferlacy@digitalpath.net); Hannah Hepner (hannah@thewatershedcenter.com); harvey@playgraeagle.com; plancom5; Heather Reineking (hreineking@sierrainstitute.us); Holly Coons; Ian James (ijames@collinsco.com); Indian Valley Park & Recreation District (info.ivrpd@gmail.com); Inge Houck; Isabella Bledsoe (ibledsoe@sierrainstitute.us); plancom3; Jamar Tate (jtate@digitalpath.net); James “Bull” Asher (svv8213@gmail.com); James Shipp (recdept@psln.com); Jan Hammill (bjhammill@frontiernet.net); Jas Shaw (jas.shaw@fire.ca.gov); Jason Harston (jason.harston@PSREC.com); Jason Moghaddas (Jmoghaddas@sig-gis.com); Jeanie Hinds (jeanie@plumascorp.org); Jeanine Foster; Engel, Jeff; Jeff Rosevear (chiefrosevear@beckpeakfpd.com); Langston, Jennifer; Jennifer Leighty; jennifer@pcateam.com; sierravalleygmd@sbcglobal.net; jbeatley@pcso.net; Jerri Nielsen (jlvnielsen1@gmail.com); Graham, Jim - Shared Mailbox; Jim Stockdale (jim.stockdale@graeaglefire.org); Jim Wilcox (jim@plumascorporation.org); Jodee Read (jread@pdh.org); Blackwell, Joe - Shared Mailbox; Joe Fish (office@myairdistrict.com); Joe Walton (Joe.Walton@fire.ca.gov); Joe Waterman (joe.waterman.jw@gmail.com); Joel Bronk (joel.bronk@usda.gov); John Parks (johnparksiii@gmail.com); John Reynolds (john@reynolds-family.us); John Rowden (john.rowden@digitalpath.net); John Rowden (projectmanager.pecsd@gmail.com); Steffanic, John; Joleen Cline (jcline@whitehawkranch.org); Jonathan Bruno (jbruno@chp.ca.gov); Jonathan Pangburn (jonathan.pangburn@fire.ca.gov); Joseph Rudeen (joseph.rudeen@dss.ca.gov); joshua.dixon@dot.ca.gov; jstarr@spi-ind.com; Julie Hunter (julieh@myairdistrict.com); Kai Walters; Kane Russell; Karrie White (kwhite@qfd.ca.gov); kate@pcirc.com; kathy.kogge@gmail.com; Katie Reid-Harris (katiereid7@gmail.com); katie@americanvalleycsd.com; katie@plumasfiresafe.org; kdd@frontiernet.net; kdowns@manhard.com; kmckillop@southfeather.com; kschmidt@usgs.gov; KTrutna@frc.edu; Kyle Felker (mapit400@gmail.com); kyle.kroll@wildlife.ca.gov; lacey.carney@chp.ca.gov; Lafe Alexander (callmelafe@aol.com); Larry Smith; Lee Kiolbasa (Leonard.Kiolbasa@libertyutilities.com); Leslie Edlund (leslie.edlund@usda.gov); LeTina Vanetti; liam@plumascorporation.org; liam@plumasfiresafe.org; Linda McCurdy; Mark Thomas (mthomas@norcalems.org); martin.janolo@water.ca.gov; Marty Senter; marty.walters@recoveryrisk.com; Matt West (mfwest82@gmail.com); mattbeatley@pcso.net; Matthew West; meadowvalleyfiredepartment@gmail.com; meganmccrorey89@gmail.com;

melissak@myairdistrict.com; mhall@frrcd.org; Michael Algots; michelle.fulton@sbcglobal.net; Mike Flanigan (mike-flanigan@leavitt.com); Mike Loew (mloew@norcalems.org); Mike Saitone (hbcsd@frontier.com); Mike Yost (msyost@frontiernet.net); Mikki Brown (mikkib@myairdistrict.com); Mimi Garner (mimithegolfgal@gmail.com); mjtaborski@spi-ind.com; plancom2; Nancy Presser (npresser@plumasruralservices.org); Naveed Paydar (Naveed.Paydar@cpuc.ca.gov); Collin, Nick; Osborn, Becky; Peay, Chandler; plancom1; quincyrecdept@outlook.com; Schrammel, Charles; Velazquez, Marco; wamwco@yahoo.com; westalmanorfd@citlink.net; william.laustalot@caloes.ca.gov; Ben Huffer; caitlin.ostomel@usda.gov; citymanager@cityofportola.com; Corey Pargee; coutland@senecahospital.org; cromberg588@gmail.com; Doug McCoy; Dwyer, Jennifer (Consultant)@DWR; Evans, Tim; Ferguson, Tracey; Galen Smith; Goings, Travis; Hall, Mimi; Howard Hughes; janie.ackley@usda.gov; kself@greenvillerancheria.com; laportefire@yahoo.com; Mario Klip; McGowan, Tom; Nils Lunder; npeay; Pat Morton (patmorton786@gmail.com); Patrick Callahan; pcmresearch@psln.com; plancom4; pmrow@jps.net; pygbuhay@up.com; Quincy Fire (quincyfire@sbcglobal.net); rachel.birkey@usda.gov; rachel.hutchinson@usda.gov; rbunzel@spi-ind.com; rdaun@pcoe.k12.ca.us; rdiefendorf@plumascdc.org; rebecca@greenhorncsd.com; Reinert, Nicole; Remy.Gill@water.ca.gov; richard.stockton.g1ee@statefarm.com; Riley duPont (rileydupont28@gmail.com); Robert Bavier (rjbavier@up.com); Robert Gray (peninsulafire00@gmail.com); Robert Hosea; Robinette, Rob; ron1942mv@gmail.com; Royce Raker (rraker@senecahospital.org); rpedersen@chp.ca.gov; rsonsteng@chesterpud.org; russell.nickerson@usda.gov; sallymtemp53@gmail.com; Sam Blesse (sblesse@REMSA-CF.com); Scott Corey (scott@plumascorporation.org); sdebonis@spi-ind.com; Shawn McKenzie; Shelton Douthit; shmp@conservation.ca.gov; sierravalleyrcd@gmail.com; Silas Rojas (srojas@co.lassen.ca.us); smunsen@sbcglobal.net; speay@pcso.net; spreston@chp.ca.gov; Stan Peiler (stan.peiler@ephc.org); steve.pecsd@gmail.com; Susan Espana; suzie@myairdistrict.com; svgmd@sierravalleygmd.org; t.roberts@ci.portola.ca.us; taletha@plumascharterschool.org; Taylorsville Cemetery (kathnpop@gmail.com); tsimonjackson72@gmail.com; Thomas Grubbs (thomas.grubbs@usda.gov); Thorman, Rob; Tim Jones; Tina Hopkins; tkschohr@ucanr.edu; Todd Johns; tommy@plumasfiresafe.org; Trina Cunningham (trina@maidusummit.org); Tyson@GreenhornCSD.com; Venable, Tina; Vieira, Willo; Wally Bird; wgrandall@gmail.com; Zach Browning; Zoe Stancer; Bob Howell; Grizzly Lake CSD (glcsddelleker@gmail.com)
Subject: Hazard Mitigation Planning Meeting
When: Wednesday, August 6, 2025 1:00 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Quincy Branch Library (445 Jackson St, Quincy, CA 95971)

Good morning,

Thanks again to everyone that attended our May Risk Assessment meeting!

You are invited to the **Plumas County 2025 Local Hazard Mitigation Plan Update Mitigation Strategy meetings of the Hazard Mitigation Planning Committee (HMPC).**

In preparation for the upcoming meetings, please see below:

Identify and bring your mitigation project ideas to the meetings!

These are the two most important meetings for this LHMP Update project:

- **Wednesday, August 6 (1:00 - 4:00 pm)** - we will be briefly revisiting the risk assessment data developed to date and will be establishing updated LHMP goals and objectives.
- **Thursday, August 6 (9:00 am – 12:00 pm)** - we will be working to identify and discuss potential mitigation actions and projects for reducing Plumas County's risk and vulnerability to identified hazards and disasters.

Please make sure everyone attends that has mitigation actions and projects to include in the LHMP Update for all identified priority hazards.

Meeting Locations for Both Meetings:

Quincy Branch Library Building
445 Jackson Street
Quincy, CA 95971

As always, Hazard Mitigation Planning Committee Meetings are open to the public.

Attached is an Agenda for the two meetings.

Also attached is a FEMA publication – Mitigation Ideas: Take a look – it is easy to skim through and will give you mitigation ideas, by hazard. What fits for your Jurisdiction?

County, City, District, and stakeholder participation and coordination is a requirement of an approved LHMP, as is the inclusion of any hazard data, information, and mitigation projects you may want to see included in the Plan. Your continued participation and input are critical to the success of this project!

A.5.2. HMPC #3 & #4: Mitigation Strategy Meeting Agenda

AGENDA

PLUMAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meetings #3 & #4 – Mitigation Strategy

Wednesday August 6, 2025 (1:00 - 4:00 pm)
Thursday August 7, 2025 (9:00 am - 12:00 pm)

Quincy Branch Library | Quincy, California

HMPC Meeting #3:

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Risk Assessment Status
4. Priority Hazards Review
5. Develop Plan Goals and Objectives
6. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

1. Introductions
2. Review Mitigation Categories and Selection Criteria
3. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
4. Prioritization of Mitigation Actions/Projects
5. Next Steps

A.5.3. HMPC #3 & #4: Mitigation Strategy Meeting Sign in Sheets

August 6 Meeting

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3: Mitigation Strategy – Goals and Objectives
August 6, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Tommy Brenzovich	tommy@plumasfiresafe.org	530-927-5334	PCFSC
Marty Senter	martin.senter@usda.gov	530-927-9891	USFS - PNF
Travis Goings	TRAVISGOINGS@countyofplumas.com	530 283 6464	Plumas OES
Dale Ready	dale@plumasfiresafe.org	707 322 0240	PCFSC
Michael Hall	mhall@frcd.org	530 927 5291	FRRCD
Robert Thurman, Director	robthurman@county of plumas.com	530 283 6295	PCPW
Jeri Wilcox	jeri@plumascorp.org	(530) 283-3737	Plumas Corp
Gia Martynn	gia@plumascorp.org	(530)283-3739	Plumas Corp
Bill Jacks	bill@terrafuego.org	530-249-6000	TFRF
Zach Browning	zbrowning@sierrainstitute.us	717-448-3050	Sierra Institute
Rob Robinette	RobRobinette@county of plumas.com	530 283-6593	Plumas Env. Health
TRACEY FERGUSON	traceyferguson@countyofplumas.com	530-283-6214	PLUMAS CO. PLANNING

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3: Mitigation Strategy – Goals and Objectives
August 6, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Brady Haynes COO	bhaynes@seneca.org	530-624-3148	Admin/Seneca Healthcare District
Kristen Mackillop	kmackillop@southfeather.com	530-532-1348	South Feather Water & Power
John Outland	John.Outland@usda.gov	530 258 5172	USFS
Loki Pini	lpini@countyofplumas.com	530 283 7438	PC OES
Joe Walton	Joe.Walton@fire.CA.gov	530-310-2206	CAL FIRE
KATHY KOGGE	Kathye.kogge@gmail.com	917-655-7411	GOLD MOUNTAIN CSD
Susan Martinez	smartinez@chesterpud.org	707-310-7537	Chester Public Utilities
Greg Kinne	kgkinnes@GMAIL.com	530) 864-6159	
Zoella Spencer	ZSpencer@PDH.ORG	530-283-7963	PDH
Annie Adcock Home Care Coordinator	annie@connectingpoint.org	530-205-5224	HHSS/Connecting Point
Ryan Wade City Manager	citymanager@cityofportola.com		City of Portola
WAIVAE TATE, GM	jtate@sjrtelpath.net	530-836-1953	PLUMAS EUREKA CSD

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3: Mitigation Strategy – Goals and Objectives
August 6, 2025 (1:00-4:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Tracy Schohr	tkschohr@ucdavis.edu	916-716-2643	UC Cooperative Ext.
SHERIFF CHAD HERMANN	chadhermann@COUNTYOFPLUMAS.com	530-283-6361	P.C.S.O.
Charlotte Walters, Resident			Quincy resident
Greg Margason	margasongreg@gmail.com		East Quincy resident
Marty Walters, County Coordination	marty@plumasfiresafe.org	530-394-0187	Recovery Risk Plumas Fire Safe Council

August 7 Meeting

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #4: Mitigation Strategy – Actions and Projects
August 7, 2025 (9:00-12:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Marty Walters	marty@plumasfiresafe.org marty.walters@recovery4k.com		RR, PFSC
Robert Lonnecchi	robert.sovereign@caloes.ca.gov		CalOES
Kyle Felker	mapit400@gmail.com		
Ryan Beale	citymanager@cityofportola.com		city of Portola
Travis Goings	travisgoings@plumas.com		Plumas OES
Brady Hayes	bhayes@senecahospital.org		Seneca, Admin
Marty Senter	martin.senter@usda.gov		USFS - PNF
Joe Walters	Joe.Walters@fire.ca.gov		CALFIRE Lassen
Scott Outland	John.Outland@USDA.gov		USFS - LNF
Rob Thorman	robthorman@countyofplum.com		PCPW
Jamie Tate / Gun	jtate@digitalpath.net		PECSD
Zoella Stanton	ZStanton@PDH		PDH

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #4: Mitigation Strategy – Actions and Projects
August 7, 2025 (9:00-12:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
CHARLES SCHRAMMEL	charles.schramme1@county	6457	PCPHA
Tommy BRENZOVICH	tommy@plumasfiresafe.org	530 ~~596~~ 283-5334	PCFSC
KATHY KOGGE	kathy.kogge@gmail.com	~~827~~ 917-655-7411	GMCSD
Annie Adcock Home Care Coordinator	annie@connectingpoint.org	530-205-5224	Connecting Point / IHSS
Bill Jacks	bill@terrafuego.org	530-249-6000	TFRF
JEREMY BEATTY	JEREMYBEATTY@countyofplumas.com	530-283-6381	PCSO
Rob Robinette	RobRobinette@countyofplumas.com	7302836593	Plumas Env Health
Michael Hall	mhall@frcd.ca.gov	5309275299	FRRCD
Zach Browning	zbrowning@sierrainstitute.us	717-448-3050	SI
Dale Ready	dale@plumasfiresafe.org	707 322 0290	PCFSC
Kristen McKellar	kmckellar@southfeather.com	530-532-1346	SFWPA
Gia Martynn	gia@plumascorp.org	530-283-3739	Plumas Corp

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #4: Mitigation Strategy – Actions and Projects
August 7, 2025 (9:00-12:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Lori Pini	PC		PCOES
Travis Goings			PCOES
David Hawkes	david.hawkes@pge.com	(916)838-6210	PG&E

A.6 HMPC #5: Final HMPC Meeting

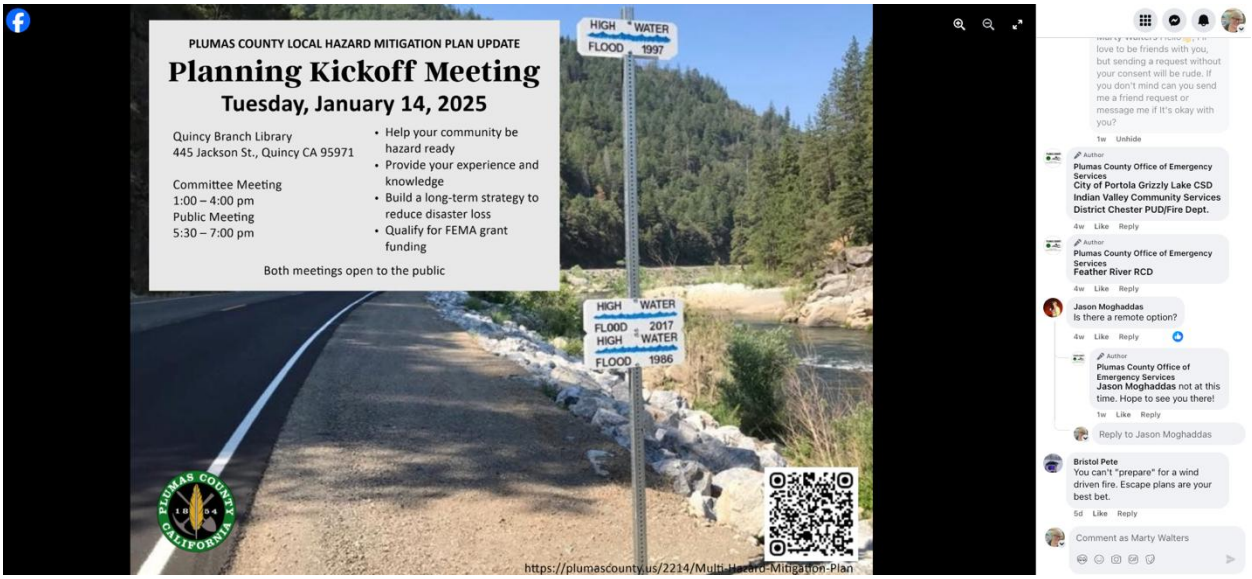
A.6.1. Final HMPC Meeting Invite

A.6.2. HMPC #5: Final HMPC Meeting Agenda

A.6.3. HMPC #5: Final Meeting Sign In Sheets

A.7 Public Involvement

A.7.1. Public Meeting #1 Outreach – December 20, 2024 Facebook Post



Source: Plumas County

A.7.2. Public Meeting #1 Outreach –Mentions in Other Forums

Recovery Risk

Kai Walters <kai.walters@recoveryrisk.com>

Your newsletter - mentioning LHMP

Amber Hughes <amber@plumasfiresafe.org> Tue, Jan 28, 2025 at 2:56 PM
To: Marty Walters <marty.walters@recoveryrisk.com>
Cc: Kai Walters <kai.walters@recoveryrisk.com>

Hey Folks,

I forwarded the email I received to the PCFW Leads, which has 83 contacts.
--
In collaboration,

Amber Hughes | Rural Community Outreach Coordinator
amber@plumasfiresafe.org
+1 530-927-5294
420 N Mill Creek Rd
PO Box 1225
Quincy, CA 95971
Plumas County Fire Safe Council

PLUMAS COUNTY FireSafe COUNCIL

[Quoted text hidden]

A.7.3. Public Meeting #1 Outreach – VOAD Newsletter

Recovery Risk

Marty Walters <marty.walters@recoveryrisk.com>

New Year, Same Hazards
1 message

Marty Walters <marty.walters@recoveryrisk.com> Sun, Jan 5, 2025 at 10:36 PM
To: Info <info@playgraeagle.com>

Plumas County VOAD
Voluntary Organizations Active in Disaster

We're kicking off the new year with a really good To Do List. Here's what we have so far - Use this Zoom registration link to get all our meetings onto your calendar! All our hybrid meetings are on Wednesdays at 3 p.m. Would you like to host Plumas VOAD for an in-person meeting? Let me know!

1. Food During Emergencies: Wednesday, January 15, 3-4 pm Quincy Library
2. Training and Biz Meeting: February 26, 3 pm, Register for Zoom Link Here
3. Facilities and Logistics During Emergencies: March 26, 3 pm, Register for Zoom Link Here
4. Fire Season Prep and Biz Meeting: May 28, 3 pm, Register for Zoom Link Here
5. Training and Biz Meeting: August 27, 3 pm, Register for Zoom Link Here
6. Flood Season Prep and Biz Meeting: November 19, Register for Zoom Link Here

We focus a lot on what happens in the first few days to weeks of a disaster, but we want to support any and all efforts that help reduce the impact of disasters on people in Plumas County.

It's been four years since the Dixie Fire devastated our forests and communities, and it's time for Plumas County to update its Local Hazard Mitigation Plan. Here's your opportunity to look at priorities and actually have an impact on how we prioritize and plan and spend money on mitigation projects that could make a huge difference during the next disaster. Please consider getting involved throughout 2025 in this process. I'll be walking alongside you all during this process and really welcome comments, suggestions, and input from all corners of our county, including especially people who might have more difficulty accessing resources during evacuations and disasters. County OES manager and VOAD partner Lori

Pini is the lead for the project. Come to one of the meetings on January 14 and check out the county's website for the project.

–

Marty Walters
Chair, Plumas County VOAD

marty.walters@recoveryrisk.com
Mobile: +1 (530) 394-0187
Office: +1 (530) 616-8398
P.O. Box 411, Quincy, CA 95971 USA

A.7.4. Public Meeting #1 Outreach – Plumas County News and Updates Email Blast

From: News & Public Notices listserv@civicplus.com
Subject: Multi-Jurisdictional Hazard Mitigation Planning Meeting for www.plumascounty.us
Date: January 6, 2025 at 9:36 AM
To: info@martywalters.com

View this in your browser

January 06, 2025

Multi-Jurisdictional Hazard Mitigation Planning Meeting

Plumas County, CA: Plumas County is partnering with the City of Portola and five special districts, Grizzly Lake Community Services District, Indian Valley Community Services District, Plumas-Eureka Community Services District, Chester Public Utility District, and Feather River Resource Conservation District, to update the 2020 Plumas County and 2019 City of Portola Local Hazard Mitigation Plans (LHMPs), in addition to preparing new plan annexes for the five special districts. Wildfire, floods, drought, and severe weather are just a few of the hazards of concern in Plumas County. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. The goal of the project is to have a FEMA-approved multi-jurisdictional LHMP that will then allow the County, City, and special districts to apply for both pre- and post-disaster mitigation grant funding.

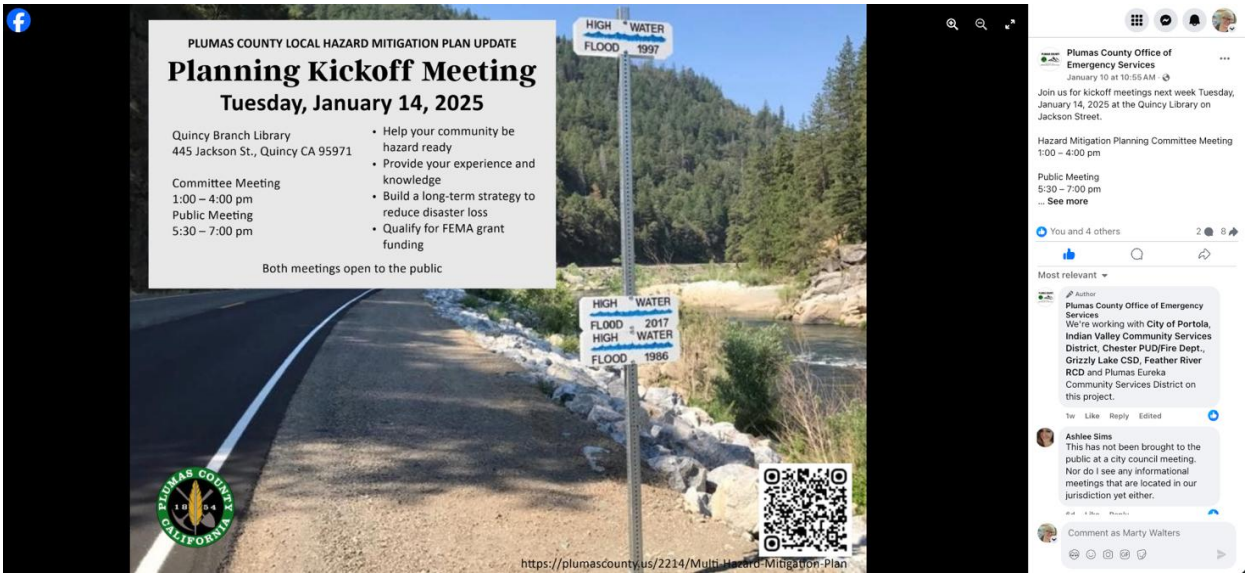
You are invited. Members of the public and all interested stakeholders are encouraged to attend and participate in the upcoming project kickoff meetings. An initial Public Meeting will explain the multi-jurisdictional LHMP update and development process, the benefits of hazard mitigation planning, and how the community can be involved. In addition, the Hazard Mitigation Planning Committee (HMPC) Meeting with partnering jurisdictions and other stakeholders is open to the public. Please select the meeting and time that works best for you.

HMPC Meeting - January 14, 2025 (Tuesday) - 1:00 – 4:00 pm Quincy Branch Library 445 Jackson St., Quincy 95971

Public Meeting - January 14, 2025 (Tuesday) - 5:30 – 7:00 pm Quincy Branch Library 445 Jackson St., Quincy 95971

For more information on the 2026 Multi-Jurisdictional LHMP update, please visit: https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan. Please contact Lori Pini, Manager, Plumas County Office of Emergency Services at (530) 283-7438 or email at loripini@countyofplumas.com with any questions.

A.7.5. Public Meeting #1 Outreach – January 7 and 10, 2025 Facebook Post



Source: Plumas County

A.7.6. Public Meeting #1 Outreach – Plumas Sun Article From 1/7/2025

The Plumas Sun

Home › News › Events › Hazard mitigation plans to be updated

News Events

Hazard mitigation plans to be updated

January 7, 2025 | The Plumas Sun

Photo courtesy of Plumas County Office of Emergency Services

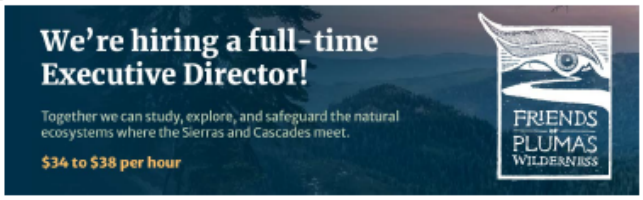
Plumas County is partnering with the City of Portola and five special districts to update the 2020 Plumas County and 2019 City of Portola Local Hazard Mitigation Plans. The partners also plan to prepare new plan annexes for the five special districts: Grizzly Lake Community Services District, Indian Valley Community Services District, Plumas-Eureka Community Services District, Chester Public Utility District, and Feather River Resource Conservation District.

Wildfire, floods, drought, and severe weather are just a few of the hazards of concern in Plumas County. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. The goal of the project is to have a FEMA-approved multi-jurisdictional LHMP that will then allow the county, city, and special districts to apply for both pre- and post-disaster mitigation grant funding.

Members of the public and all interested stakeholders are encouraged to attend and participate in the upcoming project kickoff meetings. An initial public meeting will explain the multi-jurisdictional LHMP update and development process, the benefits of hazard mitigation planning, and how the community can be involved. The Hazard Mitigation Planning Committee meeting with partnering jurisdictions and other stakeholders is open to the public. Following are meeting times and locations:

HMPC Meeting – Tuesday, Jan, 14, 2025, 1:00 – 4:00 p.m., Quincy Branch Library, 445 Jackson St., Quincy.

- Sponsored By -



Public Meeting Tuesday, Jan. 14, 5:30 – 7:00 p.m., Quincy Branch Library 445 Jackson St., Quincy.

For more information on the 2026 Multi-Jurisdictional LHMP update, visit: https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan. Contact Lori Pini, manager, Plumas County Office of Emergency Services at (530) 283-7438 or email loripini@countyofplumas.com with any questions.

Information provided by Plumas County Office of Emergency Services

A.7.7. Public Meeting #1 Outreach – 20,000 Lives Weekly Update 1/8/2025

Recovery Risk

Marty Walters <marty.walters@recoveryrisk.com>

20,000 Lives Weekly Update 01.08.24
1 message

20,000 Lives <20000lives@countyofplumas.com> Wed, Jan 8, 2025 at 9:07 AM
To: "20,000 Lives" <20000lives@countyofplumas.com>

Good Morning 20,000 Lives members,

To review the flyers referenced in this email, click this current flyer link. Also, to share your resources and upcoming events, respond to this email or use the upload link. They may be shared for up to a month.

***NEW EVENTS/OPPORTUNITIES

- Plumas County Officer of Emergency Services Kickoff Meeting - Multi-Jurisdiction Local Hazard Mitigation Plan Update. Help your community be hazard ready,

provide your experience and knowledge, build a long-term strategy to reduce disaster loss, and qualify for FEMA grant funding. **Tuesday, January 14,** at the Quincy Library. Committee Meeting: **1 pm – 4 pm.** Public meeting: **5:30 pm – 7 pm.** Open to the public. See flyer for more information.

- Plumas Rural Services January 2025 Newsletter available here.
- First 5 Plumas Breastfeeding Group! Parents of babies and toddlers discuss feeding, parenting and available resources while connecting with other parents. **2nd Wednesday of each month at 9:00 am.** Dramaworks Rehearsal Room 14 Crescent St, Quincy CA (during winter months). See flyer for more information.
- First 5 Plumas Playgroup! Come connect with other children and parents. **Every Wednesday, from 9:30 am – 10:30 am.** Dramaworks Rehearsal Room 14 Crescent St, Quincy CA (during winter months). See flyer for more information.
- The Brewing Lair + Quintopia Brewing Co Death Over Drafts - A community event to spark curiosity and conversation about death and dying. Please join Death Doula Susan DeLano for a Q&A about Plumas Community Hospice. **Friday, January 10, at 5 pm** at Quintopia Brewing Co in Quincy. See flyer for more information.

***PREVIOUSLY SHARED EVENTS/OPPORTUNITIES

- Plumas County's Tobacco Use Reduction Program Community Engagement Grant Application is available here! This grant provides the opportunity to fund current or new projects that support our tobacco prevention and education efforts. Applicants are not required to have prior tobacco knowledge or experience. See the grant application for more details.
- Adventure Monkeys Full Moon Ski! Featuring live music by local musicians! **Saturday, January 11** at the Johnsville Ski Bowl. Music begins at dusk. Click here for tickets. See flyer for more information.
- Adventure Monkeys Plumas County Winter Concert and Recreation Series. Click here to check out all the fun winter activities happening in Plumas County! Events include skate nights, full-moon skiing, live music, and more!
- First 5 Plumas Plumas Early Childhood Inclusion Meeting & Lunch! Open to anyone interested in bringing positive change to young children in Plumas County. **Wednesday, January 15, from 12 pm – 2 pm** at the PUSD Office, 50 Church St. (downstairs) in Quincy. Liz Welch of Plumas Stars and PRS will be presenting. See flyer for more information.

Upcoming Coalition/Workgroup Meetings (share yours here!)

- Plumas Rural Services Mental Health Awareness Working Group. **Thursday, January 16, on Zoom from 11 am - 12 pm.** Click here to register for this series of meetings. MAWG is an opportunity to share with community members, partners, and service providers - your concerns, information, resources, and events that we can support in relation to mental health & wellness in our communities.

- Plumas County's Tobacco Use Reduction Program Plumas Adults Against Tobacco Coalition Meetings: **The third Wednesday of the month from 1:00 pm – 2:00 p.m.** via teams. To register, please email Anai Gabriel at anaigabriel@countyofplumas.com.
- Plumas County's Oral Health Program Oral Health Coalition Meeting: **Wednesday, January 29, at 11:30 AM**. This coalition plays a vital role in shaping PCPHA's Oral Health Program, as stakeholders provide valuable guidance. The Oral Health Program is currently seeking additional members to join their coalition, particularly parents, as their insights are important. To register, please email Tori Brown at toribrown@countyofplumas.com.

Job Opportunities

- Plumas County Multiple positions open. Please click here for the county HR page and more information.
- Friends of Plumas Wilderness Hiring Executive Director. Are YOU Friends of Plumas Wilderness' next Executive Director? Full-time position in Quincy. Requires commitment to conservation and a passion for protecting public lands. Demands strategy development & campaign planning, org leadership, fundraising, and excellent communication skills. $70-80K DOE + benefits. Transition bonus. ExecComm@plumaswilderness.org. See flyer for more information.
- AMERICORPS SENIORS WANTS YOU – Provide rides for seniors. For more information, see flyer, call Samantha at 530-898-4027, or visit https://www.passagescenter.org/senior-corps/.

Please feel free to contact us if you have any questions and/or ideas! You can also submit a comment or feedback here on the website!

Supporting Thriving Communities

20,000 Lives | Plumas County Public Health Agency

(530) 283-6337| 20000Lives@countyofplumas.com

20,000 Lives Web | Plumas Health & Wellness Facebook

plumascounty.us/DocumentCenter/View/50359/20000-Lives-Weekly-Update-20240801
20,000 Lives Weekly Update 2024.07.01.pdf
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100%
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLAN UPDATE
Planning Kickoff Meeting
Tuesday, January 14, 2025
Quincy Branch Library
445 Jackson St., Quincy CA 95971
Committee Meeting
1:00 – 4:00 pm
Public Meeting
5:30 – 7:00 pm
• Help your community be hazard ready
• Provide your experience and knowledge
• Build a long-term strategy to reduce disaster loss
• Qualify for FEMA grant funding
Both meetings open to the public
HIGH WATER FLOOD 1997
HIGH WATER FLOOD 2017
HIGH WATER FLOOD 1986
PLUMAS COUNTY CALIFORNIA 1854

A.7.8. Public Meeting #1 Outreach – Fire Safe Council 1/9/2025 and Fire Chief's Association Meeting Announcements

Recovery Risk

Marty Walters <marty.walters@recoveryrisk.com>

RE: Plumas LHMP Update: Public Outreach Strategy
1 message

Pini, Lori <loripini@countyofplumas.com> Fri, Jan 10, 2025 at 8:57 AM
To: Jeanine Foster <jeanine.foster@fostermorrison.com>, "Goings, Travis" <travisgoings@countyofplumas.com>
Cc: "Ferguson, Tracey" <TraceyFerguson@countyofplumas.com>, Marty Walters <marty.walters@recoveryrisk.com>

Looks good.

I presented at the Fire Safe meeting 1/9/2025 – 30 people

I will present at the Fire Chief's meeting on 1/11/2025

Lori Pini, Manager

Plumas County Office of Emergency Services

1446 E. Main Street

Quincy, California 95971

(530) 283-7438 Office

(530) 616-1899 Cell Phone

loripini@countyofplumas.com

From: Jeanine Foster <jeanine.foster@fostermorrison.com>
Sent: Thursday, January 9, 2025 6:35 AM
To: Pini, Lori <loripini@countyofplumas.com>; Goings, Travis <travisgoings@countyofplumas.com>
Cc: Ferguson, Tracey <TraceyFerguson@countyofplumas.com>; Marty Walters <marty.walters@recoveryrisk.com>
Subject: Plumas LHMP Update: Public Outreach Strategy

CAUTION: This email originated from OUTSIDE THE ORGANIZATION. Do not click links or open attachments unless you recognize the sender and know the content is safe.

A.7.9. Public Meeting #1 Outreach – 20,000 Lives Weekly Update 1/14/2025

Recovery Risk

Marty Walters <marty.walters@recoveryrisk.com>

20,000 Lives Weekly Update 01.14.25
1 message

20,000 Lives <20000lives@countyofplumas.com> Tue, Jan 14, 2025 at 3:57 PM
To: "20,000 Lives" <20000lives@countyofplumas.com>

Good Evening 20,000 Lives members,

To review the flyers referenced in this email, click this current flyer link. Also, to share your resources and upcoming events, respond to this email or use the upload link. They may be shared for up to a month.

***NEW EVENTS/OPPORTUNITIES

- Plumas County Library Teen Game Night! Come out for Board Games, Tabletop Roll Playing, Collectable Trading Card Games, and more! Occurs **every third Friday of the month, from 6pm – 8pm** at the Quincy Library. Click here for more information.
- Lake Almanor Elks Lodge Elks Crab Feed! **January 25** at the Lake Almanor Elks Lodge. Social hour begins at **5 pm,** dinner is at **6 pm.** Tickets are available at Roland Insurance, 650 Main St. in Chester or call Terry Parsons at (530) 258-9447. See flyer for more information.

***PREVIOUSLY SHARED EVENTS/OPPORTUNITIES

- Plumas County Officer of Emergency Services Kickoff Meeting - Multi-Jurisdiction Local Hazard Mitigation Plan Update. Help your community be hazard ready,

  provide your experience and knowledge, build a long-term strategy to reduce disaster loss, and qualify for FEMA grant funding. **Tuesday, January 14,** at the Quincy Library. Committee Meeting: **1 pm – 4 pm.** Public meeting: **5:30 pm – 7 pm.** Open to the public. See flyer for more information.

- Plumas Rural Services January 2025 Newsletter available here.
- First 5 Plumas Breastfeeding Group! Parents of babies and toddlers discuss feeding, parenting and available resources while connecting with other parents. **2nd Wednesday of each month at 9:00 am.** Dramaworks Rehearsal Room 14 Crescent St, Quincy CA (during winter months). See flyer for more information.
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- Plumas County's Tobacco Use Reduction Program Community Engagement Grant Application is available here! This grant provides the opportunity to fund current or new projects that support our tobacco prevention and education efforts. Applicants are not required to have prior tobacco knowledge or experience. See the grant application for more details.
- Adventure Monkeys Plumas County Winter Concert and Recreation Series. Click here to check out all the fun winter activities happening in Plumas County! Events include skate nights, full-moon skiing, live music, and more!
- First 5 Plumas Plumas Early Childhood Inclusion Meeting & Lunch! Open to anyone interested in bringing positive change to young children in Plumas County. **Wednesday, January 15, from 12 pm – 2 pm** at the PUSD Office, 50 Church St. (downstairs) in Quincy. Liz Welch of Plumas Stars and PRS will be presenting. See flyer for more information.

Upcoming Coalition/Workgroup Meetings (share yours here!)

- Plumas Rural Services Mental Health Awareness Working Group. **Thursday, January 16 meeting is CANCELLED.** The next meeting will be on **Monday, January 20, on Zoom from 11 am - 12 pm.** Click here to

register for this series of meetings. MAWG is an opportunity to share with community members, partners, and service providers - your concerns, information, resources, and events that we can support in relation to mental health & wellness in our communities.

- Plumas County's Tobacco Use Reduction Program Plumas Adults Against Tobacco Coalition Meetings: **The third Wednesday of the month from 1:00 pm – 2:00 p.m.** via teams. To register, please email Anai Gabriel at anaigabriel@countyofplumas.com.
- Plumas County's Oral Health Program Oral Health Coalition Meeting: **Wednesday, January 29, at 11:30 AM**. This coalition plays a vital role in shaping PCPHA's Oral Health Program, as stakeholders provide valuable guidance. The Oral Health Program is currently seeking additional members to join their coalition, particularly parents, as their insights are important. To register, please email Tori Brown at toribrown@countyofplumas.com.

Job Opportunities

- Plumas County Multiple positions open. Please click here for the county HR page and more information.
- Friends of Plumas Wilderness Hiring Executive Director. Are YOU Friends of Plumas Wilderness' next Executive Director? Full-time position in Quincy. Requires commitment to conservation and a passion for protecting public lands. Demands strategy development & campaign planning, org leadership, fundraising, and excellent communication skills. $70-80K DOE + benefits. Transition bonus. ExecComm@plumaswilderness.org. See flyer for more information.
- AMERICORPS SENIORS WANTS YOU – Provide rides for seniors. For more information, see flyer, call Samantha at 530-898-4027, or visit https://www.passagescenter.org/senior-corps/.

Please feel free to contact us if you have any questions and/or ideas! You can also submit a comment or feedback here on the website!

Supporting Thriving Communities

20,000 Lives | Plumas County Public Health Agency

(530) 283-6337| 20000Lives@countyofplumas.com

20,000 Lives Web | Plumas Health & Wellness Facebook

A.7.10. Public Meeting #1 – Posting Locations of Outreach Flyers

Below is a list of all the places the Outreach Flyer was posted and the jurisdictions or Districts participating in the LHMP Update that were targeted:

- Chester Post Office: Chester PUD, Feather River RCD
- Canyon Dam Post Office: Feather River RCD
- Greenville Post Office: Indian Valley CSD, Feather River RCD
- Crescent Mills Post Office: Indian Valley CSD, Feather River RCD
- Taylorsville Post Office: Indian Valley CSD, Feather River RCD
- Chilcoot-Vinton Post Office
- Feather River Food Co-Op: Portola City of Portola
- Portola Post Office: City of Portola, Grizzly Lake CSD (PO service area)
- Clio Post Office: Feather River RCD
- Graeagle Store: Feather River RCD
- Blairsden/Graeagle Post Office: Plumas-Eureka CSD (PO service area), Feather River RCD
- Feather River Food Co-Op, Quincy: Feather River RCD
- Quincy Post Office: Feather River RCD
- Forest Stationers, Quincy: Feather River RCD
- Rhythm and Grace Dance Studio, Quincy: Feather River RCD
- Quincy Branch Library: Feather River RCD

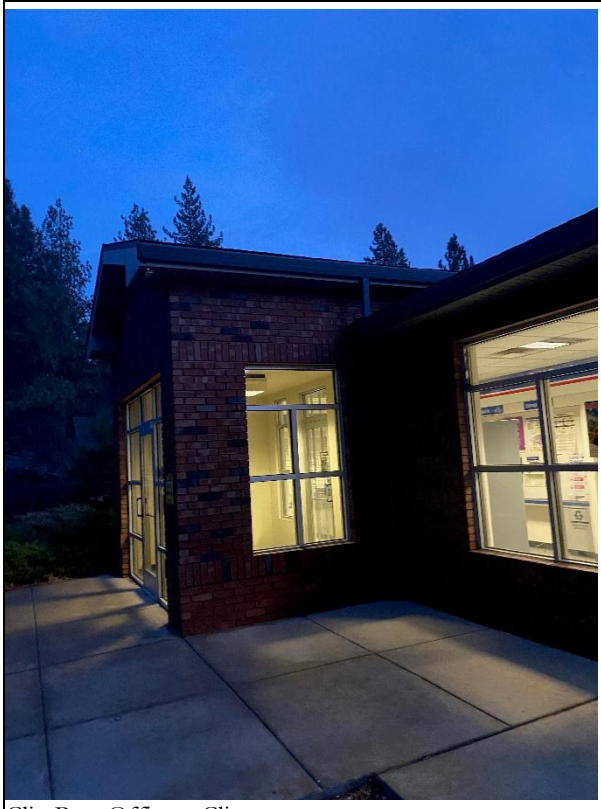
Photos of the location and the boards the flyers were placed on are below.

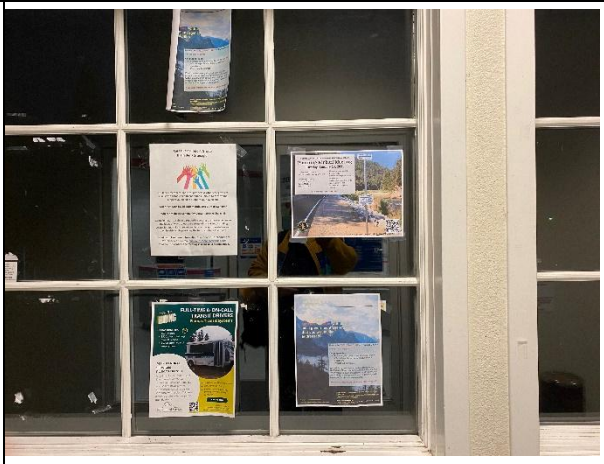
Location	Poster
Chester Post Office – Chester	

Location	Poster
Canyon Dam Post Office – Canyon Dam	
Greenville Post Office – Greenville	

Location	Poster
Crescent Mills Post Office – Crescent Mills	
Taylorsville Post Office – Taylorsville	

Location	Poster
Chilcoot-Vinton Post Office - Chilcoot	
Feather River Food Co-Op – Portola	
Portola Post Office – Portola	

Location	Poster
 Clio Post Office – Clio	
Graeagle Store – Graeagle	

Location	Poster
Blairsden/Graeagle Post Office – Graeagle	
Feather River Food Co-Op – Quincy	

A.7.11. Public Meeting #1: Public Agenda

AGENDA

PLUMAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Public Kickoff Meeting #1

Tuesday January 14, 2025
5:30 - 7:00 pm
Quincy Branch Library | Quincy, California

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1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. LHMP Update Schedule
4. Hazard Identification
5. Next Steps
6. Questions?

A.7.12. Public Meeting #1: Public Sign in Sheet

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #1: Project Kickoff
January 14, 2025 (5:30-7:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
LORI PINI	loripini@countyofplumas.com	530-283-7438	Plumas Co. OES
TRAVIS GOINCS	TRAVISGOINCS@countyofplumas.com	530 283 6464	Plumas Co. OES
Kai Walters	kai.walters@recoveryrisk.com	530 394 0567	Recovery Risk llc
Marty Walters	marty.walters@recoveryrisk.com	530-394-0187	Recovery Risk
GERD EBELING	QOH637@GMAIL.COM		FIREWISE
Kyle Felker	mapit400@gmail.com	530 ~~256-1166~~ 2516112	
TIM JONES	sarscan@psln.com	530 249 3790	
Inge Christian Houck	inge.christian.houck@gmail.com	603-978-4311	civilian observer
TRACEY FERGUSON	traceyferguson@countyofplumas.com	530-283-6214	COUNTY PLANNING
Tina Hopkins	Kristina.hopkins@usda.gov	530-990-1728	USFS FA Fish Aquatics Interagency Region

A.7.13. Public Meeting #2 Outreach – Plumas County OES Facebook Post, 4/25/2025

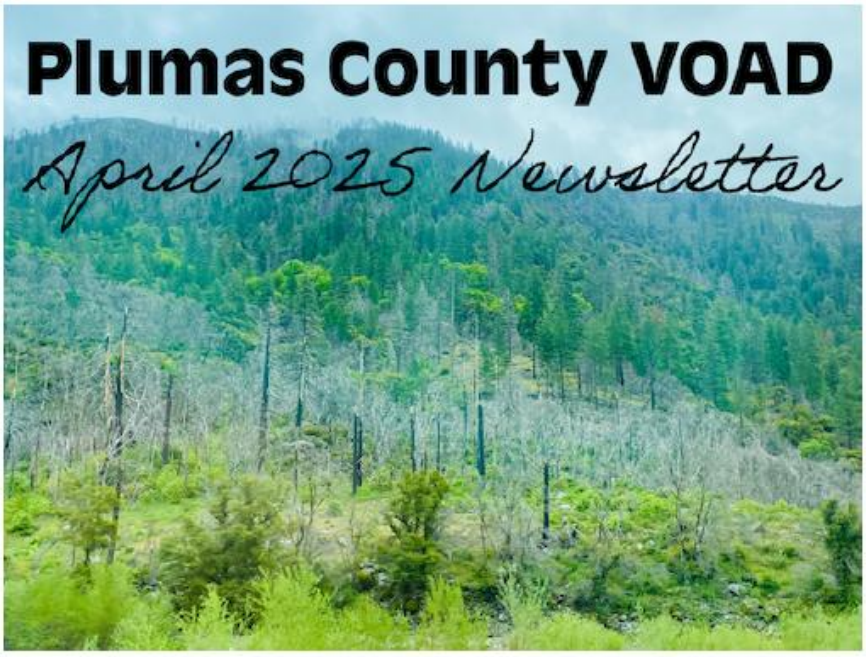
A.7.14. Public Meeting #2 Outreach – VOAD email newsletter, 4/29/2025

Recovery Risk

Marty Walters <marty.walters@recoveryrisk.com>

Cram School for Fire Season ** Plumas VOAD Newsletter
1 message

Marty Walters <marty.walters@recoveryrisk.com> Tue, Apr 29, 2025 at 1:53 PM
To: Marty Walters <marty.walters@recoveryrisk.com>



May is exam season, and I'm preparing for some tough exams for professional certifications. It got me thinking about what we need to study for the upcoming wildfire season. After a good water season for Northern California, we're now seeing a lot of spring growth. Many of our fire scars are showing a characteristic greening up of grasses and shrubs amongst the tree skeletons. As our forests and meadows and communities greet the warmer weather, it's a good reminder that our changing world means that fire season will mean different challenges and fuel types as we continue to recover from recent fires.

1. Post-Fire Forest Resilience Workshop

There's a course just for Plumas County landowners and learners starting tomorrow, offered by the University of California Agriculture and Natural Resources. Register here.

When:
Wednesdays, April 30 – May 28, from 6:00 – 7:30 PM (Zoom sessions)
Saturday, May 31 – In-person field trip in Plumas County
More information: nicdutch@ucanr.edu

2. Plumas County Local Hazard Mitigation Plan Risk Assessment Meetings

The Office of Emergency Management along with the City of Portola and a number of special services districts are teaming up to complete a risk assessment for natural hazards in Plumas County, all part of the Local Hazard Mitigation Planning process that allows us to apply for project grants to make our communities more resilient. Even if you can't attend the meeting, please complete the survey for this project.

When: Thursday, May 8, 2025. 2 p.m. committee meeting (open to the public) and 5:30 public meeting with Zoom virtual option
Where: Quincy Library, 445 Jackson Street, Quincy, CA
More information: loripini@countyofplumas.com

3. Plumas County Children's Fair

Fire Safe Council is sponsoring Wildfire Preparedness Day at the Children's Fair. Nina Peay and I will be staffing a booth with Listos materials, and we'd love to showcase our VOAD members! Send me a note if you want to provide any educational material or child-friendly items for our booth.

When: Saturday, May 17, 2025 from 10 am to 2 pm
Where: Plumas County Fairgrounds, 204 Fairgrounds Road, Quincy, CA
More information: amber@plumasfiresafe.org

4. Local Responsibility Area Fire Hazard Severity Zones - you need to read this!

This topic really deserves some study, and it's going to be painful! Plumas County and the City of Portola are adopting new maps that come from the State Fire Marshall and will have a major impact on many people living in Portola, Chester, Quincy/East Quincy and Beckwourth/Sierra Valley. Many of us will be switched from having no fire severity rating to high and very high ratings. When these maps are adopted no later than June 10, 2025, any new construction in very high severity zones will need to meet wildfire building code requirements, and we'll have to disclose to any purchaser of our property of the very high severity wildfire risk. In addition, new vegetation management requirements will apply to all of us in these areas, including the new "zero zone" regulations that are being developed right now. In the next few years, we will see requirements to retrofit existing buildings in high and very high severity zones to make them more fire resilient. I can speak for myself in saying that my home in Quincy is absolutely not ready for this change, and I need to plan and finance a bunch of home hardening projects. I've definitely started worrying about losing my home insurance or not being able to afford it. Are you interested in this topic? Did you experience some of these things when the State Responsibility Areas were updated a couple years ago? Let me know if you'd like me to invite our county and Portola officials to join a webinar about the changes.

Submit comments
Unincorporated Plumas County: traceyferguson@countyofplumas.com
City of Portola: admin@cityofportola.com
–

Marty Walters
Chair, Plumas County Voluntary Organizations Active in Disaster

Plumas County VOAD
Voluntary Organizations Active in Disaster

marty.walters@recoveryrisk.com
Office: +1 (530) 616-8398
Mobile: +1 (530) 394-0187
P.O. Box 411, Quincy, CA 95971 USA

Recovery Risk

A.7.15. Public Meeting #2 Outreach – Plumas County News and Public Notices email

From: "News & Public Notices" <listserv@civicplus.com>
Subject: Risk Assessment - Multi-Jurisdictional Hazard Mitigation Planning Meeting for www.plumascounty.us
Date: May 5, 2025 at 10:40:29 AM PDT
To: info@martywalters.com

View this in your browser

May 05, 2025

Risk Assessment - Multi-Jurisdictional Hazard Mitigation Planning Meeting

Plumas County, CA: What does it mean to mitigate natural hazards? On May 8, 2025, Plumas County residents have a chance to participate in the planning process to make our communities more resilient to disasters. The County, City of Portola, and other local government entities are teaming up to study natural hazard risks in the County.

Residents, visitors, and workers in Plumas County are all welcome to come share their personal experiences and local knowledge about extreme weather events and other natural hazards such as flood and wildfire. This helps to create a full picture of the County and its challenges when it comes to identifying and prioritizing projects that help reduce the impacts of future hazard events and disasters.

Plumas County is partnering with the City of Portola and several special districts to update the 2020 Plumas County and 2019 City of Portola Local Hazard Mitigation Plans (LHMPs). Wildfire, floods, drought, and severe weather are just a few of the hazards of concern in Plumas County. Since the project kickoff in January, the project team has been focused on collecting data to inform the updated risk assessment.

While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. The goal of the project is to have a multi-jurisdictional LHMP approved by the Federal Emergency Management Agency (FEMA) that will then allow the County, City, and special districts to apply for both pre- and post-disaster mitigation grant funding.

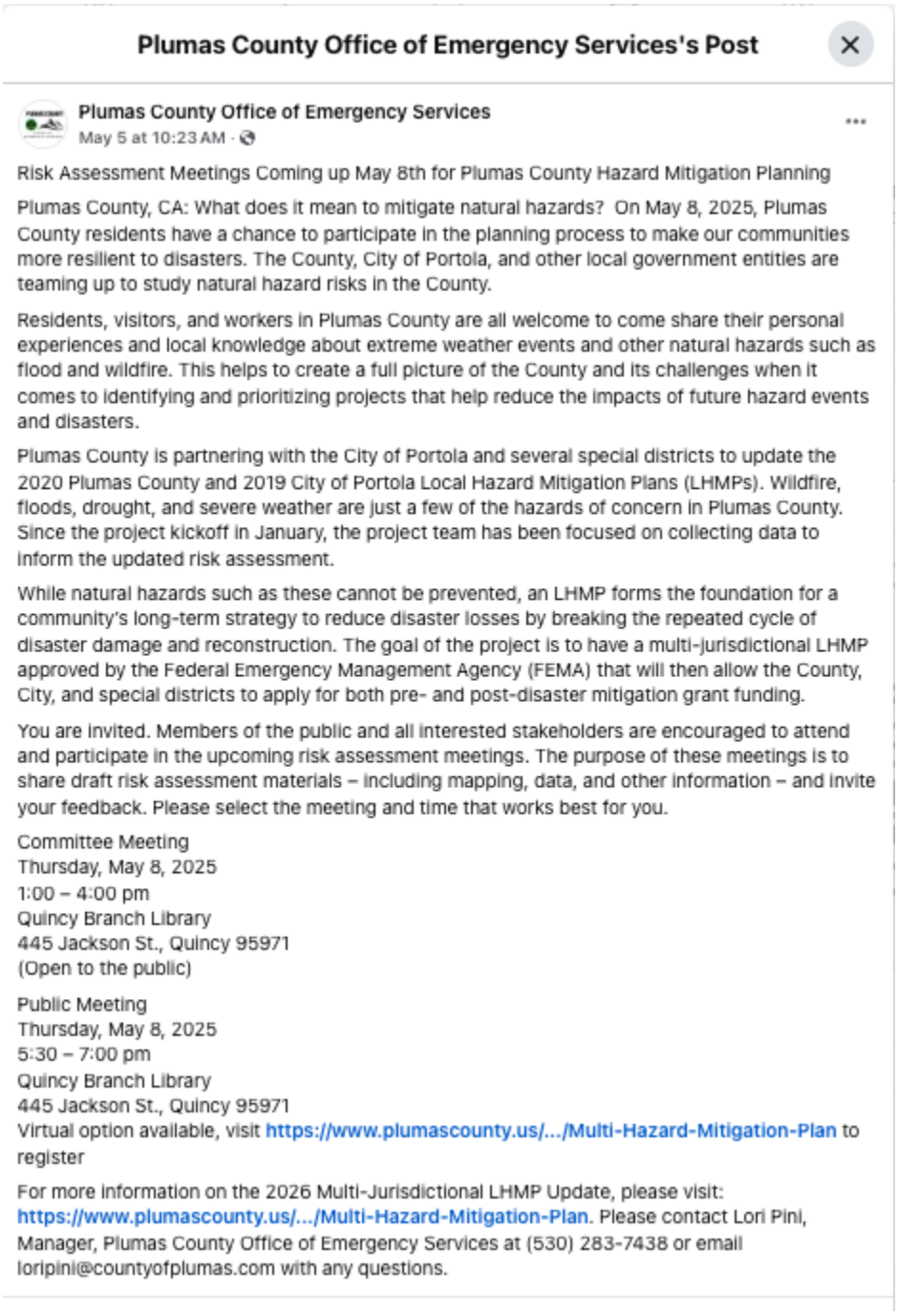
You are invited. Members of the public and all interested stakeholders are encouraged to attend and participate in the upcoming risk assessment meetings. The purpose of these meetings is to share draft risk assessment materials – including mapping, data, and other information – and invite your feedback. Please select the meeting and time that works best for you.

Committee Meeting
Thursday, May 8, 2025
1:00 – 4:00 pm
Quincy Branch Library
445 Jackson St., Quincy 95971
(Open to the public)

Public Meeting
Thursday, May 8, 2025
5:30 – 7:00 pm
Quincy Branch Library
445 Jackson St., Quincy 95971
Virtual option available, visit https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan to register

For more information on the 2026 Multi-Jurisdictional LHMP Update, please visit: https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan. Please contact Lori Pini, Manager, Plumas County Office of Emergency Services at (530) 283-7438 or email loripini@countyofplumas.com with any questions.

A.7.16. Public Meeting #2 Outreach – Plumas County OES Facebook Post, 5/5/2025



Plumas County Office of Emergency Services's Post

Plumas County Office of Emergency Services
May 5 at 10:23 AM ·

Risk Assessment Meetings Coming up May 8th for Plumas County Hazard Mitigation Planning

Plumas County, CA: What does it mean to mitigate natural hazards? On May 8, 2025, Plumas County residents have a chance to participate in the planning process to make our communities more resilient to disasters. The County, City of Portola, and other local government entities are teaming up to study natural hazard risks in the County.

Residents, visitors, and workers in Plumas County are all welcome to come share their personal experiences and local knowledge about extreme weather events and other natural hazards such as flood and wildfire. This helps to create a full picture of the County and its challenges when it comes to identifying and prioritizing projects that help reduce the impacts of future hazard events and disasters.

Plumas County is partnering with the City of Portola and several special districts to update the 2020 Plumas County and 2019 City of Portola Local Hazard Mitigation Plans (LHMPs). Wildfire, floods, drought, and severe weather are just a few of the hazards of concern in Plumas County. Since the project kickoff in January, the project team has been focused on collecting data to inform the updated risk assessment.

While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. The goal of the project is to have a multi-jurisdictional LHMP approved by the Federal Emergency Management Agency (FEMA) that will then allow the County, City, and special districts to apply for both pre- and post-disaster mitigation grant funding.

You are invited. Members of the public and all interested stakeholders are encouraged to attend and participate in the upcoming risk assessment meetings. The purpose of these meetings is to share draft risk assessment materials – including mapping, data, and other information – and invite your feedback. Please select the meeting and time that works best for you.

Committee Meeting
Thursday, May 8, 2025
1:00 – 4:00 pm
Quincy Branch Library
445 Jackson St., Quincy 95971
(Open to the public)

Public Meeting
Thursday, May 8, 2025
5:30 – 7:00 pm
Quincy Branch Library
445 Jackson St., Quincy 95971
Virtual option available, visit https://www.plumascounty.us/.../Multi-Hazard-Mitigation-Plan to register

For more information on the 2026 Multi-Jurisdictional LHMP Update, please visit: https://www.plumascounty.us/.../Multi-Hazard-Mitigation-Plan. Please contact Lori Pini, Manager, Plumas County Office of Emergency Services at (530) 283-7438 or email loripini@countyofplumas.com with any questions.

A.7.17. Public Meeting #2 Outreach – Plumas Sun news announcement, 1/7/2025

The Plumas Sun

Home › News › Press Release › Two local risk assessment meetings set for May 8

News Events Press Release

Two local risk assessment meetings set for May 8

May 6, 2025 | **The Plumas Sun**

Two May 8 meetings will address local hazard mitigation. Image courtesy Plumas County Office of Emergency Services

"What does it mean to mitigate natural hazards?" asks the Plumas County Office of Emergency Services. The topic will be up for discussion at two meetings May 8, in which Plumas County residents have a chance to participate in the planning process to make local communities more resilient to disasters. The county, city of Portola and other local government entities are teaming up to study natural hazard risks in the county.

Residents, visitors and workers in Plumas County are all welcome to come share their personal experiences and local knowledge about extreme weather events and other natural hazards such as flood and wildfire, said OES. This helps to create a full picture of the county and its challenges when it comes to identifying and prioritizing projects that help reduce the impacts of future hazard events and disasters.

Plumas County is partnering with the city of Portola and several special districts to update the 2020 Plumas County and 2019 city of Portola local hazard mitigation plans. Wildfire, floods, drought and severe weather are

just a few of the hazards of concern in Plumas County. Since the project kickoff in January, the project team has been focused on collecting data to inform the updated risk assessment.

While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. The goal of the project is to have a multijurisdictional LHMP approved by the Federal Emergency Management Agency. This will then allow the county, city and special districts to apply for both pre- and postdisaster mitigation grant funding.

- Sponsored By -

The community is invited. Members of the public and all interested stakeholders are encouraged to attend and participate in the upcoming risk assessment meetings. The purpose of these meetings is to share draft risk assessment materials — including mapping, data and other information — and invite feedback. Those interested can select the meeting and time that works best for them. Both meetings are set for Thursday, May 8, at the Quincy library, 445 Jackson St.

The committee meeting will be held from 1 to 4 p.m. It is open to the public. The public meeting will be held from 5:30 to 7 p.m. A virtual option is available for this meeting; registration is available at http://bit.ly/42LC5ek.

More information on the 2026 multijurisdictional LHMP update is available at https://www.plumascounty.us/2214/Multi-Hazard-Mitigation-Plan. Questions can be directed to Lori Pini, manager, Plumas County Office of Emergency Services, at 530-283-7438 or loripini@countyofplumas.com.

A.7.18. Public Meeting #2 – Posting Locations of Outreach Flyers

Below is a list of all the places the Outreach Flyer was posted::

- Blairsden Sierra Suds Laundromat
- Blairsden-Graeagle Post Office
- Canyondam Post Office
- Chester Laundromat
- Chester Library
- Chester Plumas Bank
- Chester Post Office
- Chilcoot-Vinton Post Office
- Clio Post Office
- Crescent Mills Crescent Country Antiques and Gifts
- Crescent Mills Post Office
- East Quincy East Side Laundromat
- Graeagle Store
- Greenville Evergreen Market
- Greenville Plumas Bank
- Greenville Post Office
- Meadow Valley Post Office
- Portola Feather River Food Coop
- Portola City Hall
- Portola Leanard's Market
- Portola Library
- Portola Plaza Laundromat
- Quincy Plumas Bank
- Quincy Post Office
- Taylorsville Post Office
- Twain Store

Blairsden Sierra Suds Laundromat

Blairsden-Graeagle Post Office

Canyondam Post Office

Chester Laundromat

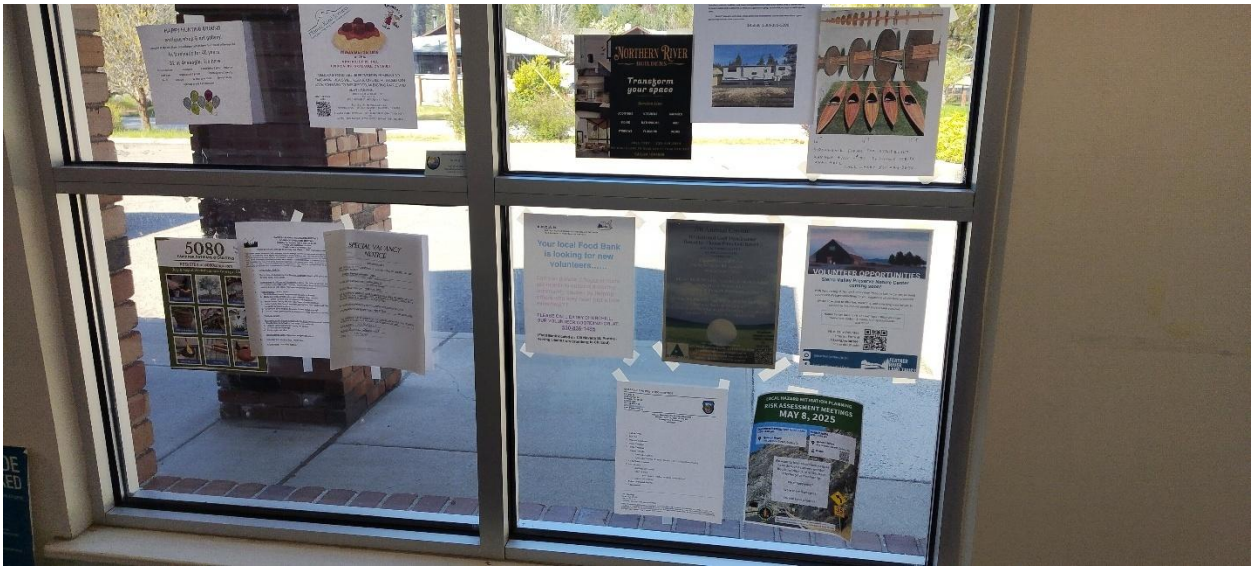
Chester Library

Chester Plumas Bank

Chester Post Office

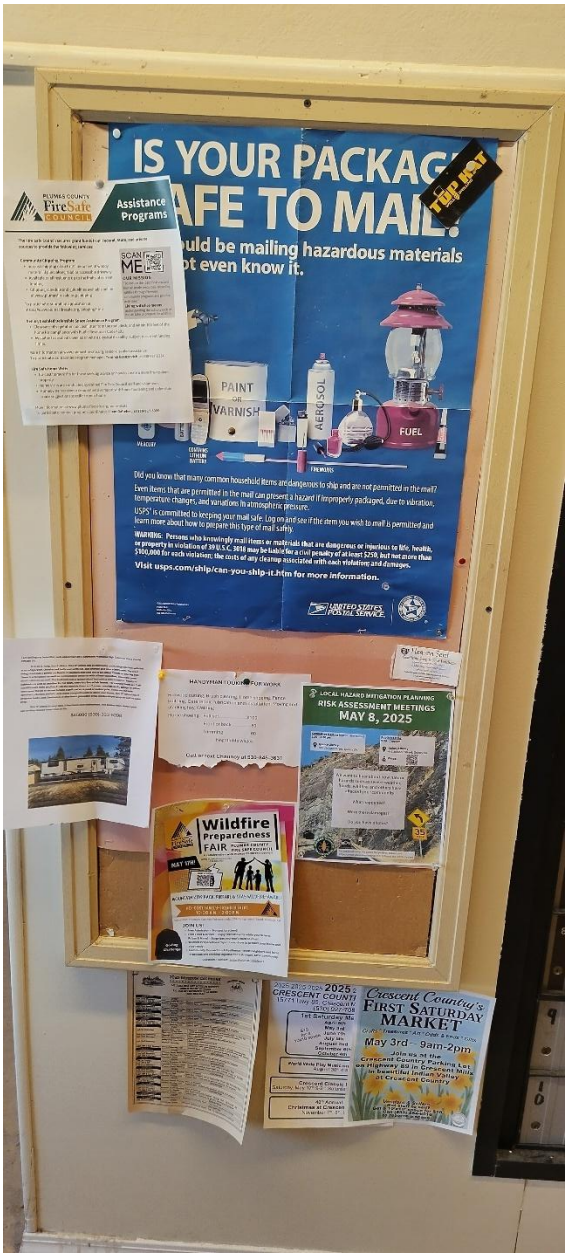
Chilcoot-Vinton Post Office

Clio Post Office



Crescent Mills Crescent Country Antiques and Gifts

Crescent Mills Post Office



East Quincy East Side Laundromat

Graeagle Store

Greenville Evergreen Market

Greenville Plumas Bank

Greenville Post Office

Meadow Valley Post Office

Portola Feather River Food Coop

Portola City Hall

Portola Leanard's Market

Portola Library

Portola Plaza Laundromat

Quincy Plumas Bank

Quincy Post Office

Taylorsville Post Office

Twain Store

MOBILE OUTREACH
SUPPORT YOUR COMMUNITY
Stump Grinding
530-519-0809
RISK ASSESSMENT MEETINGS
MAY 8, 2025
DR. MAC

A.7.19. Public Meeting #2 Agenda

AGENDA

PLUMAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Public Risk Assessment Meeting #2

Thursday May 8, 2025
5:30 - 7:00 pm
Quincy Branch Library | Quincy, California

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1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment (PowerPoint)
4. Open Discussion and Input on the Risk Assessment
5. Questions and Next Steps

A.7.20. Public Meeting #2 Sign in Sheet

SIGN-IN SHEET
PLUMAS COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #2: Risk Assessment
May 8, 2025 (5:30-7:00 pm)
Quincy Branch Library | Quincy, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
TRAVIS GOINGS	TRAVISGOINGS@COUNTYOFPLUMAS.COM	530 283-6464	Plumas Co. OES
Lori Pini	lori.pini@countyofplumas.com	5302837438	Plumas Co. OES
Marty Walters	marty.walters@recoveryrisk.com	530-394-0187	Recovery Risk
Kai Walters	kai.walters@recoveryrisk.com	530-394-0567	Recovery Risk
Jeanine Foster	jeanine.foster@fostermorrison.com	3037177771	foster Morrison
Chris Morrison	chris.morrison@fostermorrison.com	701-318-4445	Foster Morrison
Kevin Dengler	kevin@globalexchange.org	415-501-9796	property owner
TRACEY FERGUSON	tracey.ferguson@countyofplumas.com	530-283-6214	PLUMAS COUNTY PLANNING

A.7.21. Public Meeting #3: OUTREACH

A.7.22. Public Meeting #3: Agenda

A.7.23. Public Meeting #3: Sign in Sheets

A.7.24. Public Comments

No public or other stakeholder comments were received during the 2025 LHMP Update development process.

A.8 Meeting Handouts

Below are the handouts for each meeting. Handouts specific to the Mitigation Strategy Meetings can be found in Appendix C.

A.8.1. HMPC Meeting #1: Kickoff Meeting Handouts

Plumas County Multi-Jurisdictional LHMP Update: Hazard Identification and Profiles – 2026

Disaster Declarations and National Weather Service Research

Plumas County Disaster History

Plumas County – Disaster Declarations 1950-2024

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2023	California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	Storms	Storms	3/1/2023-3/8/2023	DR-4699 4/3/2023
2023	California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	Flood	Storms	3/1/2023-3/8/2023	EM-3592 3/10/2023
2021	California Wildfires	Fire	Fire	2021-04 7/16/2021 (Lava Fire) 7/16/2021 (Beckwourth Complex) 8/6/2021	DR-4610 8/24/2021
2021	Dixie Fire	Fire	Fire	2021-03 7/23/2021	FM-5400 7/20/2021
2021	2021 Northeast Wildfires	Fire	Fire	2021-04 2021-03 8/6/2021 8/10/2021 (Monument Fire)	–
2020	Bear Fire	Fire	Fire	2020-06 8/18/2020	FM-5363 9/9/2020
2020	California Wildfires	Fire	Fire	–	DR-4458 8/22/2020

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2020	Covid-19	Pandemic	Pandemic	2020-01 3/4/2020	DR-4482 3/22/2020
2020	Covid-19	Pandemic	Pandemic	2020-01 3/4/2020	EM-3428 3/13/2020
2017	Severe Winter Storms, Flooding, Mudslides in California	Flood	Storms	2017-03 3/7/2017	DR-4308 4/1/2017
2017	Severe Winter Storms, Flooding, Mudslides in California	Flood	Storms	2017-01 1/23/2017	DR-4301 2/14/2017
2014	California Drought	Drought	Drought	2014-03 9/18//2014	–
2008	California Wildfires	Fire	Fire	–	EM-3287 6/28/2008
2007	Severe Freeze	Freeze	Freeze	2007-02 01/12/2007- 1/26/2007	DR-1689 3/13/2007
2005/2006	Severe Storms, Flooding, Mudslides, and Landslides in California	Flood	Storms	2006-01 1/12/2006	DR-1628 2/3/2006
2005	Hurricane Katrina Evacuations	Hurricane	Hurricane	–	EM-3248 9/13/2005
2001	Energy Emergency	Economic	Greed	1/1/2001	–
1999	California Extreme Fire Hazards	Fire	Fire	99-05 8/26/1999	EM-3140 9/1/1999
1997	California Severe Storms/flooding	Flood	Storms	97-01 1/2/97-1/31/97	DR-1155 1/4/1997
1996	Torrential Wind and Rains	Flood	Storms	GP 96-01 1/2/1996	–
1995	California Severe Winter Storms, Flooding, Landslides, Mud Flows	Flood	Storms	95-03 03/12/95 – 03/24/95	DR-1046 3/12/1995
1995	1995 Severe Winter Storms	Flood	Storms	95-01, 95-02, 95-03, 95-04 1/6/95-3/14/95	DR-1044 1/13/1995

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
1993	California Severe Storm, Winter Storm, Mud & Landslides, Flooding	Flood	Storms	–	DR-979 2/3/1993
1992	Late California Severe Storm, Winter Storm, Mud & Landslides, Flooding	Flood	Storms	93-01 2/12/92, 2/19/92	DR-979 2/25/1992
1992	1992 Late Winter Storms	Flood	Storms	93-01 1/7/93 - 2/19/93	DR-979 1/15/1992
1987	1987 Wildland Fires	Fire	Fire	9/10/1987, 9/3/1987	–
1986	California Severe Storms, Flooding	Flood	Storms	86-01 2/18-86-3/12/86	DR-758 2/21/1986
1980	April Storms	Flood	Storms	80-01–80-25 4/1/1980	–
1977	California Drought	Drought	Drought	–	EM-3023 1/20/1977
1970	California Severe Storms, Flooding	Flood	Flood	1/27/1970 - 3/2/1970	DR 283 2/16/1970
1969	California Severe Storms, Flooding	Flood	Storms	1/23/69, 1/25,69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	DR-253 1/26/1969
1964	California Heavy Rains & Flooding	Flood	Storms	12/22/64, 12/23/64, 12/28/64, 1/5/65, & 1/14/65	DR-183 12/24/1964
1964	Seismic Wave	Other	Other	–	DR-169 4/1/1964
1963	1963 Floods and Rains	Flood	Storms	2/7/63, 2/26/63, 2/29/63, & 4/22/63	DR-145 2/25/1963
1963	1963 Floods	Flood	Storms	2/14/1964	–
1960	1960 Widespread Wildfires	Fire	Fire	8/16/1960	–
1958	1958 April Storms and Floods	Flood	Storms	4/2/1958	DR-52 4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	2/26/1958	CDO 58-03
1955	1955 Floods	Flood	Flood	12/22/1955	DR-47 12/23/1955

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
1950	1950 Floods	Flood	Flood	11/21/1950	CDO 50-01

Source: Cal OES, FEMA. Retrieved December 2024.

Plumas County Disaster Declaration Summary Table by Hazard Type 1950-2024

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	1	2014	1	1997
Economic	1	2001	0	–
Fire	7	1960, 1987, 1999, 2020, 2021 (three)	6	1999, 2008, 2020 (twice), 2021 (twice)
Flood	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)
Freeze	1	2007	1	2007
Hurricane	0	–	1	2005
Pandemic	2	2020 (twice)	2	2020 (twice)
Seismic Sea Wave (Tsunami)	0	–	1	1964
Totals	**34**		**31**	

Source: Cal OES, FEMA. Retrieved October 2024.

Plumas County Disasters since 2019 City of Portola and 2020 Plumas County LHMP

- 2020 California Covid-19 Pandemic (2 state and 2 federal declarations)
- 2020 California Wildfires (federal declaration)
- 2020 Bear Fire (state and federal declaration)
- 2021 Northeast Wildfires (state declaration)
- 2021 Dixie Fire (state and federal declaration)
- 2021 California Wildfires (state and federal declaration)
- 2023 California Severe Winter Storms, Flooding, Landslides, and Mudslides (2 federal and 2 state declarations)

Severe Weather Events

NCDC Storm Events 1950 to 7/31/2024

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Astronomical Low Tide	2	1	0	0	0	$0	$0
Blizzard	3	0	0	0	0	$0	$0
Cold/Wind Chill	3	0	0	0	0	$0	$0
Debris Flows	21	0	0	0	0	$2,000	$0

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Dense Fog	9	0	0	0	0	$1,000	$0
Dense Smoke	1	0	0	0	0	$0	$0
Drought	2	0	0	0	0	$50,000	$0
Excessive Heat	5	0	0	0	0	$0	$0
Flash Flood	3	0	0	0	0	$0	$0
Flood	12	0	0	1	0	$3,140,000	$0
Freezing Fog	1	0	0	0	0	$0	$0
Hail	10	0	0	0	0	$100	$5,000
Heat	2	0	0	0	0	$0	$0
Heavy Rain	60	0	0	0	0	$1,000	$0
Heavy Snow	330	1	0	0	0	$220,000	$0
High Wind	88	0	0	1	0	$2,245,500	$0
Ice Storm	1	0	0	0	0	$0	$0
Lightning	1	0	0	0	0	$0	$0
Strong Wind	4	0	0	0	0	$63,300	$0
Thunderstorm Wind	2	0	0	0	0	$675,000	$0
Wildfire	14	1	0	3	0	$22,775,000	$0
Winter Storm	150	0	0	0	0	$150,000	$0
Winter Weather	61	0	0	0	0	$0	$0
Total	**785**	**3**	**0**	**5**	**0**	**$29,322,900**	**$0**

Source: National Climatic Data Center (retrieved November 2024)

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Plumas County

FEMA's National Risk Index, 2024: List of 18 Hazards

FEMA's National Risk Index is a dataset and online tool that can be used to help communities better understand the natural hazard risk to their communities. FEMA requires LHMPs to utilize the 18 identified hazards as a starting point for determining hazards of concern in their Hazard Mitigation Planning Process.

- Avalanche
- Coastal Flooding
- Cold Wave
- Drought
- Earthquake
- Hail
- Heat Wave
- Hurricane
- Ice Storm
- Landslide
- Lightning
- Riverine Flooding
- Strong Wind
- Tornado
- Tsunami
- Volcanic Activity
- Wildfire
- Winter Weather

2026 Plumas County Hazards Comparison Summary

2020 Plumas County LHMP Hazards	Plumas County General Plan Safety Element (2013)	City of Portola 2019 LHMP Hazards	City of Portola General Plan Safety Element (2019)	2023 State of California Plan Applicable Hazards	Proposed 2026 LHMP Hazards
Avalanche	–	–	–	Avalanche	Avalanche
Climate Change	–	–	–	Climate Change & Related Hazards	Climate Change
Dam Failure	Flood and Dam Inundation	Dam Failure	Dam Failure Inundation	Dam Failure	Dam Failure
Drought & Water shortage	–	–	–	Droughts and Water Shortage	Drought & Water shortage (w/tree mortality)
Earthquake	Geologic and Seismic Hazards	Earthquake	Seismic and Geologic Hazards	Earthquake	Earthquake
Flood: 1%/0.2% annual chance	Flood and Dam Inundation	Flood	Flood Hazards	Riverine, Stream, and Alluvial Flood	Flood: 1%/0.2% annual chance
Flood: Localized Stormwater	Flood and Dam Inundation	–	–	–	Flood: Localized Stormwater
Landslide, Mudslide, and Debris Flow	Geologic and Seismic Hazards	–	–	Landslide, Debris Flow, and Other Earth Movements	Landslide, Mudslide, and Debris Flow
Levee Failure	–	–	–	Levee Failure	Levee Failure
Pandemic	–	–	–	Epidemic, Pandemic, and Vector Borne Disease	–
–	–	–	–	Extreme Cold and Freeze	Extreme Cold, Freeze, and Snow
Severe Weather: Extreme Heat	–	Extreme Heat	Severe Weather, Winter Storms, and Extreme Cold/Heat	Extreme Heat	Severe Weather: Extreme Heat
Severe Weather: Heavy Rains and Storms	–	Severe Weather	Severe Weather, Winter Storms, and Extreme Cold/Heat	Severe Wind, Weather, and Storms	Severe Weather: Heavy Rains and Storms
Severe Weather: High Winds and Tornadoes	–	Severe Weather	Severe Weather, Winter Storms, and Extreme Cold/Heat	Severe Wind, Weather, and Storms	Severe Weather: High Winds and Tornadoes

2020 Plumas County LHMP Hazards	Plumas County General Plan Safety Element (2013)	City of Portola 2019 LHMP Hazards	City of Portola General Plan Safety Element (2019)	2023 State of California Plan Applicable Hazards	Proposed 2026 LHMP Hazards
Severe Weather: Winter Storms and Freeze	–	Winter Storms and Extreme Cold	Severe Weather, Winter Storms, and Extreme Cold/Heat	Part of Severe Wind, Weather, and Storms listed above	This will be a component of extreme cold, freeze, and snow.
Tree Mortality	Wildland Fire Hazards and Fire Protection	–	–	Tree Mortality	This will be a component of drought.
Volcano	–	–	–	Volcano	–
Wildfire	Wildland Fire Hazards and Fire Protection	Wildfire	Wildland and Urban Fire	Wildfire	Wildfire (w/smoke and air quality)

* Power Outages/PSPS will be discussed as a Common Vulnerability Among All Hazards. As such it is not a stand alone hazard, but to the extent Power Outages/PSPS is an impact other hazards, it is discussed in those hazard sections.

Plumas County Hazard Identification 2026

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Avalanche					
Climate Change					
Dam Failure					
Drought & Water Shortage (w/tree mortality)					
Earthquake					
Flood: 1%/0.2% annual chance					
Flood: Localized Stormwater					
Landslide, Mudslide, and Debris Flow					
Levee Failure					
Severe Weather: Extreme Cold, Freeze, and Snow					
Severe Weather: Extreme Heat					
Severe Weather: Heavy Rains and Storms					
Severe Weather: High Winds and Tornadoes					
Wildfire (w/smoke and air quality)					

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

A.8.2. HMPC Meeting #2: Risk Assessment Meeting Handouts

AGENDA

PLUMAS COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC) Meeting #2
Risk Assessment

Thursday May 8, 2025
1:00 - 4:00 pm
Quincy Branch Library | Quincy, California

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1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment (PowerPoint)
4. Open Discussion and Input on the Risk Assessment (Handout)
5. Review of Data Needs
6. Next Steps
7. Questions?

Contact Info:

Jeanine Foster (jeanine.foster@fostermorrison.com)
(303.717.7171)
Foster Morrison Consulting, Ltd.

FOSTER MORRISON CONSULTING

Status of the 2026 Plumas County LHMP Update Project/Next Steps

FEMA's 4-Phase-10 Step DMA/CRS Planning Process

Phase I: Organize Resources

1) Get organized

2) Plan for public involvement

3) Coordinate with other departments and agencies

Phase II: Risk Assessment

4) Identify the hazard(s)

5) Assess the risks

Capability Assessment

Phase III: Mitigation Strategy

6) Set planning goals

7) Review mitigation alternatives

8) Draft an action plan

Phase IV: Adoption and Implementation

9) Adopt the plan

10) Implement the plan, evaluate its worth, and revise as needed

LHMP Update Project Schedule/Key Dates

2026 LHMP Update Meetings

- **May 8** (Thursday) HMPC Meeting #2 (Risk Assessment) (1:00-4:00 pm)
- **May 8** (Thursday) HMPC Meeting #2 (Risk Assessment) (5:30-7:00 pm)
- **August 6** (Wednesday) HMPC Meeting #3 (Mitigation Strategy: Goals Development) (1:00-4:00 pm)
- **August 7** (Thursday) HMPC Meeting #4 (Mitigation Strategy: Actions/Projects) (9:00 am -12:00 pm)
- **December 3** (Wednesday) Final Public Meeting #2 (Draft Plan) (5:30-7:00 pm)
- **December 4** (Thursday) HMPC Meeting #5 (9:00 am -12:00 pm)

LHMP Document Drafts

- **October 3** (Friday): HMPC (First) Draft LHMP to Plumas/HMPC
- **October 31** (Friday): Plumas/HMPC comments due on Draft Plan
- **November 14** (Friday): Comments incorporated into Public Review (Second) Draft to Plumas/HMPC
- **November 19** (Wednesday): Public Review Draft on Plumas website
- **December 18** (Friday)**:** all final Plumas, HMPC and Public input to Foster Morrison
- **January 16** (Friday): All final comments incorporated and LHMP submittal to Cal OES – January 2026

Hazard Identification & Profiles: Plumas County

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather/ Pests/Weeds	Extensive	Highly Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Unlikely/Occasional	Catastrophic	Medium	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Occasional/Unlikely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Haz Mat Transportation	Significant	Occasional	Critical	Medium	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Low
Volcano	Extensive	Unlikely	Critical	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely**: Near 100% chance of occurrence in next year, or happens every year.
- **Likely**: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional**: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely**: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low**: The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low**: Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**: Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**: Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High**: Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Plumas County Planning Area

Agricultural Hazards: Severe Weather/Insects/Pests

- Agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.
- According to the 2023 Plumas County Crop Report, many commodities are grown in Plumas County. The top three commodities for the County in 2023 were cattle; field crops; and timber products. According to the 2023 Crop Report, Plumas County's 2023 estimated commodity production value is $38,541,746.00.
- There have been 17 past USDA Secretarial Disaster Declarations since 2012. 13 were for drought, 3 were from freeze, and 1 from heavy rains and storms.
- The Plumas County Agricultural Commissioner noted that of the list of hazards for this LHMP, the County is most concerned with drought and freeze. It is also concerned with insect infestations.
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium or High?
- Priority Hazard

Climate Change

- The 2023 State of California Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- DO ANY JURISDICTIONS HAVE ADDITIONAL INFORMATION ON CLIMATE CHANGE IMPACTS OR SPECIFIC CONCERNS/ISSUES?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam Failure

- According to data provided by Plumas County, CA DWR DSOD data, there are 22 dams in Plumas County that were constructed for flood control, storage, treatment impoundments, electrical generation, and recreational purposes. One dam outside the County (Indian Ole in Lassen County – a high hazard dam) also has an inundation area inside the County. Of the 23 dams that could affect the County, 1 is rated as Extremely High (EH) Hazard, 16 are rated as High Hazard (HH), 4 are rated as Significant Hazard, and 2 are rated as Low Hazard. All EH and HH dams had available inundation data.
- The most significant dams of concern include the Extremely High and High Hazard where loss of life is possible.

- The Extremely High hazard dam (Lake Almanor) affects the unincorporated County only. Of the 16 high hazard dams, all affect the unincorporated County with only 3 affecting the City of Portola (Frenchman, Grizzly Creek, and Grizzly Valley). Several Districts have inundations from the EH and DHH dams that extend within their boundaries.
- South Feather Water and Power owns 1 high hazard dam in the County: Little Grass Valley (important for the High Hazard Potential Dams Program and funding stream) and 2 low hazard dams.
- According to multiple sources, there have been no past dam failure events or issues of concern.
- ARE THERE SPECIFIC CONCERNS TO NOTE FOR ANY OF THESE DAMS?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High or Extremely High?
- Priority Hazard

Drought and Water Shortage (w/ Tree Mortality)

- Plumas County has been in and out of drought since 2014. Historical drought data for the Plumas County Planning Area and region indicate there have been 5 significant droughts in the last 87 years.
- 1 state (1977) disaster declarations and 1 federal declaration (1977) for Plumas County since 1950. 13 USDA Secretarial Drought declarations since 2012. There have been 2 NCDC drought events in Plumas County, both related to the 2014 to 2023 drought.
- The 2035 Plumas County General Plan Water Resources Element noted that the amount of precipitation received throughout the watershed varies but greatly contributes to the significant amount of water available in the County and throughout the region.
- There have been four (multi-year) tree mortality events in the County since 1980.
- The Water Shortage Vulnerability Scoring and Tool shows that there are 34 water providers in the County, using both ground and surface water. ARE THERE ANY WATER SUPPLY CONCERNS TO NOTE?
- CAN YOU PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED IN THE COUNTY RECENTLY DUE TO THE MOST RECENT DROUGHT? WHAT HAS BEEN IMPACTED THE MOST?
- CAN YOU PROVIDE INFORMATION ON NATURE AND EXTENT OF TREE MORTALITY IN THE COUNTY? EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: Medium
- Priority Hazard

Earthquake

- Plumas County is located in a relatively aseismic area with respect to other more seismically active areas in California. Several potentially active faults pass through Plumas County. The Almanor Fault, Butt Creek Fault Zone, and the Mohawk Valley Fault traverse the County. The Indian Valley Fault is also considered an active fault located within the County. Additionally, the Honey Lake and Fort Sage Faults are two active faults located east of the County.
- The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC

establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Plumas County is within the less hazardous Zone 3.

- The USGS National Seismic Hazard Maps provides acceleration and probabilities for various time periods. Plumas County falls within an area of mostly low to moderate seismic risk.
- USGS identified 431 magnitude 5.0 or greater earthquakes (from 1850 to April 2025) have occurred within 90 miles of Portola (these are earthquakes that could have affected the County).
- A series of earthquakes occurred near Lake Almanor on May 24, 2013. This included a 5.7 magnitude earthquake near Canyon Dam, near the southern end of Lake Almanor. Injuries were reported and damage to infrastructure and homes were sustained. Lake Almanor Mutual Water Company sustained a water main rupture which resulted in water supply loss, and 600 PG&E customers on the Lake Almanor peninsula lost power.
- 2023 EVENTS (5.16 and 5.48 near Lake Almanor) ON 5/11 AND 5/12/2023. DAMAGES FROM THESE EVENTS TO EACH JURISDICTION?
- HAVE ANY RECENT STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES? DOES PORTOLA HAVE A URM OR OTHER INVENTORY?
- WHAT ARE EACH JURISDICTIONS PRIMARY CONCERNS TO THIS HAZARD?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: High or Extremely High?
- Priority Hazard

Flood Hazards

1%/0.2% Annual Chance Flood (w/levee failure)

- Historically, portions of Plumas County have always been at risk to flooding because of its annual percentage of rainfall in the winter and the number of watercourses that traverse the County. According to the 2005 Flood Insurance Study for Plumas County, flooding in Plumas County may be caused by either general rainstorms or cloudburst storms. Cloudbursts are high intensity floods and can produce peak flows substantially larger than those of general rainstorms. Atmospheric river events in recent years have also contributed to the flood hazard.
- A search of the National Levee Database identified 3 leveed areas in Plumas County. None of these 3 levees are certified (in the FEMA FIS) as providing protection from the 1% annual chance flood. These levees include: 1) Plumas County Levee 1 (near Taylorsville); 2) Plumas County Levee 2 (near Greenville); and 3) North Fork Feather River at Chester (near Chester) – East and West levees. National Levee Database has some analysis on these levees.
- 19 state and 22 federal declarations from 1950-present were for flooding including heavy rains and storms. 15 NCDC flood events since 1993.
- HAS EACH JURISDICTION PROVIDED DETAILS ON PAST FLOOD DAMAGES AFFECTING THEIR JURISDICTION FROM RECENT EVENTS SINCE 2020/2019?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- Recent atmospheric river events occurring in 2021, 2022, and 2023 have led to more significant flooding throughout the County.
- WE HAVE A LARGE LIST OF PROBLEM AREAS FOR THE COUNTY; ANY RECENT ADDITIONS/DELETIONS? PAST OCCURRENCES SINCE 2020/2019?
- NEED LIST OF PROBLEM AREAS SPECIFIC TO EACH JURISDICTION.
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Hazardous Materials Transportation

- This is a new hazard in the LHMP Update.
- In Plumas County there are multiple hazardous materials transportation routes. State Roads 36, 49, 70, 89, and 147 are all highway hazardous materials routes. The Union Pacific, BNSF, Quincy Railroad, and Almanor Railroad are railroad hazardous materials routes.
- The USDOT Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety tracks hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in the County. 11 separate events were contained in the database. Most were minor, with 2 larger events of fuel spills.
- The HMPC provided another event that occurred in February of 2024 related to a railcar spill. ANY OTHER EVENTS OF NOTE?
- WHAT ARE THE PRIMARY LOCAL CONCERNS SPECIFIC TO EACH JURISDICTION FOR HAZARDOUS MATERIALS TRANSPORT SPILLS? SPECIFIC LOCATIONS OF CONCERN?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Landslides, Mudslides, and Debris Flows

- The 2035 Plumas County General Plan Public Health & Safety Element noted that areas with steep slopes in the County could be prone to landslides, mudslides and avalanches.
- There have been no disaster declarations associated directly with landslides in Plumas County. However, there have been 7 state and 5 federal disaster declarations from flooding that included landslide issues. The NCDC contains no records of landslides (but 21 records of debris flows) in the County since 1993.
- The County has provided some past occurrences (including one that caused a haz-mat spill) since the 2020 Plan. ANY PAST LANDSLIDE EVENTS TO ADD?
- CGS Deep-Seated Landslide mapping indicate that many areas throughout the County are at moderate, high, and very high risk of landslides. Many of these are along transportation routes.
- There is a list of landslide risk areas provided by the HMPC. ANY NEW LANDSLIDE AREAS SINCE THE LAST PLAN? BURN SCAR AREAS?
- NEED LANDSLIDE PROBLEM AREAS SPECIFIC TO EACH JURISDICTION.

- ANY ACTIVE LANDSLIDE AREAS TO BE MITIGATED? HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Severe Weather

Extreme Cold, Freeze, Snow (w/Avalanche)

- Annual occurrences of cold temperatures. The lowest recorded daily extreme was -28°F in January 1937. In a typical year, minimum temperatures fall below 32°F on 166.9 days in Plumas, with 1.5 days falling below 0°.
- Average snowfall in Plumas is 55.1 inches with record snowfall in 1952 of 167.2 inches.
- The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement create an avalanching episode.
- The County has 1 state and 0 federal disaster declarations for extreme cold and freeze. There have been 4 USDA Secretarial Disasters from freeze (2016, twice in 2022, 2023). NCDC identified 549 extreme cold, freeze, and snow events. There have been no disaster declarations or NCDC events associated with avalanche in Plumas County.
- An avalanche occurred in the winter of 2012 near Sloat. No injuries or deaths were reported. Timber stock in the avalanche area was damaged, though no damage estimates were available. OTHERS SINCE 2020/2019?
- WHAT ARE THE PRIMARY CONCERNS TO THE COUNTY? OTHER JURISDICTIONS? THE 2020 LHMP NOTED THE GRIZZLY RIDGE AREA AS A KEY AREA OF CONCERN FOR AVALANCHES – ARE THERE OTHER AREAS OF CONCERN?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures. The highest recorded daily extreme was 110°F in August 1981 and September 1988 in Plumas (Quincy). In a typical year, maximum temperatures exceed 90°F on 45.3 days in Plumas.
- No state or federal disaster declarations from heat since 1950. No USDA heat declarations since 2012. 7 extreme heat events (NCDC) since 1993. Lots of local heat data from Vieira Ranch.
- PLEASE PROVIDE DETAILS ON EXTREME HEAT AND MAJOR CONCERNS FOR EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy Rains and Storms (including Hail, Lightning)

- Significant County history: annual occurrences. High intensity cloudburst and heavy rains occur in the Plumas County Planning Area. Severe storms/heavy rains are the primary cause of most major flooding. Recent atmospheric river events have been contributing to this hazard.
- The NCDC data recorded 10 hail, 60 rain, 61 winter storm (that includes heavy rain), and 1 lightning event for Plumas County since 1950, for a total of 132 NCDC events.
- There have been 19 federal and 22 state declarations since 1950 for flooding, including heavy rains and storms. 1 USDA disaster declaration (2016) from excessive rain. Lots of local rain and storm data from Vieira Ranch.
- PLEASE PROVIDE DETAILS ON MAJOR CONERNS TO EACH JURISDICTION RELATED TO HEAVY RAINS AND STORMS.
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes – non reported
- No federal or state disaster decs. One USDA disaster dec (2016) associated with high winds (among others). The NCDC data recorded 94 high wind events; no events for tornadoes since 1955.
- Biggest issues are associated with wind fueling fires and also triggering PSPS events. Downed trees are also a concern during high wind events.
- WHAT ARE THE PRIMARY CONCERNS TO EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Volcano

- Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Lassen Peak is the closet potential threat to Plumas County.
- Lassen Peak experienced a significant eruption in 1915.
- No federal or state disaster declaration. No NCDC events for volcanoes.
- WHAT ARE THE CONCERNS FROM LASSEN PEAK/OTHERS?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium?
- Non-Priority Hazard?

Wildfire (w/smoke and air quality)

- Wildfires occur on an annual basis in the Plumas County Planning Area. Any ignition has the potential to become an out-of-control wildfire. Compounding the issue is the number of dead or dying hazardous trees. Wildfire is the most significant hazard the County faces.

- 7 state and 6 federal disaster declarations for Wildfire since 1950: 1960 -unnamed fire; 1987 -Clarks Fire; 1999 –Bucks Fire; 2008 BTU Lightning Complex Fire, 2020 Bear Fire and Lightning Complex Fire, 2021 Dixie Fire, Lava Fire/Beckwourth Complex, and Monument Fire. 15 NCDC wildfire events since 1993; 1 of these for smoke. Smoke and air quality past events were supplied by Vieira Ranch.
- WHAT ARE THE PRIMARY ISSUES/CONCERNS TO EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

A.8.3. HMPC #3 & #4: Mitigation Strategy Meeting Handouts

These can be found in Appendix C of this Plan.

A.8.4. HMPC #5: Final Meeting Handouts for HMPC

The handout used for the HMPC is in Section 2.2 of the Base Plan.

A.8.5. Public Meeting #1 and #2 Meeting Handouts

*Plumas County Multi-Jurisdictional LHMP Update: 2026 Hazards**

- Ag Hazard: Severe Weather/Insets/Pests
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: 1%/0.2% annual chance
- Flood: Localized Stormwater (w/levee failure)
- Hazardous Materials Transportation
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Volcano
- Wildfire (w/ smoke and air quality)

* Power Outages/PSPS will be discussed as a Common Vulnerability Among All Hazards

Plumas County LHMP Update: Historic Hazard Worksheet (Past Occurrences)

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, links, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Crop Damage	
Property damage	
Infrastructure damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

	Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 6095 Zang Way Arvada, CO 80004 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

A.8.6. Public Meeting #2 Handouts for Public

Appendix B References

2005 Flood Insurance Study for Plumas County

2011 California Geologic Survey Deep Seated Landslide Susceptibility data

2013 Plumas County General Plan

2014 California Natural Resources Report

2017 California Adaptation Planning Guide

2018 State of California Hazard Mitigation Plan

2019-2024 Plumas County Housing Element Background Report

2019 Plumas County Community Wildfire Protection Plan

2020 Plumas County Hazard Mitigation Plan

2020 US Census

2020 US Census Bureau Average Household Size

2023 Plumas County HazMat Response Plan

2023 State of California Hazard Mitigation Plan

2023 US Census Bureau American Community Survey

2023 US Census American Community Survey Average Household

2024 Cal DOF E-1 Report

2024 Plumas County Parcel/Assessor data

2035 Plumas County General Plan Public Health & Safety Element

American Society of Civil Engineers

America's Labor Market Information System (ALMIS) Employer Database, 2025 1st Edition

Bureau of Land Management

Cal Adapt – Extended Drought Scenarios

CAL FIRE

CAL FIRE (FHSZ SRA 2024, FHSZ FRA 2007)

CAL FIRE (LRA 2025)

Cal Fire Inciweb

Cal-Adapt

Cal-Adapt – Number of Extreme Heat Days by Year

Cal-Adapt – Precipitation: Decadal Averages Map

Cal-Adapt – Temperature: Decadal Averages Map

Cal-Adapt 2017/2023

Cal-Adapt Climate Projections

CalAtlas

2021 California Climate Adaptation Strategy

2024 Draft California Climate Adaptation Strategy

California Department of Conservation

California Department of Conservation's Farmland Mapping and Monitoring Program

California Department of Finance

California Department of Finance, P-2 Report

California Department of Fish and Wildlife Service

California Department of Parks and Recreation Office of Historic Preservation

California Department of Public Health

California Department of Water Resources

California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping

California Department of Water Resources 2012-2016 California Drought: Historical Perspective

California Department of Water Resources Best Available Maps

California Department of Water Resources Division of Safety of Dams

California Division of Mines and Geology

California Employment Development Department

California Environmental Protection Agency (Cal EPA) Disadvantaged Communities

California Environmental Quality Act (CEQA)

California Geological Survey

California Invasive Plant Council

California Natural Diversity Database

California Natural Resource Agency

California Office of Emergency Services

California Office of Emergency Services Division of Safety of Dams

California Public Utilities Commission

California Public Utility Commission PSPS Dashboard

California's Adaptation Planning Guide: Understanding Regional Characteristics

Center for Disease Control (CDC) Social Vulnerability Index

Center for Western Weather and Water Extremes

Climate Change and Health Profile Report – Plumas County

Design-Magnitude Avalanche Mapping and Mitigation Analyses

DSOD/Cal OES/NID Dam Status 1/25

Environmental Protection Agency

FEMA 03/02/2005 DFIRM

FEMA CIS 2024

Federal Emergency Management Agency – DFIRM 1/20/2016

Federal Emergency Management Agency – Disaster Declaration Database

Federal Emergency Management Agency – National Flood Hazard Layer

Federal Emergency Management Agency – Wind Zones in the United States

Federal Emergency Management Agency: Building Performance Assessment: Oklahoma and Kansas Tornadoes

FEMA Community Disaster Resilience Zones

FEMA Disaster Declaration Database

FEMA National Risk Index

Fire and Resource Assessment Program

FM Global Insurance company

Foxweather.com

Geology Open File Report 84-52 (1994)

Hazus-MH 6.1

HMPC input

Intergovernmental Panel on Climate Change

Member of HMPC

Multi-Hazard Identification and Risk Assessment, FEMA 1997

National Aeronautics and Space Administration

National Avalanche Center

National Center for Atmospheric Research

National Climate Assessment

National Climatic Data Center Storm Events Database

National Drought Mitigation Center

National Earthquake Information Center

National Environmental Policy Act (NEPA)

National Flood Insurance Program

National Hazardous Materials Routes Registry

National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report

National Integrated Drought Information System

National Inventory of Dams

National Levee Database

National Oceanic and Atmospheric Administration

National Oceanic and Atmospheric Administration Storm Prediction Center

National Oceanic and Atmospheric Administration's National Climatic Data Center

National Park Service

National Performance of Dams Program

National Weather Service

National Weather Service HeatRisk

National Weather Service XMAC site

PG&E

2016 Plumas County General Plan Land Use Element

2035 Plumas County General Plan Conservation Open Space Element

Plumas County 2014 LHMP

Plumas County Building Department and Planning Department

Plumas County GIS

Plumas County Planning Team

Plumas County Public Works

Public Policy Institute of California

Sierra Avalanche Center

Smoke Impacts CA: 2020 Lessons – 2021 Actions

State of California Department of Conservation

State of California Department of Conservation Farmland Mapping and Monitoring Program

Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011)

The Storm of ’86 by Robert Moon, Feather River Publishing, Quincy, CA 1986

UC Davis Health (Phillips MC, LaRocque RC, Thompson GR. Infectious Diseases in a Changing Climate. *JAMA*. 2024;331(15):1318–1319. doi:10.1001/jama.2023.27724)

University of California, Berkeley’s Department of Environmental Science, Policy, and Management

US Army Corps of Engineers

US Census Bureau

US Department of Agriculture

US Department of Agriculture – Farm Service Agency Secretarial Disasters Declarations

U.S. Department of Transportation

US Drought Monitor

US Farm Service Agency

US Fish and Wildlife Service

US Forest Service

US Geological Survey Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977

US Geological Survey Emergency Assessment of Post-Fire Debris Flow Hazards

US Geological Survey: Volcanic Ash: Effect & Mitigation Strategies

US Geological Survey National Earthquake Information Center

US Geological Survey Open File Report 2015-3009

U.S. Occupational Safety and Health Administration

USDOT’s Emergency Response Guidebook

USDOT Pipeline and Hazardous Materials Safety Administration Data

USFWS October 2024 National Wetlands Inventory

USGS – A Sight “Fearfully Grans” – Eruptions of Lassen Peak California, 1914 to 1917

USGS Bulletin 1847

USGS Fact Sheet 2014-3120

USGS Publication 2014-3120

USGS Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977

USGS National Earthquake Information Center database

Vaisala National Lightning Detection Network

Western Regional Climate Center

Wildfire Safety Operations Center

UCERF Analysis

United States Geological Survey Open File Report 2015-3009

CGS Analysis

Appendix C Mitigation Strategy

Plumas County 2026 Local Hazard Mitigation Plan (LHMP) Update
HMPC Meetings #3 & #4 - Mitigation Strategy
August 6 & 7, 2025

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Jeanine Foster (jeanine.foster@fostermorrison.com)
Foster Morrison Consulting Ltd.
(303) 717-7171

AGENDA

PLUMAS COUNTY
2026 LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meetings #3 & #4 – Mitigation Strategy Meetings

Wednesday August 6, 2025 (1:00 - 4:00 pm)
Thursday August 7, 2025 (9:00 am - 12:00 pm)

HMPC Meeting #3:

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Risk Assessment Status
4. Priority Hazards Review
5. Develop Plan Goals and Objectives
6. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

1. Introductions
2. Review Mitigation Categories and Selection Criteria
3. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
4. Prioritization of Mitigation Actions/Projects
5. Next Steps

Mitigation Strategy Meetings
August 6 & 7, 2025
Day 1

Status of the 2026 Plumas County LHMP Update Project/Next Steps

FEMA's 4-Phase-10 Step DMA/CRS Planning Process

Phase I: Organize Resources

1) Get organized

2) Plan for public involvement

3) Coordinate with other departments and agencies

Phase II: Risk Assessment

4) Identify the hazard(s)

5) Assess the risks

Capability Assessment

Phase III: Mitigation Strategy

6) Set planning goals

7) Review mitigation alternatives

8) Draft an action plan

Phase IV: Adoption and Implementation

9) Adopt the plan

10) Implement the plan, evaluate its worth, and revise as needed

LHMP Project Schedule/Key Dates

2025 LHMP Update Meetings

- **August 6 (Wednesday):** HMPC Meetings #3 (Mitigation Strategy: Goals Development) (1:00 – 4:00 pm)
- **August 7 (Thursday):** HMPC Meetings #4 (Mitigation Strategy: Actions and Projects) (9:00 am – 12:00 pm)
- **December 3 (Wednesday):** Final Public Meeting #3 (5:30 – 7:00 pm)
- **December 4 (Thursday):** Final HMPC Meeting #5 (9:00 am – 12:00 pm)

Mitigation Strategy Meetings - Follow up

- **August 15 (Friday):** Mitigation Strategy (goals/actions) follow up processed and sent to Plumas/HMPC
- **September 12 (Friday):** Mitigation Action (Project) Worksheets due to Foster Morrison

LHMP Document Drafts

- **October 3 (Friday):** HMPC (First) Draft LHMP to Plumas /HMPC
- **October 31 (Friday):** Plumas/HMPC comments due on Draft Plan
- **November 14 (Friday):** Comments incorporated into Public Review (Second) Draft to Plumas
- **November 19 (Wednesday):** Public Review Draft on Plumas website
- **December 18 (Thursday):** all Plumas, HMPC, and Public input to Foster Morrison
- **January 9 (Friday):** Public and final comments incorporated and LHMP ready for submittal to Cal OES – **January 2026**

2026 Plumas Hazard Identification & Profiles

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazard: Severe Weather/ Pests/Weeds	Extensive	Highly Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Unlikely/Occasional	Catastrophic	Medium	Low
Flood: 1%/0.2% annual chance (w/levee failure)	Significant	Occasional/Unlikely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Haz Mat Transportation	Significant	Occasional	Critical	Medium	Low
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Negligible	Medium	High
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Low
Volcano	Extensive	Unlikely	Critical	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely**: Near 100% chance of occurrence in next year, or happens every year.
- **Likely**: Between 10 and 90% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional**: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely**: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low**: The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low**: Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**: Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**: Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High**: Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This considers both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Plumas 2026 LHMP

Plumas County Disasters since 2020/2019 LHMPs

- 2020 California Covid-19 Pandemic (2 state and 2 federal declarations)
- 2020 California Wildfires (federal declaration)
- 2020 Bear Fire (state and federal declaration)
- 2021 Northeast Wildfires (state declaration)
- 2021 Dixie Fire (state and federal declaration)
- 2021 California Wildfires (state and federal declaration)
- 2023 California Severe Winter Storms, Flooding, Landslides, and Mudslides (2 federal and 2 state declarations)

Agricultural Hazards: Severe Weather/Pests/Weeds

- Agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.
- According to the 2023 Plumas County Crop Report, many commodities are grown in Plumas County. The top three commodities for the County in 2023 were cattle; field crops; and timber products. According to the 2023 Crop Report, Plumas County's 2023 estimated commodity production value is $38,541,746.00.
- There have been 17 past USDA Secretarial Disaster Declarations since 2012. 13 were for drought, 3 were from freeze, and 1 from heavy rains and storms.
- The Plumas County Agricultural Commissioner noted that of the list of hazards for this LHMP, the County is most concerned with drought and freeze. It is also concerned with insect infestations.
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium - High
- Priority Hazard

Climate Change

- The 2023 State of California Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- DO ANY JURISDICTIONS HAVE ADDITIONAL INFORMATION ON CLIMATE CHANGE IMPACTS OR SPECIFIC CONCERNS/ISSUES?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam Failure

- According to data provided by Plumas County, CA DWR DSOD data, there are 22 dams in Plumas County that were constructed for flood control, storage, treatment impoundments, electrical generation, and recreational purposes. One dam outside the County (Indian Ole in Lassen County – a high hazard dam) also has an inundation area inside the County. Of the 23 dams that could affect the County, 1 is rated as Extremely High (EH) Hazard, 16 are rated as High Hazard (HH), 4 are rated as Significant Hazard, and 2 are rated as Low Hazard. All EH and HH dams had available inundation data.
- The most significant dams of concern include the Extremely High and High Hazard where loss of life is possible.
- The Extremely High hazard dam (Lake Almanor) affects the unincorporated County only. Of the 16 high hazard dams, all affect the unincorporated County with only 3 affecting the City of Portola (Frenchman, Grizzly Creek, and Grizzly Valley). Several Districts have inundations from the EH and HH dams that extend within their boundaries.
- South Feather Water and Power owns 1 high hazard dam in the County: Little Grass Valley (important for the High Hazard Potential Dams Program and funding stream) and 2 low hazard dams.
- According to multiple sources, there have been no past dam failure events or issues of concern.
- ARE THERE SPECIFIC CONCERNS TO NOTE FOR ANY OF THESE DAMS?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High - Extremely High
- Priority Hazard

Drought and Water Shortage (w/ Tree Mortality)

- Plumas County has been in and out of drought since 2014. Historical drought data for the Plumas County Planning Area and region indicate there have been 5 significant droughts in the last 87 years.
- 1 state (1977) disaster declarations and 1 federal declaration (1977) for Plumas County since 1950. 13 USDA Secretarial Drought declarations since 2012. There have been 2 NCDC drought events in Plumas County, both related to the 2014 to 2023 drought.
- The 2035 Plumas County General Plan Water Resources Element noted that the amount of precipitation received throughout the watershed varies but greatly contributes to the significant amount of water available in the County and throughout the region.
- There have been four (multi-year) tree mortality events in the County since 1980.
- The Water Shortage Vulnerability Scoring and Tool shows that there are 34 water providers in the County, using both ground and surface water. ARE THERE ANY WATER SUPPLY CONCERNS TO NOTE?
- CAN YOU PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED IN THE COUNTY RECENTLY DUE TO THE MOST RECENT DROUGHT? WHAT HAS BEEN IMPACTED THE MOST?
- CAN YOU PROVIDE INFORMATION ON NATURE AND EXTENT OF TREE MORTALITY IN THE COUNTY? EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: Medium
- Priority Hazard

Earthquake

- Plumas County is located in a relatively aseismic area with respect to other more seismically active areas in California. Several potentially active faults pass through Plumas County. The Almanor Fault, Butt Creek Fault Zone, and the Mohawk Valley Fault traverse the County. The Indian Valley Fault is also considered an active fault located within the County. Additionally, the Honey Lake and Fort Sage Faults are two active faults located east of the County.
- The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Plumas County is within the less hazardous Zone 3.
- The USGS National Seismic Hazard Maps provides acceleration and probabilities for various time periods. Plumas County falls within an area of mostly low to moderate seismic risk.
- USGS identified 431 magnitude 5.0 or greater earthquakes (from 1850 to April 2025) have occurred within 90 miles of Portola (these are earthquakes that could have affected the County).
- A series of earthquakes occurred near Lake Almanor on May 24, 2013. This included a 5.7 magnitude earthquake near Canyon Dam, near the southern end of Lake Almanor. Injuries were reported and damage to infrastructure and homes were sustained. Lake Almanor Mutual Water Company sustained a water main rupture which resulted in water supply loss, and 600 PG&E customers on the Lake Almanor peninsula lost power.
- 2023 EVENTS (5.16 and 5.48 near Lake Almanor) ON 5/11 AND 5/12/2023. DAMAGES FROM THESE EVENTS TO EACH JURISDICTION?
- HAVE ANY RECENT STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES? DOES PORTOLA HAVE A URM OR OTHER INVENTORY?
- WHAT ARE EACH JURISDICTIONS PRIMARY CONCERNS TO THIS HAZARD?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: High
- Priority Hazard

Flood Hazards

1%/0.2% Annual Chance Flood (w/levee failure)

- Historically, portions of Plumas County have always been at risk to flooding because of its annual percentage of rainfall in the winter and the number of watercourses that traverse the County. According to the 2005 Flood Insurance Study for Plumas County, flooding in Plumas County may be caused by either general rainstorms or cloudburst storms. Cloudbursts are high intensity floods and can produce peak flows substantially larger than those of general rainstorms. Atmospheric river events in recent years have also contributed to the flood hazard.
- A search of the National Levee Database identified 3 leveed areas in Plumas County. None of these 3 levees are certified (in the FEMA FIS) as providing protection from the 1% annual chance flood. These levees include: 1) Plumas County Levee 1 (near Taylorsville); 2) Plumas County Levee 2 (near Greenville); and 3) North Fork Feather River at Chester (near Chester) – East and West levees. National Levee Database has some analysis on these levees.

- 19 state and 22 federal declarations from 1950-present were for flooding including heavy rains and storms. 15 NCDC flood events since 1993.
- HAS EACH JURISDICTION PROVIDED DETAILS ON PAST FLOOD DAMAGES AFFECTING THEIR JURISDICTION FROM RECENT EVENTS SINCE 2020/2019?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- Recent atmospheric river events occurring in 2021, 2022, and 2023 have led to more significant flooding throughout the County.
- WE HAVE A LARGE LIST OF PROBLEM AREAS FOR THE COUNTY; ANY RECENT ADDITIONS/DELETIONS? PAST OCCURRENCES SINCE 2020/2019?
- NEED LIST OF PROBLEM AREAS SPECIFIC TO EACH JURISDICTION.
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Hazardous Materials Transportation

- This is a new hazard in the LHMP Update.
- In Plumas County there are multiple hazardous materials transportation routes. State Roads 36, 49, 70, 89, and 147 are all highway hazardous materials routes. The Union Pacific, BNSF, Quincy Railroad, and Almanor Railroad are railroad hazardous materials routes.
- The USDOT Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety tracks hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in the County. 11 separate events were contained in the database. Most were minor, with 2 larger events of fuel spills.
- The HMPC provided another event that occurred in February of 2024 related to a railcar spill. ANY OTHER EVENTS OF NOTE?
- WHAT ARE THE PRIMARY LOCAL CONCERNS SPECIFIC TO EACH JURISDICTION FOR HAZARDOUS MATERIALS TRANSPORT SPILLS? SPECIFIC LOCATIONS OF CONCERN?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Landslides, Mudslides, and Debris Flows

- The 2035 Plumas County General Plan Public Health & Safety Element noted that areas with steep slopes in the County could be prone to landslides, mudslides and avalanches.
- There have been no disaster declarations associated directly with landslides in Plumas County. However, there have been 7 state and 5 federal disaster declarations from flooding that included

landslide issues. The NCDC contains no records of landslides (but 21 records of debris flows) in the County since 1993.

- The County has provided some past occurrences (including one that caused a haz-mat spill) since the 2020 Plan. ANY PAST LANDSLIDE EVENTS TO ADD?
- CGS Deep-Seated Landslide mapping indicate that many areas throughout the County are at moderate, high, and very high risk of landslides. Many of these are along transportation routes.
- There is a list of landslide risk areas provided by the HMPC. ANY NEW LANDSLIDE AREAS SINCE THE LAST PLAN? BURN SCAR AREAS?
- NEED LANDSLIDE PROBLEM AREAS SPECIFIC TO EACH JURISDICTION.
- ANY ACTIVE LANDSLIDE AREAS TO BE MITIGATED? HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Severe Weather

Extreme Cold, Freeze, Snow (w/Avalanche)

- Annual occurrences of cold temperatures. The lowest recorded daily extreme was -28°F in January 1937. In a typical year, minimum temperatures fall below 32°F on 166.9 days in Plumas, with 1.5 days falling below 0°.
- Average snowfall in Plumas is 55.1 inches with record snowfall in 1952 of 167.2 inches.
- The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement create an avalanching episode.
- The County has 1 state and 0 federal disaster declarations for extreme cold and freeze. There have been 4 USDA Secretarial Disasters from freeze (2016, twice in 2022, 2023). NCDC identified 549 extreme cold, freeze, and snow events. There have been no disaster declarations or NCDC events associated with avalanche in Plumas County.
- An avalanche occurred in the winter of 2012 near Sloat. No injuries or deaths were reported. Timber stock in the avalanche area was damaged, though no damage estimates were available. OTHERS SINCE 2020/2019?
- WHAT ARE THE PRIMARY CONCERNS TO THE COUNTY? OTHER JURISDICTIONS? THE 2020 LHMP NOTED THE GRIZZLY RIDGE AREA AS A KEY AREA OF CONCERN FOR AVALANCHES – ARE THERE OTHER AREAS OF CONCERN?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures. The highest recorded daily extreme was 110°F in August 1981 and September 1988 in Plumas (Quincy). In a typical year, maximum temperatures exceed 90°F on 45.3 days in Plumas.
- No state or federal disaster declarations from heat since 1950. No USDA heat declarations since 2012. 7 extreme heat events (NCDC) since 1993. Lots of local heat data from Vieira Ranch.
- PLEASE PROVIDE DETAILS ON EXTREME HEAT AND MAJOR CONCERNS FOR EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy Rains and Storms (including Hail, Lightning)

- Significant County history: annual occurrences. High intensity cloudburst and heavy rains occur in the Plumas County Planning Area. Severe storms/heavy rains are the primary cause of most major flooding. Recent atmospheric river events have been contributing to this hazard.
- The NCDC data recorded 10 hail, 60 rain, 61 winter storm (that includes heavy rain), and 1 lightning event for Plumas County since 1950, for a total of 132 NCDC events.
- There have been 19 federal and 22 state declarations since 1950 for flooding, including heavy rains and storms. 1 USDA disaster declaration (2016) from excessive rain. Lots of local rain and storm data from Vieira Ranch.
- PLEASE PROVIDE DETAILS ON MAJOR CONERNS TO EACH JURISDICTION RELATED TO HEAVY RAINS AND STORMS.
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes – non reported
- No federal or state disaster decs. One USDA disaster dec (2016) associated with high winds (among others). The NCDC data recorded 94 high wind events; no events for tornadoes since 1955.
- Biggest issues are associated with wind fueling fires and also triggering PSPS events. Downed trees are also a concern during high wind events.
- WHAT ARE THE PRIMARY CONCERNS TO EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Volcano

- Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Lassen Peak is the closet potential threat to Plumas County.
- Lassen Peak experienced a significant eruption in 1915.
- No federal or state disaster declaration. No NCDC events for volcanoes.
- WHAT ARE THE CONCERNS FROM LASSEN PEAK/OTHERS?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Non-Priority Hazard?

Wildfire (w/smoke and air quality)

- Wildfires occur on an annual basis in the Plumas County Planning Area. Any ignition has the potential to become an out-of-control wildfire. Compounding the issue is the number of dead or dying hazardous trees. Wildfire is the most significant hazard the County faces.
- 7 state and 6 federal disaster declarations for Wildfire since 1950: 1960 -unnamed fire; 1987 -Clarks Fire; 1999 –Bucks Fire; 2008 BTU Lightning Complex Fire, 2020 Bear Fire and Lightning Complex Fire, 2021 Dixie Fire, Lava Fire/Beckwourth Complex, and Monument Fire. 15 NCDC wildfire events since 1993; 1 of these for smoke. Smoke and air quality past events were supplied by Vieira Ranch.
- WHAT ARE THE PRIMARY ISSUES/CONCERNS TO EACH JURISDICTION?
- HOW WILL THIS HAZARD BE MITIGATED?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Plumas County 2026 LHMP Update Priority Hazards

SHOULD ANY HAZARDS BE MOVED TO LOW PRIORITY – ARE THERE MITIGATION ACTIONS FOR EACH OF THESE HAZARDS?

Plumas County

Priority Hazards:

- Ag Hazards: Severe Weather/Pests/Weeds
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: 1%/0.2% Annual Chance Flood (w/ levee failure)
- Flood: Localized Stormwater
- Hazardous materials Transportation
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornados
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Volcano
-
-
-

City of Portola

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Hazardous Materials Transportation
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards: Severe Weather/ Pests/Weeds
- Severe Weather: Extreme Heat
- Volcano
-
-
-

Chester Public Utility District

Priority Hazards:

- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Heavy Rains and Storms
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards: Severe Weather/ Pests/Weeds
- Climate Change
- Dam Failure
- Earthquake??
- Hazardous Materials Transportation
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Volcano

Gold Mountain Community Services District

Priority Hazards:

- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

Ag Hazards: Severe Weather/ Pests/Weeds

- Climate Change
- Dam Failure
- Flood: 1%/0.2% annual chance (w/levee failure)
- Hazardous Materials Transportation
- Volcano

Grizzley Lake Community Services District

Priority Hazards:

- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Severe Weather: Extreme Cold, Freeze, and Snow (w/Avalanche)
- Severe Weather: Heavy Rains and Storms
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards Severe Weather/ Pests/Weeds
- Dam Failure
- Hazardous Materials Transportation
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Volcano

Plumas Corp/Fire Safe Council

Priority Hazards:

- Ag Hazards: Severe Weather/ Pests/Weeds
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Dam Failure
- Earthquake
- Hazardous Materials Transportation
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Volcano

Feather River Resource Conservation District

Priority Hazards:

- Climate Change
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards Severe Weather/Pests/Weeds
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: 1%/0.2% annual chance (w/levee failure)
- Hazardous Materials Transportation
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Volcano

Plumas Eureka CSD

Priority Hazards:

- Ag Hazards: Severe Weather/Pests/Weeds
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Hazardous Materials Transportation
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Landslide, Mudslide, Debris Flow
- Volcano

South Feather Water and Power

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Landslide, Mudslide, Debris Flow
- Severe Weather: Heavy Rains and Storms
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards Severe Weather/Pests/Weeds
- Earthquake??
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Hazardous Materials Transportation
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Volcano

Mitigation Strategy: Goals

The most important element of the LHMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

6. Mitigation Goals
7. Mitigation Actions
8. Mitigation Action (Implementation) Plan

Mitigation Goals

Up to now, the Hazard Mitigation Planning Committee (HMPC) has been involved in collecting and providing data for the 2026 Plumas County Local Hazard Mitigation Plan Update. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of Plumas to identified hazards and includes an assessment of the County's current capabilities for countering these threats through existing policies, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals should lead to incorporating these improvements into the Mitigation Strategy portion of the LHMP. Our planning goals should provide direction for what risk reduction activities can be undertaken to make the Plumas County Planning Area more disaster resilient.

Mitigation Goals are general guidelines that represent the County's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation, cost, schedule, and means are not considered.

Goals are public policy statements that:

- **Represent basic desires of the jurisdiction;**
- **Encompass all aspects of planning area, public and private;**
- **Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;**
- **Are future-oriented, in that they are achievable in the future; and**
- **Are time-independent, in that they are not scheduled events.**

  - ✓ While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.
  - ✓ Goal statements may form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.
  - ✓ The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.
  - ✓ Consider other planning area goals from other regional/county/city programs, plans and priorities.

Types/Sources of other area mitigation plans/ programs include:

- General Plans
- Master and Strategic Plans
- Stormwater Program and Plans
- Flood/Levee/Stormwater Management Plans and Studies
- Drought Plans, Urban/Integrated Regional Water Management Plans
- Earthquake Studies and Plans
- Community Wildfire Protection Plans
- Strategic Fire Plans
- Dam Emergency Action Plans
- Emergency Operations Plans
- Climate Plans
- Others?

2018 California State Hazard Mitigation Plan Goals

1. Significantly reduce life loss and injuries.

2. Minimize damage to structures and property, as well as minimizing interruption of essential services and activities.

3. Protect the environment.

4. Promote community resilience through integration of hazard mitigation with public policy and standard business practices.

2023 State Hazard Mitigation Plan Goals

GOAL 1—Significantly reduce risk to life, community lifelines, the environment, property, and infrastructure by planning and implementing whole-community risk reduction and resilience strategies.

GOAL 2—Build capacity and capabilities to increase disaster resilience among historically underserved populations, individuals with access and functional needs, and communities disproportionately impacted by disasters and climate change.

GOAL 3—Incorporate equity metrics, tools, and strategies into all mitigation planning, policy, funding, outreach, and implementation efforts.

GOAL 4—Apply the best available science and authoritative data to design, implement, and prioritize projects that enhance resilience to natural hazards and climate change impacts.

GOAL 5—Integrate mitigation principles into laws, regulations, policies, and guidance to support equitable outcomes to benefit the whole community.

GOAL 6— Significantly reduce barriers to timely, efficient, and effective hazard mitigation planning and action.

Goals from Other Plumas/Regional Plans

2019, Plumas County Communities Wildfire Protection Plan (CWPP), Plumas FSC

Purpose: The **purpose** of this plan **it io outline the risks and hazards associated with a wildland fire threat to Plumas County communities and to identify potential mitigation measures.**

Implementation of this plan will further the **Fire Safe Council's Mission**: **To reduce the loss of natural and human made resources caused by wildfire through Firewise community programs and pre-fire activities." The Fire Safe Council has a specific goal relating to: "Implement and amend as necessary the Plumas County Community Wildfire Protection Plan"**

Plumas County 2013 General Plan: Hazard Related Goals: Public Health and Safety Element

Goal PHS 6.1	**To protect local communities from injury and damage resulting from natural catastrophes and man-made hazardous conditions.**
Policy 6.1.1	Development Constraints – The County shall limit the density and intensity of development in areas to the levels needed to reduce hazards to public health and safety.
Policy 6.1.2	Building and Code Updates – Except as otherwise noted by State law, the County shall ensure that all new structures intended for human habitation are designed in compliance with the latest adopted editions of the California Building Standards Code.
Policy 6.1.3	Hazard Awareness and Public Education – The County shall continue to promote awareness and education among residents regarding possible natural hazards, including soil conditions, landslides, earthquakes, flooding, wildfire hazards and emergency procedures.
Policy 6.1.4	Public Safety Programs – The County shall promote all applicable public safety programs, including neighborhood-watch programs, hazards materials disposal, public awareness and prevention of wildfire hazards, and other public-education efforts.
Goal PHS 6.2	**To identify and prevent development in "areas of unstable geologic conditions," which include: active faults, landslides and areas of potential ground failure such as liquefaction, mudslides and subsidence.**
Policy 6.2.1	Maintenance of Updated Geologic and Seismic Hazard Information – The County shall maintain updated geologic, seismic and avalanche hazard maps and other hazard inventory information in cooperation with the State Office of Emergency Services, California Department of Conservation—Division of Mines and Geology, United States Forest Service, California Department of Transportation and other agencies as this information is made available.
Policy 6.2.2	Design Measures – The County shall require earthquake resistant designs consistent with the requirements of the California Building Standards Code for all critical structures, such as fire stations, emergency communication centers, private schools, high occupancy buildings, and non-highway bridges.
Policy 6.2.3	Seismic Retrofitting – The County shall support and encourage seismic upgrades to older buildings that may be structurally deficient. Upgrades shall consider any applicable historic building preservation requirements.
Policy 6.2.4	Development on Slopes – The County shall not allow development on slopes 30 percent or greater, unless the applicant can sufficiently mitigate the inherent problems associated with developing on steep slopes.
Policy 6.2.5	Avalanche, Landslide and Mudflow Hazards – The County shall prohibit new subdivisions in high risk areas of known avalanche, landslide or mudflow hazards.
Policy 6.2.6	Naturally Occurring Asbestos – The County shall work with the Northern Sierra Air Quality Management District to map locations of naturally occurring asbestos and to mitigate potential hazards from development.

Policy 6.2.7	Development Requirements – The County shall continue to address seismic standards of dam safety as required by the State Division of Safety and Dams.
Goal PHS 6.3	**To minimize the possibility of the loss of life, injury, damage to property, and loss of habitat and natural resources as a result of fire.**
Policy 6.3.1	Defensible Space – The County shall review and update its Fire Safe ordinance to attain and maintain defensible space through conditioning of tentative maps and in new development at the final map and/or building-permit stage.
Policy 6.3.2	Limitations in Fire Hazard Areas – The County shall consult the current Fire Hazard Severity Zone Maps during the review of all projects so that standards and mitigation measures appropriate to each hazard classification can be applied. Land use densities and intensities shall be determined by mitigation measures in areas designated with a high or very high fire hazard rating. Intensive development in areas with high or very high fire hazard rating shall be discouraged.
Policy 6.3.3	Structural Fire Protection – All developments within the service boundaries of an entity which provides structural fire protection may be required to make contribution to the maintenance of the existing level of structural service proportionate to the increase in demand for service structural fire protection and Emergency Medical Services resulting from the development.
Policy 6.3.4	New Development Requirements – As a requirement for approving new development, the County must find (based on information provided by the applicant and the responsible fire protection district), that concurrent with development, adequate emergency water flow, fire access – Public Health & Safety Element| 140 – and fire-fighting personnel and equipment, will be available in accordance with applicable State, County, and local fire district standards.
Policy 6.3.5	Emergency Access – As a requirement of new development, the applicant must demonstrate that adequate emergency access exists or can be provided to ensure that emergency vehicles can access the site and that private vehicles can evacuate the area.
Policy 6.3.6	Fire Protection and Roadside Maintenance – As a condition of development, the County shall require the long-term maintenance of private roads, including roadside vegetation management, to the standards of original improvements.
Policy 6.3.7	Rural Fire Protection Water System – The County shall research the feasibility of a countywide rural fire protection water system that provides a cost-effective, adequate water supply.
Policy 6.3.8	Fire Protection Facility Upgrades – The County shall encourage upgrading facilities within existing fire protection districts and encourage expansion of existing districts where warranted by population density allowed under the General Plan.
Policy 6.3.9	Fuel Modification – The County shall require new development within high and very high fire hazard areas to designate fuel break zones that comply with defensible space requirements to benefit the new and, where possible, existing development.
Policy 6.3.10	Prescribed Burning – The County shall encourage the use of prescribed burning as a management tool for hazardous fuels reduction, timber management purposes, livestock production and enhancement of wildlife habitat. The County shall support removal of fuels and chipping and onsite distribution of chipped materials as an alternative to burning.
Policy 6.3.11	Regional Cooperation – The County shall cooperate with Federal, State, community fire safety groups and other fire protection entities in fire prevention programs and in identifying opportunities for hazardous fuel reduction projects in zones of high and very high fire hazard either prior to or as a component of project review.
Policy 6.3.12	Fire Prevention Education – The County, in cooperation with Federal and State agencies, community fire safety groups, and the local fire protection districts, shall educate the public about the hazards of wildfires, methods to reduce the potential for fires to occur, and mitigation measures, including reducing fuel loads, to lessen the impacts of wildfires.
Policy 6.3.13	Landscape-Scale Fuel Modification – The County shall support fuel modification across public and private forestlands to reduce the potential for catastrophic wildfires, with the highest priority directed toward reducing hazardous fuel levels in the wildland-urban interface.

Goal PHS 6.4	To minimize the loss of life, injury or damage to property as a result of floods in Plumas County.
Policy 6.4.1	Coordination with Federal Emergency Management Agency, United States Army Corps of Engineers and Department of Water Resources Division of Flood Management – The County shall continue participation in the Federal Emergency Management Agency's National Flood Insurance Program, utilizing the Flood Insurance Rate Maps and the County's floodplain ordinances that implement Federal and State flood management standards. The County shall continue to utilize floodplain management and flood control information provided by the Department of Water Resources Division of Flood Management and the United States Army Corps of Engineers and coordinate with these agencies when undertaking updates to the County's floodplain ordinances and policies.
Policy 6.4.2	Development in Floodways and Dam Inundation Areas – The County shall prohibit the development of new critical or high-occupancy structures within the floodway of any river, stream or other body of water. Similar structures should not be located within the inundation area resulting from failure of dams identified by the State Department of Water Resources Division of Safety of Dams.
Policy 6.4.3	New Parcels in Floodplain – The County shall strongly discourage the creation of new residential parcels which lie entirely within Special Flood Hazard Areas as identified on the most current version of the Flood Insurance Rate Maps provided by the Federal Emergency Management Agency. Proposals for new parcels that are partially located within designated Special Flood Hazard Areas must be evaluated to determine if sufficient land is available outside the Special Flood Hazard Area to support residential development and that potential flood impacts can be sufficiently mitigated.
Policy 6.4.4	Floodplain Development Restrictions – The County shall ensure that riparian areas and drainage areas within floodplains are free from development that may adversely affect floodway capacity or characteristics of natural/riparian areas or natural groundwater recharge areas.
Policy 6.4.5	Multi-Purpose Flood Control Measures – The County shall encourage multi-purpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat and scenic values of the County's waterways.
Policy 6.4.6	Flood Control Design – The County shall avoid flood control projects involving further channeling, straightening or lining of waterways until alternative multi-purpose modes of treatment, such as wider berms and landscaped areas in combination with recreation amenities, are studied.
Policy 6.4.7	Limit Surface Runoff – The County shall review development projects to determine that such development can be permitted without alteration of off-site historical flood patterns or contribution to flooding hazards for downstream users. Each project with the potential to create off-site drainage shall be required to submit a plan showing how the impacts of such drainage will be addressed, both on-site and off-site.
Policy 6.4.8	Storm Water Retention/Detention and Groundwater Infiltration – As appropriate, the County shall require development to incorporate storm-water retention/detention ponds to encourage groundwater recharge and to make efficient use of storm water.
Goal PHS 6.5	**To protect the community from hazardous materials through safe and efficient use, storage, transport and disposal.**
Policy 6.5.1	The County Environmental Health Division, as the Certified Unified Program Agency (CUPA), shall strive to ensure hazardous materials are used, stored, transported and disposed of in a safe manner in compliance with local, State and Federal safety standards.
Policy 6.5.3	The County shall continue to coordinate with the California Highway Patrol (CHP) and railroad operators to establish procedures for the movement of hazardous wastes and explosives within the County.

Goal PHS 6.7	To provide effective emergency response to natural or human-made hazards and disasters.
Policy 6.7.1	Emergency Response Services Coordination with Government Agencies – The County shall coordinate emergency response with local, State and Federal governmental agencies, community organizations, volunteer agencies and other response partners during emergencies or disasters utilizing the Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS).
Policy 6.7.2	Mutual Aid Agreement – The County shall participate in established local, State and Federal mutual aid systems. Where necessary and appropriate, the County shall enter into agreements to ensure the effective provision of emergency services, such as mass care, heavy rescue, hazardous materials or other specialized functions.
Policy 6.7.3	Maintenance of Emergency Evacuation Plans – The County shall continue to create, revise and maintain emergency plans for the broad range of natural and human-made disasters and response activities that could be foreseen to impact Plumas County. This shall include, but not be limited to, flooding, dam failure, extreme weather, evacuation/transportation, mass care and shelter, and animal evacuation and sheltering. Emergency Planning projects shall be in line with the County's Emergency Operations Plan and incorporate current guidance and initiatives from State and Federal Emergency Management Agencies.
Policy 6.7.4	Streets and Highways Upgrades – The County shall evaluate and strive to upgrade vital streets and highways to an acceptable level for emergency services and for public safety.
Policy 6.7.5	Search and Rescue – The County should continue to provide search and rescue operation capabilities through the Plumas County Sheriff's Department.
Policy 6.7.6	Joint Exercises – The County shall encourage fire, law enforcement, emergency medical services, resource management, public health and other governmental and non-governmental response partners to periodically conduct joint training exercises with the goal of developing the best possible coordinated action and effective response times in the event of a natural or human-made disaster across all local jurisdictions.

Portola 2024 General Plan: Hazard Related Goals: Public Services & Facilities Element

Goals:

Goal PF-1. The City will be innovative in new techniques and technologies to provide the best available "state-of-the-art" level of public services in a cost effective manner.

Goal PF-4. Public improvements and facilities will be designed to enhance, rather than degrade, the natural environment in the City and surrounding area.

Policies: Water Supply and Distribution

PF-P-5. Secure sufficient sources of water to meet the needs of the existing community and planned growth.

PF-P-8. City water service will not be extended to unincorporated areas unless an adequate supply is available for all areas within the city.

PF-P-9. The City will develop a program for the use of recycled water for exterior landscaping within the parameters of State and County Health Codes and standards.

PF-P-10. Develop and implement water conservation measures as necessary elements of the water system.

PF-P-12. Monitor water quality regularly and take necessary measures to prevent contamination.

PF-P-13. Provide an emergency backup system that meets 150% of average demand.

Policies: Storm Water

PF-P-18. The City will seek to minimize additional storm water runoff from new development areas.

PF-P-19. The City will establish equitable methods of paying for future storm drainage improvements.

PF-P-20. Storm water will be managed in natural channels rather than underground pipes where feasible.
PF-P-21. No net increase in storm water compared to the undeveloped condition will be permitted in new development areas.
PF-P-22. Stormwater system improvements will be extended to the infill areas when feasible

Policies: Education

PF-P-31. Where feasible, schools will be located away from hazards or sensitive resource conservation areas, except where the proximity of resources may be of educational value and the protection of resources is reasonably assured.

Policies: Fire Protection

PF-P-43. The City will establish fundamental standards for level of service that include response times and level of response criteria and will establish the criteria for determining the circumstances under which fire service will be improved.
PF-P-44. The City will continue exploring ways to ensure sustainable fire and emergency services are provided to the City.

Plumas County Goals from Previous 2020 LHMP (This is what we are updating)

Goal #1: Minimize loss of life and injuries and protect property and the environment from natural hazards.

- Minimize loss from priority natural hazards to include wildfire, flood, earthquake, dam failure, drought, landslides, and severe weather hazards
- Minimize impact to existing and future development
- Minimize economic and natural resource impact
- Promote resiliency strategies
- Support mitigation planning and implementation in all County departments and operations

Goal #2: Reduce losses and provide protection for critical facilities, infrastructure, and services from hazard impacts

- Implement critical facility upgrades and mitigation measures to ensure reliability of services
- Update and maintain a GIS database of critical facilities to include: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Minimize the loss of agricultural and natural resource productivity (foundation of rural economy) from natural hazards

- Support education and training of private land managers on hazard mitigation and disaster preparedness
- Promote local research, education, and technical assistance on sustainable agriculture and forestry practices
- Foster agricultural and natural resource resilience to natural hazards through implementation of best management practices and restoration activities
- Provide training, technical assistance, outreach and education to private landowners on tree mortality, identification, management, and prevention strategies

Goal #4: Increase community awareness, education, preparedness, and self-reliance to natural hazards

- Enhance public and stakeholder outreach, education, and preparedness programs to include all hazards of concern
- Increase public and stakeholder knowledge about the risk and vulnerability to identified hazards and how to be more self-reliant in mitigating risks from natural hazards
- Provide public and stakeholder education and outreach specific to evacuation routes, various available emergency communication modes, and roles and responsibilities.

Goal #5: Increase communities' ability to mitigate hazards and be prepared for, respond to, and recover from a disaster event in Plumas County

- Improve community capabilities to mitigate hazards and reduce losses
- Enhance community capabilities by improved coordination of local, state, and federal resources
- Increase capabilities to provide mitigation opportunities and assistance to Plumas County communities
- Increase the capacity to effectively respond to and recover from natural disaster events
- Enhance emergency communication capabilities (e.g., cell phones, radios, sirens, reverse 911, etc.)
- Increase capabilities for continuity of government
- Improve community's ability to be competitive/successful with grant funding opportunities from application development to project delivery

Goal #6: Minimize life safety issues, property loss, environmental damages, and economic impacts associated with wildfires, the #1 natural hazard of concern in Plumas County

- Reduce the wildfire risk and vulnerability
- Update, maintain, and implement Community Wildfire Protection Plans
- Develop a Countywide fuels management implementation strategy
- Coordinate comprehensive fire protection strategies among all federal, state, and local agencies and across all property boundaries to implement a fire-adapted community concept approach at broader county-wide geographic and policy scales.
- Increase community education, outreach, and awareness of wildfire mitigation strategies, including those to be undertaken by private property owners
- Continue to seek establishment of Firewise USA sites (communities)
- Promote and develop a tree mortality action plan for monitoring, prevention and mitigation activities
- Promote and enhance fire-fighting capabilities (e.g., access roads, water supply, etc.)
- Improve community infrastructure for wildfire preparedness and response including locating safety zones, augmenting community water supplies, and reducing fire hazard along transportation and power infrastructure.
- Enhance the county wildfire hazard codes, including enforcement capabilities, within areas of high wildfire risk
- Continue land use planning efforts to ensure increased fire safety in new developments
- Develop and implement outreach, education, and technical assistance to encourage "home hardening" and retrofitting of older residences and structures to increase community resilience to wildfire

Goal #7: Minimize the effects of climate change on natural hazards in Plumas County

- Develop a Climate Action Plan for Plumas County
- Consider and integrate climate change information and issues in future General Plan updates

City of Portola Goals from Previous 2019 LHMP (This is what we are updating)

Goal 1. Increase public awareness of potential natural hazards and self-reliant mitigation actions.

- Objective 1.1 Involve the public in disaster planning and promote individual mitigation and preparedness measures.

Goal 2. Reduce risk of loss of life/injuries due to natural hazards

- Objective 2.1 Establish Public Community Warning system in the event of a natural disaster. (ALL)
- Objective 2.2 Reduce possibility of injury or loss of life due to flooding (DAM FAILURE, FLOOD)
- Objective 2.3 Minimize Injury or loss of life due to seismic or geologic hazards (EARTHQUAKE)
- Objective 2.4 Minimize Injury or loss of life due to wildfire (WILDFIRE, DEBRIS FLOW)

Goal 3. Reduce risk of loss to property, both public and private

- Objective 3.1 Establish Public Community Warning system in the event of a natural disaster. (ALL)
- Objective 3.2 Protect existing public infrastructure (ALL)
- Objective 3.3 Pursue flood control solutions which minimize environmental impacts (FLOOD)
- Objective 3.4 Regulate Land Use and Development within flood areas (FLOOD)
- Objective 3.5 Reduce property damage due to seismic and geologic hazards (EARTHQUAKE)
- Objective 3.6 Minimize loss of property due to wildfire (WILDFIRE, DEBRIS FLOW)

Goal 4. Maintain and increase funding for natural disaster preparedness, planning and response.

- Objective 4.1 Cooperate with other local agencies, jurisdictions or non-profit organizations involved in disaster planning or response so that efforts to secure funding are coordinated and will work toward maximum benefits. (ALL)
- Objective 4.2 Support efforts put forth by other agencies where funding for mitigation efforts presents the potential to benefit the City. (ALL)
- Objective 4.3 Evaluate and improve current training for response personnel and equipment. Consider increased training for first responders and updating outdated equipment. (ALL)

Other Example Goal Statements

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 200/500-year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of technology

General Recommendation for Categories of Goals

- Reduce Losses/Protection of Life, Property, Public Health, and the Environment from all Hazards
- Reduce Losses/Protection of Critical Facilities and Infrastructure from all Hazards
- Public Education
- Increase City Capabilities to all Hazards
- Any Hazard-specific goals
- Integrate strategies for the protection of underserved and vulnerable populations

Goals Development

The purpose of goal's development is to reach a consensus on goals for the Plumas County 2026 LHMP Update. Provided above are numerous example goals for this LHMP. ***You may reword those above or develop your own goals.*** These goal statements should serve as examples. It is vital that our HMPC establish its own goals for this update.

You will each be given 3 sticky notes. On each note you will write what you think the goals for this LHMP Update should be. Use one sticky note for each goal.

When done, we will:

- Pin/tape them to the wall/easel-chart and arrange them by category
- Combine and reword them into 3-5 goals for the plan and send them out to the HMPC for further review and refinement

Mitigation Strategy Meetings
August 6 & 7, 2025
Day 2

Mitigation Strategy Action Development: Ground Rules

Rule 1: All participating jurisdictions MUST have a Mitigation Action/Project to address each of their Priority Hazards (those rated as a high or medium significance in their Hazard Identification table).

Rule 2: Every Mitigation Action/Project MUST be supported by Risk Assessment Data contained within Chap 4 of the Base Plan and Jurisdictional Annexes. Note: this might necessitate backfilling the hazard risk assessment data.

Rule 3: The Mitigation Actions/Projects for this 2026 LHMP should reflect each jurisdiction's WISH LIST for mitigation, regardless of funding source.

Rule 4: Any Mitigation Action/Project that might be considered for FEMA mitigation grant funding over the next 5-years covered by this LHMP MUST be included in this 2026 LHMP.

Rule 5: While the updated Mitigation Strategy should include all potential Mitigation Actions/Projects for the participating jurisdictions (regardless of funding source), keep in mind that the jurisdictions are NOT obligated to implement ANY of the identified Mitigation Actions/Projects – all are always subject to funding and changing priorities.

Rule 6: Each Mitigation Action/Project to be included in this LHMP MUST have a Mitigation Action Worksheet completed by the owning jurisdiction, department or agency. This applies to Mitigation Actions/Projects being carried forward from the County's/City's previous LHMPs.

REMEMBER: Having a FEMA approved LHMP for Plumas County and participating jurisdictions is a prerequisite for being eligible to apply for FEMA pre and post disaster mitigation funding.

Mitigation Strategy: Actions

Mitigation Actions are specific projects and activities that help achieve the LHMP goals and accomplish risk reduction in the community.

Categories of Mitigation Actions

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
  - ✓ Subdivision regulations
  - ✓ Building Codes
    - Fire-Wise Construction
  - ✓ Floodplain development regulations
  - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
  - ✓ NOAA Weather Radio
  - ✓ Sirens
  - ✓ "Reverse 911" (Emergency Notification System)
- Emergency Response
  - ✓ Evacuation & Sheltering
  - ✓ Communications
  - ✓ Backup power supply/generators
  - ✓ Emergency Planning
    - Activating the EOC (emergency management)
    - Closing streets or bridges (police or public works)
    - Shutting off power to threatened areas (utility company)
    - Holding/releasing children at school (school district)
    - Ordering an evacuation (mayor)
    - Opening emergency shelters (Red Cross)
    - Monitoring water levels (engineering)
    - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)

- ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
- ✓ Lifeline Utilities Protection

➢ Post-Disaster Mitigation

➢ Building Inspections

- ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

➢ Retrofitting/disaster proofing

- ✓ Floods
  - Wet/Dry floodproofing (barriers, shields, backflow valves)
  - Relocation/Elevation
  - Acquisition
  - Retrofitting
- ✓ High Winds/Tornadoes
  - Safe Rooms
  - Securing roofs and foundations with fasteners and tie-downs
  - Strengthening garage doors and other large openings
- ✓ Winter Storms
  - Immediate snow/ice removal from roofs, tree limbs
  - "Living" snow fences
- ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
  - Anchoring, bracing, shear walls
  - Dewatering sites, agricultural practices
  - Catch basins
- ✓ Drought
  - Improve water supply (transport/storage/conservation)
  - Remove moisture competitive plants (Tamarisk/Salt Cedar)
  - Water Restrictions/Water Saver Sprinklers/Appliances
  - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
  - Create incentives to consolidate/connect water services
  - Recycled wastewater on golf courses
- ✓ Wildfire, Grassfires
  - Replacing building components with fireproof materials
  - Roofing, screening
  - Create "Defensible Space"
  - Installing spark arrestors
  - Fuels Modification
- ✓ Noxious Weeds/Insects

- Mowing
- Spraying
- Replacement planting
- Stop overgrazing
- Introduce natural predators

- Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the natural beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices

Best management practices ("BMPs") are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project's design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

1. Avoidance: setting construction projects back from the stream.
2. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
3. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained:

- Dumping Regulations
- Set-back regulations/buffers
- Fuels Management
- Water Use Restrictions

- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they "stop" flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection:

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Actions/Projects from 2020 Plumas County LHMP (This is what we are updating)

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Plumas County				
All Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Public Health & Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access				
Action 4. Companion Animal/Livestock/Horse/Equipment Trailer				
Action 5. Plumas County General Plan Public Health & Safety Element update to incorporate Senate Bill (SB) 379 requirements				
Action 6. Continue Telephone Emergency Notification System (TENS) Capability Enhancements Countywide				
Action 7. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.				
Action 8. Evaluate Coverage and Expansion for Broadband Services. Advance Grants and Projects Accordingly				
Action 9. Harden Cell Tower Sites. Increase Cell Service Coverage by Increasing the Number of Cell Towers. Increase the Number of Repeater Sites. Install Backup Generators in Case of Power Failure.				
Action 10. Identify Critical Facilities Requiring Backup Generators				
Action 11. Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter				
Action 12. Explore establishing a Community Emergency Response Team (CERT)				
Action 13. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access				
Action 14. PRC 4290 – Plumas County Code Title 9, Chapter 8. Street Address System. Promote and continue to implement compliant street/address reflective signage for public and private roads and structures				
Action 15. Designation of minor County roads and forest service roads to be used as alternate routes around road closures during wildfire and other hazard events. Plumas and Lassen National Forests have funding for new road connections to form alternate routes.				
Climate Change, Drought and Water Shortage Actions				
Action 16. Develop a Climate Action Plan				
Action 17. Water Shortage Preparedness and Contingency Planning Pilot Project				
Action 18. Water Supply Infrastructure Improvements				
Dam Failure, Flood, Localized Flood, Levee Failure, Landslide, Mudslide, and Debris Flow, and Severe Weather Actions				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 19. Countywide Stormwater Drainage and Grading Ordinance				
Action 20. Develop a Countywide Drainage Master Plan				
Action 21. FEMA Mapping Update				
Action 22. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)				
Action 23. Ongoing Implementation of Stream Clearing and Maintenance Programs				
Action 24. Plumas Eureka CSD stream bank flood mitigation				
Action 25. Evaluate and Implement Projects to Reduce Flooding in Plumas Eureka CSD				
Action 26. Plumas Eureka CSD Sewer Plant Flood Mitigation				
Action 27. Evaluate Options for Obtaining 100-year Level of Certification for the Diversion Dam (East and West Chester Levees)				
Action 28. Review and Update, as Needed, Title 8 (Building Regulations), Chapter 17 (Flood) of the Plumas County Code re: Floodplain Ordinance and Applicable Title 9 (Planning and Zoning) Sections				
Action 29. Identify and Implement Bank Stabilization Projects				
Action 30. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad				
Action 31. Evaluate and Implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas				
Earthquake Actions				
Action 32. Conduct a Seismic Risk Evaluation of Critical Facilities and Public Buildings; Prioritize and Implement Seismic Retrofits: PECSD Water Storage Tank Replacement				
Action 33. Seismic Risk Evaluations to Prioritize and Implement Seismic Retrofits				
Pandemic Actions				
Action 34. Update and Refine Pandemic Plan				
Wildfire, Drought and Water Shortage, and Tree Mortality Actions				
Action 35. Plumas County Agriculture, Forestry, and Natural Resources Resilience				
Action 36. Invasive Species Control and Eradication				
Action 37. Continue and Promote Defensible space (PRC 4291) Projects Including Assistance Efforts for Senior and Disabled Residents				
Action 38. Establish Additional Firewise USA Sites (communities) and Promote Existing Ones				
Action 39. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects				
Action 40. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 41. Identify and Implement Priority Wildfire Risk Reduction Projects from the Plumas County CWPP to Enhance Forest Health Including Detection, Prevention, and Mitigation of Tree Mortality				
Action 42. Plumas County General Plan Public Health & Safety Element update to address state law requirements for land classified as State Responsibility Areas (SRAs) and within Very High Fire Hazard Severity Zones (VHFHSZs)				
Action 43. Local Adoption of State Responsibility Area Fire Safe Regulations				
Action 44. Improve Funding and Response Capabilities of Local Fire Protection Districts and Expand Districts in Areas not Covered				
Action 45. Review and Update, as Needed, Plumas County Code to Address Defensible Space and Vegetation Management				

Mitigation Actions/Projects from 2019 City of Portola LHMP (This is what we are updating)

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Goal 1. Increase public awareness of potential natural hazards and self-reliant mitigation actions.				
Objective 1.1 Involve the public in disaster planning and promote individual mitigation and preparedness measures.				
Strategy 1.1.1 Educate public about potential hazards and high hazard areas within the community in the event of a natural disaster.				
Strategy 1.12 Encourage property owners to actively participate in education programs, access resources, and develop personal mitigation measures as they relate to natural hazards specific to the community and personal property.				
Strategy 1.1.3 Provide online access to awareness/protection materials relevant to City of Portola residents.				
Strategy 1.1.4 Educate the public on the Citywide Emergency Evacuation Plan and Emergency Action Plan.				
Strategy 1.1.5 Educate the public on living with fire and fire safe requirements in the General Plan Safety Element and the Wildfire Protection Plan.				
Strategy 1.1.5 Educate the public on living with fire and fire safe requirements in the General Plan Safety Element and the Wildfire Protection Plan.				
Strategy 1.1.7 Maintain an outreach protocol with the American Red Cross.				
Goal 2. Reduce risk of loss of life/injuries due to natural hazards				
Objective 2.1 Establish Public Community Warning system in the event of a natural disaster.				
URM Mapping and Identification				
Strategy 2.1.1 Provide hazard warning and forecasting information to City residents.				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Strategy 2.1.2 Establish a rapid communication system for the community in the event of a natural disaster (Television, Radio, Emergency alert, & Local Citizen Network with Low Watt Transmitters)				
Strategy 2.1.3 Actively participate in the development of Plumas County's Safety Element to ascertain Portola's concerns are addressed.				
Objective 2.2 Reduce possibility of injury or loss of life due to flooding				
Strategy 2.2.1 Coordinate with the California Department of Water Resources (Dam Safety Division) for mitigation measures within the community as a result of a dam failure inundation.				
Strategy 2.2.2 All Development within floodway shall meet FEMA Standards.				
Objective 2.3 Minimize Injury or loss of life due to seismic or geologic hazards				
Central City Flood Hazard Mitigation Project				
Strategy 2.3.1 Mitigate the potential impacts to new structures by mandating compliance with California Building Code (CBC).				
Strategy 2.3.2 Prioritize and evaluate essential facilities for seismic evaluation and potential retrofit				
Strategy 2.3.3 Monitor and continue to regulate grading and slope development standards to reduce potential landslide and slope movement events.				
Objective 2.4 Minimize Injury or loss of life due to wildfire				
Strategy 2.4.1 Enforce compliance with open space and fuel break requirements set forth in the City of Portola General Plan Safety Element Wildland Fire section.				
Strategy 2.4.2 Review and update mutual aid agreements with the forest service, CAL Fire, and other surrounding fire departments and agencies.				
Strategy 2.4.3 Adopt California PRC 4290 and PRC 4291 legislation.				
Strategy 2.4.4 Evaluate and update the existing Citywide Emergency Evacuation Plan to include present roadway and development conditions.				
Strategy 2.4.5 Adopt and complete steps to meet FEMA's Fire-Adapted Communities requirements or become a 'Fire Wise Community.'				
Strategy 2.4.6 Seek opportunities to reduce high fuel hazards and create fuel breaks.				
Goal 3. Reduce risk of loss to property, both public and private				
Objective 3.1 Establish Public Community Warning system in the event of a natural disaster.				
Strategy 3.1.1 Provide flood & event warning and forecasting information to City residents.				
Strategy 3.1.2 Establish a rapid communication system for the community in the event of a natural disaster (Television, Radio, Emergency alert)				
Strategy 3.1.3 Actively participate in the development of Plumas County's Safety Element to ascertain Portola's concerns are addressed.				
Objective 3.2 Protect existing public infrastructure				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Strategy 3.2.1 Evaluate potential impacts of identified hazards on existing utilities and facilities (water, sewer, power, public transportation routes & structures). Prioritize those utilities for mitigation based on risk level and criticality to community and/or criticality to emergency evacuation routes.				
Strategy 3.2.2 Ensure that all essential facilities (hospitals, schools, evacuation centers, and other emergency facilities) are evaluated for specific risks and where risk is identified prioritize for analysis and mitigation.				
Objective 3.3 Pursue flood control solutions which minimize environmental impacts				
Strategy 3.3.1 Continue to combine water quality, open space, recreation projects within flood measures where feasible.				
Strategy 3.3.2 Maintain natural stream courses and adjacent habitat, where feasible during flood control improvements.				
Objective 3.4 Regulate Land Use and Development within flood areas				
Strategy 3.4.1 Establish zoning and land use ordinances that limit development in flood prone areas				
Strategy 3.4.2 Ensure the impacts of flooding are adequately analyzed when considering areas for future urban development or significant improvements to existing facilities or structures.				
Strategy 3.4.3 Ensure that flood mitigation measures are incorporated into repairs, new development, major alterations, and new redevelopment applications.				
Strategy 3.4.4 Enforce compliance with the City of Portola Master Drainage Plan and Floodplain Management Ordinance.				
Strategy 3.4.5 Pursue a regional approach to flood issues				
Objective 3.5 Reduce property damage due to seismic and geologic hazards				
Strategy 3.5.1 Mitigate the potential impacts to new structures by mandating compliance with California Building Code (CBC).				
3.5.2 Prioritize and evaluate essential facilities for seismic evaluation and potential retrofit.				
Strategy 3.5.3 Monitor and continue to regulate grading and slope development standards.				
Strategy 3.5.4 Educate and encourage residents to adopt seismic safety protocols as their time and resources allow.				
Objective 3.6 Minimize loss of property due to wildfire				
Strategy 3.6.1 Enforce compliance with open space and fuel break requirements set forth in the City of Portola General Plan Safety Element Wildland Fire section.				
Strategy 3.6.2 Review and update mutual aid agreements with Forest Service, CAL Fire, and other surrounding fire departments and agencies.				
Strategy 3.6.3 Adopt California 4290 and 4291 legislations.				
Strategy 3.6.4 Evaluate and update the existing Citywide Emergency Evacuation Plan to include present roadway and development conditions.				
Strategy 3.6.5 Adopt and complete steps to meet FEMA's Fire-Adapted Communities requirements or become a 'Fire Wise Community.'				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Goal 4. Maintain and increase funding for natural disaster preparedness, planning and response.				
Objective 4.1 Cooperate with other local agencies, jurisdictions or non-profit organizations involved in disaster planning or response so that efforts to secure funding are coordinated and will work toward maximum benefits.				
Strategy 4.1.1 Secure a grant that would provide support staff to aid in the implementation and execution of the LHMP.				
Strategy 4.1.2 Apply for grants specific to identified action items, including scientific studies and evaluation of existing improvements.				
Strategy 4.1.3 Cross train staff with Plumas County personnel and adopt uniform protocols where applicable.				
Strategy 4.1.4 Work toward securing multi-jurisdiction grants and funding for disaster planning and response.				
Strategy 4.1.5 Create a community network for emergency response alternatives including churches, and civic meeting halls.				
Objective 4.2 Support efforts put forth by other agencies where funding for mitigation efforts presents the potential to benefit the City.				
Strategy 4.2.1 Continue involvement in the update to the Plumas County LHMP.				
Strategy 4.2.2 Apply for grants that may help fund improvements beyond the City limits; e.g. fire safety and wildfire hazard mitigation, channel and water quality improvements to the Middle Fork of the Feather River, etc.				
Objective 4.3 Evaluate and improve current training for response personnel and equipment. Consider increased training for first responders and updating outdated equipment.				
Strategy 4.3.1 Review existing training protocol and update/upgrade as necessary.				
Strategy 4.3.2 Begin to search grant/funding opportunities for upgrade of fire equipment & training opportunities.				
Strategy 4.3.3 Utilize County, State, and other regulatory agency opportunities for cross and specialty training modules.				

Mitigation Strategy: Action (Implementation) Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation action(s) and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Term Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- Does measure address area with highest risk?
- Does measure protect …
  - ✓ The largest # of people exposed to risk?
  - ✓ The largest # of buildings?
  - ✓ The largest # of jobs?
  - ✓ The largest tax income?
  - ✓ The largest average annual loss potential?
  - ✓ The area impacted most frequently?
  - ✓ Critical Infrastructure (access, power, water, gas, telecommunications)
- Timing of Available funding
- Visibility of Project
- Community Credibility

Mitigation Action Prioritization Instructions

The HMPC's brainstormed list of mitigation actions and projects are organized by hazard and posted on flip-chart paper around the room.

You each have 3 sets of colored dots:

- 3 red dots
- 3 blue dots
- 3 green dots

The red dots are for high priority (5 points each)

The blue dots are for medium priority (3 points each)

The green dots are for low priority (1 point each)

Place your dots on any mitigation action/project, using the different colors to indicate your priority. You may use as many of your dots, of any color, on any mitigation action/project --- or you may spread them out using as few of your dots as you wish. The scored dots will indicate the consensus of the HMPC.

Use the list of mitigation selection criteria (above) to help you make your determinations.

Your votes will indicate the consensus of the team.

After the totals are counted, we will discuss them further to confirm or modify any of the results as necessary to best meet the goals of this LHMP Update.

Plumas County
Mitigation Action Worksheet

Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background (Problem Statement):	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Benefits (Losses Avoided):	
Potential Funding (Local Budgets, Grant Funds, etc.):	
Timeline:	
Project Priority (High, Medium, Low):	

Worksheet completed by:	
Name and Title:	
Phone:	

Mitigation Strategy Meetings – Action Prioritizationv.1

Actions Sorted by Hazards

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ City/ All	1. Develop/Enhance Public Education and Outreach program for all hazards (priority and non-priority) to include focus on self-reliance of all community members (and vulnerable populations). Utilize a multi-agency approach (i.e., VOAD and other stakeholder groups), and include education on 211 system	Multi-Hazard	77
All	2. Backup power redundancy projects for critical facilities and infrastructure (e.g., generators, batteries, solar, etc.)	Multi-Hazard	46
County/ City	3. Debris management planning, including establishing post disaster debris collection sites	Multi-Hazard	6
County	4. Ongoing evacuation planning & implementation, education, outreach, training, and exercises -establish SOPs -increase community education and awareness including routes and signage -obtain agreements for access to unofficial road areas, non-public roads, forest service roads	Multi-Hazard	0
County/ City	5. Shelter planning to establish accessible shelters/centers for cooling/heating/air quality protection in key County locations, with signage and public education.	Multi-Hazard	15
County	6. Animal care, sheltering, and evacuation planning for hazard events (i.e., public stables)	Multi-Hazard	0
	7. Food Security Planning during hazard events	Multi-Hazard	7
County/ City	8. EOP Update w/ Annexes. Include considerations for FEMA PA, IA and other key elements	Multi-Hazard	33
County/ City	9. Personal protective equipment planning/purchasing for use during disaster response and recovery (i.e., air quality issues, public health considerations, others)	Multi-Hazard	22
County/ City	10. Recovery Planning	Multi-Hazard	8
County/ City	11. General Plan Updates to Health and Safety and other Elements to reflect new hazard goals, policies and implementation measures and AB 2140 compliance	Multi-Hazard	0
County/ City	12. Assessment and hardening/seismic retrofits of Transportation facilities and infrastructure: bridges, tunnels, roads, evacuation routes	Multi-Hazard/ Earthquake	5
County/ City/ Districts	13. Communication enhancements countywide: To include backup power, redundancy, hardening and enhancing cell service, radios, reverse 911, sirens, etc. (e.g., additional cell/repeater towers/mobile repeaters, generator backup, common frequencies, etc. Key area to include Dyer Mountain stabilization of power source	Multi-Hazard/ Severe Weather: All	110

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	14. Undergrounding utilities	Multi-hazard/ Severe Weather/ Wildfire	N/A
County	15. Alert and Warning project, w/technology enhancements to improve public notifications and action	Multi-Hazard	N/A
All	16. Technology enhancements to support hazard mitigation planning and project implementation and for use in disaster mitigation, preparedness, response, and recovery efforts (e.g., GIS application enhancements)	Multi-Hazard	N/A
County/ City	17. Development of Climate Plans: i.e., Climate Action Plan, Climate Adaptation Plan, Climate Vulnerability Assessment	Climate Change	6
County/ FSC/ RCD	18. Reforestation and fire return interval planning	Climate Change/ Wildfire	14
County/ City	19. Real estate resiliency	Climate Change	0
County/ City/ Districts	20. Continued Coordination, Dam EAP review, planning and exercises w/ Dam owners	Dam Failure	1
County	21. Integrate inundation maps with evacuation planning and maps	Dam Failure	3
SFW&P	22. Slope Stabilization to protect spillway during hazard events at Little Grass Valley Reservoir	Dam Failure	3
County/ City/ Districts	23. Drought & Water Shortage Contingency Planning to include future conditions (i.e., climate change, future growth)	Climate Change/ Drought & Water Shortage	0
County	24. DWR grant program for SB 522 Drought Task Force and resiliency planning (Short (i.e, availability and distribution of water during hazard events) and long term planning (such as system enhancements, consolidation, etc.)	Drought & Water Shortage	2
County/ City/ Districts	25. Recycled water/ gray water reuse projects	Drought & Water Shortage	6
County/ City/ Districts	26. Tree Mortality monitoring, removal, and mitigation projects	Drought & Water Shortage/ Severe Weather	14
PUDs/ CSDs	27. Landscape and irrigation scheduling, monitoring and metering apart from potable water use	Drought & Water Shortage	5
County/ City/ Districts	28. Develop and implement conservation/landscaping ordinances/codes at various levels, County/City, PUDs/CSDs, HOAs w/ and enforcement component	Drought & Water Shortage	0
County	29. County to track and map (in GIS) dry wells	Drought & Water Shortage	N/A
County	30. County to assess the potential risk for non-drought hazards (e.g. wildfire, earthquake, landslides, etc.) that could interrupt domestic well or SSWS supplies and provide finding to appropriate planning efforts	Drought & Water Shortage	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County	31. County to establish a program to provide temporary, mobile bulk water storage tanks for domestic well and SSWS users. This includes ensuring policies and mutual aid agreements are in place for coordination with public water systems to provide temporary water supplies during a water shortage emergency contingent upon finding funding sources and storage facilities	Drought & Water Shortage	N/A
County	32. County to identify and establish a program to acquire and distribute packaged or bottled water to domestic well and SSWS users during a water shortage emergency	Drought & Water Shortage	N/A
County	33. County to establish mutual aid agreements with entities commonly relied upon by communities in the event of a disaster	Drought & Water Shortage	N/A
All	34. Assessment and hardening/seismic retrofits of critical facilities and infrastructure to EQ to include hospitals, schools, and all other identified critical facilities	Earthquake	22
County/ City	35. Identify Un-Reinforced Masonry (URM) and other seismically vulnerable buildings for retrofitting	Earthquake	N/A
County/ City	36. Develop drainage and grading ordinance	Flood: All	0
All	37. Stream clearing and maintenance projects to include access coordination with private property owners	Flood: All/ Severe Weather: Heavy Rain and Storms	4
County/ City	38. Culvert clearing projects	Flood: All/ Severe Weather: Heavy Rain and Storms	N/A
County/ City	39. Stormwater master plan development and implementation w/ considerations for climate change (i.e., conduct surveys, updated hydrology standards, culvert upgrades, etc.)	Climate Change/ Flood: All/ Severe Weather: Heavy Rain and Storms	20
Plumas Corp./RCD /Others	40. Floodplain restoration	Flood/Wildfire	8
County	41. FEMA DFIRM Map Updates	Flood: 1%/0.2%	0
Plumas Eureka CSD	42. Flood mitigation for private homes and treatment plant	Flood: All	10
County/ City	43. Establish a countywide flood tracking/data gathering system with a citizen reporting component	Flood	3
All	44. Identify and implement mitigation measures to address rain on snow events	Flood: All	14
County/ FSC/ RCD	45. Upper watershed restoration	Flood: All/ Wildfire	14
All	46. Flood protection projects for debris flows, bridge scour, etc.	Flood: All	N/A
All	47. Establish and maintain mutual aid agreements for incidence response	Hazardous Materials Transportation	7

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County	48. Secure and maintain equipment, materials, and supplies for incidence response	Hazardous Materials Transportation	0
County	49. Hazwoper training for first responders	Hazardous Materials Transportation	6
County/ City/ Districts	50. Slope stabilization projects in post fire burn areas and other sloped areas prone to landslides (i.e., Feather River Canyon, Quincy, Portola, SR 89 Wye to Crescent Mills, Greenville to Canyon Dam, CR 284 – Frenchman Lake Dam, Beckwourth-Genessee Road outside Taylorsville, Goat Hill, others)	Landslide, Mudslide, Debris Flow/ Wildfire	38
County	51. Evaluate need for additional stream gages for real time monitoring and add additional gages	Flood/ Heavy Rain and Storms	11
County	52. Establish and maintain sand bag program	Flood/ Heavy Rain and Storms	1
County/ City	53. Cooling/warming center w/transportation contingency planning	Severe Weather: Extreme Cold/Heat	4
County	54. Establish a system for severe weather data collection and reporting and develop/implement needed mitigation actions	Severe Weather: All	18
County/ City/ Districts	55. Hazardous tree removal	Drought/ Severe Weather/ Wildfire	29
County/ City/ Districts	56. Mitigation of wind impacts to communities without trees, especially post fire	Severe Weather/ Wildfire	0
County/ Districts	57. Snow Removal planning/ primary and access roads	Severe Weather	N/A
County Ag	58. Mitigation/management of crop damage	Ag Hazards/ Severe Weather	N/A
County/ City/ Districts	59. Prescribed Fires (Adopt frequent, landscape scale prescription designed to eliminate catastrophic wildfire and restore fire return intervals/fire ecology)	Wildfire	46
County/ City/ Districts	60. Establish and implement green waste management and infrastructure program countywide	Wildfire	41
County/ City/ Districts	61. Establish and implement countywide Biomass management program	Wildfire	16
County/ City/ Districts	62. Address water supply, capacity, and access for fire fighting and other related needs (i.e., prescribed burning)	Wildfire	13
PUDs/ CSDs?	63. Upgrade fire pumps	Wildfire	N/A
PUDs/ CSDs?	64. Raw water bypass for firefighting purposes	Wildfire	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ FSC	65. Promote and develop a tree mortality action plan for monitoring, prevention and mitigation activities	Wildfire	N/A
County/ FSC	66. Establish community encompassing wildfire lines	Wildfire	12
County/ FSC	67. Brush fire reduction rating program planning and implementation to support insurance premium reduction	Wildfire	14
County/ FSC/ All	68. Hazardous Fuels Mitigation projects to include all types of fuels management techniques– initial treatment efforts	Wildfire	66
County/ FSC/ All	69. Hazardous Fuels Mitigation projects to include all types of fuels management techniques – monitoring and maintenance efforts	Wildfire	0
County/ City/ Districts	70. Forest Health projects: habitat and fire ecology restoration	Wildfire	3
County/ FSC/RCD	71. Wetlands restoration and maintenance in WUI areas	Wildfire	0
FSC	72. Update CWPP and implement resulting projects	Wildfire	22
County/ FSC/ All	73. Identification of fire hazards and associated mitigation maximizing the use of technology, science, and best practices	Wildfire	14
County/ City	74. Establish weed abatement ordinance	Wildfire	3
County/ FSC	75. Establish goat grazing program for vegetation management	Wildfire	3
County/ FSC/ All	76. Defensible space and home hardening program expansion to include all vulnerable populations	Wildfire	5
County/ FSC/ All	77. Capacity building for Fire Districts to include workforce development and training: locally based, public and private, capacity to collaborate, strategies for identifying and treating non-accessible areas	Wildfire	11
County/ City/ FSC	78. Firewise Program promotion and public education	Wildfire	11
County/ City/ Districts	79. LRA (and SRA) Code Review and Update to include all requirement components, (i.e.. Vegetation management, defensible space, home hardening w/, education and enforcement	Wildfire	0

N/A (Column 4): Actions identified after action prioritization process

Actions Sorted by Prioritization (Voting) Results

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ City/ Districts	80. Communication enhancements countywide: To include backup power, redundancy, hardening and enhancing cell service, radios, reverse 911, sirens, etc. (e.g., additional cell/repeater towers/mobile repeaters, generator backup, common frequencies, etc. Key area to include Dyer Mountain stabilization of power source	Multi-Hazard/ Severe Weather: All	110
County/ City/ All	81. Develop/Enhance Public Education and Outreach program for all hazards (priority and non-priority) to include focus on self-reliance of all community members (and vulnerable populations). Utilize a multi-agency approach (i.e., VOAD and other stakeholder groups), and include education on 211 system	Multi-Hazard	77
County/ FSC/ All	82. Hazardous Fuels Mitigation projects to include all types of fuels management techniques– initial treatment efforts	Wildfire	66
All	83. Backup power redundancy projects for critical facilities and infrastructure (e.g., generators, batteries, solar, etc.)	Multi-Hazard	46
County/ City/ Districts	84. Prescribed Fires (Adopt frequent, landscape scale prescription designed to eliminate catastrophic wildfire and restore fire return intervals/fire ecology)	Wildfire	46
County/ City/ Districts	85. Establish and implement green waste management and infrastructure program countywide	Wildfire	41
County/ City/ Districts	86. Slope stabilization projects in post fire burn areas and other sloped areas prone to landslides (i.e., Feather River Canyon, Quincy, Portola, SR 89 Wye to Crescent Mills, Greenville to Canyon Dam, CR 284 – Frenchman Lake Dam, Beckwourth-Genessee Road outside Taylorsville, Goat Hill, others)	Landslide, Mudslide, Debris Flow/ Wildfire	38
County/ City	87. EOP Update w/ Annexes. Include considerations for FEMA PA, IA and other key elements	Multi-Hazard	33
County/ City/ Districts	88. Hazardous tree removal	Drought/ Severe Weather/ Wildfire	29
County/ City	89. Personal protective equipment planning/purchasing for use during disaster response and recovery (i.e., air quality issues, public health considerations, others)	Multi-Hazard	22
All	90. Assessment and hardening/seismic retrofits of critical facilities and infrastructure to EQ to include hospitals, schools, and all other identified critical facilities	Earthquake	22
FSC	91. Update CWPP and implement resulting projects	Wildfire	22
County/ City	92. Stormwater master plan development and implementation w/ considerations for climate change (i.e., conduct surveys, updated hydrology standards, culvert upgrades, etc.)	Climate Change/ Flood: All/ Severe Weather: Heavy Rain and Storms	20
County	93. Establish a system for severe weather data collection and reporting and develop/implement needed mitigation actions	Severe Weather: All	18

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ City/ Districts	94. Establish and implement countywide Biomass management program	Wildfire	16
County/ City	95. Shelter planning to establish accessible shelters/centers for cooling/heating/air quality protection in key County locations, with signage and public education.	Multi-Hazard	15
County/ FSC/ RCD	96. Reforestation and fire return interval planning	Climate Change/ Wildfire	14
County/ City/ Districts	97. Tree Mortality monitoring, removal, and mitigation projects	Drought & Water Shortage/ Severe Weather	14
All	98. Identify and implement mitigation measures to address rain on snow events	Flood: All	14
County/ FSC/ RCD	99. Upper watershed restoration	Flood: All/ Wildfire	14
County/ FSC	100. Brush fire reduction rating program planning and implementation to support insurance premium reduction	Wildfire	14
County/ FSC/ All	101. Identification of fire hazards and associated mitigation maximizing the use of technology, science, and best practices	Wildfire	14
County/ City/ Districts	102. Address water supply, capacity, and access for fire fighting and other related needs (i.e., prescribed burning)	Wildfire	13
County/ FSC	103. Establish community encompassing wildfire lines	Wildfire	12
County	104. Evaluate need for additional stream gages for real time monitoring and add additional gages	Flood/ Heavy Rain and Storms	11
County/ FSC/ All	105. Capacity building for Fire Districts to include workforce development and training: locally based, public and private, capacity to collaborate, strategies for identifying and treating non-accessible areas	Wildfire	11
County/ City/ FSC	106. Firewise Program promotion and public education	Wildfire	11
Plumas Eureka CSD	107. Flood mitigation for private homes and treatment plant	Flood: All	10
County/ City	108. Recovery Planning	Multi-Hazard	8
Plumas Corp./RCD /Others	109. Floodplain restoration	Flood/Wildfire	8
	110. Food Security Planning during hazard events	Multi-Hazard	7
All	111. Establish and maintain mutual aid agreements for incidence response	Hazardous Materials Transportation	7
County/ City	112. Debris management planning, including establishing post disaster debris collection sites	Multi-Hazard	6

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ City	113. Development of Climate Plans: i.e., Climate Action Plan, Climate Adaptation Plan, Climate Vulnerability Assessment	Climate Change	6
County/ City/ Districts	114. Recycled water/ gray water reuse projects	Drought & Water Shortage	6
County	115. Hazwoper training for first responders	Hazardous Materials Transportation	6
County/ City	116. Assessment and hardening/seismic retrofits of Transportation facilities and infrastructure: bridges, tunnels, roads, evacuation routes	Multi-Hazard/ Earthquake	5
PUDs/ CSDs	117. Landscape and irrigation scheduling, monitoring and metering apart from potable water use	Drought & Water Shortage	5
County/ FSC/ All	118. Defensible space and home hardening program expansion to include all vulnerable populations	Wildfire	5
All	119. Stream clearing and maintenance projects to include access coordination with private property owners	Flood: All/ Severe Weather: Heavy Rain and Storms	4
County/ City	120. Cooling/warming center w/transportation contingency planning	Severe Weather: Extreme Cold/Heat	4
County	121. Integrate inundation maps with evacuation planning and maps	Dam Failure	3
SFW&P	122. Slope Stabilization to protect spillway during hazard events at Little Grass Valley Reservoir	Dam Failure	3
County/ City	123. Establish a countywide flood tracking/data gathering system with a citizen reporting component	Flood	3
County/ City/ Districts	124. Forest Health projects: habitat and fire ecology restoration	Wildfire	3
County/ City	125. Establish weed abatement ordinance	Wildfire	3
County/ FSC	126. Establish goat grazing program for vegetation management	Wildfire	3
County	127. DWR grant program for SB 522 Drought Task Force and resiliency planning (Short (i.e, availability and distribution of water during hazard events) and long term planning (such as system enhancements, consolidation, etc.)	Drought & Water Shortage	2
County/ City/ Districts	128. Continued Coordination, Dam EAP review, planning and exercises w/ Dam owners	Dam Failure	1
County	129. Establish and maintain sand bag program	Flood/ Heavy Rain and Storms	1

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County	130. Ongoing evacuation planning & implementation, education, outreach, training, and exercises -establish SOPs -increase community education and awareness including routes and signage -obtain agreements for access to unofficial road areas, non-public roads, forest service roads	Multi-Hazard	0
County	131. Animal care, sheltering, and evacuation planning for hazard events (i.e., public stables)	Multi-Hazard	0
County/ City	132. General Plan Updates to Health and Safety and other Elements to reflect new hazard goals, policies and implementation measures and AB 2140 compliance	Multi-Hazard	0
County/ City	133. Real estate resiliency	Climate Change	0
County/ City/ Districts	134. Drought & Water Shortage Contingency Planning to include future conditions (i.e., climate change, future growth)	Climate Change/ Drought & Water Shortage	0
County/ City/ Districts	135. Develop and implement conservation/landscaping ordinances/codes at various levels, County/City, PUDs/CSDs, HOAs w/ and enforcement component	Drought & Water Shortage	0
County/ City	136. Develop drainage and grading ordinance	Flood: All	0
County	137. FEMA DFIRM Map Updates	Flood: 1%/0.2%	0
County	138. Secure and maintain equipment, materials, and supplies for incidence response	Hazardous Materials Transportation	0
County/ City/ Districts	139. Mitigation of wind impacts to communities without trees, especially post fire	Severe Weather/ Wildfire	0
County/ FSC/ All	140. Hazardous Fuels Mitigation projects to include all types of fuels management techniques – monitoring and maintenance efforts	Wildfire	0
County/ FSC/RCD	141. Wetlands restoration and maintenance in WUI areas	Wildfire	0
County/ City/ Districts	142. LRA (and SRA) Code Review and Update to include all requirement components, (i.e.. Vegetation management, defensible space, home hardening w/, education and enforcement	Wildfire	0
	143. Undergrounding utilities	Multi-hazard/ Severe Weather/ Wildfire	N/A
County	144. Alert and Warning project, w/technology enhancements to improve public notifications and action	Multi-Hazard	N/A
All	145. Technology enhancements to support hazard mitigation planning and project implementation and for use in disaster mitigation, preparedness, response, and recovery efforts (e.g., GIS application enhancements)	Multi-Hazard	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County	146. County to track and map (in GIS) dry wells	Drought & Water Shortage	N/A
County	147. County to assess the potential risk for non-drought hazards (e.g. wildfire, earthquake, landslides, etc.) that could interrupt domestic well or SSWS supplies and provide finding to appropriate planning efforts	Drought & Water Shortage	N/A
County	148. County to establish a program to provide temporary, mobile bulk water storage tanks for domestic well and SSWS users. This includes ensuring policies and mutual aid agreements are in place for coordination with public water systems to provide temporary water supplies during a water shortage emergency contingent upon finding funding sources and storage facilities	Drought & Water Shortage	N/A
County	149. County to identify and establish a program to acquire and distribute packaged or bottled water to domestic well and SSWS users during a water shortage emergency	Drought & Water Shortage	N/A
County	150. County to establish mutual aid agreements with entities commonly relied upon by communities in the event of a disaster	Drought & Water Shortage	N/A
County/ City	151. Identify Un-Reinforced Masonry (URM) and other seismically vulnerable buildings for retrofitting	Earthquake	N/A
County/ City	152. Culvert clearing projects	Flood: All/ Severe Weather: Heavy Rain and Storms	N/A
All	153. Flood protection projects for debris flows, bridge scour, etc.	Flood: All	N/A
County/ Districts	154. Snow Removal planning/ primary and access roads	Severe Weather	N/A
County Ag	155. Mitigation/management of crop damage	Ag Hazards/ Severe Weather	N/A
PUDs/ CSDs?	156. Upgrade fire pumps	Wildfire	N/A
PUDs/ CSDs?	157. Raw water bypass for firefighting purposes	Wildfire	N/A
County/ FSC	158. Promote and develop a tree mortality action plan for monitoring, prevention and mitigation activities	Wildfire	N/A

N/A (Column 4): Actions identified after action prioritization process

Appendix D Adoption Resolution

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be executed by each participating jurisdiction and added to this appendix. Two model resolutions are provided below. For Plumas County and the City of Portola this adoption resolution also includes compliance with AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan.

Two resolutions were created – one for the County and incorporated community and one for the Special Districts.

Sample County and Incorporated Community Adoption Resolution

(LOCAL GOVERNMENT: County, Incorporated Communities)

RESOLUTION NO.

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN).

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

WHEREAS, the (local governing body) seeking FEMA approval of hazard mitigation plan desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the (title and date of mitigation plan) by reference into the Safety Element of the General Plan in accordance with the requirements of AB 2140; and

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). *While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.*

BE IT RESOLVED, that the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) adopts the (title and date of mitigation plan) by reference into the safety element of their general plan in accordance with the requirements of AB 2140; and

BE IT FURTHER RESOLVED, the (local governing body) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirement of AB 2140.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this _____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

Sample Special District Adoption Resolution

(LOCAL GOVERNMENT: Special Districts)

RESOLUTION NO.

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN).

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). *While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.*

BE IT FURTHER RESOLVED, the (local governing body) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this _____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

Appendix E Threatened and Endangered Species

Table E–1 Special Status Species in Plumas County

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals – Amphibians					
Ambystoma macrodactylum sigillatum	southern long-toed salamander	None	None	SSC	–
Rana cascadae	Cascades frog	None	Candidate Endangered	SSC	–
Animals – Birds					
Accipiter atricapillus	American goshawk	None	None	SSC	–
Accipiter cooperii	Coopers hawk	None	None	WL	–
Aquila chrysaetos	golden eagle	None	None	FP | WL	–
Buteo swainsoni	Swainsons hawk	None	Threatened	–	–
Circus hudsonius	northern harrier	None	None	SSC	–
Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP	–
Ardea alba	great egret	None	None	–	–
Ardea herodias	great blue heron	None	None	–	–
Egretta thula	snowy egret	None	None	–	–
Nycticorax nycticorax	black-crowned night heron	None	None	–	–
Charadrius montanus	mountain plover	None	None	SSC	–
Falco columbarius	merlin	None	None	WL	–
Falco mexicanus	prairie falcon	None	None	WL	–
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	–	–
Gavia immer	common loon	None	None	SSC	–
Antigone canadensis canadensis	lesser sandhill crane	None	None	SSC	–
Antigone canadensis tabida	greater sandhill crane	None	Threatened	FP	–
Progne subis	purple martin	None	None	SSC	–
Riparia riparia	bank swallow	None	Threatened	–	–
Agelaius tricolor	tricolored blackbird	None	Threatened	SSC	–
Xanthocephalus xanthocephalus	yellow-headed blackbird	None	None	SSC	–
Lanius ludovicianus	loggerhead shrike	None	None	SSC	–
Chlidonias niger	black tern	None	None	SSC	–
Hydroprogne caspia	Caspian tern	None	None	–	–
Larus californicus	California gull	None	None	WL	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Pandion haliaetus	osprey	None	None	WL	–
Setophaga petechia	yellow warbler	None	None	SSC	–
Spizella breweri	Brewers sparrow	None	None	–	–
Pelecanus erythrorhynchos	American white pelican	None	None	SSC	–
Nannopterum auritum	double-crested cormorant	None	None	WL	–
Centrocercus urophasianus	greater sage-grouse	Proposed Threatened	Candidate Endangered	SSC	–
Tympanuchus phasianellus columbianus	Columbian sharp-tailed grouse	None	None	SSC	–
Melanerpes lewis	Lewis woodpecker	None	None	–	–
Picoides arcticus	black-backed woodpecker	None	None	–	–
Coturnicops noveboracensis	yellow rail	None	None	SSC	–
Numenius americanus	long-billed curlew	None	None	WL	–
Asio flammeus	short-eared owl	None	None	SSC	–
Asio otus	long-eared owl	None	None	SSC	–
Athene cunicularia	burrowing owl	None	Candidate Endangered	SSC	–
Psiloscops flammeolus	flammulated owl	None	None	–	–
Strix nebulosa	great gray owl	None	Endangered	–	–
Strix occidentalis caurina	Northern Spotted Owl	Threatened	Threatened	–	–
Strix occidentalis occidentalis	California Spotted Owl	Proposed Endangered; Proposed Threatened	None	SSC	–
Plegadis chihi	white-faced ibis	None	None	WL	–
Selasphorus rufus	rufous hummingbird	None	None	–	–
Contopus cooperi	olive-sided flycatcher	None	None	SSC	–
Empidonax traillii	willow flycatcher	None	Endangered	–	–
Animals – Fish					
Catostomus lahontan	Lahontan mountain sucker	None	None	SSC	–
Catostomus microps	Modoc sucker	Delisted	Endangered	FP	–
Hesperoleucus mitrulus	northern roach	None	None	SSC	–
Siphateles bicolor ssp. 11	High Rock Springs tui chub	None	None	–	–
Siphateles bicolor ssp. 12	Eagle Lake tui chub	None	None	SSC	–
Entosphenus lethophagus	Pit-Klamath brook lamprey	None	None	SSC	–
Oncorhynchus mykiss aquilarum	Eagle Lake rainbow trout	None	None	SSC	–
Animals – Insects					
Bombus morrisoni	Morrison bumble bee	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Bombus occidentalis	western bumble bee	None	Candidate Endangered	–	–
Bombus pensylvanicus	American bumble bee	None	None	–	–
Argochrysis lassenae	Lassen cuckoo wasp	None	None	–	–
Pseudocopaeodes eunus obscurus	Carson wandering skipper	Endangered	None	–	–
Desmona bethula	amphibious caddisfly	None	None	–	–
Animals – Mammals					
Antilocapra americana	pronghorn	None	None	–	–
Aplodontia rufa californica	Sierra Nevada mountain beaver	None	None	SSC	–
Ovis canadensis nelsoni	desert bighorn sheep	None	None	FP	–
Canis lupus	gray wolf	Endangered	Endangered	–	–
Vulpes vulpes necator pop. 1	Sierra Nevada red fox - southern Cascades DPS	None	Threatened	–	–
Erethizon dorsatum	North American porcupine	None	None	–	–
Brachylagus idahoensis	pygmy rabbit	None	None	SSC	–
Lepus americanus klamathensis	Oregon snowshoe hare	None	None	SSC	–
Lepus americanus tahoensis	Sierra Nevada snowshoe hare	None	None	SSC	–
Lepus townsendii townsendii	western white-tailed jackrabbit	None	None	SSC	–
Gulo gulo	wolverine	Threatened	Threatened	FP	–
Martes caurina sierrae	Sierra marten	None	None	–	–
Pekania pennanti	Fisher	None	None	SSC	–
Taxidea taxus	American badger	None	None	SSC	–
Ochotona princeps schisticeps	gray-headed pika	None	None	–	–
Urocitellus mollis	Piute ground squirrel	None	None	–	–
Antrozous pallidus	pallid bat	None	None	SSC	–
Corynorhinus townsendii	Townsends big-eared bat	None	None	SSC	–
Lasionycteris noctivagans	silver-haired bat	None	None	–	–
Lasiurus cinereus	hoary bat	None	None	–	–
Lasiurus frantzii	western red bat	None	None	SSC	–
Myotis ciliolabrum	western small-footed myotis	None	None	–	–
Myotis evotis	long-eared myotis	None	None	–	–
Myotis thysanodes	fringed myotis	None	None	–	–
Myotis volans	long-legged myotis	None	None	–	–
Myotis yumanensis	Yuma myotis	None	None	–	–
Animals – Mollusks					
Pyrgulopsis cinerana	Ash Valley pyrg	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Pyrgulopsis eremica	Smoke Creek pyrg	None	None	–	–
Pyrgulopsis gibba	Surprise Valley pyrg	None	None	–	–
Pyrgulopsis lasseni	Willow Creek pyrg	None	None	–	–
Pyrgulopsis longae	Long Valley pyrg	None	None	–	–
Fluminicola seminalis	nugget pebblesnail	None	None	–	–
Margaritifera falcata	western pearlshell	None	None	–	–
Helisoma newberryi	Great Basin rams-horn	None	None	–	–
Juga acutifilosa	topaz juga	None	None	–	–
Pisidium ultramontanum	montane peaclam	None	None	–	–
Anodonta californiensis	California floater	None	None	–	–
Animals – Reptiles					
Actinemys marmorata	northwestern pond turtle	Proposed Threatened	None	SSC	–
Sceloporus graciosus graciosus	northern sagebrush lizard	None	None	–	–
Community - Aquatic					
–	Eagle Lake	None	None	–	–
–	Pine Creek Tributary To Eagle Lake	None	None	–	–
–	Pit River Drainage Modoc Sucker Stream	None	None	–	–
Community – Terrestrial					
–	Ponderosa Dune Forest	None	None	–	–
Plants – Bryophytes					
Meesia triquetra	three-ranked hump moss	None	None	–	4.2
Meesia uliginosa	broad-nerved hump moss	None	None	–	2B.2
Plants – Vascular					
Alisma gramineum	grass alisma	None	None	–	2B.2
Allium atrorubens var. atrorubens	Great Basin onion	None	None	–	2B.3
Lomatium canbyi	Canbys lomatium	None	None	–	4.3
Lomatium foeniculaceum ssp. macdougalii	Macdougals lomatium	None	None	–	2B.2
Lomatium hendersonii	Hendersons lomatium	None	None	–	2B.3
Lomatium ravenii var. paiutense	Paiute lomatium	None	None	–	2B.3
Lomatium ravenii var. ravenii	Ravens lomatium	None	None	–	1B.3
Lomatium roseanum	adobe lomatium	None	None	–	1B.2
Antennaria flagellaris	stoloniferous pussy-toes	None	None	–	4.2
Arnica fulgens	hillside arnica	None	None	–	2B.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Crepis runcinata	fiddleleaf hawksbeard	None	None	–	2B.2
Dimeresia howellii	doublet	None	None	–	2B.3
Erigeron eatonii var. nevadincola	Nevada daisy	None	None	–	2B.3
Erigeron elegantulus	volcanic daisy	None	None	–	4.3
Erigeron inornatus var. calidipetris	hot rock daisy	None	None	–	4.3
Erigeron lassenianus var. deficiens	Plumas rayless daisy	None	None	–	1B.3
Erigeron nivalis	snow fleabane daisy	None	None	–	2B.3
Hymenoxys lemmonii	alkali hymenoxys	None	None	–	2B.2
Oreostemma elatum	tall alpine-aster	None	None	–	1B.2
Packera indecora	rayless mountain ragwort	None	None	–	2B.2
Pyrrocoma lucida	sticky pyrrocoma	None	None	–	1B.2
Senecio hydrophiloides	sweet marsh ragwort	None	None	–	4.2
Stenotus lanuginosus var. lanuginosus	woolly stenotus	None	None	–	2B.2
Betula glandulosa	dwarf resin birch	None	None	–	2B.2
Cryptantha glomeriflora	clustered-flower cryptantha	None	None	–	4.3
Cryptantha scoparia	gray cryptantha	None	None	–	4.3
Hackelia amethystina	amethyst stickseed	None	None	–	4.3
Hackelia cusickii	Cusicks stickseed	None	None	–	4.3
Mertensia cusickii	Toiyabe bluebells	None	None	–	2B.2
Mertensia longiflora	long bluebells	None	None	–	2B.2
Mertensia oblongifolia var. amoena	beautiful sagebrush bluebells	None	None	–	2B.2
Mertensia oblongifolia var. oblongifolia	sagebrush bluebells	None	None	–	2B.2
Oreocarya schoolcraftii	Schoolcrafts oreocarya	None	None	–	2B.2
Caulanthus major var. nevadensis	slender jewelflower	None	None	–	4.3
Polyctenium fremontii var. fremontii	Fremonts combleaf	None	None	–	4.3
Polyctenium williamsiae	Williams combleaf	None	None	–	1B.2
Rorippa columbiae	Columbia yellow cress	None	None	–	1B.2
Stanleya viridiflora	green-flowered princes plume	None	None	–	2B.3
Thelypodium howellii ssp. howellii	Howells thelypodium	None	None	–	1B.2
Thelypodium integrifolium ssp. complanatum	foxtail thelypodium	None	None	–	2B.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Thelypodium milleflorum	many-flowered thelypodium	None	None	–	2B.2
Brasenia schreberi	watershield	None	None	–	2B.3
Downingia laeta	Great Basin downingia	None	None	–	2B.2
Engellaria obtusa	obtuse starwort	None	None	–	4.3
Loeflingia squarrosa var. artemisiarum	sagebrush loeflingia	None	None	–	2B.2
Silene occidentalis ssp. occidentalis	western campion	None	None	–	4.3
Silene oregana	Oregon campion	None	None	–	2B.2
Stellaria longifolia	long-leaved starwort	None	None	–	2B.2
Atriplex argentea var. hillmanii	Hillmans silverscale	None	None	–	2B.2
Atriplex gardneri var. falcata	falcate saltbush	None	None	–	2B.2
Alisma gramineum	grass alisma	None	None	–	2B.2
Allium atrorubens var. atrorubens	Great Basin onion	None	None	–	2B.3
Lomatium canbyi	Canbys lomatium	None	None	–	4.3
Lomatium foeniculaceum ssp. macdougalii	Macdougals lomatium	None	None	–	2B.2
Lomatium hendersonii	Hendersons lomatium	None	None	–	2B.3
Lomatium ravenii var. paiutense	Paiute lomatium	None	None	–	2B.3
Lomatium ravenii var. ravenii	Ravens lomatium	None	None	–	1B.3
Lomatium roseanum	adobe lomatium	None	None	–	1B.2
Antennaria flagellaris	stoloniferous pussy-toes	None	None	–	4.2
Arnica fulgens	hillside arnica	None	None	–	2B.2
Crepis runcinata	fiddleleaf hawksbeard	None	None	–	2B.2
Dimeresia howellii	doublet	None	None	–	2B.3
Erigeron eatonii var. nevadincola	Nevada daisy	None	None	–	2B.3
Erigeron elegantulus	volcanic daisy	None	None	–	4.3
Erigeron inornatus var. calidipetris	hot rock daisy	None	None	–	4.3
Erigeron lassenianus var. deficiens	Plumas rayless daisy	None	None	–	1B.3
Erigeron nivalis	snow fleabane daisy	None	None	–	2B.3
Hymenoxys lemmonii	alkali hymenoxys	None	None	–	2B.2
Oreostemma elatum	tall alpine-aster	None	None	–	1B.2
Packera indecora	rayless mountain ragwort	None	None	–	2B.2
Pyrrocoma lucida	sticky pyrrocoma	None	None	–	1B.2
Senecio hydrophiloides	sweet marsh ragwort	None	None	–	4.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Stenotus lanuginosus var. lanuginosus	woolly stenotus	None	None	–	2B.2
Betula glandulosa	dwarf resin birch	None	None	–	2B.2
Cryptantha glomeriflora	clustered-flower cryptantha	None	None	–	4.3
Cryptantha scoparia	gray cryptantha	None	None	–	4.3
Hackelia amethystina	amethyst stickseed	None	None	–	4.3
Hackelia cusickii	Cusicks stickseed	None	None	–	4.3
Mertensia cusickii	Toiyabe bluebells	None	None	–	2B.2
Mertensia longiflora	long bluebells	None	None	–	2B.2
Mertensia oblongifolia var. amoena	beautiful sagebrush bluebells	None	None	–	2B.2
Mertensia oblongifolia var. oblongifolia	sagebrush bluebells	None	None	–	2B.2
Oreocarya schoolcraftii	Schoolcrafts oreocarya	None	None	–	2B.2
Caulanthus major var. nevadensis	slender jewelflower	None	None	–	4.3
Polyctenium fremontii var. fremontii	Fremonts combleaf	None	None	–	4.3
Polyctenium williamsiae	Williams combleaf	None	None	–	1B.2
Rorippa columbiae	Columbia yellow cress	None	None	–	1B.2
Stanleya viridiflora	green-flowered princes plume	None	None	–	2B.3
Thelypodium howellii ssp. howellii	Howells thelypodium	None	None	–	1B.2
Thelypodium integrifolium ssp. complanatum	foxtail thelypodium	None	None	–	2B.2
Thelypodium milleflorum	many-flowered thelypodium	None	None	–	2B.2
Brasenia schreberi	watershield	None	None	–	2B.3
Downingia laeta	Great Basin downingia	None	None	–	2B.2
Engellaria obtusa	obtuse starwort	None	None	–	4.3
Loeflingia squarrosa var. artemisiarum	sagebrush loeflingia	None	None	–	2B.2
Silene occidentalis ssp. occidentalis	western campion	None	None	–	4.3
Silene oregana	Oregon campion	None	None	–	2B.2
Stellaria longifolia	long-leaved starwort	None	None	–	2B.2
Atriplex argentea var. hillmanii	Hillmans silverscale	None	None	–	2B.2
Atriplex gardneri var. falcata	falcate saltbush	None	None	–	2B.2
Sidalcea multifida	cut-leaf checkerbloom	None	None	–	2B.3
Sphaeralcea grossulariifolia	currant-leaved desert mallow	None	None	–	2B.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Claytonia palustris	marsh claytonia	None	None	–	4.3
Claytonia umbellata	Great Basin claytonia	None	None	–	2B.3
Lewisia kelloggii ssp. kelloggii	Kelloggs lewisia	None	None	–	3.2
Tripterocalyx crux-maltae	Kelloggs sand-verbena	None	None	–	2B.2
Chylismia claviformis ssp. cruciformis	cruciform evening-primrose	None	None	–	2B.3
Epilobium palustre	marsh willowherb	None	None	–	2B.3
Eremothera boothii ssp. alyssoides	Pine Creek evening-primrose	None	None	–	4.3
Eremothera minor	Nelsons evening-primrose	None	None	–	2B.3
Oenothera cespitosa ssp. crinita	caespitose evening-primrose	None	None	–	4.2
Botrychium ascendens	upswept moonwort	None	None	–	2B.3
Botrychium crenulatum	scalloped moonwort	None	None	–	2B.2
Botrychium minganense	Mingan moonwort	None	None	–	4.2
Botrychium montanum	western goblin	None	None	–	2B.1
Botrychium pinnatum	northwestern moonwort	None	None	–	2B.3
Cypripedium californicum	California ladys-slipper	None	None	–	4.2
Cypripedium fasciculatum	clustered ladys-slipper	None	None	–	4.2
Cypripedium montanum	mountain ladys-slipper	None	None	–	4.2
Piperia colemanii	Colemans rein orchid	None	None	–	4.3
Castilleja lassenensis	Lassen paintbrush	None	None	–	1B.3
Orthocarpus bracteosus	rosy orthocarpus	None	None	–	2B.1
Pedicularis centranthera	Great Basin lousewort	None	None	–	2B.3
Diplacus pygmaeus	Egg Lake monkeyflower	None	None	–	4.2
Erythranthe inflatula	ephemeral monkeyflower	None	None	–	1B.2
Gratiola heterosepala	Boggs Lake hedge-hyssop	None	Endangered	–	1B.2
Penstemon cinicola	ash beardtongue	None	None	–	4.3
Penstemon heterodoxus var. shastensis	Shasta beardtongue	None	None	–	4.3
Penstemon janishiae	Janishs beardtongue	None	None	–	2B.2
Penstemon sudans	Susanville beardtongue	None	None	–	4.3
Synthyris missurica ssp. missurica	kitten-tails	None	None	–	2B.3
Melica spectabilis	purple onion grass	None	None	–	4.3
Muhlenbergia jonesii	Jones muhly	None	None	–	4.3
Orcuttia tenuis	slender Orcutt grass	Threatened	Endangered	–	1B.1
Stipa exigua	little ricegrass	None	None	–	2B.3
Eriastrum sparsiflorum	few-flowered eriastrum	None	None	–	4.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Eriastrum tracyi	Tracys eriastrum	None	Rare	–	3.2
Navarretia leucocephala ssp. bakeri	Bakers navarretia	None	None	–	1B.1
Phlox muscoides	squarestem phlox	None	None	–	2B.3
Rhinotropis subspinosa	spiny milkwort	None	None	–	2B.2
Eriogonum baileyi var. praebens	Baileys woolly buckwheat	None	None	–	4.3
Eriogonum collinum	hill buckwheat	None	None	–	4.3
Eriogonum heracleoides var. heracleoides	parsnip-flowered buckwheat	None	None	–	4.3
Eriogonum microthecum var. schoolcraftii	Schoolcrafts wild buckwheat	None	None	–	1B.2
Eriogonum nutans var. nutans	Dugway wild buckwheat	None	None	–	2B.3
Eriogonum ochrocephalum var. ochrocephalum	ochre-flowered buckwheat	None	None	–	2B.2
Eriogonum ovalifolium var. depressum	depressed wild buckwheat	None	None	–	2B.1
Eriogonum prociduum	prostrate buckwheat	None	None	–	1B.2
Eriogonum pyrolifolium var. pyrolifolium	pyrola-leaved buckwheat	None	None	–	2B.3
Eriogonum umbellatum var. glaberrimum	Warner Mountains buckwheat	None	None	–	1B.3
Eriogonum ursinum var. erubescens	blushing wild buckwheat	None	None	–	1B.3
Rumex venosus	winged dock	None	None	–	2B.3
Potamogeton praelongus	white-stemmed pondweed	None	None	–	2B.3
Potamogeton zosteriformis	eel-grass pondweed	None	None	–	2B.2
Stuckenia filiformis ssp. alpina	northern slender pondweed	None	None	–	2B.2
Stuckenia striata	broadleaf pondweed	None	None	–	2B.3
Primula pauciflora	beautiful shootingstar	None	None	–	4.2
Delphinium stachydeum	spiked larkspur	None	None	–	2B.3
Ranunculus macounii	Macouns buttercup	None	None	–	2B.2
Rhamnus alnifolia	alder buckthorn	None	None	–	2B.2
Geum aleppicum	Aleppo avens	None	None	–	2B.2
Ivesia aperta var. aperta	Sierra Valley ivesia	None	None	–	1B.2
Ivesia baileyi var. baileyi	Baileys ivesia	None	None	–	2B.3
Ivesia paniculata	Ash Creek ivesia	None	None	–	1B.2
Ivesia sericoleuca	Plumas ivesia	None	None	–	1B.2
Ivesia webberi	Webbers ivesia	Threatened	None	–	1B.1
Potentilla basaltica	Black Rock potentilla	None	None	–	1B.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Potentilla newberryi	Newberrys cinquefoil	None	None	–	2B.3
Salix bebbiana	Bebbs willow	None	None	–	2B.3
Sparganium natans	small bur-reed	None	None	–	4.3
Viola purpurea ssp. aurea	golden violet	None	None	–	2B.2

Source: California Natural Diversity Database BIOS Viewer Tool

Federal Status

Endangered: The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Threatened: The classification provided to an animal or plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Proposed Endangered: The classification provided to an animal or plant that is proposed for federal listing as Endangered in the Federal Register under Section 4 of the Endangered Species Act.

Proposed Threatened: The classification provided to an animal or plant that is proposed for federal listing as Threatened in the Federal Register under Section 4 of the Endangered Species Act.

Candidate: The classification provided to an animal or plant that has been studied by the United States Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.

None: The plant or animal has no federal status.

Delisted: The plant or animal was previously listed as Endangered or Threatened, but is no longer listed on the Federal Endangered and Threatened species list.

CDFW Status

FP: Fully Protected: This classification was the State of California's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction.

SSC: Species of Special Concern: To this end, the Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long–term viability.

WL: Watch List: Species that were previously designated as "Species of Special Concern" but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

CA Rare Plant Rank

1A: Plants presumed extinct in California and rare/extinct elsewhere

1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California

1B.2: Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California

1B.3: Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California

2A: Plants presumed extirpated in California, but more common elsewhere

2B.1: Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California

2B.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California

2B.3: Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California

3.1: Plants about which we need more information; seriously threatened in California

3.2: Plants about which we need more information; fairly threatened in California

3.3: Plants about which we need more information; not very threatened in California

4.1: Plants of limited distribution; seriously threatened in California

4.2: Plants of limited distribution; fairly threatened in California

4.3: Plants of limited distribution; not very threatened in California

Appendix F Plumas County Historic Buildings and Places

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Beckwourth	Beckwourth Cabin	1850	2081 Rocky Point Road	025190009	Local	A bronze plaque placed by E Clampus Vitus (Clampers) in 1964, stating the log cabin was mountain man James P. BeckwourthΓÇÖs trading post is affixed directly to this log cabin museum. This was the first house in Sierra Valley.
Beckwourth	Beckwourth Trail - The Road Forks Marker	2012	78840 Hwy 70	025200ROW	Local	This marker is located at the Lester T. Davis Safety Roadside Rest Area, west of Beckwourth.
Beckwourth	James P. Beckwourth Ranch and Trading Post (Marker)	1970	Located at the Roadside Area Reststop (Lester T. Davis)	025200ROW	Unknown/Unclassified	Marker Reads: Beckwourth, a mountaineer, trader, and Crow Chief, discovered and promoted this emigrant trail. In 1852, near this site, he established the first waystop for emigrants between here and Salt Lake City.
Beckwourth	Masonic Lodge Plaque (Hope Lodge 234 F&AM)	1875	214 Main Street	140031009	Local	The original Masonic hall was built in 1875 and was twice destroyed by fire in 1898 and 1909. The brick structure was plaque by the Clampers in September 1975 on the 100th anniversary of the original lodge hall construction.
Belden	Belden	1857	14785 Beldon Town Road	002340002	Local	A bronze plaque affixed to the Belden Hotel by the Clampers notes this townΓÇÖs prominent history in the Feather River canyon.
Belden	Eby Stamp Mill	1898-1937	SR 70	002220PGE	Unknown/Unclassified	Reconstructed at this site, the Eby Stamp Mill has interpretive signage explaining how the huge ireon stamps were used to crush gold-bearing quartz from mines near Seneca from 1898-1937.
Belden	Eyraud Home	1852	18176 Rich Bar Road	002360003	Local	A wood house built by DeWitt Kellog in 1852 from lumber milled on site, this residence was later purchased by Frank Eyraud, a newcomer to

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						Rich Bar in 1878 who immigrated to the US from France. In 2021, the Dixie Fire destroyed this site.
Belden	Feather River Highway (Plaque/Monument)	1987	SR 70	002220USA	Unknown/Unclassified	A stone monument and bronze plaque placed by the Clampers in 1995 to recognize the 1987 celebration commemorating the 50th anniversary of the completion of the Feather River Highway, at a cost of $8,000,000.
Belden	Pacific Crest Trail Marker	2012	14786 Belden Town Road	002340002	Unknown/Unclassified	Marker erected by E Clampus Vitus describing the history of the Pacific Crest Trail
Blairsden	Feather River Prep School (Closed)	1915	65899 Highway 70	123140036	Local	Feather River Inn opened in May 1915 and became known as the most exclusive resorts for Northern California. The Inn was especially unique in that it generated its own electricity from Bonta Creek, raised its own cattle, and had an ice plant.
Blairsden	Feather River Prep School Barn	1915	8929 Highway 89	123140021	Local	In 1963 Fleur du Lac school was opened on a Lake Tahoe estate. In 1964 Fleur du Lac moved to Chambers Lodge Resort & renamed Tahoe Sierra School. Feather River Inn was purchased in the late 60s the school was relocated & renamed Feather River Preparatory
Blairsden	Jamison City, Eureka Mine and Mill, Johnstown Marker	1935	Hwy 70 & 89	123140ROW	State	Marker inscribed: Along the Pioneer Trail lies Jamison City and Mine. Large producer, famous for its 52-pound nugget; Eureka Mill and Mine yielding $17 millions to Cornish miners and others. Johnstown, now Johnsville, well preserved '49 town.
Blairsden	Mohawk Bridge	1916	Blairsden-Graeagle Road (County Road 521) Bridge	(blank)	Local	Mohawk Howe Truss Bridge at the Denten Place

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Bucks Lake	Bucks Lake Ranch Hotel and Store	1850	Bucks Lake Road Near Marina	112310005	State	This was the site of a ranch established by Horace "Buck" Bucklin and Francis Walker in 1850. Later came a large hotel, post office, and express office. The site is now inundated by Buck's Dam and Reservoir.
Bucks Lake	Pioneer Grave (P. Linthiouh)	1852	Bucks Lake Road Near Washboard Road	112060005	State	Legend: 'The lad was returning to Marysville from a trip to the mines. Having packed a trainload of provisions to the mines,was returning with gold dust.He was murdered & robbed. Later a comrade carved on a tree: P.Linthiouh died September 1852 age 19'.
Bucks Lake	Spanish Creek Mines	1851-1905	Bucks Lake Road East of Snake Lake Road	113010USA	Local	Stone and bronze monument features a map and indicators for early mines and towns along this stretch of Spanish Creek. Erected by the Clampers in 1997.
Butt Lake	Humbug Valley	(blank)	(blank)	(blank)	Unknown/Unclassified	Marker erected by E Clampus Vitus - marker reads that the soda springs were used by the Maidu, Andrew Miller first saw the velley in 1849 and in 1850 built a homstead, store, and hotel. Others settlers followed.
Butt Lake	Keefer Ranch	1900	3000 Humbug Road	(blank)	Local	House and barn built prior to 1900 and situated in a meadow, Keefer married the surviving daughter of Antone-Dotta, early settler of Humbug Valley.
Butt Lake	Lemm Ranch	1854	8000 Humbug Road	(blank)	Local	Thought to be homesteaded in 1854 by one of the Lemms.
Butt Lake	Miller House	1901	3430 Humbug Road	(blank)	Local	Victorian styled house was constructed in 1901, by the Miller family, who also owned a hotel/stage-stop on the Humbug road across from the house. The hotel has since burned.
Butt Lake	Soda Spring	(blank)	(blank)	(blank)	Unknown/Unclassified	Marker states that water from this spring have been used for generation by the Mountain Maidu and local ranchers. The ground water flows

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						naturally through calcium carbonate rocks, creating a characteristic fizz or soda taste.
Butt Lake	Tasman Koyom	(blank)	Humbug Road	002060PGE	Local	Monument inscribed as: You are in the historic homeland of the Mountain Maidu people, where their spirits still linger to guard sacred sites in this pristine valley... where they lived free for thousands of years... their paradise.
Canyon	Bucks Creek Powerhouse	1928	Feather River Scenic Byway	002280USA	Unknown/Unclassified	Construction was started by Feather River Power Company, but due to financial problems it was sold to Great Western Power Company who completed the project.
Chester	Bidwell House	1901	112 Main Street	100043007	Local	Circa 1901 residence built for Annie Bidwell, of the famous California pioneer family. The two story gabled house remains as a significant architectural landmark.
Chester	Butt Valley Dinky (Plaque)	(blank)	SR 36 and Chateau Way	100470001	Unknown/Unclassified	Bronze plaque commemorates the hard life of the Butt Valley steam ΓÇ¿Dinky,ΓÇ¥ a small locomotive used in the construction of nearby Butt Valley Reservoir.
Chester	Char's Beauty Salon	1945	181 Main Street Chester	100050022	Unknown/Unclassified	Originally a dance hall, by 1945 it became the Chester Bowl. Clamper plaque.
Chester	Chester Library	1929	210 First Street	100062002	Local	Marble plaque commemorating the donation and construction of the Chester Library in 1929 was placed by the Clampers in 2002.
Chester	Chester Old Jail	(blank)	1013 Hwy 36	001340045	Unknown/Unclassified	Old Chester jail
Chester	Chester Old School House	1890	1013 Hwy 36	001340045	Local	Serving as a classroom into the 1950's, this structure was constructed in the 1890s. It was originally located on the Olsen property, near what is now the memorial hall. Currently being used by County Public Works as an office building.
Chester	Corner Store (Old Town Grocery)	1912	189 Main Street	100050001	Unknown/Unclassified	Built in 1912 by George Olsen. Placed by Clampers.

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Chester	Humbug Valley - Soda Springs (Plaque)	(blank)	Humboldt Road, Plumas National Forest	002030020	Unknown/Unclassified	Bronze and stone monument commemorates the natural soda waters of this spring, used by the Maidu Indians and later white settlers.
Chester	Lumberjack Plaque	1972	Willow Street and First Avenue	100062002	Local	Bronze plaque set in a large boulder in front of the Chester Civic Complex honors the loggers who helped make our nation strong. Placed by the Clampers in 1972.
Chester	Martin Dairy/Sierra Creamery	1873-1886	Meadow Road/Settlers Road	100340016	Local	Remains of dairy that was part of the 1,300-acre Martin ranch purchased by Jonathan Martin between 1873-1886. Shown as Sierra Creamery on Keddie's 1892 Survey Map of Plumas County.
Chester	Mt. Lassen Club	1911	173 Main Street	100050004	Unknown/Unclassified	Built in 1911 as the first grocery store between Susanville and Red Bluff. In 1932 it became the Mt. Lassen Club. Another Clamper project.
Chester	Olsen Hotel	1913	317 Melissa Ave	100052012	Local	Hotel was built onto an existing ranch house in 1913 by the Olsen brothers, Nels and George, who were sons of Chester/Big Meadows original pioneers Peter and Melissa Olsen. Hotel was the site of the Chester Post Office from 1890 to 1912.
Chester	Rainbow Lodge - Grey Squirrel	1934	119 & 123 Main Street	100051007	Local	Built in 1934 by Minnie Lee West as the first hotel between Red Bluff and Susanville. May have been a house of ill repute during ChesterΓÇÖs ΓÇ¿Little Reno Day.ΓÇ¥
Chester	Stover Ranch	1862	321 Melissa Ave	100052013	Local	Site of the original Stover brothers homestead of 1862, the ranch was also the site of the annual Chester Rodeo from 1920-1938.
Chester	Stump Ranch Marker	(blank)	Section Old Red Bluff Road (County Route 311)	011090008	Local	Marker erected by E Clampus Vitus describing Stump Ranch as a stage stop on the Red Bluff - Susanville Wagon Road. In 2021, the Dixie Fire destroyed this site.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Chester	Wesleyan Church	1898	263 Gay Street	100054008	Local	Oldest church in Chester. Structure was built by General John Bidwell on the ranch where he used to summer, approximately 1-mile outside of Chester. It was later moved to the present location by a 12-horse team around 1912.
Chilcoot	Chilcoot Tunnel (Railroad)	1906	SR 70	010230006	Unknown/Unclassified	The Chilcoot Tunnel, constructed beneath Beckwourth Pass, was built in 1906 by theтáWestern Pacific Railroadтáas part of itstáFeather River Route.[5]тáThetáFeather River Routetáis currently used by thetáUnion Pacific Railroad.
Clio	Clio General Store	1870	276 Lower Main Street	133052001	Local	Built as a general store & post office, this structure is known to the community as the origin of the town's name. According to legend, the towns name was suggested to Postmaster Fred King in 1905, from the trade name of a Clio heating store.
Clio	Clio Trestle (Railroad)	1909	SR 40A	123130ROW	Unknown/Unclassified	The Clio Trestle, also known as the Willow Creek Viaduct, carries the UPRR over Clio State 40A Rd & Willow Creek. Built as part of the WPRR's Feather River Route, the Clio Trestle travels as high as 172ft above the valley floor & is 1,005ft long.
Clio	White Sulpher Springs Ranch	1852	2200 Highway 89	133110040	Local	Est. in 1852, it was first a stagecoach stop, hotel for travelers & ranch, serving the stagecoach line that ran between Quincy & Truckee.The 3-story hotel hosted a spring fed Olympic sized swimming pool, 5 warm & 4 artesian cold springs on 400 acres.
Crescent Mills	Crescent Mills Schoolhouse	1886	275 Main Street	111061002	Local	Built in 1996 to serve the Crescent Mills School District, the structure still stands in service as a community center.

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Crescent Mills	Knoll Ranch	1860	377 Mill View Road	111180011	Local	Originally settled by Matthias Knoll in the 1860s, who also built and operated a brewery on the same site for a number of years.
Crescent Mills	Madigan House	1880	16791 Highway 89	111030005	Local	Constructed on a knoll in the early 1880s, this residence is known to be one of the earliest homesteads on the south-west side of Indian Valley.
Crescent Mills	Sheehan House	(blank)	16963 Highway 89	111030010	Local	Brick ranch house of Irishman Clifford Sheehan
Crescent Mills	Whitney Boarding House	1860	113 Crescent Street	111080005	Local	Built in the 1860s, this structure was the only acceptable shelter in the area for the Crescent Mine crews.
Cromberg	Haddick Ranch	1880	60128 Highway 70	122150011	Local	The Haddick ranch, built in 1880 is know for the most diversified ranch operations in the Cromberg area. Construction camps for the WPRR were situated on the ranch property and previously the ranch stable were used as a stop for the Reno Stage Line.
Cromberg	Long Valley Pioneers Plaque	(blank)	Mount Tomba Road Opposite Old Mill Pond Road	122150ROW	Unknown/Unclassified	Privately erected concrete block and bronze plaque honoring General Jackson, Ephriam Ross, L.V. Tefft and James Dempsey, Long Valley pioneers.
Cromberg	Twenty-Mile House	1887	700 Old Cromberg Road	122090010	Local	Clampers placed a bronze plaque here in 1969 to honor this historic stage stop, hotel, and store built about 1887 on the original Quincy-Reno Road. In 1945, the Magill family refaced the original wood siding with used brick.
Cromberg	Vardanega Spring (plaque)	1938	Mt. Tomba Road	025010USA	Unknown/Unclassified	John Vardanega, first owner of Mt. Tomba Inn, (1933-1944) designed and built this cement tank with the help of the CCC on or about 1938 for water supply in the immediate vicinity.
East of Quincy	Spring Garden Ranch	(blank)	SR 70	009060ROW	Unknown/Unclassified	Bronze plaque commemorating the history of the Spring Garden Ranch and the Western

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						Pacific Railroad camp of Spring Garden was attached to the wall of the old Spring Garden Store in 1997.
East Shore	Hamilton Dairy	1860	(blank)	(blank)	Unknown/Unclassified	Marker erected by E Clampus Vitus. The Hamilton Dairy opened in Big Meadows in 1860. In 1910 Canyon Dam was built, then filled in 1914, creating Lake Almanor. This milkhouse was them moved here out of the meadows above lake level.
Feather River Canyon	Elephant Butte (Feather River Scenic Byway)	1937	SR 70	002290007	Unknown/Unclassified	Elephant Butte Tunnel was constructed as part of the larger project to complete the alignment of the original State Sign Route 24/Feather River Hwy that same year.This tunnel was necessary due to unstable geological conditions. It is 1,187ft in length.
Feather River Canyon	Grizzly Dome (Feather River Scenic Byway)	1936	SR 70	002290007	Unknown/Unclassified	Grizzly Dome Tunnel was constructed in 1937 as part of the larger project to complete the entire alignment of the original State Sign Route 24/Feather River Highway that same year. The Grizzly Dome Tunnel is 390 feet long.
Genesee	Hosselkus Home	1889	7202 Genesee Road	008350006	Local	Built in 1889 by Edwin Hosselkus, an early settler of Genesse Valley since 1865, the house was noted one of the finest in Plumas County as it was constructed of brick and fitted with all the conveniences of the day.
Genesee	Hosselkus Ranch	1889	7202 Genesee Road	008350006	Local	Homesteaded in 1878 the ranch served as a cattle operation . The Genesee Store located in the center of the ranch was originally a stagecoach stop and Genesse post office.
Genesee	Walker Mine	1914	12000 Walker Mine Road	009100009	Local	Copper Mine and community. Known for its unique tram line to Spring Garden. The tram cars became the vital link to Walker Mine.
Gold Lake	Lakes Basin Petroglyphs	(blank)	(blank)	006200USA	National	Located between Lakes Basin Campground and Elwell Lodge, interpretive signs explain art

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						carved into nearby rocks by prehistoric Native Americans
Greenville	Ayoob Building - The Kiyus Saloon *Site - burned in Dixie Fire 2021	1915	320 Main Street	110062037	Local	The Kiyus Saloon and a court room occuipied this two-story building before 1881 fire destroyed it, rebuilt, then destroyed in a 1909 fire. Another building was was erected in 1915. This was destroyed by Dixie Fire in 2021.
Greenville	Bransford and McIntyre Store *Site - burned in Dixie Fire 2021	1881	224 Main Street	110061008	Local	General store run by Bransford and A.D. McIntyre that included the telegraph and Wells Fargo Express. Building is built like a fortress complete with steel-shuttered doors and windows. This building was destroyed by the Dixie Fire in 2021.
Greenville	Bransford and McIntyre Warehouse (Cy Hall Memorial Museum) *site burned in the Dixie Fire 2021	1877	132 Main Street	110040019	Local	A large marble plaque was installed by the Clampers on the southeast corner of this board warehouse. In 2021, this was destroyed by the Dixie Fire.
Greenville	Cervantes House	1862	139 Ayoob Aly	110120022	Local	One of the first houses built in Greenville by Henry C. Bidwell in 1862, grandfather of Bruce Bidwell. In 2021, the Dixie Fire destroyed this site.
Greenville	Greenville Hotel Site *site burned in Dixie Fire 2021	1872	303 Main Street	110063009	Unknown/Unclassified	About 5 hotels were destroyed by fires here. In 1922 the Greenville Hotel burned again. Mike Ayoob built the hotel in 1931 for about $40,000. It includes the Pioneer Bar & Restaurant. This was all destroyed by the Dixie Fire in 2021.
Greenville	Greenville Meat Market Site *burned in the Dixie Fire 2021	1872	209 Main Street	110110015	Unknown/Unclassified	Site of a meat market for 67 yrs. The market was a wood-frame bldg & also incl. a "butcher barn" where animals were slaughtered. Old bank next door was converted to a cold storage room. This was destroyed by Dixie Fire in 2021.
Greenville	Indian Mission Site	1860	3674 Greenville	004110002	Local	Built in the 1860s, the Indian Mission is a site important to the recent history of first significant

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
			Reservation Road			contract between the Maidu and white population. As headquarters for the Bureau of Indian Affairs as well as a school.
Greenville	Indian Valley Bank Site (Current Justice Court/Sheriff Sub) *Site - burned in Dixie Fire 2021	1913	115 Crescent Street / 115 SE Ann Street	110110010	Unknown/Unclassified	Erected in 1913 for the Indian Valley Bank with Murray as president & H.C. Chamberlain, cashier. The bank remained here until 1955. The small white building in back was the local "jail" used until the 1960s. This was destroyed by Dixie Fire in 2021
Greenville	Indian Valley Railroad	1916	(blank)	007090003	Unknown/Unclassified	Marker erected by E Clampus Vitus describing the Indian Valley Railroad Co. which was incorporated in 1916 by Engels Copper Mining Co. to form a connection on the Western Pacific Rail at Paxton, to Engels. Railroad operated until 1938.
Greenville	Lassen Trading Post Site (Peter Lassen Marker)	1850	North Valley Road; 4.5 Miles East of Greenville	004439015	State	In 1850, Lassen & companion, Isidore Meyerwitz, went to Indian Valley where they erected a log cabin in 1851 for their trading post. In 1855 Lassen moved to Honey Lake Valley, Lassen Co. where he risided as a miner & farmer until his death in 1859.
Greenville	Lawrence Livery Stable Site *burned in the Dixie Fire 2021	1860	317 Main Street	110063010	Unknown/Unclassified	Charles Lawrence's livery stable was in business until the 1900's. Two small buildings built in the 1930's occupy the site prior to 2021. In 2021 the Dixie Fire destroyed this site.
Greenville	Masonic Lodge (Sincerity Lodge 132) aka Warehouse/McBeth and Compton *burned in Dixie fire 2021	1878	204 Main Street	110061013	Local	John McBeth & Compton built this brick bldg in 1878.. In 1890 the upper floor was the Odd Fellows Hall that served as meeting place for Masons. Bronze plaque placed on the building by the Clampers in 1971. In 2021, the Dixie Fire destroyed this site
Greenville	McLeod Carriage Shop Site *site burned in the Dixie Fire 2021	1882	328 Main Street	110062014	Unknown/Unclassified	Lawrence's meat market site was here until the 1881 fire. Rebuilt it housed the carriage shop of Kenneth McLeod for 25 yrs. In 1909 fire

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						destroyed it.. Rebuilt again as Pastime Club in the 1930s. In 2021, the Dixie Fire destroyed this site.
Greenville	Miller Store (McBeth and Compton) *site burned in the Dixie Fire 2021	1865	225 Main Street	110110019	Local	The F.L. Miller Company Store was constructed in 1865, and added onto in 1870, and represents historical development of the commercial district in Greenville. In 2021, the Dixie Fire destroyed this site.
Greenville	Morris - Outland Building *site burned in the Dixie Fire 2021	1939	384 Main Street	110062025	Unknown/Unclassified	Originally a telegraph office, shoe shop, saddle & harness shop, and paint store until the fire of 1881. In the 1920's the site housed fire equipment & then Morris' Quality Grocery & Outland's Drug Store. In 2021, it was destroyed by the Dixie Fire.
Greenville	Murray Home (J.R. Murray)	1880	528 Main Street	110071007	Local	Built in 1880 by J.R. Murray who owned a substantial number of business properties in Greenville, and contributed to Greenville's early commercial development. In 2021, the Dixie Fire destroyed this site.
Greenville	Northern Saloon *site burned in the Dixie Fire 2021	1911	300 Main Street	110062036	Unknown/Unclassified	A saloon until Prohibition in 1919, then Harry Wardlow converted it to a confectionary and soda fountain until the end of Prohibition. By 1938 it was a bar again.
Greenville	Owl Caf├⌐ - Saloon *site burned in the Dixie Fire 2021	1904	207 Main Street	110110005	Local	Sam Torelli's Federal Saloon was erected here in 1880. It burned in 1895 along with several nearby buildings. A new building became the Owl Saloon and was soon enlarged for the Owl Cafe.┬áIn 2021, it was destroyed by the Dixie Fire.
Greenville	Perine Bank *Site burned in the Dixie Fire 2021	1877	213 Main Street	110110007	Local	Brick building was constructed in 1877 as the Perine Bank, J.M. Perine was the Wells Fargo Express Agent. It later became part of the meat market next door. In 2021, it was destroyed by the Dixie Fire.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Greenville	Scheiser Ranch	(blank)	2448 North Valley Road	004090030	Local	Originally established as a dairy ranch by Will and Andy Scheiser.
Greenville	Standart Garage *site burned in the Dixie Fire 2021	1925	208 Main Street	110061012	Unknown/Unclassified	In the 1920's this was the Standart Garage. Originally, there were two buildings joined together with auto supplies, gas and oil on one side, and auto repair on the other. In 2021, it was destroyed by the Dixie Fire.
Greenville	Williams Drug Store Site *site burned in the Dixie Fire 2021	1879	341 & 333 Main Street	110063012	Unknown/Unclassified	Site of two buildings: Williams Drug (1879) and Fortiner's Harness Shop (1881) next door.. In 2021, this was destroyed by the Dixie Fire.
Humboldt	Baccala Ranch	1870	2500 28N36	002010007; 002010010; 002010031; 002010033; 002010003; 001160054; 001160034;	Local	Clamper-sponsored bronze plaque is located on private land along the Humboldt Road to commemorate the Swiss family Baccalas, early-day ranchers in this area.
Humboldt	Faniani Ranch	(blank)	4500 Humboldt Road	(blank)	Local	Residence and structures still stand at Soldiers Meadows. Constructed by John Faniani, a Swiss born, naturalized citizen who started a dairy.
Humboldt	Ruffa Ranch	1860s	11755 Humboldt Road	(blank)	Local	Ranch with original house and barns where Charles and Louis Ruffa, two Italian-Swiss pioneer ran cattle from 1890. The ranch included stage-stop hotel on the Humboldt road.
Indian Falls	Ch'ichu'yam-bam (also known as Soda Rock or Dog Rock)	(blank)	(blank)	005010USA	National	A protruding travertine dome that rises 70-120ft above Indian Creek. This rock formation not only has unique geological features, but is steeped with Maidu history.
Johnsville	Johnsville Fire House	1908	Graeagle-Johnsville Road	(blank)	Local	Downtown Johnsville, 5 miles west of Mohawk on Johnsville Rd. This small wood building was built in 1908 after fire wiped out much of the townΓÇÖs business section. It was restored in memory of Jackie Yonge and dedicated by the Clampers in 1967.

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Keddie	Keddie Resort	1910	(blank)	005120011; 005120012; 005120013; 005120014	Local	Keddie Resort started as a construction camp for WPRR in 1908. After completion of the RR, R. Koonter purchased it in 1910 & built a general store & butcher shop. C. Rehms purchased Keddie as a destination for WP passengers & built a hotel & other bldgs.
Keddie	Keddie Wye (Railroad wye)	1909	SR 70	005110USA	Unknown/Unclassified	Only railroad wye in the world with two legs on bridges and a closing track in a tunnel. This imposing structure, known as the Keddie Wye
Keddie Total						
La Porte	Alturas Snowshoe Club (Plaque/Monument)	1991	Lexington Hill Road	003210USA	Unknown/Unclassified	This plaque commemorates the origins of the worldΓÇÖs first downhill snowshoe racing events which began in Plumas and Sierra Counties in the 1850ΓÇÖs. The Alturas Snowshoe Club was the worldΓÇÖs first organized ski club, having originated between Gibsonv
La Porte	Benjamin W. Barnes (Barnes Spring)	(blank)	(blank)	003340USA	Local	Marker erected by E Clampus Vitus reads: ΓÇ¿Barnes SpringΓÇ¥ established as La Portes water supply 1858. For his efforts our citizens will forever by indebted.
La Porte	Charles W. Hendel "Quick Silver Charley" marker	(blank)	(blank)	003340USA	Local	E Clampus Vitus plaque reads: ΓÇ¿Quick Silver CharleyΓÇ¥ Charles W. Hendel - Chronicler of the Long Board ΓÇöSnow-shoe Race beginning 1854; Sierra County Surveyor 1870; Deputy U.S. Surveyor 1871; Plumas County Surveyor 1879; Plumas County Supervisor 1910
La Porte	Cleve OΓÇÖRourke Memorial Stampmill	1980	Main Street at Aristocracy Drive	(blank)	Unknown/Unclassified	Large bronze plaque to the memory of Cleve OΓÇÖRourke, local community leader and benefactor, and in the process renamed the mill.
La Porte	Frank D. Everts	(blank)	(blank)	003044014	Local	Plaque erected by E Clampus Vitus to commemorate first express and mail service,

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La Porte	Fuller & Buell	1856	Main Street	(blank)	Unknown/Unclassified	Brick and bronze monument erected by the Clampers in 1995 to commemorate the first brick building in Sierra County, later Plumas County.
La Porte	John Conly & Co. Bankers site plaque	(blank)	(blank)	003044001	Local	This was the site of the John Conly fireproof banking office built in 1858 and incorporated as the Bank of La Porte in 1871.
La Porte	Kingdon House	1800's	1950 Church Street	003052008	Unknown/Unclassified	Built by Richard Kingdon who was the superintendent of the Bellevue Mine.
La Porte	La Porte (Plaque/Monument)	1970	1851 Quincy La Porte Road	003044005	Unknown/Unclassified	The Clampers erected a bronze plaque on a large granite boulder in 1970 to commemorate the founding of Rabbit Creek, later La Porte.
La Porte	La PorteΓÇÖs Chinese Community	(blank)	(blank)	003053008	Local	In 1870 the Chinese community of Goodwin Township consisted of 184 dwellings housing 248 people. They were accepted and more welcome here than in other mining areas due to the respect of their leader, Ah Tye in the white and Chine
La Porte	Lexington Ski Hill Marker	(blank)	(blank)	003210USA	Unknown/Unclassified	USFS erected sign describing when snow skiing was introduced to Plumas County.
La Porte	Lotta Crabtree Marker	(blank)	(blank)	003013018	Local	Charlotte (Lotta) Mignon Crabtree, born November 7, 1847, New York City. Moved to Grass Valley California in late spring of 1853. In the fall of 1854, the Crabtrees moved to Rabbit Creek (La Porte). Mart Taylor, a saloon owner wit
La Porte	Quincy-La Porte Road (Quincy Wagon Road)	1867	Quincy-La Porte Road Near Little Grass Valley Road	003210USA	Unknown/Unclassified	A brick monument with a bronze plaque was placed by the Clampers to recognize the 1867 construction of one of the most important roads in Plumas County history.
La Porte	Rabbit Creek Hotel Monument	(blank)	Main and Church Streets	003040ROW	State	La Porte, first known as Rabbit Creek, was one of the most important settlements in the

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						southern part of Plumas County. In the fall of 1852, Eli S. Lester built the Rabbit Creek Hotel, the first house in town.
La Porte	ReillyΓÇÖs Saloon	(blank)	(blank)	003042002	Local	Originally Burrel-Buckley, barn lot circa 1860, Jumbo MerianΓÇÖs Grocery & Gas Station, 1930-1945, purchased by Frank C. Reilly, operator from 1945-1965. Frank C. Reilly was the first Humbug of FCR 5978, E Clampus Vitus and one of t
La Porte	Union Hotel	1906	1915 Main Street	003043003	Unknown/Unclassified	(Kitt's)Hotel was est. 1855 by Josephine Cayot who emigrated from France. In 1860, the hotel was renamed the Union Hotel in honor of local Union soldiers. It was remodeled in the 1970s. The only remaining portion of the orig. structure is the brick safe.
Lassen Volcanic National Park	Drakesbad Guest Ranch Historic District	1900	Chester-Warner Valley Road	011010003	National	The original ranch was founded in the 1880s by Edward R. Drake and sold to the Siffords in the 1900s who established the guest ranch and hotel. In 2021, portion of site destroyed by the Dixie Fire.
Lassen Volcanic National Park	Warner Valley Major Developed Area Historic District	1950-1974, 1925-1949	Chester-Warner Valley Road	(blank)	National	(blank)
Lassen Volcanic National Park	Warner Valley Ranger Station	1926	Lassen Volcanic National Park	(blank)	National	Originally built in 1926, it had the distinction of being the first building constructed by the National Park Service in the newly created Lassen Volcanic National park. In 2021, portion of site destroyed by the Dixie Fire.
Meadow Valley	Meadow Valley Cemetery	(blank)	Meadow Valley Cemetery Road off Bucks Lake Road	113190009	Unknown/Unclassified	Local boulders were mortared together by the Clampers to build the monument holding a bronze plaque dedicated to the memory of the Meadow Valley-Spanish Ranch pioneers.

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Meadow Valley	Meadow Valley Historical Site marker/plaque	(blank)	(blank)	113190010	Local	Here early residents of what was then an isolated valley created their own cultural center. On land deeded by Richard Jacks, through subscription and donated labor, they constructed the first public school of the area.
Meadow Valley	Meadow Valley School	1914	7512 Bucks Lake Road	113190010	Local	Bronze and stone monument placed by the Clampers in 1971 commemorates the two Meadow Valley schools and the Philomathean Hall, which stood on the opposite side of the road. The school, built in 1914, now serves as a community hall.
Meadow Valley	Spanish Ranch and Meadow Valley (Plaque)	1850	Spanish Ranch Road Near Fales Court West of Quincy	113030011	State	Miners going to the East Branch, Middle Fork, or North Fork of the Feather River separated at Spanish Rancho, established in July 1850 by two Spaniards, and at Meadow Valley, 2.5 miles from Spanish Ranch.
Mohawk	Mohawk Hotel & Tavern	1862	999 Graeagle-Johnsville Road	123280008	Local	Built in 1862, the Mohawk Hotel and Tavern was the centerpiece of the Mohawk Village. It was also used as a stage stop.
Northeast of Quincy	Quincy Junction (Railroad)	(blank)	Quincy Junction Road	005450001	Unknown/Unclassified	The Quincy Railroad was built to connect the town of Quincy (and lumber interests nearby) to the WPRR a few miles away. From Quincy, the railroad ran across the flat American Valley and then climbed a quick 4% grade up to the WP at Quincy Junction.
Paxton	Paxton Lodge	1917	32420 Paxton Road	005060003	Local	Paxton is an old Indian Valley Railroad recreation/resort consisting of 61 acres of land with six cabins, five houses and the lodge facility. The lodge served as a wayside station for miners highway and railroad workers.
Plumas National Forest	Englemine	1914-1930	Diamond Mountain Road	007090003	Local	This Clamper and owner-sponsored plaque recognizes Engelmine and the Superior Mine as the largest copper-producing mines in California

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						in the 1920s. This is a recent addition, erected in 2007.
Plumas-Eureka State Park	Emigrant Trail 1850 Marysville-Jamison City (Plaque)	1850	Johnsville-La Porte Road, Half Mile South of Park Museum	006190004	Local	An old arrastra or ΓÇ£Chile wheelΓÇ¥ used to crush gold bearing quartz sits atop a concrete pedestal w/bronze plaque placed by the Native Sons & Native Daughters of the Golden West in 1932 to commemorate the so. branch of Beckwourth Emigrant Trail.
Plumas-Eureka State Park	Jamison City Plaque	1870	County Road A14	006190004	State	Along the Pioneer Trail lies Jamison City and mine, large producer and famous for its 52-pound nugget. Eureka Mill and mine yielded $17 million to Cornish miners and others. Johnstown, now Johnsville, is a well-preserved '49er town.
Plumas-Eureka State Park	Johnsville (Pioneer) Ski Area Plaque	1961	County Road A14	006190004	State	The first sport ski area in the western hemisphere was in the Sierra Nevada, and by 1860 races were being held in the Plumas-Sierra region. The mining towns of Whiskey Diggings, Poker Flat, Port Wine, Onion Valley, La Porte, Jamison City, and Johnsville
Plumas-Eureka State Park	Longboard Ski Races plaque	(blank)	Johnsville Eureka Lake Road	006190004	Unknown/Unclassified	Gold Mountain, now Eureka Peak, is the site of some of the first organized ski races in the western hemisphere. Ski clubs organized in the 1850ΓÇÖs rode 10-14 foot "longboards snowshoe" down "Lost Sierra" slopes in Plumas and Sierra counties.
Plumas-Eureka State Park	Plumas-Eureka Mill, Jamison Mines District	1875-1899, 1850-1874	County Road A14	006190004	National	Eureka Mill, a wooden structure, stands 72 feet high.
Portola	Jim Beckwourth Museum (Plaque)	1964	1820 Rocky Point Road	025190009	Local	(blank)
Portola	Western Pacific Railroad Museum	(blank)	700 Western Pacific Way	126050037	Unknown/Unclassified	Museum in Portola with displays and historic trains.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Quincy	American Ranch and Hotel Site	1852	355 Main Street	115024016	State	James H. Bradley in 1854 built the American Hotel, the first sawed-lumber house in Quincy. In 1854, three commissioners met to form a new county from a portion of Butte Co, & the hotel became the county seat of Plumas until a new location was found.
Quincy	Author W. Keddie (Plaque)	1842-1924	384 West Main Street	115063003	Unknown/Unclassified	Bronze plaque placed by the Clampers commemorates the life and accomplishments of Arthur W. Keddie, a prominent citizen and professional surveyor. When originally placed in 1976, it was affixed to the Plumas Co. Bank Bldg.
Quincy	Ayoob's	1935	511 & 515 Main Street	115013040	Unknown/Unclassified	Ayoob's is the last name of a Lebanese family that started their retail business out of a horse and buggy.┬á┬áLater on they had opened seven retail clothing and shoe stores throughout Plumas County and Northern Nevada.
Quincy	Beckwourth Trail - New England Ranch	(blank)	(blank)	005290ROW	Local	Plaque that reads: ΓÇ£Had a hard road, crooked & rocky. Had to cross (Greenhorn) creek 8 times in going 5 miles. Got down to the New England Ranch at noon, camped here for today.ΓÇ¥ - Chester Smith, Sep. 27, 1852.
Quincy	Berg Home	1902	379 Jackson Street	115063018	Local	Widow Anna Berg sold her ranch home about 1902 and moved to this enchanting Queen Anne style home in town
Quincy	Boring/Stephen Home	1882	326 Main Street	115064003	Local	About 1882 Jacob Stephan bought Edward's Livery Stable and also the whous which Sheriff Boring had moved from a nearby ranch.
Quincy	Capitol Saloon (Huskinson Block)	1905	521 & 519 Main Street	115013039	Local	Part of the early Huskinson block, the brick building was popularly known as Col. Wyatts Saloon Bldg. The Capitol Saloon was established as a business in 1870, & the old bar is still in use. The building also housed the first office of the PNF in 1905.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Quincy	Casa De La Sierr	1800s	332 Jackson Street	115068001	Local	Residence of Arthur and Verbenia Phelps Hall, this was the childhood home of Helen Hall Lawry, noted Plumas County historian. Built by Joshua Variel in the late 1800s.
Quincy	Cate/Hail Home	1860	528 & 532 Jackson Street	115055018	Local	Constructed in the late 1860's by Daniel Rogers Cate, first County Treasurer. As a rancher, he rented this house from J.E. Edwars in the 1860s-70s. George Stephan added the stone pillars and foundation in 1918.
Quincy	Chinese American Cemetery (Plumas County Memorial Park)	1992	Radio Hill Road	116290038	State	A large red sign reads ΓÇ¿Chinese Memorial Park.ΓÇ¥ The segregated cemetery was created in 1913 following public outcry over an attempt to bury a Chinese girl in the whites-only Quincy Cemetery. Ten of the 11 people buried here died between 1916 and 1935
Quincy	Clinch Building	1905	432-446 Main Street	115062003	Local	In 1905, William Clinch built the distinctive building for his meat market. W.M. Hemstallc, noteworthy stone mason of early Plumas County, constructed the building creating the unusual rock fa ├ºade using arch windows and gas lamps.
Quincy	Clinch Ranch House	1911	766 Quincy Junction Road	005310015	Unknown/Unclassified	John Clinch moved to American Valley in 1872 and bought the 110-acre ranch Sears kit bungalow home.
Quincy	Clough-Braden House	1879	353 Jackson Street	115064014	Unknown/Unclassified	Plumas Bank commemorated this 1879 home of Judge Greenleaf Greeley Clough and later, the home of Sheriff Arch Braden, by placing a bronze plaque in 1990.
Quincy	Colonel Wyatt's Bank Building (Huskinson Block/100F Hall)	1876	525 Main Street	115013038	Unknown/Unclassified	Housed a dry goods store & post office on the 1st floor & the Odd Fellows Lodge on the 2nd. The center building, also from 1876, was Colonel Wyatt's Bank Building. In 1905, the 1st office of the PNF Service Supervisor moved into the 2nd story.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Quincy	Dedmon Home	1900	252 Jackson Street	115073005	Local	The Dedmon Family Home was built sometime around 1900. The porches on each side have been added over time.
Quincy	Dr. Stewart Home and Office	1870	75 Court Street	115053002	Unknown/Unclassified	This residence, built around 1870, was originally called the McChesney House. Dr. Stewart, a dentist, and his bride Leona Kaulback moved into the house in 1905 and lived there until his death in 1933.
Quincy	Elizabethtown (Monument)	1852-1860	40950 Purdy Lane	005470ROW	State	Tate's Ravine was named in 1852, when Alex & Frank Tate discovered gold there. Lewis Stark & family came across the plains to settle here in 1852. A rich mine opened up & grew in population. The miners named it Elizabethtown in honor of Stark's daughter.
Quincy	Feather Publishing Co. Marker	(blank)	555 Main Street	115011057	Unknown/Unclassified	Two markers. One commemorating 125 years of Journalism & another erected by E. Clampus Vitus inscribing "Feather Publishing Co., A tradition of newspapers serving Plumas County since 1866. Dedicated September 15, 1978
Quincy	Flournoy Building/Plumas National Forest Office	1908	307 Main Street	115024011	Local	The first Forest Service Supervisor's Office building was built by Harley Flournoy. The USFS moved into this building in 1908, and moved to their present site on Lawrence Street in 1933.
Quincy	Gansner Home	1900	639 Main Street	115011044	Unknown/Unclassified	This was originally the home of Fred Gansner, one of eight children of pioneers Florian and Christina Gansner. It was built about 1900 and sported "quoines" much like the Variel Home on Coburn Street.
Quincy	Garland Home	(blank)	83 Meyers Street	115051007	Local	Garland Home. One of Quincy's oldest, Richard E. Garland's house still has its original ginderbread trim, amethyst windows, and Victorian Charm. The first structure in Quincy,

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						a log house, was located next to this house but was razed about 1949.
Quincy	Garner Home	1877	333 Jackson Street	115064008	Local	Edward Garner, a native of England, came to Quincy in 1877. A noted taxidermist, house painter, and wallpaper hanger, many of his mounted specimens are in the musemu's collection. The oak tree has been there since the early 1900s.
Quincy	Goodwin House	1873	586 Jackson Street	115065004	Local	Built before 1873, the Goodwin residence is thought to be the first brick home in town. After his death in 1908, the house became a hospital, remining in medical use until the mid 1990s..
Quincy	Goodwin Law Office	1863	514 Jackson Street	115065004	Local	The bronze plaque states that this diminutive building has been in continuous use as a law office since 1860. Place by the Clampers in June 1961.
Quincy	Gray Home	1902	208 Jackson Street	115073008	Local	This home was owned by Quincy Drug Store owner Asa Gray, and was buit about 1902.
Quincy	Hail Home	(blank)	602 Jackson Street	115059009	Local	Felix Grundy Hail, former publisher of Greenville Bulletin & publisher of Plumas National, lived here. Hail was convicted of the shooting death of John A. Boyle, Quincy Atty in 1913, over dispute of where to locate the county high school.
Quincy	Hogan Home	1860s	332 E. High Street	115069006	Local	Judge Edmund T. Hogan was an early barrister, judge, and one-time newspaper printer in Quincy. Home built sometime in the 1860s.
Quincy	Hughes Home	1911	321 Jackson Street	115064013	Local	Laura Hughes was a grade school teacher and Lewellyn H. Hughes a lawyer and District Attorney. The California Bungalow - Crafsman style house was built about 1911.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Quincy	Huskinson Home	1890	542 Jackson Street	115056014	Local	Constructed by Edward Huskinson. Huskinson was the manager of Plumas House, and was later elected County Supervisor in 1890.
Quincy	Jake Stephan Home	1912	314 Main Street	115064004	Local	In 1912, son Jake built this California Bungalow-style home with the oval glass door next to his father's place.
Quincy	Kaulbach/Beyers Home	1868	520 Jackson Street	115065023	Local	In 1868 Quincy Wells Fargo Agent Charles Kaulbach bought this unfurnished house for his bride, Mary Loring. In 1900, the house was sold to William Beyers who served as County Clerk in 1877.
Quincy	Kellog Home	1870	420 Jackson Street	115066026	Local	Built by A.P. Moore, William Kellog bought the home in 1873. A fine orator, Kellog was elected County Assessor & Clerk, School Trustee, Assemblyman, and later Senator. He published the Quincy Union newspaper for 8 years.
Quincy	King Home	1905	307 Jackson Street	115064006	Local	Willis and Tennye King were the first residents of this house. It was built in 1905, but little else is known of it.
Quincy	Knisely/McLaughlin/Bell Home	1885	372 Main Street	115063003	Local	Jacob Knisely built this home of local brick in 1885. A carpenter, he gave talent to the Methodist Church where he is memorialized in a window. Judge Charles McLaughlin owned the home in 1900s. William Bell family lived in home from 1919-1970.
Quincy	Loring Home	1882	470 Jackson Street	115066028	Local	An early miner, John Loring settled here. A zealous worker for the Methodist Church he is memorailaized in a church window for his gift of the church bell and his service as janitor. The Sequoia next to the house was planted as a sapling in 1932.
Quincy	Lowell Home	1884	363 Jackson Street	115063016	Local	James and Ruth Millet Lowell moved here in 1884. Daughter, Mettie Lowell, became the wife of Judge Greenleaf Clough.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Quincy	Masonic Temple	1854	70 Harbison Street	115063011	Local	This hall, standing in its original condition, was constructed in 1854 by the First Masonic Lodge in Plumas Co. Many of the pillars & wall boards are hand-hewn originals. Quincy school classes were once held downstairs, & also housed the County Library.
Quincy	McIntosh Home	1850s	Main Street	(blank)	Unknown/Unclassified	The McIntosh family owned and operated a hardware store in Quincy in the 1900s
Quincy	Methodist Episcopal Church	1875	282 & 292 Jackson Street	115073001	Local	Est. in 1854, the congregation was served by a circuit of preachers until the existing bldg 1875. A Quincy landmark, services are held weekly. The stained glass windows were dedicated in 1912 in mem. of John Loring, who donated the bell.
Quincy	Miller Home	1980	583 Jackson Street	115053005	Local	Built in 1890 by the proprietor of the Quincy Hotel, William Miller, Miller's daughter, Fay, was a respected teacher and music composer of the Quincy area.
Quincy	Moncur Home	1909	356 Jackson Street	115067004	Local	Judge James O. Moncur, a northern California lawyer, moved to Quincy in 1902. He served as Superior Court Judge from 1908-1951.
Quincy	Mori Home	1900	70 Buchanan Street	115053006	Local	Built approximately 1900, it was occupied by Louis & Violet Mori. Louis was the County Tax Collector for 28 years. Violet took countless photographs around the county and collected items now in the museum's collection.
Quincy	Mt. Ingalls Lookout	1935	Plumas County Fairgrounds	116010022	Local	Donated by USFS/Plumas - Built by Company 989 C.C.C. in 1935. Dismantled and rebuilt by Reserve navy Mobil Construction Battalion - 2 "Sea Bees"
Quincy	Odd Fellows Lodge (Huskinson Block)	1876	531 Main Street	115013037	Unknown/Unclassified	Called Huskinson Block after 1900, this bldg dates fr 1850, & represents one of the first perm. brick struct. of the Quincy bus. dist.The bldg was const. by the Cohen Bros. & was used for

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						dry goods store & post office. The IOOF(Odd Fellows) met upstairs.
Quincy	Orr Home	1913	262 Jackson Street	115073009	Local	George and Winifred Orr built this Crafsman-style home in 1913 when they were married. A forest service employee, Orr planted the Sequioa gigantea in 1913.
Quincy	Pioneer School House	1857	Plumas County Fairgrounds	116010022	State	In 1857 the residents of the eastern end of American Valley built a school, the first schoolhouse in Plumas County. On July 2, 1857, Mr. S. A. Ballou was engaged as teacher for 19 children. The building is now used for kindergarten purposes (1957).
Quincy	Plumas Club "Harvey's Place"	1914	443 Main Street	115023018	Local	Built in 1914 as "Harvey's Place" by Harvey Egbert. During Prohibition Ed Dory ran the Quincy Dairy Sore and some slot machines here.
Quincy	Plumas County Bank Building	1903	400 Main Street & Harbison Avenue"	115062011	Local	Formed in 1903, its Board of Directors were C.J. Lee, E. Huskinson, H.C. Flournoy, C.E. McLaughlin, W.J. Clinch, and J.D. Goodwin - all historical figures of Plumas County. The esplanade style building was labeled pretentious by many in the community.
Quincy	Plumas County Courthouse	1919	520 Main Street	115061001	Local	The original courthouse, built in 1859, was replaced by this Classic revival building in 1919 at the cost of $325,000. Dedicated by CA governor W.M. Stephens in 1921.
Quincy	Plumas House - Hotel Quincy Site	1853	570 Main Street	115053001	Local	The 1st & 2nd Plumas houses were built on this site. The 2nd was built in 1866 by James & Jane Edwards.This hotel, the center of Quincy's social & business life for more than thirty years, burned to the ground June 23, 1923. Now Dame Shirley Plaza.
Quincy	Plumas House Livery Stable Site	1875	Main and Crescent Streets	115053001	Unknown/Unclassified	Gurdon W. Meylert, a rancher and local contractor, built the 40ft x 80ft livery stable.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Quincy	Quincy Drug Store	1934	493 Main Street	115023022	Local	Established in 1875, the Great Main Street Fire destroyed the original building two-story brick building and was rebuilt in 1934 . The 1890s stone sotrage building in the back is a survivor of the fire.
Quincy	Quincy Elementary School	1905	50 Church Street	115071001	Local	Built in 1905 to replace the 1876 brick school, first through eighth grade classes were held here from 1905 to 1951. The bronze plaque memorializes it as ΓÇ£A Monument to Education.ΓÇ¥
Quincy	Rogers Home	1912	335 Main Street	115024014	Local	Dave "D.N." Rogers, the secont Plumas National Forest Supervisor, had this shingle-sided Craftsman-style house built in 1912. He and his wife lived there until their deaths in 1970.
Quincy	Schneider Home	1903	88 Harbison Street	115063010	Local	Born in Meadow Valley in 1859, Bernard "Barney" Schneider was a successful druggist in Quincy. He was partner with Huskinson in 1885 and sole owner of Quincy Drug in 1890.
Quincy	Thompson Ranch	1850	(blank)	117180041	Unknown/Unclassified	Formerly known as Illinois Ranch, the original homestead burned in 1927, causing the brick creamery building dating from the 1850s to be converted into a residence which is still being used today.
Quincy	Town Hall Theater	1934	473 Main Street	115023021	Local	Formed in 1872, the Town Hall Assoc. raised funds to buy the Exchange Saloon Bldg.The Hall hosted fairs, high school classes, church services, & other activities. Used as a movie house before the Quincy fire in 1934, it was rebuilt as a theatre.
Quincy	Variel House	1878	137 Coburn Street	115065006	Unknown/Unclassified	Beckwourth Pass emigrant Joshua Variel and his son Will built this three-story home in the fall of 1878 as evidenced by WillΓÇÖs dated signature on a section of the houseΓÇÖs framing. A

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						bronze plaque on the house was provided courtesy of Plumas Bank.
Quincy	Watson Home	1900s	562 Jackson Street	115056001	Local	About 1902 Clark Lee moved Anna Berg's ranch house to this site. County Surveyor William Watson took it over in 1904. His son H.S. (Herbert Sidney) "Tiny" Watson lived there until his death in 1982.
Quincy	Wheeler House	1860s	Main and Myers Street	(blank)	Unknown/Unclassified	First frame house built in Quincy. Water piped into house from spring behind house. The Wheelers were in the draying and express buisiness.It was made for Theresa & Isaac Wheeler, who became the first bride and groom in Quincy, on Jan 2, 1854.
Quincy	White Home	1913	570 Jackson Street	115055011	Local	In 1913, widow Nannie White chose local stone mason William Hemstalk to build this unique structure. Hemstalk, orig. from England, acquired his rock mason skills passed down through his family for generations. He formed & dried the cement blocks himself.
Quincy	Whitlock House	1877	325 Main Street	115024013	Local	Built in 1877, US Army Major J. Whitlock, a veteran of Indian wars, lived at this location from 1881-1903/ A popular merchant, he also served as County Treasurer and State Legislator.
Quincy	Wilson Home	1895	314 Jackson Street	115068003	Local	George Wilson was Quincy Brass Band's leader around 1900. In 1895 it was noted that Wilson was gathering rocks for his house foundation from a site at the early gold rush camp of Elizabethtown, two miles north.
Rich Bar	Rich Bar	1850	SR 70 (PM 18.8)	002230USA	State	Gold was first found here in July 1850 by miners coming over the mountains from the Yuba Diggins. Here 'Dame Shirley' (Louise Amelia Knapp Smith Clappe) wrote her 'Letters From the California Mines', one of the classics of the gold rush.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Rich Bar	Rich Bar Cemetery	(blank)	SR 70 (PM 18.8)	002230USA	Local	Town cemetery is one of the few tangible remains of a town that was home to 1,000 people and produced nearly $9 Million in gold. In 2021, the Dixie Fire destroyed this site.
Scotts	Beckwourth Pass Plaque	1937	Highway 70 (PM 95.8)	010230006	State	Beckwourth Pass, at an elevation of 5,221 feet, the lowest pass in the Sierra Nevada, was discovered in 1851 by James P. Beckwourth. The monument is dedicated to the discoverer and to the pioneers who passed along this trail.
Seneca	McMillan House	1910	6201 Seneca Road	(blank)	Local	Built about 1910 by Bill McMillan, son of the superintendent and owner of the Glacier Mine, this house is the second oldest structure remaining in the Seneca area. In 2021, the Dixie Fire destroyed this site.
Seneca	Piazzoni Cabin	1868	Seneca Road (T26N R8 S18)	002070USA	Local	Located near the Seneca-Butt Lake Road, this cabin was built on a mining claim by Baptista Piazzoni in 1868. Piazzoni owned and operated the successful mining operation at the Swiss Mine. In 2021, the Dixie Fire destroyed this site.
Sloat	Sloat (Plaque at old Sloat Mill)	(blank)	1201 Sloat Road, Sloat	122070023	Local	Clamper plaque. Sloat Mill Site (thought to have been named for Commodore John Drake Sloat of Bear Flag Revolt fame.)
Sloat	Sloat Towne Hall (Plaque & Building)	1935	(blank)	122070024	Local	Historic Sloat Towne Hall was built in 1935 and recently lovingly restored. The Hall is located in a rustic setting within walking distance to the Feather River and Plumas National Forest in Sloat, California.
Soldier Meadows	Stump Ranch Barn	1880	10000 Old Red Bluff Road	(blank)	Local	This barn, constructed of hand-hewn timbers and wooden pegs was built in 1880 by Isaac McKenzie. In 2021, the Dixie Fire destroyed this site.
Soldier Meadows	Stump Ranch Milk House	1880	10000 Old Red Bluff Road	(blank)	Local	Located in a meadow behind the McKenzie residence on the Stump ranch, is uniquely designed to utilize spring water to 'refrigerate'

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
						dairy products obtained from the dairy. In 2021, the Dixie Fire destroyed this site.
Spring Garden	Spring Garden Tunnel (Railroad)	(blank)	SR 70	122020ROW	Unknown/Unclassified	At Spring Garden, a 7,344 foot tunnel penetrates the divide under Lee Summit. The tunnel transfers the railroad from the North Fork Feather River Drainage to the Middle Fork.
Spring Garden	Williams Loop (Railroad)	(blank)	SR 70 at Squirrel Creek Road	005370USA	Unknown/Unclassified	Williams Loop railroad track makes a continuous one mile loop in a 1% grade to gain altitude. Crossing over itself, the track gains the necessary elevation required. Tangent track required a 4% grade in this area and was eliminated as soon as Williams Lo
Taylorsville	Clary Home	1864	4275 Cemetery Street	120074005	Local	This two-story wooden frame building is the second oldest home still existing in Taylorsville. It was built in 1864 by Edwin Taylor, brother of Jobe Taylor, the founder of Taylorsville.
Taylorsville	Community United Methodist Church	1875	4264 Nelson Street	120073006	Local	This single story white structure was constructed in 1875, and used continuously by the Taylorsville area congregation since that time.
Taylorsville	Cooke Home	1860	4289 Cemetery Street	120072005	Local	The original wood frame building was built on Main Street in the 1860's, but was moved to its present site by a team of oxen in the 1880's. Later, it was added onto and restored. The brick used in the restoration was from the old Flournoy Ranch house.
Taylorsville	Ford Homestead	1852	6260 North Arm Road	(blank)	Local	James Ford and his wife Martha came to California in 1852 and were one of the first to settle the North Arm of Indian Valley. Mrs. Ford was the only white woman in North Arm for two years after they settled there.
Taylorsville	Genesee Valley Store & Post Office	1880	7201 Genesee Road	008350006	Unknown/Unclassified	The Genesee Valley Store was built in 1880 along the 1873 wagon road as a stage stop and store. The bronze plaque provided by the Clampers in 1991 is on display inside the store.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Taylorsville	Herring Home	1886	4620 North Arm Road	004220045	Local	This two-story wood frame house was constructed by George Herring (rancher and dairyman) in 1886, ten years after Herring first settled in Indian Valley.
Taylorsville	Hyden Home	1875	4273 Ann Street	120061005	Local	This two-story brick structure with a white pillar front porch still stands as one of the Taylorsville most beautiful and well maintained examples of Victorian 1875 architecture.
Taylorsville	Jackson Home	1875	4538 Portsmouth Street	120074005	Local	Formerly known as the Gee and Taylor home, this residence was constructed in 1875 by A.M. Gee, and was lived in for many years by the Gee family. The James Taylor family, James being the son of Jobe Taylor, subsequently purchased the home.
Taylorsville	Jobe Taylor Marker (Monument)	1852	South Side of Main Street at Anne Street	(blank)	Local	In 1938 the Native Sons of the Golden West erected a stone monument made of millstones brought around Cape Horn for the 1st flourmill in the Pacific NW. It commemorates the site of the first perm. residence in Indian Valley built by Jobe Taylor in 1852.
Taylorsville	Stone Home	1875	4268 Nelson Street	(blank)	Local	Built in 1875. the residence was the first parsonage of the Methodist churches in Indian Valley, as most congregations were served by circuit preachers.
Taylorsville	Taylorsville Cemetery	(blank)	Cemetery Road at Portsmouth Street	(blank)	Local	Clamper erected stone monument and bronze plaque memorializes Jobe Taylor and the pioneers of Indian Valley.
Taylorsville	Taylorsville Creamery	1904	4489 Main Street	(blank)	Local	Taylorsville creamery was founded in 1904 as a cooperative and represented an active dairy industry in Indian Valley that existed for well over 100 years.
Taylorsville	Taylorsville Old School	1864	4390 Thompson Street	(blank)	Local	One room brick structure was built in 1864 and was the first grammar school in Indian Valley.

Community	Name	Year	Address	Parcel Number / APN	Authority	Description
Taylorsville	Young's Market	1862	4368 Main Street	(blank)	Unknown/Unclassified	Two-story brick store was built in 1862. Shortly after it became known as YoungΓÇÖs Market, a tradition that continues to this day. The bronze plaque in the building was placed by the Clampers.
Tobin	Tobin Resort	1915	6162 Highway 70	002320007	Local	Bill Day, Section Foreman of the WPRR built the first Tobin Resort in 1915, named after Mr. Tobin, Vice President of WPRR.
Vinton	Summit School (historical)	1890	91182 Highway 70	010050009	Local	The Summit School District was formed in 1868. The Summit School house was constructed in 1890.
Warner Valley	Lee's Camp - Lee's Ranch	1903	(blank)	011160006	Local	Purchased by the Lee family in 1903, the ranch and (still is) the site of a continuous, family owned and managed cattle ranch in Warner Valley.
Unknown	Cedar Chalet Bakery	20015	1451 Highway 36	(blank)	Unknown/Unclassified	Erected by E Clampus Vitus, this marker depicts the location of the oldest operating bakery in Plumas County. Built by Carl Giese in 1955, formerly called CarlΓÇÖs Corner. In 2021, the Dixie Fire destroyed this site.
Unknown	Onion Valley Townsite	1850s	(blank)	(blank)	Unknown/Unclassified	Gold Rush mining town settled in the 1850s - named because of a wild onlion that grw there
Unknown	Summit Store	1862	(blank)	(blank)	Local	First known as the Martin Store, located at Summit (east of Chilcoot), was the center of activity prior to the arrival of railroads and highways. The store was opened in 1862 & was operated as a store until 1908. Summit was later renamed Chilcoot.
Unknown	Wemple Cabin	(blank)	(blank)	(blank)	Unknown/Unclassified	(blank)

Appendix G Critical Facilities

A master table of critical facilities is contained on the following pages.

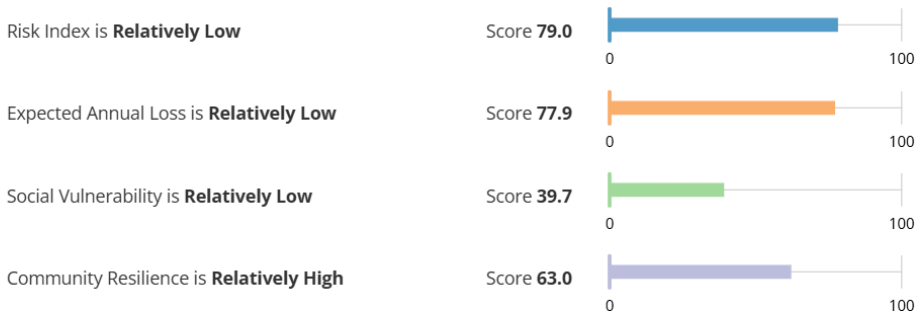
Appendix H Plumas County FEMA National Risk Index Report

National Risk Index

January 09, 2025

Plumas County, California

Summary

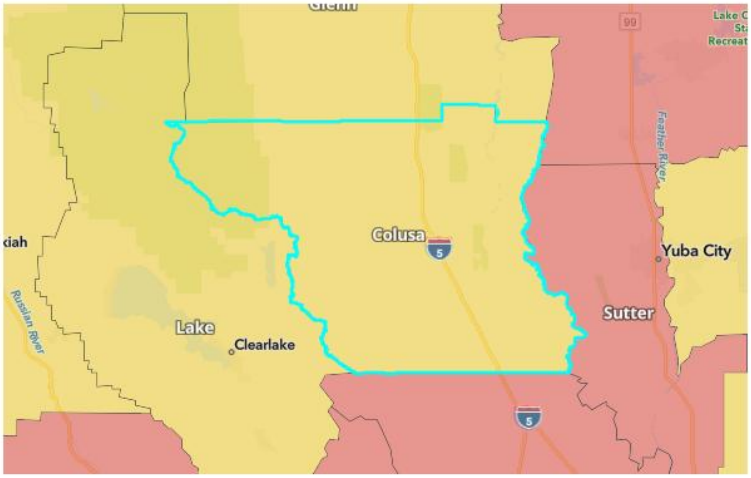


While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Risk Index

The Risk Index rating is **Relatively Moderate** for **Colusa County, CA** when compared to the rest of the U.S.



Score **95.42**

National Percentile
95.42

Percentile Within California
50.00

0 100

95% of U.S. counties have a lower Risk Index

50% of counties in California have a lower Risk Index

Risk Index Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Rating | Not Applicable | Insufficient Data

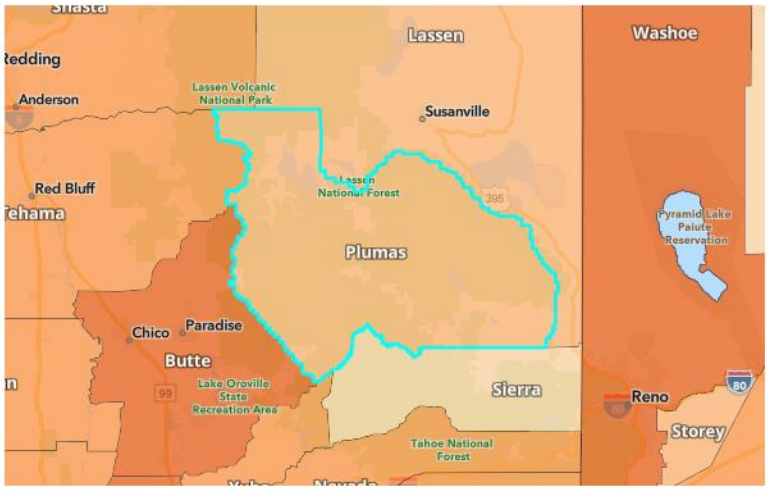
Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's Expected Annual Loss value, community risk factors, and the adjustment factor used to calculate the risk value.

Hazard Type	Risk Index Rating	Risk Index Score	National Percentile
Avalanche	Not Applicable	--	
Coastal Flooding	Not Applicable	--	
Cold Wave	No Rating	0	0 100
Drought	Relatively Moderate	87.4	0 100
Earthquake	Relatively Moderate	93.6	0 100
Hail	Very Low	6.1	0 100
Heat Wave	Very Low	23.8	0 100
Hurricane	Not Applicable	--	
Ice Storm	Not Applicable	--	
Landslide	Relatively High	94.9	0 100
Lightning	Relatively Low	45.8	0 100
Riverine Flooding	Relatively Moderate	82.9	0 100
Strong Wind	Very Low	5.4	0 100
Tornado	Very Low	8	0 100
Tsunami	Not Applicable	--	
Volcanic Activity	Relatively Low	57.3	0 100
Wildfire	Relatively High	97.6	0 100
Winter Weather	Relatively Low	35.8	0 100

Expected Annual Loss

In **Plumas County, CA**, expected loss each year due to natural hazards is **Relatively Low** when compared to the rest of the U.S.



Score	77.93

National Percentile
77.93
Percentile Within California
15.50
0 100

78% of U.S. counties have a lower Expected Annual Loss

16% of counties in California have a lower Expected Annual Loss

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low
No Expected Annual Losses | Not Applicable | Insufficient Data

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low
No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss	**$16,253,626.34**
Composite Expected Annual Loss Rate National Percentile	**87.7**

Building EAL	**$14,930,347.87**	Population EAL	**0.08** fatalities
Building EAL Rate	**$1 per $562.97 of building value**	Population EAL Rate	**1 per 244.77K people**
Agriculture EAL	**$387,504.16**	Population Equivalence EAL	**$935,774.31**
Agriculture EAL Rate	**$1 per $28.40 of agriculture value**		

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type.

13 of 18 hazard types contribute to the expected annual loss for **Plumas County, CA**.

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Wildfire	Relatively High	$7,840,595	97.4
Earthquake	Relatively Moderate	$5,576,231	92.9
Riverine Flooding	Relatively Moderate	$1,910,839	83.3
Drought	Relatively Moderate	$371,450	85.4
Landslide	Relatively Moderate	$233,919	94.6
Volcanic Activity	Relatively Low	$148,583	65.1
Lightning	Relatively Low	$77,248	45.8
Tornado	Very Low	$38,006	10.4
Winter Weather	Relatively Low	$29,230	38.8
Strong Wind	Very Low	$15,164	7.9
Heat Wave	Very Low	$8,162	25.7
Hail	Very Low	$4,198	8.5
Cold Wave	No Expected Annual Losses	$0	0.0
Avalanche	Not Applicable	--	--
Coastal Flooding	Not Applicable	--	--
Hurricane	Not Applicable	--	--
Ice Storm	Not Applicable	--	--
Tsunami	Not Applicable	--	--

Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$0	$0	$0	0.00	$0
Drought	$371,450	n/a	n/a	n/a	$371,450
Earthquake	$5,576,231	$5,008,848	$567,383	0.05	n/a
Hail	$4,198	$6	$4,142	0.00	$51
Heat Wave	$8,162	$13	$7,638	0.00	$511
Hurricane	--	--	--	--	--
Ice Storm	--	--	--	--	--
Landslide	$233,919	$43,159	$190,760	0.02	n/a
Lightning	$77,248	$1,181	$76,068	0.01	n/a
Riverine Flooding	$1,910,839	$1,893,435	$2,445	0.00	$14,960
Strong Wind	$15,164	$13,738	$1,242	0.00	$184
Tornado	$38,006	$34,140	$3,845	0.00	$21
Tsunami	--	--	--	--	--
Volcanic Activity	$148,583	$139,895	$8,688	0.00	n/a
Wildfire	$7,840,595	$7,793,853	$46,415	0.00	$328
Winter Weather	$29,230	$2,081	$27,149	0.00	$0

Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	--	--	--	--	--
Cold Wave	$0	$0	$0	0.00	$0
Drought	$3,622,270	n/a	n/a	n/a	$3,622,270
Earthquake	$237,969,269,000	$8,405,269,000	$229,564,000,000	19,790.00	n/a
Hail	$237,469,962,102	$8,405,356,144	$229,053,600,000	19,746.00	$11,005,958
Heat Wave	$237,469,807,133	$8,405,349,838	$229,053,451,338	19,745.99	$11,005,958
Hurricane	--	--	--	--	--
Ice Storm	--	--	--	--	--
Landslide	$132,005,510,075	$4,410,019,325	$127,595,490,750	10,999.61	n/a
Lightning	$237,458,956,144	$8,405,356,144	$229,053,600,000	19,746.00	n/a
Riverine Flooding	$8,960,873,982	$404,270,819	$8,548,917,102	736.98	$7,686,061
Strong Wind	$237,469,962,102	$8,405,356,144	$229,053,600,000	19,746.00	$11,005,958
Tornado	$237,469,962,102	$8,405,356,144	$229,053,600,000	19,746.00	$11,005,958
Tsunami	--	--	--	--	--
Volcanic Activity	$155,472,292,999	$5,535,188,132	$149,937,104,866	12,925.61	n/a
Wildfire	$67,542,484,158	$2,471,081,963	$65,067,739,999	5,609.29	$3,662,196
Winter Weather	$237,469,807,133	$8,405,349,838	$229,053,451,338	19,745.99	$11,005,958

Annualized Frequency Values

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	0 events per year	0	2005-2021 (16 years)
Drought	61 events per year	1,400	2000-2021 (22 years)
Earthquake	0.629% chance per year	n/a	2021 dataset
Hail	0.1 events per year	5	1986-2021 (34 years)
Heat Wave	0.7 events per year	11	2005-2021 (16 years)
Hurricane	--	--	--
Ice Storm	--	--	--
Landslide	0.1 events per year	6	2010-2021 (12 years)
Lightning	3.3 events per year	73	1991-2012 (22 years)
Riverine Flooding	0.5 events per year	11	1996-2019 (24 years)
Strong Wind	0.1 events per year	3	1986-2021 (34 years)
Tornado	0.1 events per year	0	1950-2021 (72 years)
Tsunami	--	--	--
Volcanic Activity	0 events per year	1	9310BC-2022 (11331 years)
Wildfire	0.804% chance per year	n/a	2021 dataset
Winter Weather	16.5 events per year	267	2005-2021 (16 years)

Historic Loss Ratios

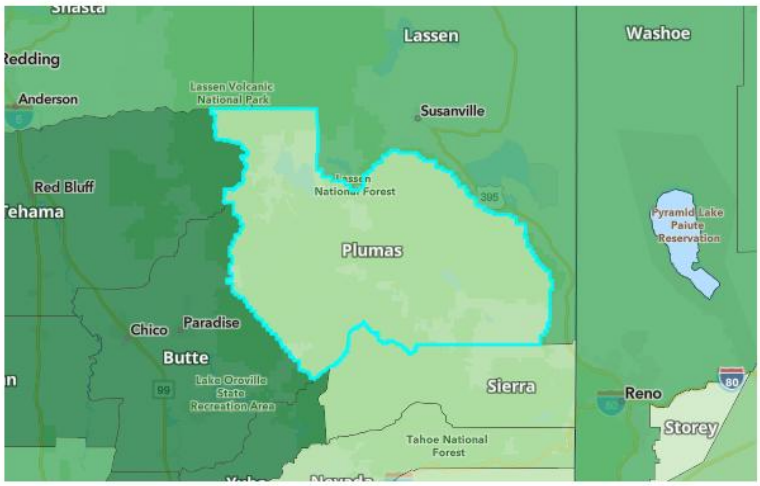
Hazard Type	Overall Rating
Avalanche	--
Coastal Flooding	--
Cold Wave	No Rating
Drought	Relatively Moderate
Earthquake	Relatively High
Hail	Relatively Low
Heat Wave	Very Low
Hurricane	--
Ice Storm	--
Landslide	Very Low
Lightning	Very High
Riverine Flooding	Relatively Moderate
Strong Wind	Relatively Moderate
Tornado	Very Low
Tsunami	--
Volcanic Activity	Relatively Moderate
Wildfire	Relatively High
Winter Weather	Very Low

Expected Annual Loss Rate

Hazard Type	Building EAL Rate (per building value)	Population EAL Rate (per population)	Agriculture EAL Rate (per agriculture value)
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	--	--	--
Drought	--	--	$1 per $29.63
Earthquake	$1 per $1.68K	1 per 403.70K	--
Hail	$1 per $1.44B	1 per 55.30M	$1 per $217.71K
Heat Wave	$1 per $661.20M	1 per 29.99M	$1 per $21.52K
Hurricane	--	--	--
Ice Storm	--	--	--
Landslide	$1 per $194.75K	1 per 1.20M	--
Lightning	$1 per $7.12M	1 per 3.01M	--
Riverine Flooding	$1 per $4.44K	1 per 93.69M	$1 per $735.70
Strong Wind	$1 per $611.83K	1 per 184.39M	$1 per $59.97K
Tornado	$1 per $246.20K	1 per 59.57M	$1 per $521.23K
Tsunami	--	--	--
Volcanic Activity	$1 per $60.08K	1 per 26.36M	--
Wildfire	$1 per $1.08K	1 per 4.93M	$1 per $33.57K
Winter Weather	$1 per $4.04M	1 per 8.44M	$1 per $38.44B

Social Vulnerability

Social groups in **Plumas County, CA** have a **Relatively Low** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



Score	39.72

National Percentile
39.72

Percentile Within California
15.50

0 100

40% of U.S. counties have a lower Social Vulnerability

16% of counties in California have a lower Social Vulnerability

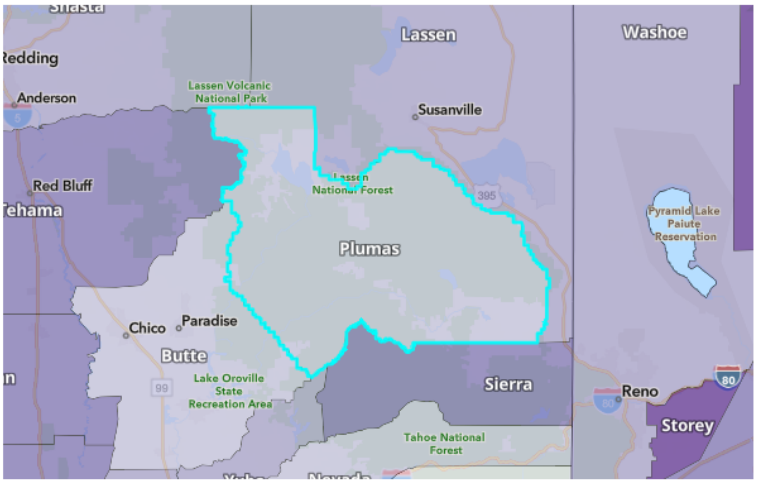
Social Vulnerability Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

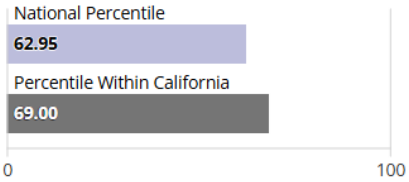
Data Unavailable

Community Resilience

Communities in **Plumas County, CA** have a **Relatively High** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.



Score **62.95**



37% of U.S. counties have a higher Community Resilience

31% of counties in California have a higher Community Resilience

Community Resilience Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at **hazards.fema.gov/nri/map**.

Visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Social Vulnerability} \div \text{Community Resilience}$$

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit hazards.fema.gov/nri/determining-risk.

Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

> **Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio**

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/expected-annual-loss**.

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

For more information, visit **hazards.fema.gov/nri/social-vulnerability**.

Calculating Community Resilience

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit **hazards.fema.gov/nri/community-resilience**.

How to Take Action

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit **hazards.fema.gov/nri/take-action**.

Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the **Contact Us** page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

The National Risk Index Contact Us page is available at **hazards.fema.gov/nri/contact-us**.

Appendix I Hazus Reports

The following pages contain the full reports for the Hazus earthquake runs for the Plumas County Planning Area. This includes:

- Great Valley 6.53 Magnitude Deterministic Scenario
- Hat Creek-McArthuer-Mayfield 7.29 Magnitude Deterministic Scenario
- Warm Spring Valley 9.92 Magnitude Deterministic Scenario

Hazus: Earthquake Global Risk Report

Region Name: Plumas2025

Earthquake Scenario: Great Valley 03a Dunnigan Hills

Print Date: April 29, 2025

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,617.63 square miles and contains 7 census tracts. There are over 9 thousand households in the region which has a total population of 19,790 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 8,405 (millions of dollars). Approximately 90.00 % of the buildings (and 73.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,290 and 6,107 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 8,405 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 87 beds. There are 18 schools, 28 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 8,397.00 (millions of dollars). This inventory includes over 179.58 miles of highways, 164 bridges, 11,245.57 miles of pipes.

Table 1: Transportation System Lifeline Inventory

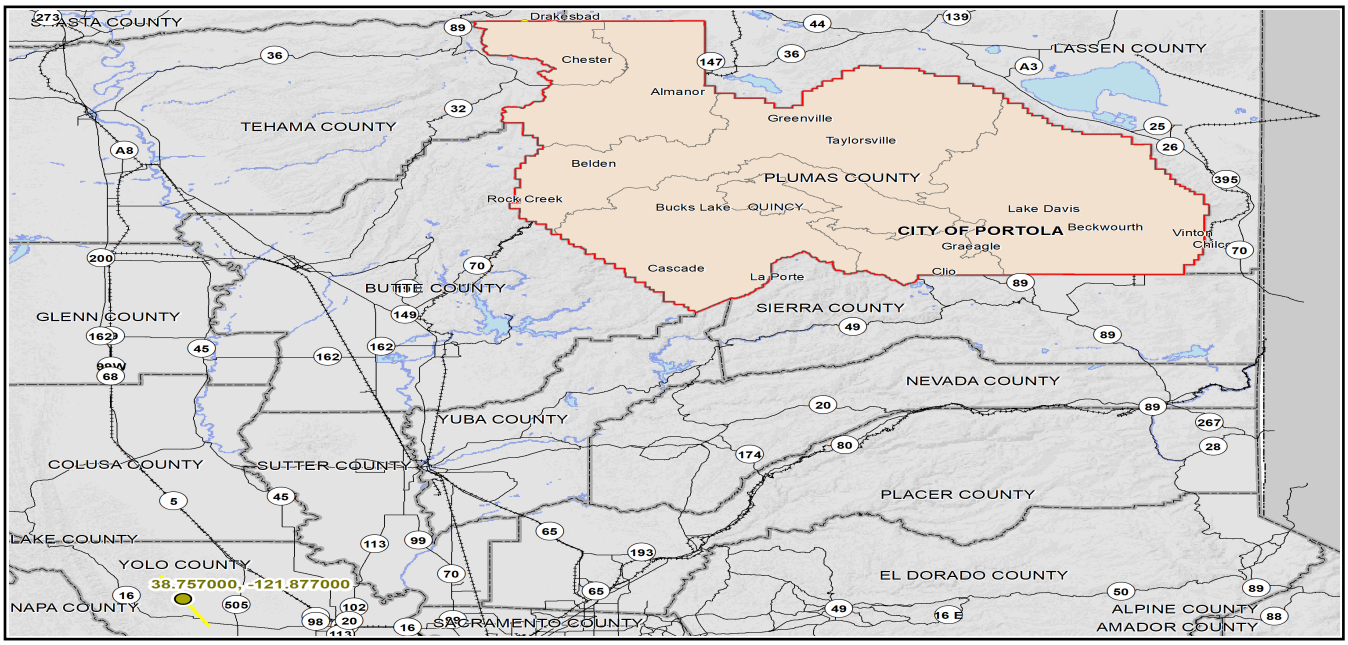
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	164	239.9915
	Segments	16	1005.2073
	Tunnels	2	16.2598
		Subtotal	**1261.4586**
Railways	Bridges	99	563.3100
	Facilities	0	0.0000
	Segments	88	411.4000
	Tunnels	0	0.0000
		Subtotal	**974.7100**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	7	37.1000
	Runways	3	17.3344
		Subtotal	**54.4344**
		Total	**2,290.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	180.9810
	Facilities	1	39.2940
	Pipelines	0	0.0000
		Subtotal	**220.2750**
Waste Water	Distribution Lines	NA	108.5886
	Facilities	4	687.8072
	Pipelines	0	0.0000
		Subtotal	**796.3958**
Natural Gas	Distribution Lines	NA	72.3924
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**72.3924**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	10	5018.0573
		Subtotal	**5018.0573**
Communication	Facilities	4	0.4720
		Subtotal	**0.4720**
		Total	**6,107.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	Great Valley 03a Dunnigan Hills
Type of Earthquake	Source
Fault Name	Great Valley 3
Historical Epicenter ID #	231
Probabilistic Return Period	NA
Longitude of Epicenter	-122.05
Latitude of Epicenter	38.75
Earthquake Magnitude	6.53
Depth (km)	7.00
Rupture Length (Km)	17.94
Rupture Orientation (degrees)	0.00
Attenuation Function	West US, Extensional 2008 - Reverse

Direct Earthquake Damage

Building Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

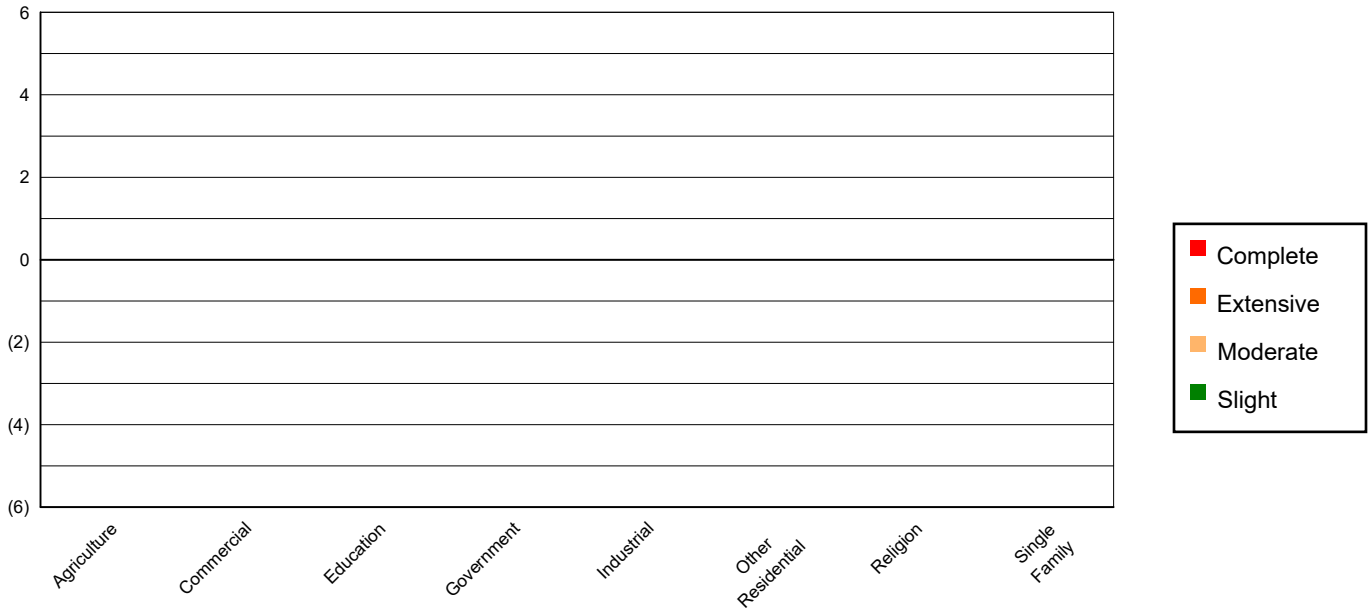


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	84.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	1215.00	7.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	26.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	45.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	184.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Residential	5032.00	30.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Religion	30.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single Family	9877.00	59.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**16,493**		**0**		**0**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	13943.69	84.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel	453.12	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Concrete	570.71	3.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Precast	223.06	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RM	663.31	4.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
URM	70.11	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MH	569.00	3.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**16,493**		**0**		**0**		**0**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 86 hospital beds (100.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	0	0	3
Schools	18	0	0	18
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	28	0	0	28

Transportation Lifeline Damage

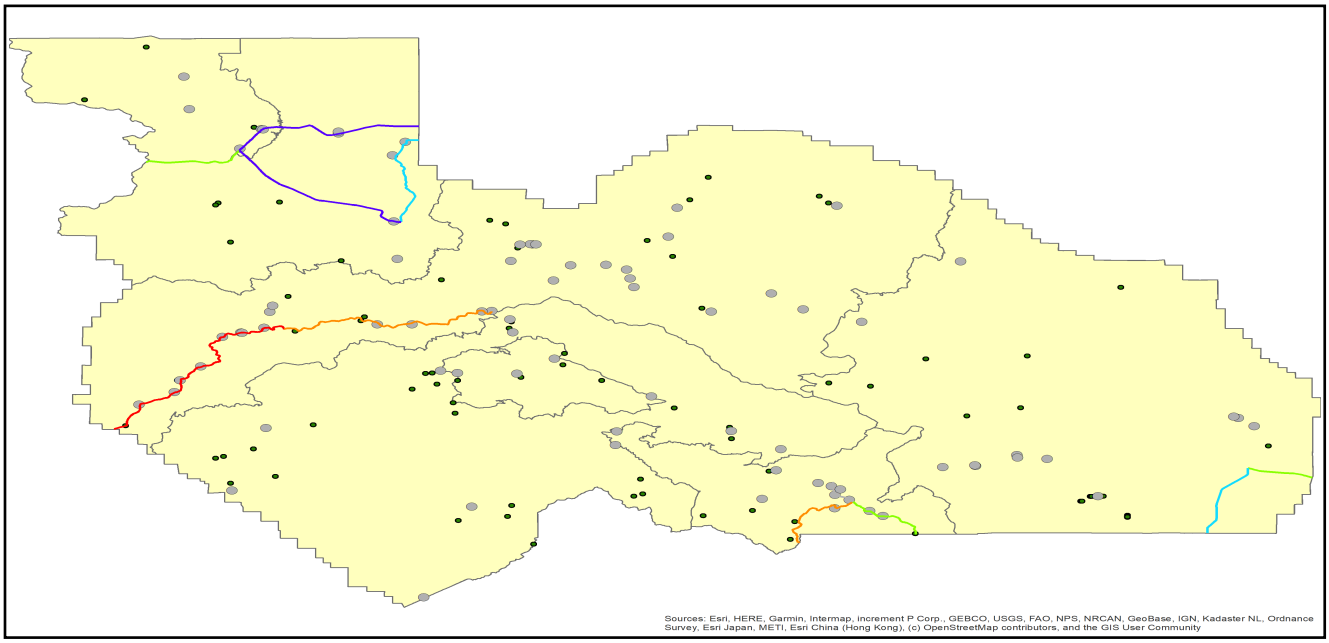


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	16	0	0	16	16
	Bridges	164	0	0	164	164
	Tunnels	2	0	0	2	2
Railways	Segments	88	0	0	88	88
	Bridges	99	0	0	99	99
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	7	0	0	7	7
	Runways	3	0	0	3	3

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	4	0	0	4	4
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	10	0	0	10	10
Communication	4	0	0	4	4

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	5,623	5	1
Waste Water	3,374	3	1
Natural Gas	2,249	1	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	9,216	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

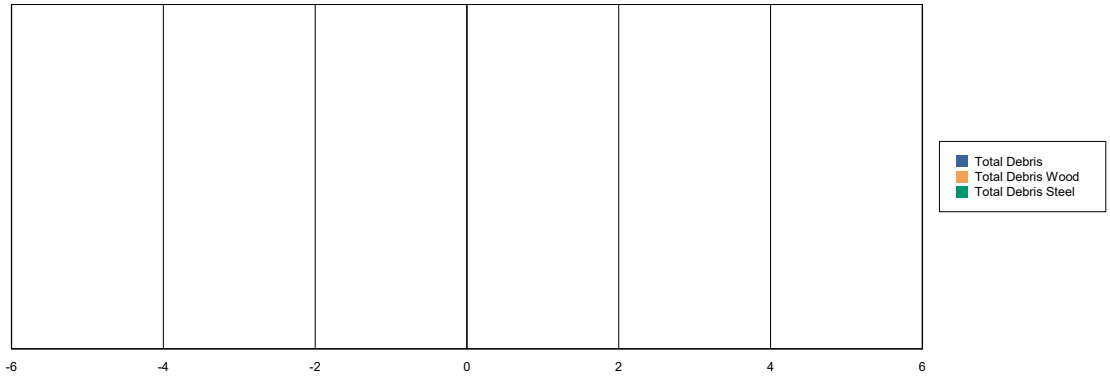
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, Brick/Wood comprises % of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
		0.00	0 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 19,790) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter

Displaced households as a result of the earthquake	Persons seeking temporary public shelter
0	0

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.00	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.00	0.00	0.00	0.00
	Other-Residential	0.00	0.00	0.00	0.00
	Single Family	0.00	0.00	0.00	0.00
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0.00	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.00	0.00	0.00	0.00
	Other-Residential	0.00	0.00	0.00	0.00
	Single Family	0.00	0.00	0.00	0.00
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0.00	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.00	0.00	0.00	0.00
	Other-Residential	0.00	0.00	0.00	0.00
	Single Family	0.00	0.00	0.00	0.00
	Total	**0**	**0**	**0**	**0**

Economic Loss

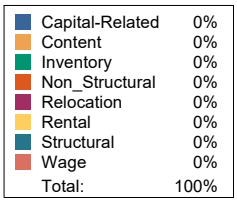
The total economic loss estimated for the earthquake is 1.80 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.00 (millions of dollars); 0 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 0 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

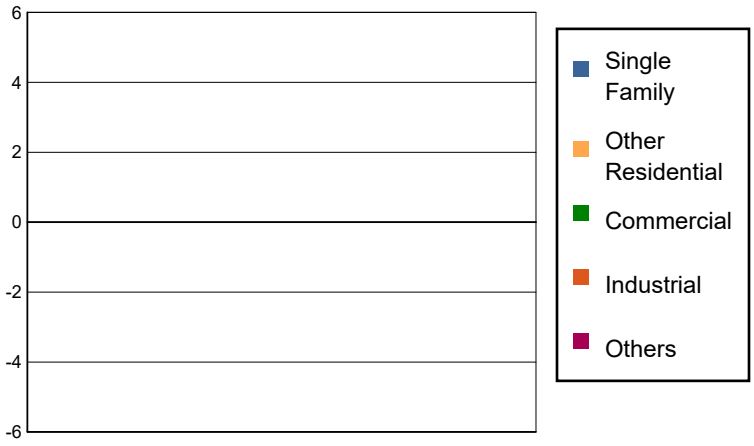


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Capital-Related	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Rental	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Relocation	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Subtotal	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**
Capital Stock Losses							
	Structural	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Non_Structural	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Content	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Inventory	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Subtotal	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1005.2073	0.0000	0.00
	Bridges	239.9915	0.0000	0.00
	Tunnels	16.2598	0.0000	0.00
	Subtotal	**1261.4586**	**0.0000**	
Railways	Segments	411.4000	0.0000	0.00
	Bridges	563.3100	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**974.7100**	**0.0000**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	37.1000	0.0215	0.06
	Runways	17.3344	0.0000	0.00
	Subtotal	**54.4344**	**0.0215**	
	Total	**2,290.60**	**0.02**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	39.2940	0.0000	0.00
	Distribution Lines	180.9810	0.0232	0.01
	Subtotal	**220.2750**	**0.0232**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	687.8072	0.0026	0.00
	Distribution Lines	108.5886	0.0117	0.01
	Subtotal	**796.3958**	**0.0143**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	72.3924	0.0040	0.01
	Subtotal	**72.3924**	**0.0040**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	5018.0573	1.7396	0.03
	Subtotal	**5018.0573**	**1.7396**	
Communication	Facilities	0.4720	0.0000	0.00
	Subtotal	**0.4720**	**0.0000**	
	Total	**6,107.59**	**1.78**	

Appendix A: County Listing for the Region

Plumas,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Plumas	19,790	6,128	2,276	8,405
Total Region		**19,790**	**6,128**	**2,276**	**8,405**

Hazus: Earthquake Global Risk Report

Region Name: Plumas2025

Earthquake Scenario: HC-MAC-MAY 7.29

Print Date: April 29, 2025

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,617.63 square miles and contains 7 census tracts. There are over 9 thousand households in the region which has a total population of 19,790 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 8,405 (millions of dollars). Approximately 90.00 % of the buildings (and 73.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,290 and 6,107 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 8,405 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 87 beds. There are 18 schools, 28 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 8,397.00 (millions of dollars). This inventory includes over 179.58 miles of highways, 164 bridges, 11,245.57 miles of pipes.

Table 1: Transportation System Lifeline Inventory

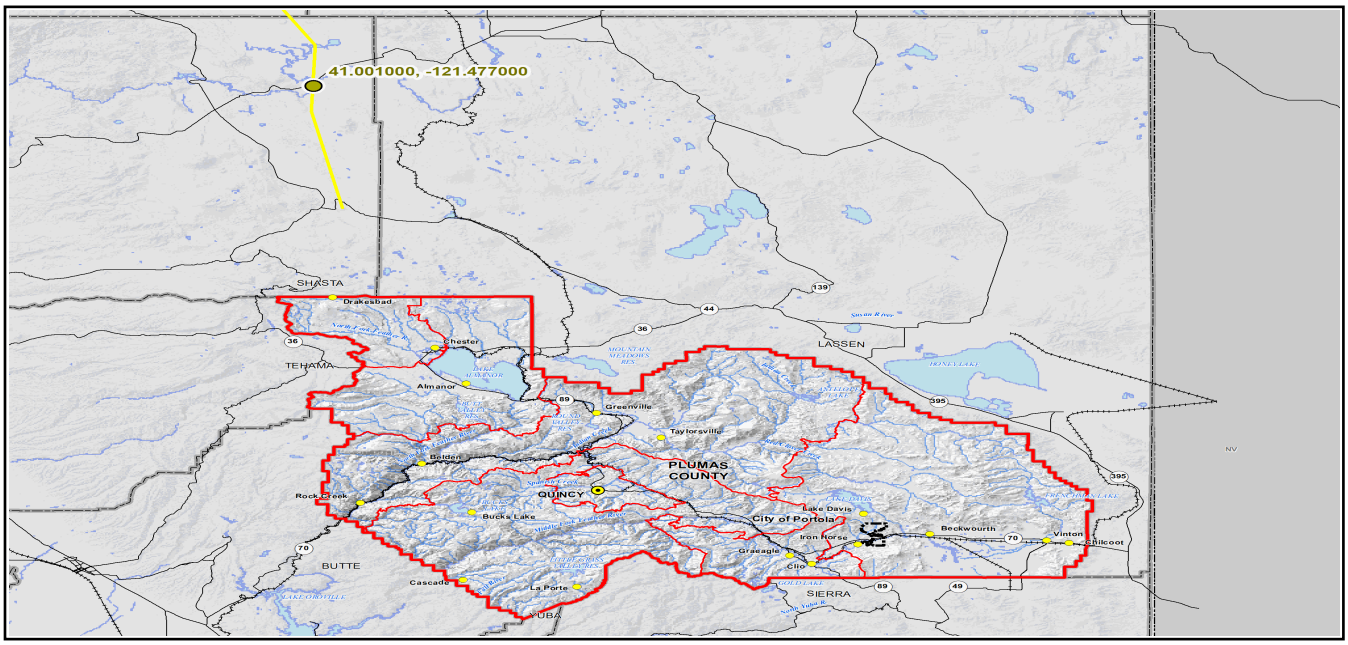
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	164	239.9915
	Segments	16	1005.2073
	Tunnels	2	16.2598
		Subtotal	**1261.4586**
Railways	Bridges	99	563.3100
	Facilities	0	0.0000
	Segments	88	411.4000
	Tunnels	0	0.0000
		Subtotal	**974.7100**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	7	37.1000
	Runways	3	17.3344
		Subtotal	**54.4344**
		Total	**2,290.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	180.9810
	Facilities	1	39.2940
	Pipelines	0	0.0000
		Subtotal	**220.2750**
Waste Water	Distribution Lines	NA	108.5886
	Facilities	4	687.8072
	Pipelines	0	0.0000
		Subtotal	**796.3958**
Natural Gas	Distribution Lines	NA	72.3924
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**72.3924**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	10	5018.0573
		Subtotal	**5018.0573**
Communication	Facilities	4	0.4720
		Subtotal	**0.4720**
		Total	**6,107.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	HC-MAC-MAY 7.29
Type of Earthquake	Source
Fault Name	Hat Creek-McArthur-Mayfield
Historical Epicenter ID #	112
Probabilistic Return Period	NA
Longitude of Epicenter	-121.44
Latitude of Epicenter	41.00
Earthquake Magnitude	7.29
Depth (km)	0.00
Rupture Length (Km)	69.92
Rupture Orientation (degrees)	0.00
Attenuation Function	West US, Extensional 2008 - Normal

Direct Earthquake Damage

Building Damage

Hazus estimates that about 72 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

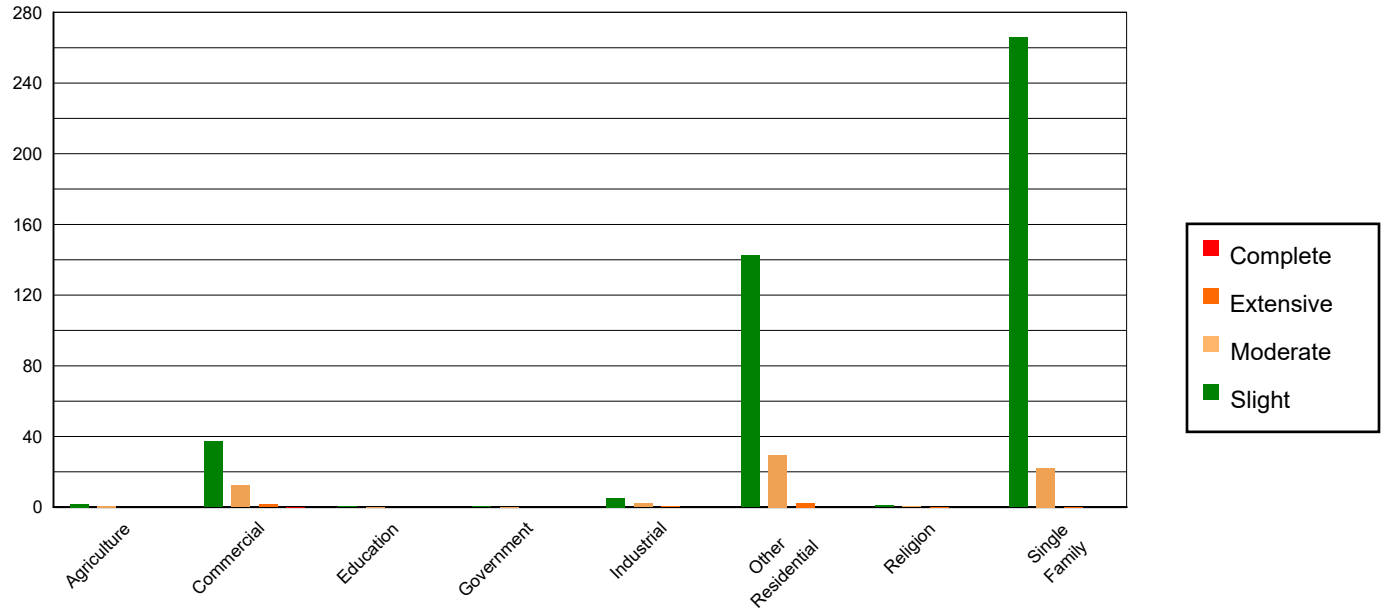


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	81.48	0.51	1.83	0.40	0.63	0.93	0.06	1.40	0.00	0.39
Commercial	1163.59	7.29	37.40	8.23	12.45	18.41	1.48	33.15	0.08	46.84
Education	25.61	0.16	0.29	0.06	0.09	0.14	0.01	0.24	0.00	0.00
Government	44.29	0.28	0.54	0.12	0.16	0.24	0.01	0.25	0.00	0.00
Industrial	176.54	1.11	5.17	1.14	2.03	3.00	0.25	5.68	0.01	4.62
Other Residential	4857.80	30.42	142.20	31.31	29.53	43.68	2.39	53.65	0.07	40.53
Religion	28.29	0.18	1.10	0.24	0.50	0.74	0.10	2.26	0.01	7.62
Single Family	9588.96	60.06	265.67	58.49	22.22	32.86	0.15	3.36	0.00	0.00
Total	**15,967**		**454**		**68**		**4**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	13543.42	84.82	368.53	81.14	31.47	46.55	0.27	5.95	0.00	0.17
Steel	425.82	2.67	17.56	3.87	8.52	12.60	1.19	26.80	0.03	15.09
Concrete	545.93	3.42	18.78	4.14	5.40	7.98	0.60	13.53	0.00	1.76
Precast	212.73	1.33	6.94	1.53	3.09	4.57	0.29	6.51	0.01	6.04
RM	643.86	4.03	13.00	2.86	5.86	8.67	0.58	13.11	0.00	0.00
URM	58.21	0.36	7.03	1.55	3.83	5.67	0.89	20.06	0.14	76.93
MH	536.59	3.36	22.35	4.92	9.43	13.95	0.63	14.05	0.00	0.00
Total	**15,967**		**454**		**68**		**4**		**0**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 82 hospital beds (95.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 99.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	0	0	3
Schools	18	0	0	18
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	28	0	0	28

Transportation Lifeline Damage

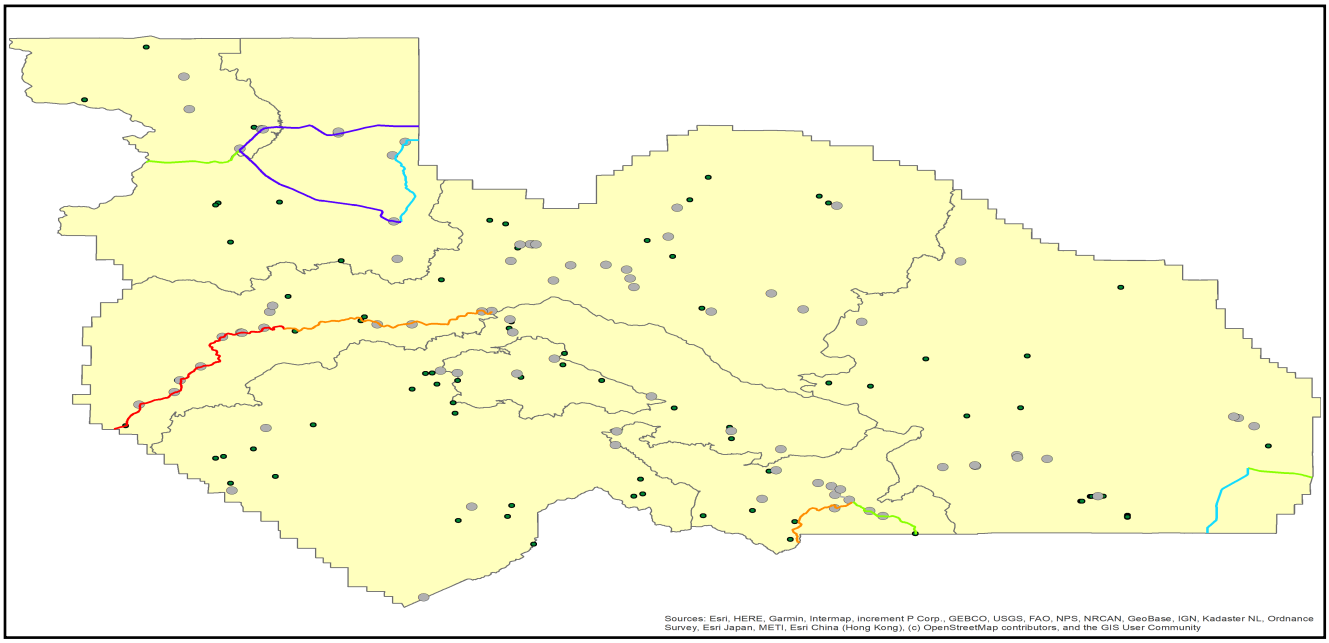


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	16	0	0	16	16
	Bridges	164	0	0	164	164
	Tunnels	2	0	0	2	2
Railways	Segments	88	0	0	88	88
	Bridges	99	0	0	99	99
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	7	0	0	7	7
	Runways	3	0	0	3	3

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	4	0	0	4	4
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	10	0	0	10	10
Communication	4	0	0	4	4

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	5,623	69	17
Waste Water	3,374	35	9
Natural Gas	2,249	12	3
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	9,216	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

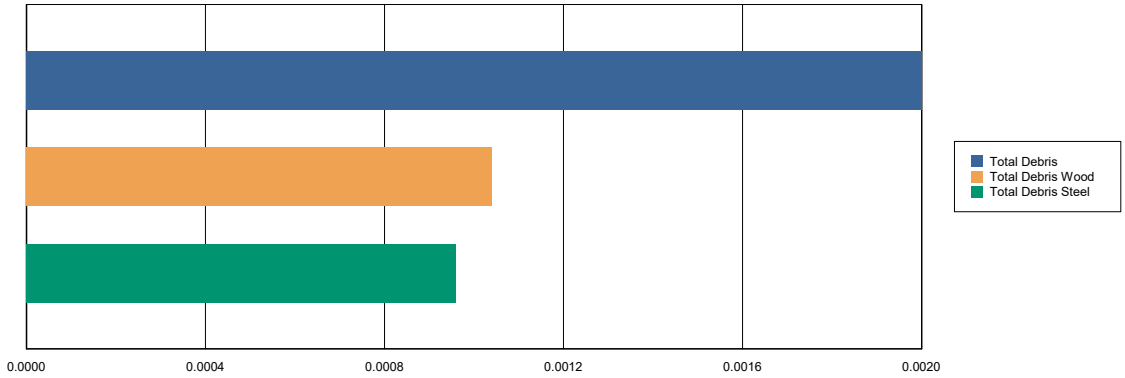
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 52.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 80 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



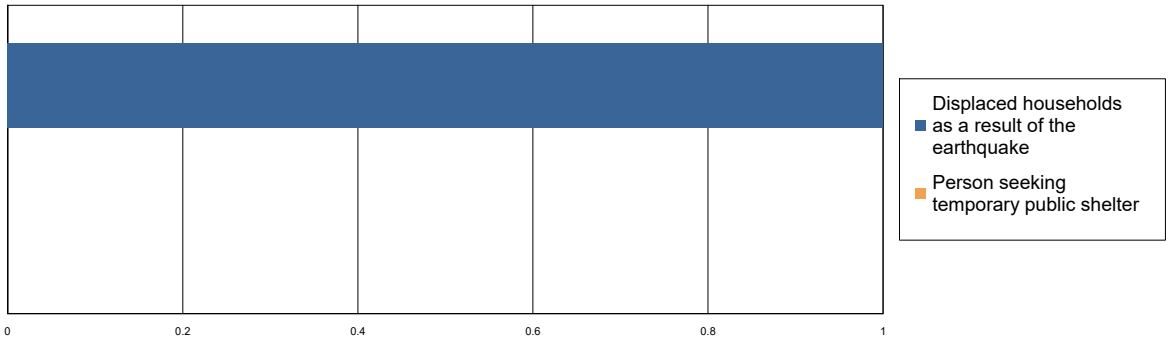
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.00	0.00	80 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 19,790) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1	0

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.01	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.01	0.00	0.00	0.00
	Other-Residential	0.36	0.03	0.00	0.00
	Single Family	0.15	0.01	0.00	0.00
	Total	**1**	**0**	**0**	**0**
2 PM	Commercial	0.57	0.07	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.11	0.01	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.05	0.00	0.00	0.00
	Other-Residential	0.13	0.01	0.00	0.00
	Single Family	0.06	0.00	0.00	0.00
	Total	**1**	**0**	**0**	**0**
5 PM	Commercial	0.35	0.04	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.02	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.03	0.00	0.00	0.00
	Other-Residential	0.13	0.01	0.00	0.00
	Single Family	0.06	0.00	0.00	0.00
	Total	**1**	**0**	**0**	**0**

Economic Loss

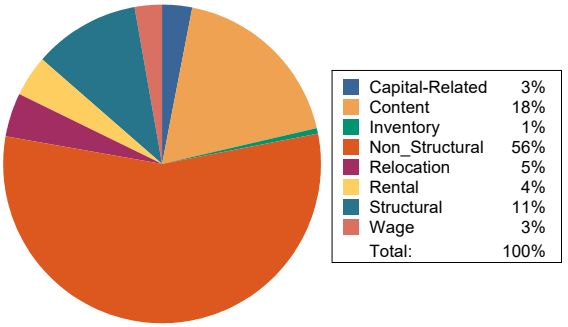
The total economic loss estimated for the earthquake is 154.05 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 19.39 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 57 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

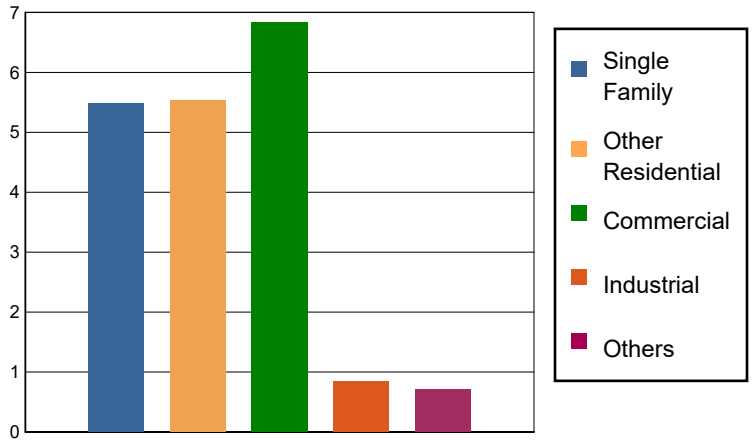


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0511	0.4560	0.0088	0.0200	0.5359
	Capital-Related	0.0000	0.0217	0.5779	0.0052	0.0048	0.6096
	Rental	0.0550	0.3306	0.3689	0.0066	0.0093	0.7704
	Relocation	0.1555	0.2181	0.4169	0.0432	0.0678	0.9015
	Subtotal	**0.2105**	**0.6215**	**1.8197**	**0.0638**	**0.1019**	**2.8174**
Capital Stock Losses							
	Structural	0.6722	0.5198	0.6987	0.1114	0.1249	2.1270
	Non_Structural	3.6097	3.5713	2.8805	0.3927	0.3209	10.7751
	Content	0.9826	0.8129	1.3804	0.2417	0.1360	3.5536
	Inventory	0.0000	0.0000	0.0575	0.0311	0.0247	0.1133
	Subtotal	**5.2645**	**4.9040**	**5.0171**	**0.7769**	**0.6065**	**16.5690**
	Total	**5.48**	**5.53**	**6.84**	**0.84**	**0.71**	**19.39**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1005.2073	0.0000	0.00
	Bridges	239.9915	0.0352	0.01
	Tunnels	16.2598	0.0000	0.00
	Subtotal	**1261.4586**	**0.0352**	
Railways	Segments	411.4000	0.0000	0.00
	Bridges	563.3100	0.0023	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**974.7100**	**0.0023**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	37.1000	1.1534	3.11
	Runways	17.3344	0.0000	0.00
	Subtotal	**54.4344**	**1.1534**	
	Total	**2,290.60**	**1.19**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	39.2940	0.0108	0.03
	Distribution Lines	180.9810	0.3110	0.17
	Subtotal	**220.2750**	**0.3218**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	687.8072	4.0013	0.58
	Distribution Lines	108.5886	0.1562	0.14
	Subtotal	**796.3958**	**4.1575**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	72.3924	0.0535	0.07
	Subtotal	**72.3924**	**0.0535**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	5018.0573	128.9347	2.57
	Subtotal	**5018.0573**	**128.9347**	
Communication	Facilities	0.4720	0.0038	0.81
	Subtotal	**0.4720**	**0.0038**	
	Total	**6,107.59**	**133.47**	

Appendix A: County Listing for the Region

Plumas,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Plumas	19,790	6,128	2,276	8,405
Total Region		**19,790**	**6,128**	**2,276**	**8,405**

Hazus: Earthquake Global Risk Report

Region Name: Plumas2025

Earthquake Scenario: HONEY LAKE 7.03

Print Date: April 28, 2025

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,617.63 square miles and contains 7 census tracts. There are over 9 thousand households in the region which has a total population of 19,790 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 8,405 (millions of dollars). Approximately 90.00 % of the buildings (and 73.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,290 and 6,107 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 8,405 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 87 beds. There are 18 schools, 28 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 8,397.00 (millions of dollars). This inventory includes over 179.58 miles of highways, 164 bridges, 11,245.57 miles of pipes.

Table 1: Transportation System Lifeline Inventory

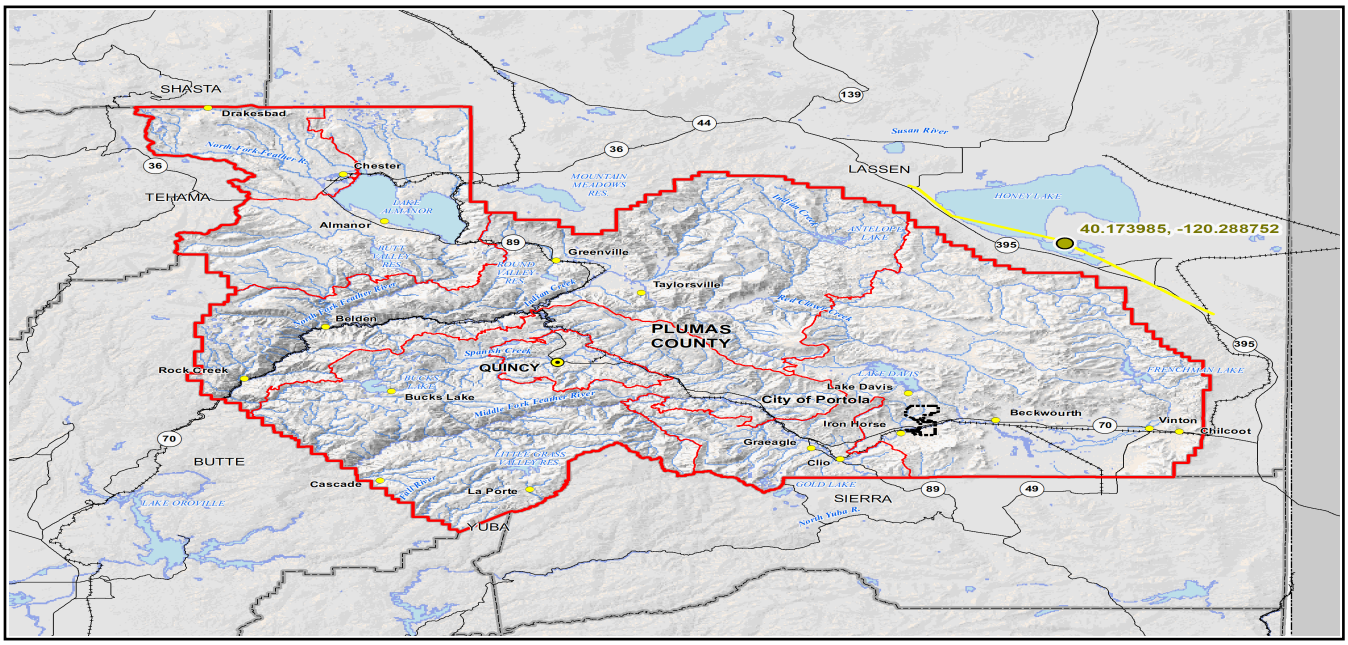
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	164	239.9915
	Segments	16	1005.2073
	Tunnels	2	16.2598
		Subtotal	**1261.4586**
Railways	Bridges	99	563.3100
	Facilities	0	0.0000
	Segments	88	411.4000
	Tunnels	0	0.0000
		Subtotal	**974.7100**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	7	37.1000
	Runways	3	17.3344
		Subtotal	**54.4344**
		Total	**2,290.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	180.9810
	Facilities	1	39.2940
	Pipelines	0	0.0000
		Subtotal	**220.2750**
Waste Water	Distribution Lines	NA	108.5886
	Facilities	4	687.8072
	Pipelines	0	0.0000
		Subtotal	**796.3958**
Natural Gas	Distribution Lines	NA	72.3924
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**72.3924**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	10	5018.0573
		Subtotal	**5018.0573**
Communication	Facilities	4	0.4720
		Subtotal	**0.4720**
		Total	**6,107.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	HONEY LAKE 7.03
Type of Earthquake	Source
Fault Name	Honey Lak
Historical Epicenter ID #	110
Probabilistic Return Period	NA
Longitude of Epicenter	-120.29
Latitude of Epicenter	40.17
Earthquake Magnitude	7.03
Depth (km)	0.00
Rupture Length (Km)	44.90
Rupture Orientation (degrees)	0.00
Attenuation Function	West US, Extensional 2008 - Strike Slip

Direct Earthquake Damage

Building Damage

Hazus estimates that about 215 buildings will be at least moderately damaged. This is over 1.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

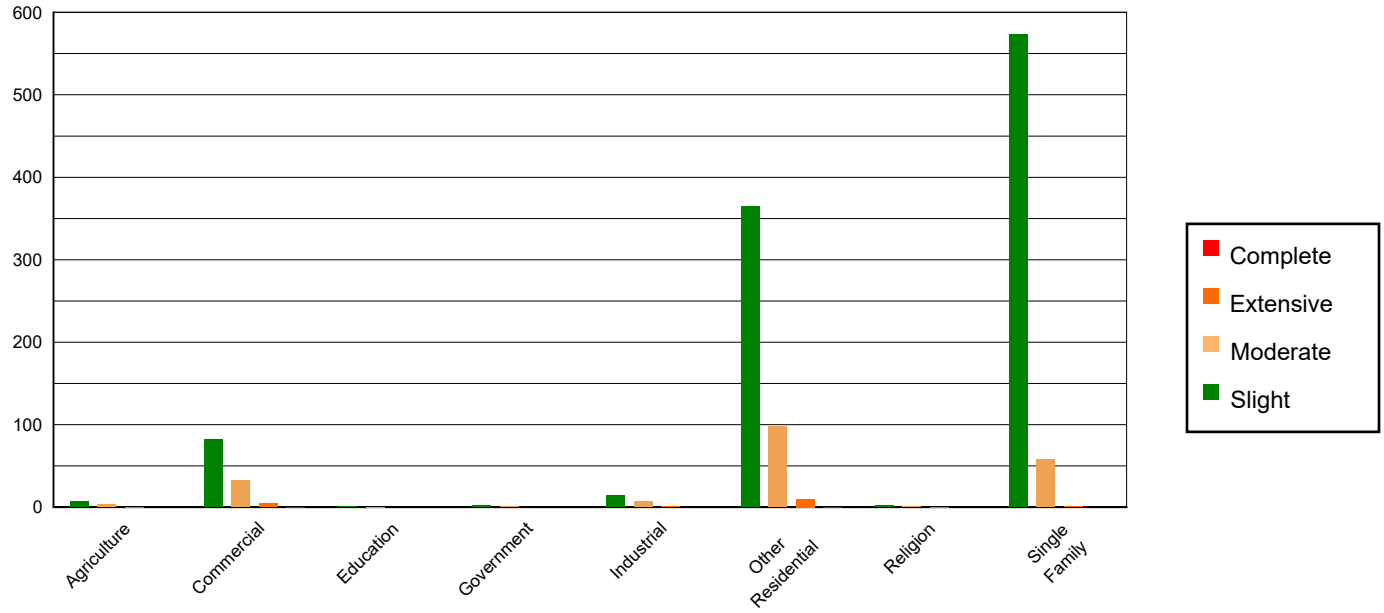


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	73.69	0.48	7.25	0.69	2.73	1.37	0.32	1.92	0.02	3.56
Commercial	1096.08	7.20	82.42	7.87	32.01	16.13	4.24	25.76	0.25	42.64
Education	24.88	0.16	0.78	0.07	0.29	0.15	0.05	0.29	0.00	0.08
Government	42.19	0.28	2.06	0.20	0.69	0.35	0.06	0.37	0.00	0.00
Industrial	162.38	1.07	14.31	1.37	6.46	3.26	0.81	4.91	0.04	6.87
Other Residential	4559.39	29.94	364.47	34.81	97.85	49.30	10.02	60.92	0.26	44.57
Religion	26.53	0.17	2.27	0.22	1.00	0.51	0.18	1.11	0.01	2.27
Single Family	9245.20	60.70	573.57	54.77	57.46	28.95	0.77	4.71	0.00	0.00
Total	**15,230**		**1,047**		**198**		**16**		**1**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	13030.53	85.56	826.92	78.97	85.04	42.85	1.19	7.26	0.00	0.36
Steel	392.18	2.58	37.23	3.56	20.65	10.40	2.94	17.90	0.11	19.10
Concrete	513.99	3.37	40.45	3.86	14.27	7.19	1.98	12.05	0.02	3.56
Precast	194.67	1.28	17.72	1.69	9.47	4.77	1.15	6.96	0.06	9.90
RM	615.18	4.04	30.94	2.95	15.37	7.74	1.83	11.10	0.00	0.00
URM	49.07	0.32	11.35	1.08	7.30	3.68	2.02	12.30	0.37	62.34
MH	434.71	2.85	82.54	7.88	46.39	23.37	5.33	32.42	0.03	4.74
Total	**15,230**		**1,047**		**198**		**16**		**1**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 81 hospital beds (93.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 99.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	0	0	3
Schools	18	0	0	18
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	28	0	0	28

Transportation Lifeline Damage

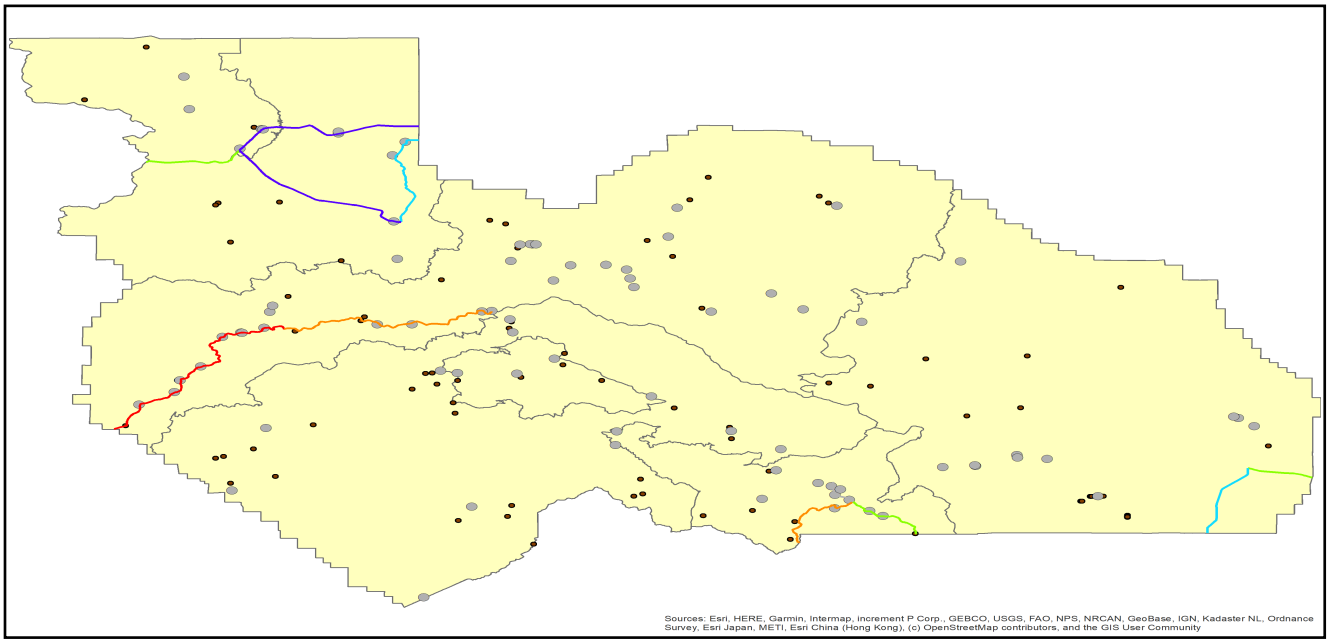


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	16	0	0	16	16
	Bridges	164	0	0	164	164
	Tunnels	2	0	0	2	2
Railways	Segments	88	0	0	88	88
	Bridges	99	0	0	99	99
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	7	0	0	7	7
	Runways	3	0	0	3	3

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	4	0	0	4	4
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	10	0	0	10	10
Communication	4	0	0	4	4

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	5,623	151	38
Waste Water	3,374	76	19
Natural Gas	2,249	26	6
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	9,216	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

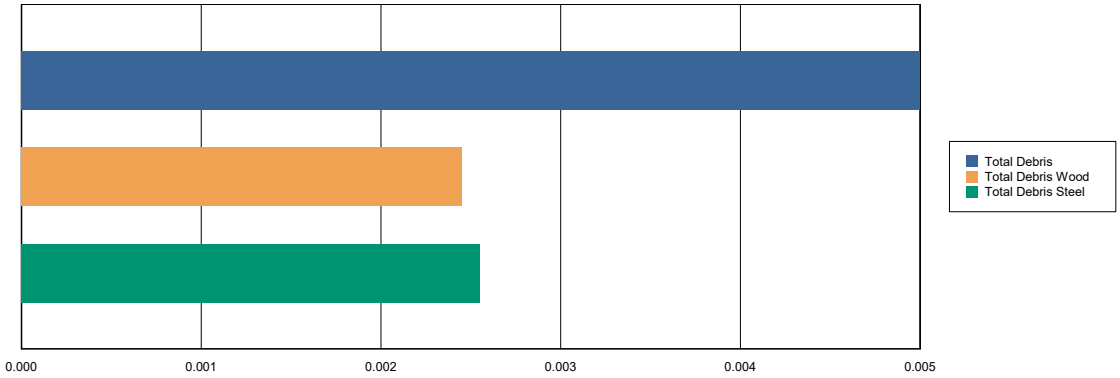
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 5,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 49.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 200 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



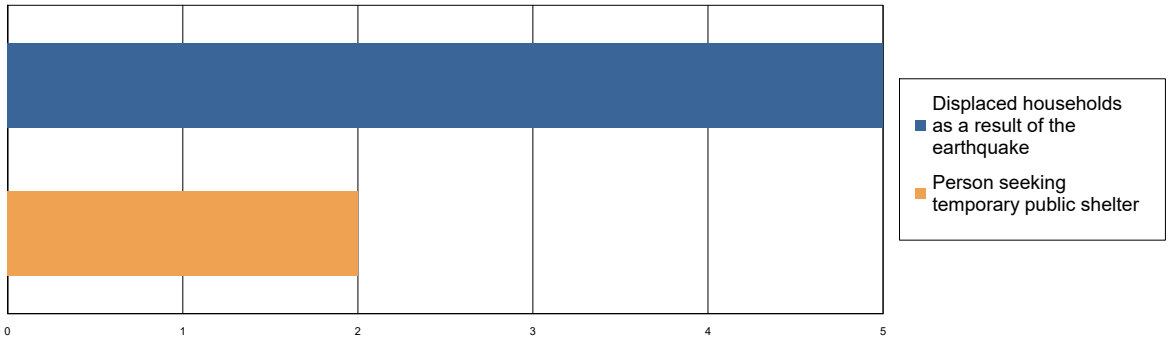
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.00	0.01	200 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 5 households to be displaced due to the earthquake. Of these, 2 people (out of a total population of 19,790) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
5	2

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.03	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.03	0.00	0.00	0.00
	Other-Residential	1.13	0.10	0.00	0.01
	Single Family	0.49	0.02	0.00	0.00
	Total	**2**	**0**	**0**	**0**
2 PM	Commercial	1.74	0.21	0.02	0.03
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.39	0.04	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.20	0.03	0.00	0.00
	Other-Residential	0.41	0.04	0.00	0.00
	Single Family	0.18	0.01	0.00	0.00
	Total	**3**	**0**	**0**	**0**
5 PM	Commercial	1.07	0.13	0.01	0.02
	Commuting	0.01	0.01	0.01	0.00
	Educational	0.09	0.01	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.12	0.02	0.00	0.00
	Other-Residential	0.42	0.04	0.00	0.00
	Single Family	0.18	0.01	0.00	0.00
	Total	**2**	**0**	**0**	**0**

Economic Loss

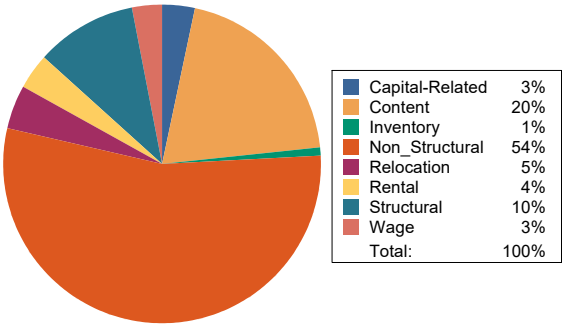
The total economic loss estimated for the earthquake is 179.64 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 50.87 (millions of dollars); 15 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 54 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

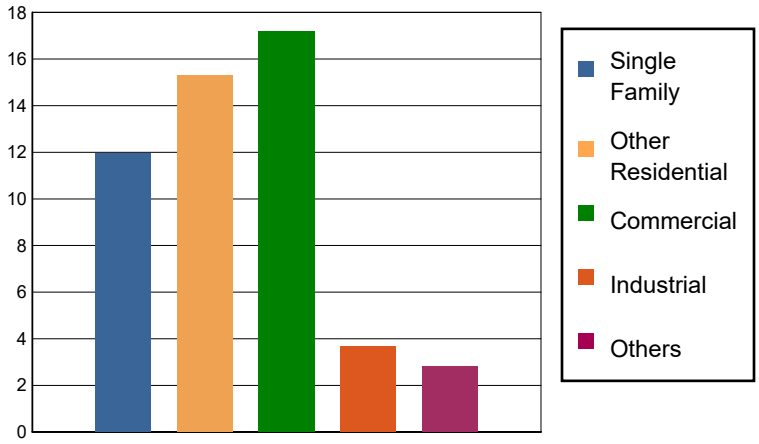


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0874	1.4027	0.0426	0.0755	1.6082
	Capital-Related	0.0000	0.0371	1.6134	0.0257	0.0141	1.6903
	Rental	0.1301	0.8162	0.8047	0.0265	0.0290	1.8065
	Relocation	0.3886	0.6255	0.9476	0.1570	0.2033	2.3220
	Subtotal	**0.5187**	**1.5662**	**4.7684**	**0.2518**	**0.3219**	**7.4270**
Capital Stock Losses							
	Structural	1.3987	1.3784	1.5292	0.4285	0.4260	5.1608
	Non_Structural	7.7135	9.8864	7.0592	1.7091	1.2423	27.6105
	Content	2.3080	2.4494	3.6276	1.1305	0.6427	10.1582
	Inventory	0.0000	0.0000	0.1816	0.1501	0.1832	0.5149
	Subtotal	**11.4202**	**13.7142**	**12.3976**	**3.4182**	**2.4942**	**43.4444**
	Total	**11.94**	**15.28**	**17.17**	**3.67**	**2.82**	**50.87**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1005.2073	0.0000	0.00
	Bridges	239.9915	0.3963	0.17
	Tunnels	16.2598	0.0000	0.00
	Subtotal	**1261.4586**	**0.3963**	
Railways	Segments	411.4000	0.0000	0.00
	Bridges	563.3100	0.0412	0.01
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**974.7100**	**0.0412**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	37.1000	1.9869	5.36
	Runways	17.3344	0.0000	0.00
	Subtotal	**54.4344**	**1.9869**	
	Total	**2,290.60**	**2.42**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	39.2940	1.5574	3.96
	Distribution Lines	180.9810	0.6783	0.37
	Subtotal	**220.2750**	**2.2357**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	687.8072	13.8481	2.01
	Distribution Lines	108.5886	0.3407	0.31
	Subtotal	**796.3958**	**14.1888**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	72.3924	0.1167	0.16
	Subtotal	**72.3924**	**0.1167**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	5018.0573	109.7887	2.19
	Subtotal	**5018.0573**	**109.7887**	
Communication	Facilities	0.4720	0.0143	3.03
	Subtotal	**0.4720**	**0.0143**	
	Total	**6,107.59**	**126.34**	

Appendix A: County Listing for the Region

Plumas,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Plumas	19,790	6,128	2,276	8,405
Total Region		**19,790**	**6,128**	**2,276**	**8,405**

Hazus: Earthquake Global Risk Report

Region Name: Plumas2025

Earthquake Scenario: Warm Springs Valley 6.92

Print Date: April 28, 2025

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Appendix A: County Listing for the Region

Appendix B: Regional Population and Building Value Data

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

California

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 2,617.63 square miles and contains 7 census tracts. There are over 9 thousand households in the region which has a total population of 19,790 peopleF. The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 16 thousand buildings in the region with a total building replacement value (excluding contents) of 8,405 (millions of dollars). Approximately 90.00 % of the buildings (and 73.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 2,290 and 6,107 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 16 thousand buildings in the region which have an aggregate total replacement value of 8,405 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 85% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 3 hospitals in the region with a total bed capacity of 87 beds. There are 18 schools, 28 fire stations, 2 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes no hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 8,397.00 (millions of dollars). This inventory includes over 179.58 miles of highways, 164 bridges, 11,245.57 miles of pipes.

Table 1: Transportation System Lifeline Inventory

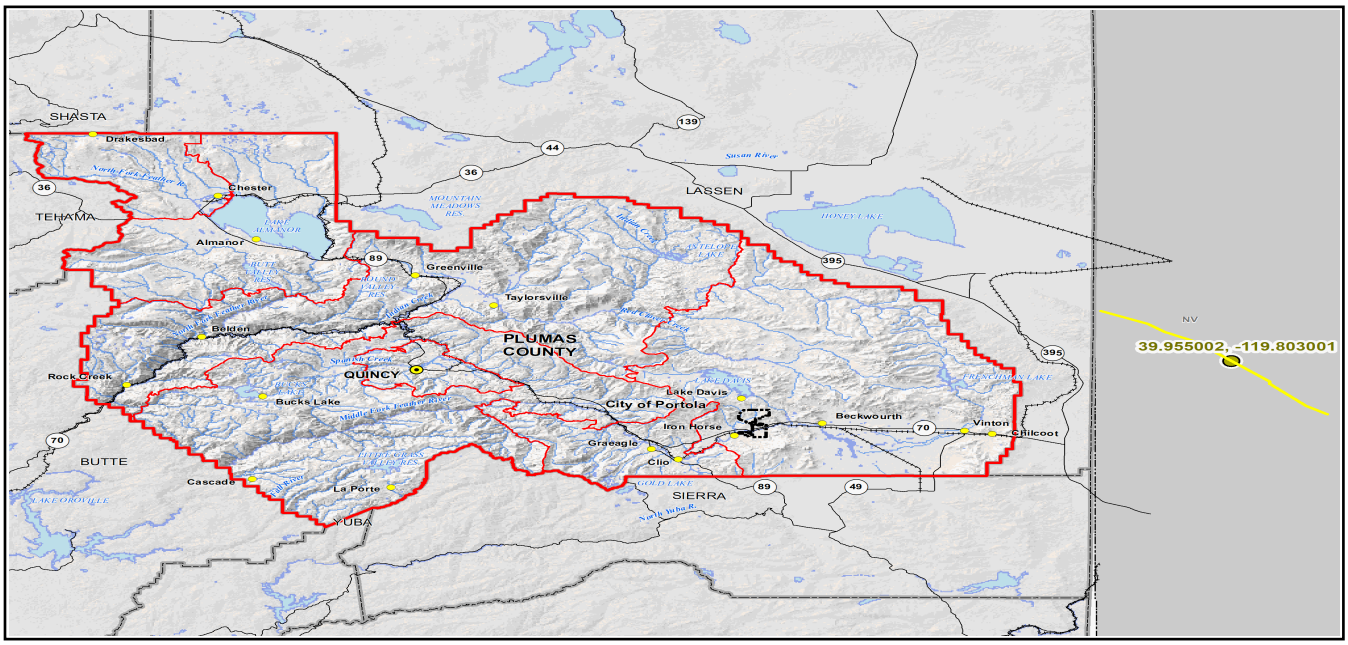
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	164	239.9915
	Segments	16	1005.2073
	Tunnels	2	16.2598
		Subtotal	**1261.4586**
Railways	Bridges	99	563.3100
	Facilities	0	0.0000
	Segments	88	411.4000
	Tunnels	0	0.0000
		Subtotal	**974.7100**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	0	0.0000
		Subtotal	**0.0000**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	7	37.1000
	Runways	3	17.3344
		Subtotal	**54.4344**
		Total	**2,290.60**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	180.9810
	Facilities	1	39.2940
	Pipelines	0	0.0000
		Subtotal	**220.2750**
Waste Water	Distribution Lines	NA	108.5886
	Facilities	4	687.8072
	Pipelines	0	0.0000
		Subtotal	**796.3958**
Natural Gas	Distribution Lines	NA	72.3924
	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**72.3924**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	10	5018.0573
		Subtotal	**5018.0573**
Communication	Facilities	4	0.4720
		Subtotal	**0.4720**
		Total	**6,107.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	Warm Springs Valley 6.92
Type of Earthquake	Source
Fault Name	Warm Springs Valley fault zone
Historical Epicenter ID #	622
Probabilistic Return Period	NA
Longitude of Epicenter	-119.80
Latitude of Epicenter	39.96
Earthquake Magnitude	6.92
Depth (km)	0.00
Rupture Length (Km)	37.22
Rupture Orientation (degrees)	0.00
Attenuation Function	West US, Extensional 2008 - Strike Slip

Direct Earthquake Damage

Building Damage

Hazus estimates that about 70 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

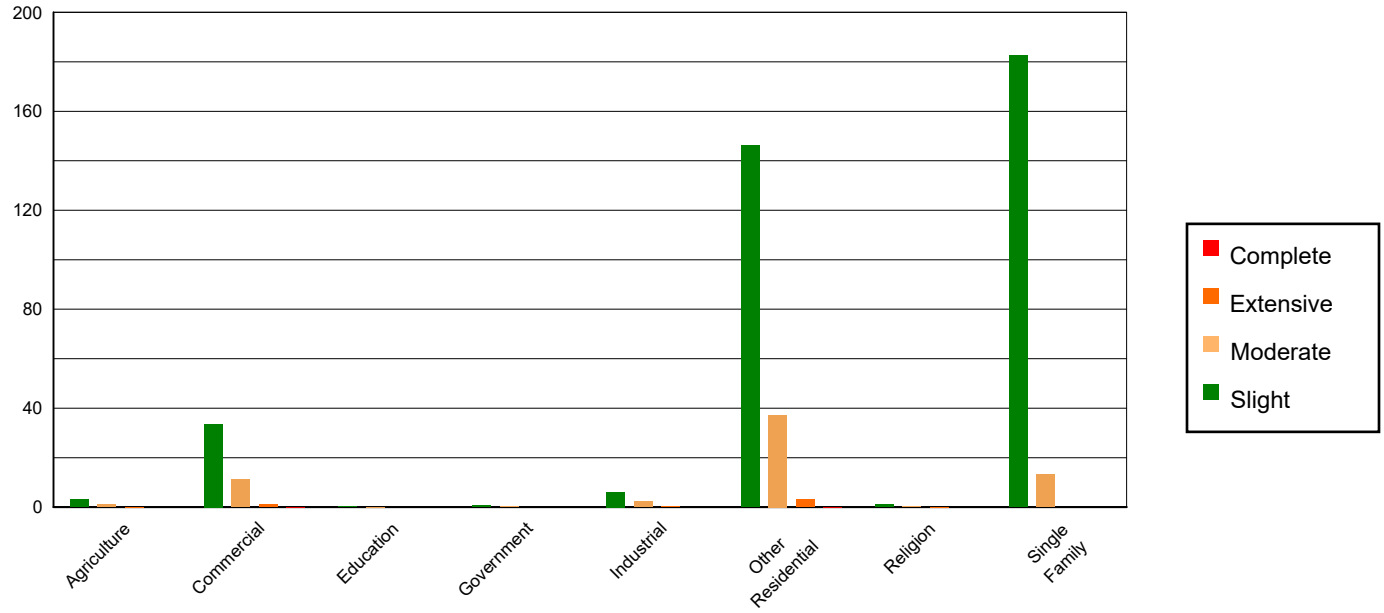


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	79.85	0.50	3.06	0.82	1.00	1.52	0.09	1.84	0.00	3.21
Commercial	1168.94	7.28	33.57	8.99	11.22	17.12	1.21	25.97	0.06	45.77
Education	25.67	0.16	0.24	0.07	0.07	0.11	0.01	0.18	0.00	0.00
Government	44.06	0.27	0.73	0.19	0.20	0.31	0.01	0.29	0.00	0.00
Industrial	175.45	1.09	6.10	1.63	2.23	3.41	0.21	4.57	0.01	4.54
Other Residential	4845.43	30.19	146.17	39.13	37.28	56.89	3.06	65.79	0.06	43.13
Religion	28.49	0.18	1.04	0.28	0.40	0.62	0.06	1.32	0.00	3.36
Single Family	9681.22	60.32	182.66	48.89	13.12	20.02	0.00	0.04	0.00	0.00
Total	**16,049**		**374**		**66**		**5**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	13655.08	85.08	268.76	71.94	19.85	30.28	0.01	0.21	0.00	0.00
Steel	428.97	2.67	16.27	4.35	7.15	10.92	0.71	15.28	0.01	8.67
Concrete	549.86	3.43	16.02	4.29	4.41	6.73	0.43	9.24	0.00	0.28
Precast	211.58	1.32	7.70	2.06	3.42	5.22	0.33	7.15	0.01	6.52
RM	645.07	4.02	12.43	3.33	5.32	8.12	0.49	10.51	0.00	0.00
URM	58.33	0.36	7.06	1.89	3.76	5.74	0.84	18.04	0.12	84.53
MH	500.20	3.12	45.35	12.14	21.62	32.98	1.84	39.56	0.00	0.00
Total	**16,049**		**374**		**66**		**5**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 87 hospital beds available for use. On the day of the earthquake, the model estimates that only 84 hospital beds (98.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service. By 30 days, 100.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	3	0	0	3
Schools	18	0	0	18
EOCs	1	0	0	1
PoliceStations	2	0	0	2
FireStations	28	0	0	28

Transportation Lifeline Damage

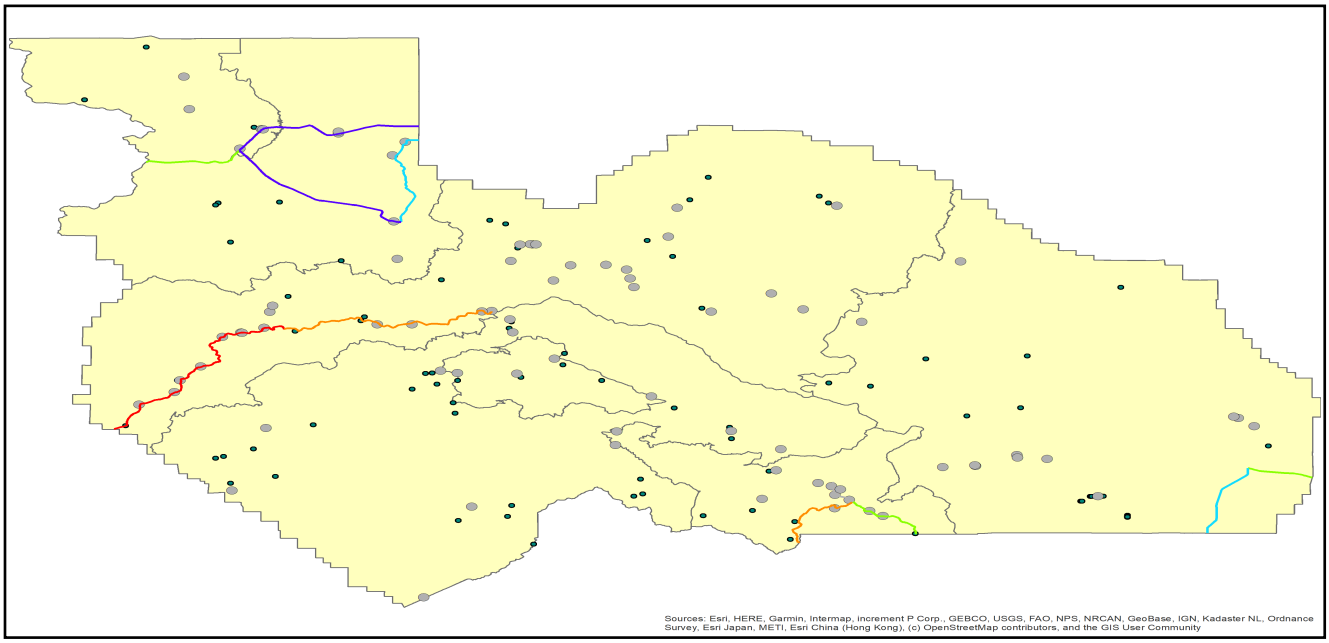


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	16	0	0	16	16
	Bridges	164	0	0	164	164
	Tunnels	2	0	0	2	2
Railways	Segments	88	0	0	88	88
	Bridges	99	0	0	99	99
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	7	0	0	7	7
	Runways	3	0	0	3	3

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	4	0	0	4	4
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	10	0	0	10	10
Communication	4	0	0	4	4

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	5,623	55	14
Waste Water	3,374	28	7
Natural Gas	2,249	10	2
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	9,216	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

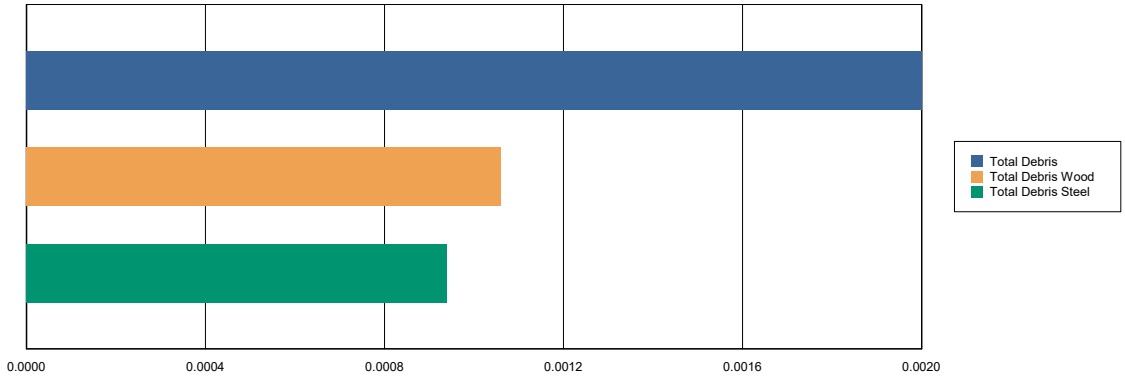
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 53.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 80 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



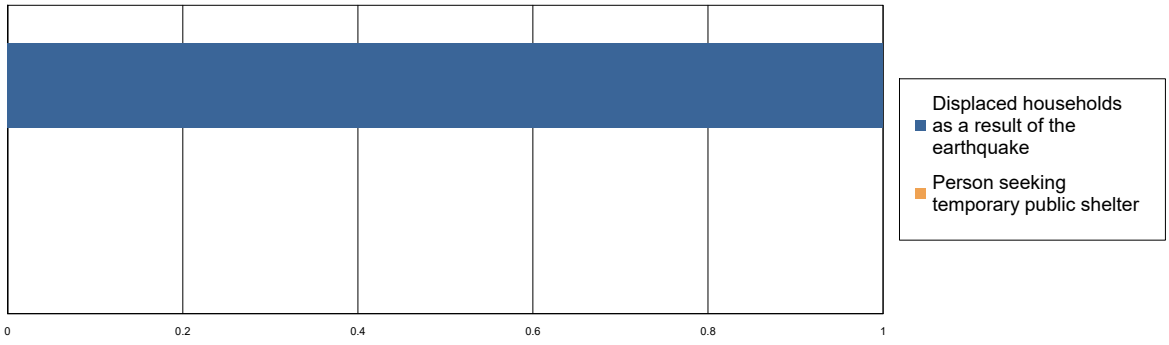
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.00	0.00	0.00	80 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 1 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 19,790) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
1	0

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.01	0.00	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.01	0.00	0.00	0.00
	Other-Residential	0.39	0.03	0.00	0.00
	Single Family	0.14	0.00	0.00	0.00
	Total	**1**	**0**	**0**	**0**
2 PM	Commercial	0.59	0.07	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.10	0.01	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.06	0.01	0.00	0.00
	Other-Residential	0.14	0.01	0.00	0.00
	Single Family	0.05	0.00	0.00	0.00
	Total	**1**	**0**	**0**	**0**
5 PM	Commercial	0.36	0.04	0.00	0.01
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.02	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.04	0.00	0.00	0.00
	Other-Residential	0.15	0.01	0.00	0.00
	Single Family	0.05	0.00	0.00	0.00
	Total	**1**	**0**	**0**	**0**

Economic Loss

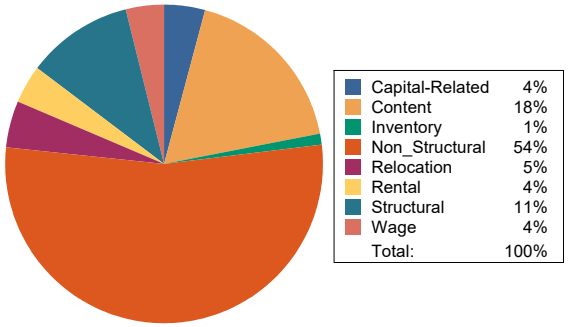
The total economic loss estimated for the earthquake is 31.20 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 15.16 (millions of dollars); 17 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 52 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

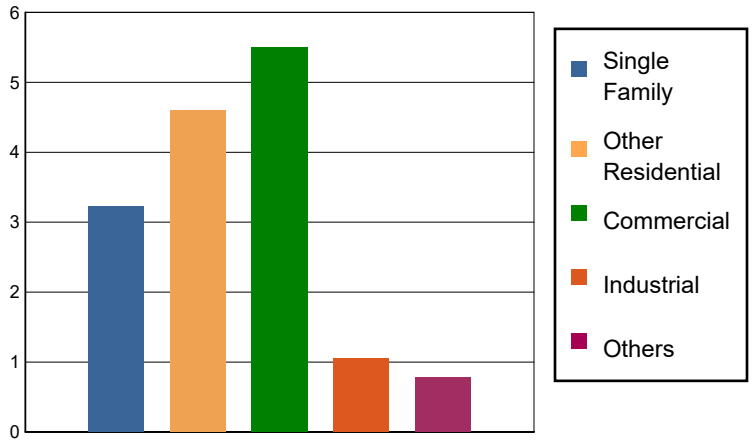


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.0302	0.5193	0.0152	0.0198	0.5845
	Capital-Related	0.0000	0.0128	0.6105	0.0091	0.0043	0.6367
	Rental	0.0324	0.2591	0.2818	0.0086	0.0076	0.5895
	Relocation	0.0864	0.2033	0.3103	0.0483	0.0583	0.7066
	Subtotal	**0.1188**	**0.5054**	**1.7219**	**0.0812**	**0.0900**	**2.5173**
Capital Stock Losses							
	Structural	0.3945	0.4650	0.5129	0.1408	0.1375	1.6507
	Non_Structural	2.1382	2.9806	2.2051	0.4869	0.3430	8.1538
	Content	0.5726	0.6536	1.0130	0.3030	0.1552	2.6974
	Inventory	0.0000	0.0000	0.0458	0.0406	0.0566	0.1430
	Subtotal	**3.1053**	**4.0992**	**3.7768**	**0.9713**	**0.6923**	**12.6449**
	Total	**3.22**	**4.60**	**5.50**	**1.05**	**0.78**	**15.16**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1005.2073	0.0000	0.00
	Bridges	239.9915	0.0391	0.02
	Tunnels	16.2598	0.0000	0.00
	Subtotal	**1261.4586**	**0.0391**	
Railways	Segments	411.4000	0.0000	0.00
	Bridges	563.3100	0.0050	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**974.7100**	**0.0050**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	37.1000	0.6783	1.83
	Runways	17.3344	0.0000	0.00
	Subtotal	**54.4344**	**0.6783**	
	Total	**2,290.60**	**0.72**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	39.2940	0.5690	1.45
	Distribution Lines	180.9810	0.2485	0.14
	Subtotal	**220.2750**	**0.8175**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	687.8072	4.7166	0.69
	Distribution Lines	108.5886	0.1248	0.11
	Subtotal	**796.3958**	**4.8414**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	72.3924	0.0428	0.06
	Subtotal	**72.3924**	**0.0428**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	5018.0573	9.6093	0.19
	Subtotal	**5018.0573**	**9.6093**	
Communication	Facilities	0.4720	0.0012	0.25
	Subtotal	**0.4720**	**0.0012**	
	Total	**6,107.59**	**15.31**	

Appendix A: County Listing for the Region

Plumas,CA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
California					
	Plumas	19,790	6,128	2,276	8,405
Total Region		**19,790**	**6,128**	**2,276**	**8,405**

Foster Morrison Consulting
6095 Zang Way
Arvada, CO 80004
303.717.7171