

Plumas County Local Hazard Mitigation Plan Update October 2020





June 23, 2021

Tracey Ferguson
Planning Director
Plumas County Planning Department
555 Main Street
Orology, CA 95971

Dear Ms. Ferguson:

The *Plumas County Local Hazard Mitigation Plan* was officially adopted by Plumas County on June 15, 2021 and submitted for review and approval to the Federal Emergency Management Agency (FEMA). The review is complete, and FEMA finds the plan to be in conformance with the Code of Federal Regulations, Title 44, Part 201, Section 6 (44 C.F.R. 201.6).

This plan approval ensures Plumas County's continued eligibility for funding under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities program (BRIC), and the Flood Mitigation Assistance (FMA) program. All requests for funding are evaluated individually according to eligibility and other program requirements. Approved hazard mitigation plans may also be eligible for points under the National Flood Insurance Program's Community Rating System (CRS).

FEMA's approval is for a period of five years, effective starting the date of this letter. Prior to **June 23, 2026**, Plumas County must review, revise, and submit their plan to FEMA for approval to maintain eligibility for grant funding. The enclosed plan review tool provides additional recommendations to incorporate into future plan updates.

If you have any questions regarding the planning or review processes, please contact the FEMA Region 9 Hazard Mitigation Planning Team at Region9.hazmit@fema.dhs.gov.

Sincerely,

KATHRYN J.
LIPIECKI

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Kathryn Lipiecki
Director, Mitigation Division
FEMA Region 9

Enclosure (1)

Plumas County Plan Review Tool, dated June 21, 2021

Local Hazard Mitigation Plan Approval Letter

June 21, 2021

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cc: Victoria LaMar-Haas, Hazard Mitigation Planning Chief, California Governor's Office of
Emergency Services
Jennifer Hogan, State Hazard Mitigation Officer, California Governor's Office of Emergency
Services
Alison Kearns, Chief, Risk Analysis Branch, FEMA Region 9



Executive Summary

This Plumas County 2020 Local Hazard Mitigation Plan (LHMP) Update serves to update the 2014 Federal Emergency Management Agency (FEMA) approved Plumas County LHMP. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Plumas County prepared this LHMP Update to the FEMA approved 2014 Plumas County LHMP in order to make the County and its residents less vulnerable to future hazard events. This LHMP Update demonstrates the community's 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' continued eligibility for certain federal disaster assistance: including the FEMA Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA).

This Plumas County 2020 LHMP Update is single jurisdiction plan that geographically covers the unincorporated area within Plumas County's jurisdictional boundaries (i.e., the Plumas County Planning Area).

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 natural 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. The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards.

LHMP 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 hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County will use to decrease vulnerability and increase resiliency and sustainability in the community.

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. The County followed a planning process prescribed by FEMA as detailed in Table ES-1.

Table ES-1 Local Hazard Mitigation Planning Process

DMA Process	Modified Community Rating System (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

Plumas County’s planning process began with the organizational phase to establish the Hazard Mitigation Planning Committee (HMPC). The HMPC is comprised of key County 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 by Plumas County followed by the development of a focused mitigation strategy. Once approved by the California Office of Emergency Services (Cal OES) and FEMA, this LHMP Update will be adopted and implemented by the County over the next five years.

Risk Assessment

The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the County, assessed the vulnerability of the Planning Area to these hazards, and examined the existing capabilities to mitigate the hazards.

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

Table ES-2 Plumas County Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Avalanche	Limited	Highly Likely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	—
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water shortage	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Significant	Occasional/ Unlikely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Levee Failure	Limited	Unlikely	Limited	Medium	Medium
Pandemic	Extensive	Likely	Critical	High	Low
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
Severe Weather: Winter Storms and Freeze	Extensive	Highly Likely	Negligible	Medium	Medium
Tree Mortality	Significant	Likely	Limited	Medium	High
Volcano	Extensive	Unlikely	Catastrophic	Low	Low
Wildfire	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					

Mitigation Strategy

Based on the results of the risk assessment, the HMPC developed a mitigation strategy for reducing the County's risk and vulnerability to hazards. The resulting mitigation strategy for the Plumas County Planning Area is comprised of LHMP goals and objectives and a mitigation action plan which includes a series of mitigation action projects and implementation measures. Based on the risk assessment, the HMPC identified goals and objectives for reducing the Plumas County Planning Area's vulnerability to hazards. The goals and objectives of this multi-hazard mitigation plan are:

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

Actions to support these goals are shown on Table ES-3.

Table ES-3 Plumas County Planning Area Mitigation Actions

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Multi-Hazard Actions					
Action 1. Integrate Local Hazard Mitigation Plan into Public Health & Safety Element of General Plan	New action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	New action	X	X	X	Public Information
Action 3. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access	New action	X	X	X	Structural Projects Emergency Services
Action 4. Companion Animal/Livestock/Horse/Equipment Trailer	New action	X	X		Emergency Services
Action 5. Plumas County General Plan Public Health & Safety Element update to incorporate Senate Bill (SB) 379 requirements	New action	X	X		Prevention
Action 6. Continue Telephone Emergency Notification System (TENS) Capability Enhancements Countywide	New action	X	X		Emergency Services
Action 7. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.	New action	X	X		Emergency Services
Action 8. Evaluate Coverage and Expansion for Broadband Services. Advance Grants and Projects Accordingly	New action	X	X		Emergency Services
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.	New action	X	X		Property Protection Structural Projects Emergency Services
Action 10. Identify Critical Facilities Requiring Backup Generators	New action	X	X		Property Protection Structural Projects Emergency Services

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 11. Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter	New action	X	X		Emergency Services
Action 12. Explore establishing a Community Emergency Response Team (CERT)	New action	X	X		Emergency Services
Action 13. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access	2014 action	X	X		Property Protection Emergency Services
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	New action	X	X		Property Protection Public Information Emergency Services
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.	New Action	X	X		Prevention Emergency Services
Climate Change, Drought and Water Shortage Actions					
Action 16. Develop a Climate Action Plan	New action	X	X	X	Prevention
Action 17. Water Shortage Preparedness and Contingency Planning Pilot Project	New action	X	X		Prevention
Action 18. Water Supply Infrastructure Improvements	New action	X	X		Property Protection Structural Projects
Dam Failure, Flood, Localized Flood, Levee Failure, Landslide, Mudslide, and Debris Flow, and Severe Weather Actions					
Action 19. Countywide Stormwater Drainage and Grading Ordinance	New action	X	X	X	Prevention
Action 20. Develop a Countywide Drainage Master Plan	New action	X	X	X	Prevention
Action 21. FEMA Mapping Update	New action	X	X	X	Prevention
Action 22. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)	New action	X	X	X	Structural Projects Property Protection Emergency Services Natural Resource Protection

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 23. Ongoing Implementation of Stream Clearing and Maintenance Programs	New action	X	X	X	Property Protection Natural Resource Protection
Action 24. Plumas Eureka CSD stream bank flood mitigation	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 25. Evaluate and Implement Projects to Reduce Flooding in Plumas Eureka CSD	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 26. Plumas Eureka CSD Sewer Plant Flood Mitigation	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 27. Evaluate Options for Obtaining 100-year Level of Certification for the Diversion Dam (East and West Chester Levees)	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
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	New action	X	X	X	Prevention
Action 29. Identify and Implement Bank Stabilization Projects	2014 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 30. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad	New action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 31. Evaluate and Implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
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	New action	X	X		Property Protection Structural Projects

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 33. Seismic Risk Evaluations to Prioritize and Implement Seismic Retrofits	New action	X	X		Property Protection Structural Projects
Pandemic Actions					
Action 34. Update and Refine Pandemic Plan	New action	X	X		Prevention
Wildfire, Drought and Water Shortage, and Tree Mortality Actions					
Action 35. Plumas County Agriculture, Forestry, and Natural Resources Resilience	New action	X	X		Prevention Natural Resource Protection
Action 36. Invasive Species Control and Eradication	New action	X	X		Prevention Natural Resource Protection
Action 37. Continue and Promote Defensible space (PRC 4291) Projects Including Assistance Efforts for Senior and Disabled Residents	New action	X	X		Property Protection
Action 38. Establish Additional Firewise USA Sites (communities) and Promote Existing Ones	New action	X	X		Prevention Public Information Property Protection
Action 39. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects	New action	X	X		Prevention
Action 40. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.	New action	X	X		Prevention Property Protection Structural Projects
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	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
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)	New action	X	X		Prevention
Action 43. Local Adoption of State Responsibility Area Fire Safe Regulations	New action	X	X		Prevention

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 44. Improve Funding and Response Capabilities of Local Fire Protection Districts and Expand Districts in Areas not Covered	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 45. Review and Update, as Needed, Plumas County Code to Address Defensible Space and Vegetation Management	New Action	X	X		Prevention Property Protection Natural Resource Protection



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Abbreviations and Acronyms

This abbreviations and acronym list contains all the acronyms used in this Plan Update. In each Chapter of this Plan Update, the first instance of each of these acronyms is spelled out in full and then the acronym defined for the rest of the Chapter.

Acronym	Definition
AB	Assembly Bill
APG	Adaptation Planning Guide
APN	Assessor Parcel Numbers
AQI	Air Quality Index
BAM	Best Available Map
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BRACE	Building Resilience Against Climate Effects
CAC	Community Assistance Contact
CalArp	California Accidental Release Response Plan
CA DWR	California Department of Water Resources
Cal OES	California Office of Emergency Services
CAS	Climate Adaptation Strategy - 2014
CAV	Community Assistance Visit
CCHPR	Climate Change and Health Profile Report
CCSM3	Community Climate System Model Version 3
CDAA	California Disaster Assistance Act
CDBG	Community Development Block Grant
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CGS	California Geological Survey
CNRA	California Natural Resource Agency
CRS	Community Rating System
CRV	Contents Replacement Values
CVP	Central Valley Project
CWPP	Community Wildfire Protection Plan
DAC	Disadvantaged Community Status
DFIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act

Acronym	Definition
DSOD	Division of Safety of Dams
EF	Enhanced Fujita
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
ESA	Endangered Species Act
F	Fujita
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zones
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FRA	Federal Responsibility Area
FRAP	Fire and Resource Assessment Program
GFDL	Geophysical Fluid Dynamics Laboratory
GHG	Greenhouse Gas
GIS	Geographic Information Systems
HFRA	Healthy Forest Restoration Act
HMGP	Hazard Mitigation Grant Program
HMPC	Hazard Mitigation Planning Committee
IBC	International Building Code
ICC	Increased Cost of Compliance
IPCC	Intergovernmental Panel on Climate Change
IRC	International Residential Code
IRWM	Integrated Regional Water Management
LOMA	Letter of Map Amendment
LOMR	Letter of Map Revision
LHMP	Local Hazard Mitigation Plan
LRA	Local Responsibility Area
MAF	Million Acre-Feet
MHDP	Multi-Hazards Demonstration Project
MHI	Median Household Income
MMI	Modified Mercalli Intensity
MPH	Miles Per Hour
NCDC	National Climactic Data Center
NDMC	National Drought Mitigation Center
NEPA	National Environmental Policy
NFIP	National Flood Insurance Program

Acronym	Definition
NFP	National Fire Plan
NIDIS	National Integrated Drought Information System
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NWS	National Weather Service
OES	Plumas County Office of Emergency Services
OHP	Office of Historic Preservation
PCIRC	Plumas Crisis Intervention & Resource Center
PDM	Pre-Disaster Mitigation
PG&E	Pacific Gas and Electric
PM	Particulate Matter
PNAS	Proceedings of the National Academy of Sciences
PRC	Public Resource Code
PSPS	Public Safety Power Shutdown
RCP	Representative Concentration Pathways
RL	Repetitive Loss
SAC-SJ	Sacramento-San Joaquin
SB	Senate Bill
SBA	Small Business Administration
SDAC	Severely Disadvantaged Community
SFHA	Special Flood Hazard Area
SGMA	Sustainable Groundwater Management Act
SRA	State Responsibility Area
SRL	Severe Repetitive Loss
SWP	State Water Project
UBC	Uniform Building Code
UCERF	Uniform California Earthquake Rupture Forecast
UHI	Urban Heat Island
URM	Unreinforced masonry
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WHO	World Health Organization
WRCC	Western Regional Climate Center

Acronym	Definition
WUI	Wildland Urban Interface



Chapter 1 Introduction

1.1 Purpose

Plumas County prepared this single jurisdiction Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA) approved 2014 Plumas County 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. This LHMP Update demonstrates the community's 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's continued eligibility for certain federal disaster assistance: including the FEMA Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA).

This Plumas County 2020 LHMP Update is single jurisdiction plan that geographically covers the unincorporated area within Plumas County's jurisdictional boundaries (i.e., the Plumas County Planning Area). The City of Portola is covered under its own LHMP.

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 additional expenses incurred by 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 reduced or even eliminated.

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 provides evidence that mitigation activities are highly cost-effective. 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 2017 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, risks and vulnerabilities and mitigation strategies the County will use to decrease vulnerability and increase resiliency and sustainability in the community.

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. While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established 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). This planning effort also follows FEMA's 2013 Plan Preparation Guidance. Because the Plumas County Planning Area is subject to many kinds of hazards, access to FEMA grant 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 critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The Plumas County Planning Area has been affected by hazards in the past and thus the County is committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

1.3 Community 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 in 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 1-1. 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 1-2 and is detailed in Table 1-1.

Figure 1-1 Plumas County



Data Source: Plumas County GIS, CalAtlas Map Date: 03/01/2020

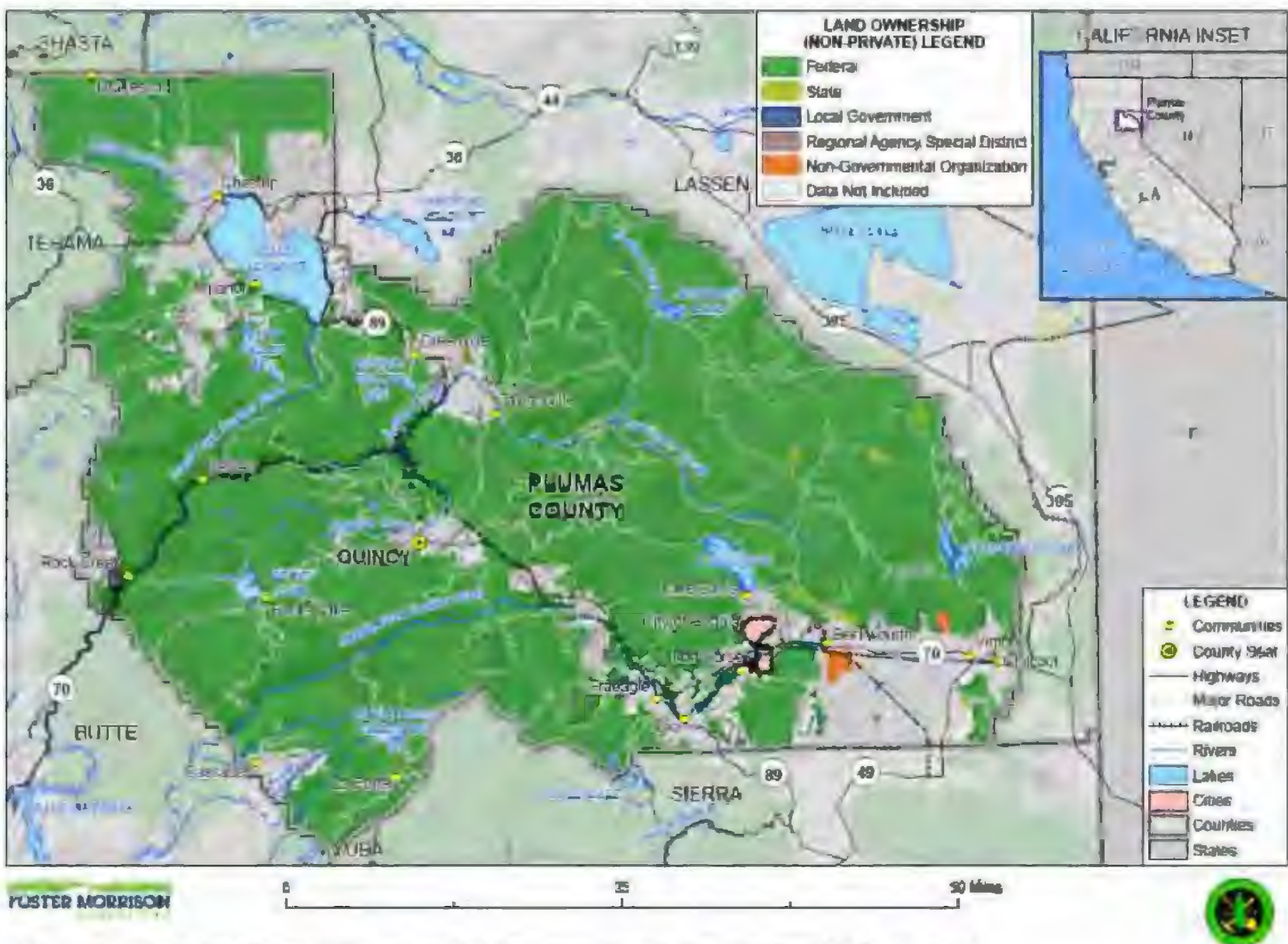


Figure 1-2 Plumas County – Land Ownership

Table 1-1 Plumas County– Land Ownership

Land Ownership	Total Acres	% of Total Acres
Federal	2,714,951	90.20%
State	11,898	0.40%
Local Government	9	0.00%
Regional Agency Special District	3	0.00%
Non-Governmental Organization	6,811	0.23%
Data Not Included	276,395	9.18%
Grand Total	3,010,067	100.00%

Source: USGS September 2018

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 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, and 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 has implications on 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. 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 (DOF) 2019 estimates for population of the County was 19,779, of which 17,803 people live in the unincorporated County. Select social and economic information for the County are shown in Table 1-2.

Table 1-2 Plumas County – Select Social and Economic Statistics

Statistic	Number
Populations	
Population under 5	4.4%
Population over 65	20.8%
Median Age	49.6
Racial Makeup	
White	89.0%
Black or African American	1.0%
American Indian or Alaska Native	2.7%
Asian	0.7%
Native Hawaiian or Pacific Islander	0.1%
Some Other Race	3.0%
Two or more races	3.6%
Income	
Median income	\$67,950
Mean Income	\$81,552
Poverty rate	
All families	8.1%
All people	13.3%
Unemployment Rate (December 2019)	7.7%

Source: 2010 US Census, 2017 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 estimates show economic characteristics for Plumas County. These are shown in Table 1-3.

Table 1-3 Plumas County Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	569	7.8%
Construction	690	9.5%
Manufacturing	436	6.0%
Wholesale trade	56	0.8%
Retail trade	727	10.0%
Transportation and warehousing, and utilities	400	5.5%
Information	110	1.5%
Finance and insurance, and real estate and rental and leasing	307	4.2%

Industry	Estimated Employment	Percent
Professional, scientific, and management, and administrative and waste management services	457	6.3%
Educational services, and health care and social assistance	1,622	22.3%
Arts, entertainment, and recreation, and accommodation and food services	936	12.9%
Other services, except public administration	407	5.6%
Public administration	543	7.5%

Source: US Census Bureau American Community Survey 2017 Estimates

Major employers in the County are shown in Table 1-4. It was noted by the County that this data represents best available data, and may not be fully accurate.

Table 1-4 Major Employers in Plumas County

Employer Name	Location	Industry
Almanor Ranger District	Chester	Ranger Services
Beckworth Ranger Plumas Natl Forest	Blairsden	Government Offices-Us
C Roy Carmichael School	Portola	Schools
Collins Co	Chester	Lumber-Wholesale
County of Plumas	Quincy	Government Offices-County
Eastern Plumas Health Care	Portola	Hospitals
Environmental Alternatives	Quincy	Foster Care
Feather River Bulletin	Quincy	News Dealers
Feather River Family Dentistry	Quincy	Dentists
Indian Jim Elementary School	Quincy	Schools
Longboards Bar & Grill	Blairsden	Restaurants
Nakoma Golf Resort	Clio	Resorts
Plumas Bancorp	Quincy	Holding Companies (bank)
Plumas Bank	Chester	Banks
Plumas Co Sheriff's Office	Quincy	Sheriff
Plumas County Board of Supervisors	Quincy	Government Offices-County
Plumas County Public Health	Quincy	Clinics
Plumas County Public Works	Quincy	Government Offices-County
Plumas District Hospital	Quincy	Hospitals
Plumas Pines Golf Resort	Blairsden	Golf Courses
Portola Medical Clinic	Portola	Clinics
Safeway	Quincy	Grocers-Retail
Seneca Health Care	Chester	Physicians & Surgeons
Seneca Healthcare District	Chester	Health Care Management
Sierra Pacific Industries	Quincy	Lumber-Manufacturers

Source: Economic Development Department - 2019

The County has a wide and varied tax base. Tax base information is tracked and maintained by the Plumas County Assessor's Office. The following table shows the tax base for the County.

Table 1-5 Unincorporated Plumas County – Values at Risk by Property Use

Property Use	Total Land Value	Improved Structure Value	Total Value	Percent of Total
Agricultural	\$105,940,628	\$23,866,908	\$129,807,536	3.49%
Commercial	\$68,665,448	\$198,890,953	\$267,556,401	7.19%
Federal Lands	\$0	\$0	\$0	0.00%
Government	\$143,742	\$0	\$143,742	0.00%
Industrial	\$9,699,636	\$45,102,146	\$54,801,782	1.47%
Institutional	\$1,884,400	\$12,698,132	\$14,582,532	0.39%
Miscellaneous	\$8,119	\$0	\$8,119	0.00%
Recreational	\$14,115,908	\$30,370,139	\$44,486,047	1.20%
Residential	\$1,085,684,913	\$2,122,163,500	\$3,207,848,413	86.25%
ROW/Utilities	\$0	\$0	\$0	0.00%
Total	\$1,286,142,794	\$2,433,091,778	\$3,719,234,572	100.00%

Source: Plumas County February 2020 Parcel/Assessor's Data

1.4 Plan Organization

This Plumas County LHMP Update is organized as follows:

Base Plan

- Chapter 1: Introduction
- Chapter 2: What's New
- Chapter 3: Planning Process
- Chapter 4: Risk Assessment
- Chapter 5: Mitigation Strategy
- Chapter 6: Plan Adoption
- Chapter 7: Plan Implementation and Maintenance

Appendices

- Appendix A: Planning Process
- Appendix B: References
- Appendix C: Mitigation Strategy
- Appendix D: Adoption Resolution
- Appendix E: Threatened and Endangered Species
- Appendix F: Critical Facilities
- Appendix G: Wildfire History



Chapter 2 What's New

Requirements §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 2014 Plumas County Local Hazard Mitigation Plan (LHMP) contained descriptions of their planning processes, the risk assessments of identified hazards for the Plumas County Planning Area and mitigation strategies for reducing the risk and vulnerability from these hazards. Since approval of this plan by FEMA, progress has been made by the County on implementation of the 2014 mitigation strategies. As part of this LHMP Update, a thorough review and update of the 2014 Plumas County LHMP was conducted to ensure that this Plan Update reflects current community conditions and priorities in order to realign the updated mitigation strategy for the next five-year planning period. This section of the Plan includes the following:

- **What's New in the Plan Update.** Section 2.1 provides an overview of the approach to updating the Plan 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 as well as information on current and future development trends affecting community vulnerability and related issues. The actual updated data, discussions, and associated analyses are contained in their respected 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 vulnerability, and any resulting modifications to the community's mitigation program priorities.
- **2014 Mitigation Strategy Status and Successes.** Section 2.3 provides a description of the status of mitigation actions from the 2014 LHMP and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2020 mitigation strategy. This section also highlights key mitigation success stories of the County since the 2014 LHMP.

This What's New section provides documentation of Plumas County Planning Area's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completion of this LHMP Update further provides documentation of the Plumas County communities' continued commitment and engagement in the mitigation planning process.

2.1 What's New in the Plan Update

This LHMP Update involved a comprehensive review and update of each section of the 2014 Plan and includes an assessment of the success of the County in evaluating, monitoring, and implementing the mitigation strategy outlined in the 2014 LHMP. Only the information and data still valid from the 2014 LHMP was carried forward, as applicable, into this LHMP Update.

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;
- 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 inventories; and
- Incorporate new action recommendations or changes in action prioritization.

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

As part of its comprehensive review and update of each section of the 2014 LHMP, Plumas County 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 combined LHMP Update is identified below in this section and is also sourced in context within Chapter 4, Risk Assessment. Specific data used is sourced throughout this Plan document. This new data and associated risk assessment analyses provided valuable input for the development of the updated mitigation strategy presented in Chapter 5 of this LHMP Update.

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

- All hazards from the 2014 plan were profiled in this LHMP Update. New hazards include localized flooding (broken out from the Flood hazard), levee failure, pandemic, and tree mortality. Water shortage was added to the drought hazard.
- A new critical facility definition was created. The County created a new list of critical facilities that were spatially quantified in GIS, and then overlaid on each mapped hazard.
- Future development data was updated and collected from the County. This was spatially quantified in GIS, and then overlaid on each mapped hazard.
- The NCDC Storm Events and FEMA/Cal OES disaster declaration tables were updated.
- New dam data provided by Cal OES was used for the dam inventory and analysis. This data included an updated hazard classification for identified dams and updated inundation mapping. Values at risk to dam inundation was analyzed. Critical facilities and populations at risk to dams were tabulated.
- An updated GIS analysis was performed for earthquake, including a Hazus earthquake run to show risk and provide potential loss estimates to the County from earthquake.
- An updated GIS analysis was performed for the flooding hazard for the 1%/0.2% annual chance floods, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.
- An updated GIS analysis was performed for landslides, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.

- More detailed GIS analysis was performed for the wildfire hazard, including values at risk, critical facilities at risk, population at risk, historic, cultural, and natural locations at risk, and general community impacts.
- An entire rework of the risk assessment for each identified hazard to reflect new information and to reflect the updated FEMA plan review tool. This included reworking the hazard profile and adding sections on location, extent, and new hazard event occurrences; redoing the entire vulnerability analysis to add additional items and updating the vulnerability assessment based on more recent hazard data as well as using the most current parcel and assessor data for the existing built environment to develop loss estimates.
- 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.
- Utilizing updated critical facility GIS mapping for the Planning Area, an analysis was conducted to provide an updated inventory of critical facilities and those that fall within mapped hazard areas.
- An enhanced vulnerability assessment was conducted, which added a GIS analysis of updated future development areas in the Planning Area and specific to each of the mapped hazards.
- A greater study of County mitigation capabilities was added.
- Incorporation and analysis of the updated California Department of Finance population data was utilized for this LHMP Update.
- Environmental justice concerns were addressed in portions of this Plan Update.
- Also, as required by current FEMA planning guidance, an analysis of ongoing and continued compliance with the NFIP was included in this LHMP Update.

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, Planning Area vulnerability, and any resulting modifications to the community's mitigation program priorities since the 2014 LHMP:

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Avalanche		X	

- Avalanche risk changes from year to year depending on weather conditions and numbers of people recreating in backcountry areas, but overall Planning Area vulnerability to Avalanche has not significantly changed.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Climate Change			X

- Climate change was addressed in the last plan, but since 2014, the effects of climate change are becoming more apparent in the Plumas County Planning Area and all of California.

- NWS data indicates temperatures are increasing resulting in more extreme heat days. 2020 temperatures have been some of the hottest.
- Weather extremes, including precipitation have become much more variable – the Planning Area is seeing increased precipitation and intensity as well as abnormally dry conditions.
- Data also suggests that changing climate conditions influence the severity of multiple hazards, such as heat, flooding, wildfire, drought, and others, identified in Plumas County.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Dam Failure		X	

- With more people moving into dam inundation areas, the vulnerability increases due to an increase in potentially affected populations, but growth in these areas has been limited.
- Risk increases over years due to aging dam infrastructure.
- With newer regulations, other dams are now required to do inundation mapping and develop EAPs which helps mitigate the risk.
- However, with more varied precipitation occurring in the County, this hazard will continue to change.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Drought and Water Shortage			X

- Drought conditions since the 2014 LHMP, including water supply issues such as a diminished water table, have had an impact on the Plumas County Planning Area and California. As a result, the drought hazard has become a significant priority for mitigation planning.
- State drought mandates, including conservations measures, to protect water supply throughout California have been implemented and continue within the Planning Area.
- Recent drought conditions have contributed to an increase in tree mortality issues, dry fuels, and general increase in wildfire conditions.
- Drought impacts the stability of soils in Plumas County leading to more erosion and other issues.
- Water quality concerns are exacerbated in drought conditions including post fire watershed impacts.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Earthquake		X	

- Overall, Plumas County is in a relatively low to moderate seismically active area.
- The primary factor that might change the earthquake vulnerability is additional development and more people moving to the area. However, adherence to current California building codes should ensure sound development in new development areas.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: 1%/0.2% events			X

- Overall, the net increase or decrease in vulnerability to flood depends on the location within the Planning Area.
- The risk and vulnerability of 1% and 0.2% flood events remain somewhat constant, changing from year to year based on weather and new development in the Planning Area.
- With the winter storms of 2017- 2019, heavy rains resulted in full reservoirs and high rivers. This contributed to flooding around the County, including within identified FEMA floodplains.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: Localized Stormwater Flooding			X

- Climate change issues may result in more localized flooding as the climate warms and more frequent, wetter, and greater intensity storms create more runoff. Weather extremes seem more variable – the Planning Area seems to fluctuate between heavy rains and dry periods.
- New development in unmapped flood hazard areas could result in a net increase in vulnerability should these areas experience increased stormwater/localized flooding. However, development requirements that require mitigation of stormwater runoff work to mitigate this hazard.
- 2017-2019 winter storms, including significant, greater intensity rains, resulted in more localized flooding throughout the Planning Area. Generally, damage occurs in low lying areas around the rivers. Road damage and closures continue to occur during heavy storm events.
- Outdated drainage systems also contribute to a greater vulnerability to localized, stormwater flooding.
- Recent drought conditions in some areas have hardened soils and predisposed areas to worse flooding.
- Recent changes in vegetation cause by past drought conditions as well as large fires also contribute to more runoff and clogged drainages, especially in post-fire burn scar areas.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Landslides, Mudslides, and Debris Flows			X

- With the most recent drought, some of the vegetation along sloped areas was lost contributing to a lack of vegetation to hold soil resulting in a greater landslide/mudslide potential.
- With heavy rains in recent years contributing to saturated and barren soils, the landslide potential increased in the Planning Area, especially in post fire areas.
- An increase in timber harvesting activities including salvage logging, creates additional areas susceptible to erosion and other slope failures. This is also compounded by recent fires.
- The North Complex Fire and other fire areas resulting in loss of vegetation has increased the potential for mudslides and debris flows in post fire areas.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Levee Failure		X	

- Similar to other hazards, increased development in areas protected by levees could result in an increase in vulnerability. But development in these areas has been limited since the last Plan.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Pandemic		X	

- Pandemic is a new hazard to the 2020 LHMP Update.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Extreme Heat			X

- The HMPC noted that there has been an increase in severe heat days in recent years. This last year (2020) was exceptionally hot, especially in the early fall where fire risk is already high following the hot summer months with limited precipitation.
- Climate change issues will continue to increase heat related impacts.
- The heat, combined with drought conditions, has increased the potential for tree mortality and wildfires.
- Extreme heat, combined with high winds, also contributes to the wildfire hazard, including the potential for a PSPS.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Heavy Rains and Storms (Hail, Lightning)			X

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season. Although during the first few years following 2014, the County experienced drought conditions, the rains of 2017-2019 had been significant, causing flooding and other adverse impacts to the County. 2020 experienced dryer weather overall.
- Hail events continue to occur in the County impacting the agricultural industry.
- Dry lightning events, including those in late summer of 2020, was the cause behind numerous ignitions, many resulting in out of control wildfires.
- Post fire conditions in fall 2020 can result in greater vulnerability during periods of heavy rain and storms.
- Climate change brings renewed concern moving forward for heavy and more intense rains, storms and associated issues to the County.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: High Winds and Tornadoes			X

- Severe wind events have had greater impact in recent years following several years of drought combined with years of heavy rains, contributing to dead and downed trees in the Planning Area.
- Straight line wind events in the Planning Area continue to affect crops in the County.
- Severe winds, combined with heat and low humidity, was a primary factor in the North Complex Fire.
- High winds, combined with extreme heat, also contributes to the wildfire hazard, including the potential for a PSPS

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Winter Storms and Freeze		X	

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season.
- Early freeze events continue to occur in the County impacting area crops.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Tree Mortality			X

- In the past decade, tree mortality has increased in the northern portion of Plumas County as well as the Lakes Basin area.
- During the past statewide tree mortality event, much of Plumas county was designated as Tier 2 High mortality hazard on the watershed scale along with numerous Tier 1 High hazard “hot spots”.
- The recent years of drought conditions combined with overall increase in temperatures leaves trees more susceptible to disease and contributes to the increase in tree mortality.

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Volcano		X	

- This hazard has not changed over the last five years

2020 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Wildfire			X

- Climate change continues to affect the nature and intensity of wildfires.

- Compounded by current drought conditions (increasing tree mortality and overall wildfire conditions) and followed by heavy rains, the wildfire hazard has substantially increased and is no longer just a seasonal issue. The wildfire season, including the potential for a catastrophic wildfire, is now a year around concern.
- Increased development in WUI areas within the County also contributes to an increase in vulnerability.
- Effective fuels management within the County continues to be an issue with much of the County under federal land ownership.
- Century old and aging infrastructure has contributed to the wildfire issue. This includes being a primary cause of wildfires as well as making wildfire more difficult to battle once an ignition has occurred.
- The road network and infrastructure, including construction, connectivity, signage, and ingress-egress issues compound the wildfire vulnerability and impact.
- Wind has been a major contributor to the potential for a catastrophic wildfire. And when combined with extreme heat, also can trigger a PSPS which leaves the community at risk in other ways.
- With large wildfires occurring throughout California, the Planning Area has seen a significant change in air quality from smoke resulting in more recorded bad air days.
- Catastrophic wildfires in northern California counties has created other issues in the County, as evacuees flee the fires and look to nearby communities for temporary housing.

2.3 2014 LHMP Mitigation Strategy Successes and Status

Plumas County has been successful in implementing actions identified in the 2014 Plumas County LHMP Mitigation Strategies, thus, working diligently towards meeting their 2014 goals and objectives of:

ALL HAZARD GOAL: Maximize the use of mitigation actions to prevent losses from natural hazards identified in the 2014 HMP.

- ALL HAZARD OBJECTIVE 1: Increase the County’s capability to provide mitigation opportunities and assistance to Plumas County communities.
- ALL HAZARD OBJECTIVE 2: Continuously improve hazard assessments.
- ALL HAZARD OBJECTIVE 3: Protect Natural and Cultural Resources through hazard mitigation.
- ALL HAZARD OBJECTIVE 3: Support mitigation planning in all County Operations.

GOAL 1: Minimize the losses of life and property due to Wildfire in Plumas County

- OBJECTIVE 1.1: Enhance community awareness of effective mitigation measures and wildfire impacts through education.
- OBJECTIVE 1.2: Enhance the county’s capability to notify and prepare the community during wildfire season.
- OBJECTIVE 1.3: Continue reducing fuel hazards conditions within the wildland-urban interface
- OBJECTIVE 1.4: Continue implementation actions of the community wildfire protection plan (CWPP), and continue to seek establishment of fire wise communities.
- OBJECTIVE 1.5: Enhance the county wildfire hazard code enforcement capabilities within wildland-urban interface.
- OBJECTIVE 1.6: Continue land use planning efforts to ensure increased fire safety in new developments.

GOAL 2: Minimize the losses of life and property due to Severe Weather in Plumas County

- OBJECTIVE 2.1: Increase community capabilities to mitigate the impact of winter weather hazards.
- OBJECTIVE 2.2: Increase community capabilities to mitigate summer weather hazards.
- OBJECTIVE 2.3: Implement actions to enhance reliability of power supply during and after

GOAL 3: Minimize the losses of life and property due to Flooding in Plumas County

- OBJECTIVE 3.1: Mitigate flooding of structures and infrastructure.
- OBJECTIVE 3.2: Increase public awareness of flood mitigation.
- OBJECTIVE 3.3: Improve the effectiveness of flood insurance programs.

GOAL 4: Minimize the losses of life and property due to Geologic Hazards in Plumas County

- OBJECTIVE 4.1: Provide for earthquake resistance in new construction.
- OBJECTIVE 4.2: Mitigate potential damage to life and property from landslides and rock falls.
- OBJECTIVE 4.3: Educate the public in earthquake mitigation and readiness.

GOAL 5: Minimize the effects of Drought and Climate Change in Plumas County

- OBJECTIVE 5.1: Educate the citizens of Plumas County on methods to reduce the effects of Drought and Climate Change
- OBJECTIVE 5.2: Protect water resources within Plumas County watersheds from drought conditions.

GOAL 6: Minimize the losses of life and property due to Dam Failure in Plumas County

- OBJECTIVE 6.1: Reduce the Risk of Dam Failure
- OBJECTIVE 6.2: Increase capability for continuity of government.
- OBJECTIVE 6.3: Enhance warning capabilities.

Where possible, Plumas County used existing plans and programs to implement the 2014 mitigation strategies. Examples include implementation of mitigation actions through the 2011 Plumas County EOP, the 2016 Upper Feather River Regional Water Management Plan, and through the 2013 and 2019 Plumas County Communities Wildfire Protection Plan (CWPP).

2.3.1. Success Stories

The County has seen the successful implementation of projects from previous mitigation plans. A few success stories are highlighted below.

All Hazards

1. Fire Preparedness and mitigation strategy messages were included in various CSD and Fire District mail out newsletters throughout Plumas County. Some Firewise Communities mailed out newsletters to their communities. Plumas County Living with Fire Publication newspaper insert was included in all

Plumas County Newspapers in 2014. (Circulation 15,000 plus). Messages were also included in some water district bills that were mailed out.

2. PSA's and Ad's were placed in Plumas News newspapers (Feather River Bulletin, Portola Reporter, Indian Valley Record, and Chester Progressive) as well as targeted feature articles.
3. Facebook social media platforms were developed by some Plumas County Firewise Communities and Fire Districts for messaging. Plumas County Sheriff's Facebook page includes some preparedness messaging for CODE RED, personal action, and evacuation plans.
4. Presentations on wildfire preparedness were completed at interagency presentations hosted by Plumas Firesafe Council. Fire Districts had guest speakers at localized events, and Plumas County Firewise Communities annually engage with their community during a Firewise Educational day that often includes a guest speaker.
5. Gold Mountain Firewise Community distributed "Go Bags" they prepared in 2018.

Flooding

Figure 2-1 showing the drainage behind Les Schwab before vegetation was removed and after removal during heavy rain event. This was completed by the Susanville Antelope Conservation Camp #25, who work very economically. This was completed during the winter of 2018-19.

Figure 2-1 Vegetation Removal behind Les Schwab Tire – Before and After



Source: Plumas County Public Works

Wildfire

1. 25 Wildfire Evacuation Route Maps were produced for Plumas County Communities between 2014 and 2018.
2. The Greenhorn Community alternate evacuation route dirt road (Harrison Road) has been improved with annual maintenance of road grading and placing ground up asphalt on a section of the road by the

Plumas County Public Works, Road Department. Some thinning has been done in the area by USFS and private timber owners owning land along the route.

2.3.2. 2014 Mitigation Strategy Update

The 2014 Plumas County LHMP mitigation strategy contained five separate mitigation actions for the County. Of the five actions, none have been completed, three are ongoing, and two have not been started. Two 2014 Plumas County actions have been identified for inclusion in this 2020 LHMP Update. Table 2-1 provides a status summary of the mitigation action projects from the 2014 Plumas County LHMP. Following the table is a description of the status of each project.

Table 2-1 Plumas County's 2014 LHMP Update: Mitigation Action Status Summary

Mitigation Action	Lead Department/ Agency	Complete	Ongoing	Not Started	Project in 2020 Update
Multi-Hazard Actions					
Assist Citizens and Business to participate in hazard mitigation activities.	PC OES			X	N
Wildfire					
Construct alternate community escape routes for high-risk communities.	PC SO, PC Public Works, Plumas County Fire Safe Council		X		Y
Flood Actions					
Evaluate Indian Valley for flooding issues in a localized setting.	Engineering, Planning Department (GIS), and PC OES			X	N
Landslide Actions					
Implement bank stabilization projects based upon criteria developed during HMP Risk Assessment for Landslide.	Public Works, Engineering, Planning Department (GIS)		X		Y
Drought and Climate Change					
Continue and enhance drought-monitoring programs through the County Agricultural Commissioner's Office.	Agricultural Commissioner, Emergency Services, Services Board of Supervisors		X		N

Plumas County Actions

Multi-Hazard Actions

Assist Citizens and Business to participate in hazard mitigation activities.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not started and will not be carried forward in the Plan Update.

Wildfire

Construct alternate community escape routes for high-risk communities.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing and new maps are created each year. Multiple maps have been created for each community. These can be found on the Wildfire Evacuation Maps page that the Office of Emergency Services maintains (<https://www.plumascounty.us/2414/Wildfire-Evacuation-Maps>).

Flood Actions

Evaluate Indian Valley for flooding issues in a localized setting.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): In 2002, a Indian Valley Creek Hydraulic model was developed. According to Plumas Public Works, this model was never formally vetted and adopted. This project will not be carried forward in this Plan Update.

Landslide Actions

Implement bank stabilization projects based upon criteria developed during HMP Risk Assessment for Landslide.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Public Works has performed several bank stabilization project for hill sides above and below roads including along creeks that impact roads, there are also several in study currently. This project is ongoing and is being carried forward in this Plan Update.

Drought and Climate Change

Continue and enhance drought-monitoring programs through the County Agricultural Commissioner's Office.

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): There have been efforts on this project, and these efforts are ongoing. 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).



Chapter 3 Planning Process

Requirements §201.6(b), §201.6(c)(1), §201.7(c)(1), and §201.7(c)(1)(ii), (iii) and (iv): 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, in conjunction with a Hazard Mitigation Planning Committee (HMPC), prepared this Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA)-approved 2014 Plumas County LHMP.

The Plumas County Office of Emergency Services (County OES) and the Planning Department recognized the importance and need of the update process for their 2014 LHMP and initiated the development of this 2020 LHMP Update. Utilizing Cal OES Hazard Mitigation Grant Program (HMGP) funds, which served as the primary funding source for this Plan, the 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 Update. Brenna Howell, of Howell Consulting also supported this effort as a subcontractor to Foster Morrison. 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's (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 made a commitment to this 2020 LHMP Update, as the single participating jurisdiction. 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 Planning Area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For this Plumas County LHMP Update, “participation” included the following:

- Providing facilities and printed materials for meetings;
- 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 Plan process and content;
- Identifying mitigation actions for the Plan;
- Reviewing and providing comments on Plan drafts;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the Plan by the County Board of Supervisors (BOS).

Plumas County, as the single participating jurisdiction to this LHMP Update seeking FEMA approval of this Plan, met all of these participation requirements. Multiple representatives from the County attended the HMPC meetings described in Table 3-3, identified and provided hazard data, identified mitigation actions and implementation strategies, and reviewed and provided input on Plan drafts. Other jurisdictions and public and private stakeholders supported the planning process through representation on the HMPC, providing data and input for the risk assessment and mitigation strategy, and reviewing and providing input on Plan drafts prior to finalization and submittal to Cal OES and FEMA.

As described, numerous individuals representing Plumas County were actively involved throughout this planning 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 provides additional information and documentation of the planning process and participants to this 2020 LHMP Update.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for updating the 2014 Plumas County LHMP using the DMA planning requirements and FEMA’s associated guidance. 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 Community Rating System (CRS) and FMA programs. Thus, 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; 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 Plumas County Local Hazard Mitigation Plan Update

DMA Process	Modified DMA/CRS Process
1) Organize Resources	
201.6(c)(1)/201.7(c)(1)	1) Organize the Planning Effort
201.6(b)(1)/201.7(c)(1)(i)	2) Involve the Public
201.6(b)(2) and (3)/ 201.7(c)(1)(ii), (iii) and (iv)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)/201.7(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)/201.7(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)/201.7(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)/201.7(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)/201.7(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)/201.7(c)(5)	9) Adopt the Plan
201.6(c)(4)/201.7(c)(4)	10) Implement, Evaluate, and Revise the Plan

The process followed to update the 2014 LHMP is detailed in the above table and the sections that follow and is in conformance with the latest DMA planning guidance. This LHMP Update involved a comprehensive review and update of each section of the 2014 Plumas County LHMP to reflect new data processes, mitigation strategies, and also includes an assessment of the success of Plumas County in evaluating, monitoring and implementing the mitigation strategy outlined in the previous plan, as previously described in more detail in Chapter 2 and Chapter 4. The information and data still valid from the 2014 LHMP were carried forward as applicable into this LHMP Update.

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With Plumas County's commitment to participate in the DMA planning process, Foster Morrison worked with County OES staff and the Planning Director, as overall project leads, to establish the framework and organization for development of this LHMP Update. A conference call was held with County OES staff and the Planning Director to discuss the organizational and process aspects of this LHMP Update.

The initial kickoff meeting was held on January 29, 2020. Invitations to the kickoff meeting were extended to key County departments, the City of Portola, and special districts as well as to other federal, state, and local stakeholders that might have an interest in participating in the 2020 LHMP Update. Representatives from the County, the City, districts, and key community stakeholders participated in this LHMP project with additional invitations extended as appropriate throughout the plan development process. The full list of invitees is included in Appendix A.

The HMPC was established as a result of the initial kickoff meeting, as well as through interest generated from the initial planning and public outreach meetings conducted for this project, as detailed later in this chapter. The HMPC, comprising key County, City, special district, and other government and stakeholder representatives and the public, developed this Plan with leadership from County OES and the Planning Director and facilitation by Foster Morrison. Plumas County seeking FEMA approval of the Plan had representation from multiple departments on the HMPC. Table 3-2 gives information on who participated on the HMPC. This list includes all HMPC members that attended one or more HMPC meetings detailed in Table 3-3 or who otherwise contributed to the plan development process. A complete list of HMPC members is also included in Appendix A.

Table 3-2 Plumas County Hazard Mitigation Planning Committee

Name	Agency/Organization	Title
Agencies and Stakeholders		
Carlos Espana	Almanor Recreation and Park District	Trails Coordinator
Shane Vargas	CAL FIRE	Pre-Fire Planning and Engineering
Kelly Riley	Cal OES	Mitigation Planning Division
Erik Egide	California Highway Patrol Quincy	Commander CHP
Marcelino "Marci " Gonzalez	Caltrans	Local Development Review, Regional Transportation Planner
Lauren Knox	City of Portola City Manager's Office	City Manager
Levi Warr	DWR	Water Resource Engineer
Sami Nall	DWR	Floodplain Management
Remy Gill	DWR	Floodplain Management
Rhonda Williams	Eastern Plumas Rural Fire Protection District	Board of Directors
Kevin Trutna	Feather River College	President

Name	Agency/Organization	Title
Brad Graevs	Feather River Resource Conservation District	District Manager
Kathy Kogge	Gold Mountain	Firewise Community Representative
Cary Curtis	Gold Mountain CSD	President
Chuck Bowman	Graeagle	Firewise Community Representative
John Reynolds	Grizzly Ranch	Firewise Community Representative
Chris Gallagher	Indian Valley CSD	Manager
Tony Balbiani	Indian Valley Fire Protection District	Chief
Jim Gibson	La Porte Fire Protection District	Chief
Russell Nickerson	Lassen National Forest	Almanor Ranger District, District Ranger
Mike Flanigan	Leavitt Group	Co-Owner
Steve Peters	Long Valley Fire Protection District	Past Chief
Warren Grandall	Meadow Valley FD	Weather spotter PU-28
Trina Cunningham	Native American Tribal consultant	Tribal Forest & Fire
Melissa Klundby	Northern Sierra Air Quality Management District	Field Office Rep
Sally McGowan	Old Highway Rd. Quincy	Firewise Community Representative
Marty Walters	PCIRC	Board Chair
Andrew Courtright	Peninsula Fire Protection District	Battalion Chief
Jim Wilcox	Plumas Corporation	Executive Director
Jeff Engle	Plumas County Board of Supervisors	District 5
Lori Simpson	Plumas County Board of Supervisors	District 4
Sherrie Thrall	Plumas County Board of Supervisors	District 3
Chuck White	Plumas County Building Department	Building Official
Jennifer Langston	Plumas County Code Enforcement	Code Enforcement Officer
Jerry Sipe	Plumas County Environmental Health	Director
Kevin Correia	Plumas County Facility Services	Director
John Steffanic	Plumas County Fair	Director
Hannah Hepner	Plumas County Fire Safe Council	Coordinator
Lindsay Fuchs	Plumas County Libraries	County Librarian
Sue McCourt	Plumas County OES	Fire Prevention Specialist
Larry Williams	Plumas County Planning Commission	Commissioner District 4
John Olofson	Plumas County Planning Commission	Past Commissioner District 5
Tracey Ferguson	Plumas County Planning Department	Director
Erin Metcalf	Plumas County Probation	Director
Andrew Woodruff	Plumas County Public Health	Director
Rob Thorman	Plumas County Public Works - alternate	Associate Engineer

Name	Agency/Organization	Title
Joe Blackwell	Plumas County Public Works - LHMP Lead	Deputy Director
Gabriel Hydrick	Plumas County Risk Management / County Administrator	Risk Manager
Carson Wingfield	Plumas County Sheriff's Office/OES	Special Operations / OES
Steve Allen	Plumas County Special District Association	President
Darren Beatty	Plumas District Hospital	COO
Zoe Stancer	Plumas District Hospital	Safety Officer
John Rowden	Plumas Eureka Community Services District	General Manager
Ray Bakker	Plumas Unified School District	Maintenance and Operations Supervisor
Frank Carey	Plumas Unified School District	Safety Officer
Tim Gibson	Plumas-Sierra Department of Agriculture	Agricultural Commissioner
Willo Vieira	Plumas-Sierra Department of Agriculture	Staff
Emily Compton	Plumas-Sierra Rural Electric Cooperative	Community Relations Manager
Bob Frank	Portola City Fire Department (under contract with EPFPD)	Chief
Lori Beatley	Public Health / OES	Health Education Specialist
Frank Carey	Quincy Fire Protection District	Assist. Chief
Michael Rodriguez	Red Cross	Northeastern California Chapter
Kyle Rodgers	Sierra Institute	Watershed Coordinator
Andrea Irving	Smith Creek Ranch	Firewise Community Representative
Jason Moghaddas	Spatial Informatics Group	Natural Hazards Team
Ryan Tompkins	UC Cooperative Extension	Forestry Manager
Tracy Schohr	UC Cooperative Extension	Livestock and Natural Resources Advisor
Michael Battles	DOT	—
Chris Morrison	Foster Morrison	Lead Planner
Jeanine Foster	Foster Morrison	Project Lead
Brenna Howell	Howell Consulting	Owner
Public		
Matt Hascche	Citizen	Citizen
Ken Donnell	Donnell Microphones	

Meetings

The planning process officially began with an internal project planning meeting held in December 2019 followed by an HMPC kick-off meeting held in Plumas on January 29, 2020. These kickoff meetings covered the scope of work and an introduction to the DMA requirements. During these HMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the LHMP Update. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to the County, quantify values at risk to identified hazards, inventory existing capabilities, and to identify possible mitigation actions. A copy of the worksheets for this project are included in Appendix A. Plumas County completed and returned the worksheets to Foster Morrison for incorporation into this LHMP.

During the planning process, the HMPC communicated through face-to-face and virtual Zoom meetings, emails, telephone conversations, a Dropbox website, and through a County developed webpage dedicated to the LHMP development process. This later website was developed to provide information to the HMPC, the public, and all other stakeholders on the LHMP Update process. Draft documents were also posted on these websites so that the HMPC members and the public could easily access and review them. The LHMP website can be accessed at:

➤ Plumas County – <https://www.plumascounty.us/2218/Documents>

The HMPC met formally five times during the planning period (January 2020 – October 2020) which adequately covers the four phases of DMA and the 10-Step CRS planning process. In addition to the HMPC meetings, an additional meeting of internal County staff was held to discuss the mitigation actions identified and determine County champions for each action to be included in this LHMP Update. The meetings held and topics discussed are described in Table 3-3. Agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-3 LHMP Update - HMPC Meetings

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
HMPC #1 Kick-off Meeting	1) Introduction to DMA and the planning process 2) Overview of current LHMP; 3) Organize Resources: the role of the HMPC, planning for public involvement, coordinating with other agencies/stakeholders 4) Introduction to Hazard Identification	1/29/2020	Plumas County Main Library
HMPC #2	1) Risk assessment overview and work session - Assess the Hazard - Assess the Problem	4/15/2020	Zoom Meeting
HMPC #3	1) Review of risk assessment summary 2) Review and update of mitigation goals 3) Intro to Mitigation Action Strategy - Set Goals - Review possible activities	5/19/2020	Zoom Meeting

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
HMPC #4	1) Review of mitigation alternatives 2) Review and update of mitigation actions from the 2014 plan 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 Plan Development	5/20/2020	Zoom Meeting
Internal County Meeting	1) Review, refinement, and designation of mitigation action champions for actions and projects to be included in this LHMP Update.	6/4/2020	Zoom Meeting
HMPC #5	1) Review of final HMPC, agency, and public comments and input to the Plan 2) Review and documentation of changed conditions, vulnerabilities and mitigation priorities 3) Plan maintenance and Implementation Procedures	10/21/2020	Zoom Meeting

Zoom Meetings

As a result of the Covid-19 Pandemic, several of the HMPC meetings were conducted virtually via the online Zoom format. This included HMPC meetings #2, #3, #4, and #5. While these Zoom meetings presented a few challenges from a collaboration standpoint, holding these meetings online also had its advantages. First, it was observed that more people were available to attend an online meeting, including those out of area agencies where travel to Plumas for a meeting was difficult due to the time involved. Another benefit was the use of the Chat function in the Zoom format. This allowed those individuals not likely to speak up in a face-to-face meeting to provide input via Chat. Further, these Chat transcripts were recorded in a written retrievable format that allowed Foster Morrison to develop comprehensive notes detailing HMPC input.

Planning Step 2: Involve the Public

Public stakeholders are defined as any stakeholders not attached to the local Plumas County government, the single participating jurisdiction to this LHMP Update. Up-front coordination discussions with Plumas County OES staff and the Planning Director established the initial plan for public involvement. It was agreed that the public outreach process would focus on leveraging established public information mechanisms and resources within the community. Public involvement activities for this LHMP Update included, newspaper articles, stakeholder and public meetings, development of an LHMP County webpage and associated website postings, and the collection of public and stakeholder comments on the draft Plan through a variety of mechanisms. Information provided to the public included an overview of the mitigation status and successes resulting from implementation of the 2014 Plan as well as information on the processes, new risk assessment data, and proposed mitigation strategies for this LHMP Update.

Early Public Meeting

Public outreach for this LHMP Update began at the beginning of the Plan development process with a newspaper article in addition to other local outreach methods and as advertised on the Plumas County LHMP webpage. This early public meeting was held to inform the public of the purpose of the DMA and the hazard mitigation planning process for the Plumas County Planning Area and to invite the public to an early public meeting to kick-off the LHMP Update project on January 29, 2020 at the Plumas County Public Library Quincy Branch.

Final Public Meeting

The first draft of the Plan was provided to the HMPC in June 2020, with a public review draft provided in October 2020. A public meeting was held on October 20, 2020 to present the draft LHMP Update and to collect public comments on the LHMP prior to finalization and submittal to Cal OES/FEMA. The public meeting was advertised in a variety of ways to maximize outreach efforts to the public at large and included, an advertisement in a local newspaper, placement on the County website, and through other outreach mechanisms inviting the public to attend the public meetings. The public outreach efforts advertising the final public meeting 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 draft plan being placed on the County website in advance of these meetings, hard copies of the draft of the plan were made available to interested parties at the Plumas County Public Library Quincy Branch (see Figure 3-1), Chester Library, Portola Library, and Greenville Library. Announcements were made on the OES Facebook page, and flyers were posted on community billboards.

Figure 3-1 Public Outreach at Plumas County Library in Quincy



Source: Plumas County

Documentation to support the final public meeting can be found in Appendix A. In addition to 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 with an interest in the Plumas County Planning Area. The majority of these people reside in Plumas County or in surrounding communities.

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 Meeting	1) Intro to DMA and mitigation planning 2) 2020 LHMP Update Process	1/29/2020	Plumas County Public Library Quincy Branch
Final Public Meeting	1) Presentation of Draft LHMP and solicitation of public and stakeholder comments	10/20/2020	Zoom Meeting

As appropriate, stakeholder and public comments and recommendations were incorporated into the final Plan throughout the LHMP development process, including the sections that address mitigation goals and strategies. Public comments received and how they were addressed are included in Appendix A. All newspaper articles, website postings, and public outreach efforts are on file with the Plumas County OES and Planning Department and are included in Appendix A.

The draft Plan is currently available online on the Plumas County website at: <https://www.plumascounty.us/2218/Documents>.

Planning Step 3: Coordinate with Other Departments and Agencies

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

- American Red Cross
- Bureau of Reclamation
- California Department of Water Resources
- Cal FIRE
- California Highway Patrol
- California Office of Emergency Services
- California State Fire Marshall
- Cal Trans
- California Department of Fish and Game
- California Department of Water Resources
- City of Portola
- Community Services Districts in the County
- Feather River College
- FEMA Region IX
- Fire Protection Districts in the County
- Lassen National Forest
- Local FireWise communities
- National Weather Service/NOAA
- Northern Sierra Air Quality Management District
- Pacific Gas & Electric
- Plumas District Hospital
- Plumas National Forest
- Plumas-Sierra Rural Electric Cooperative
- Sierra Institute
- Sierra Nevada Conservancy
- University of California Cooperative Extension
- United States Corps of Engineers
- United States Department of Agriculture
- United States Forest Service

Coordination with key agencies, organizations, and groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as to review

any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Coordination involved contacting these agencies through a variety of mechanisms and informing them on how to participate in the LHMP Update process and if they had any expertise or assistance they could lend to the planning process, risk assessment, or specific mitigation strategies. These groups and agencies were solicited asking for their assistance and input, telling them how to become involved in the LHMP Update process, and inviting them to HMPC meetings.

In addition, 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
- City of Portola
- FEMA Region IX
- KCRA News
- 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 Farm Service Agency
- United States Forest Service
- United States Geological Survey
- United States Occupational Health and Safety Agency

➤ 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, these groups were invited to attend the public meetings and to review and comment on the LHMP Update 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 uses a variety of comprehensive planning mechanisms, such as the County's General Plan and County Code of Ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this Plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this Plan incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions. This includes, but is not limited to:

- CAL OES plans and data
- California Department of Finance demographic documents
- California Department of Water Resources plans and information
- California Geological Survey Plans
- CAL FIRE Plans and data
- Climate Adaptation Plans
- CWPPs
- Emergency Operations Plans
- Evacuation Plans
- FEMA mitigation planning documents
- Flood Insurance Studies
- General Plans – County and Cities
- National Weather Service documents
- Stormwater Master Plans
- US Department of Agriculture Reports
- US Department of Interior Plans
- US Fish and Wildlife 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 risk assessment and hazard vulnerability sections of the Plan. Where the data from the existing studies and reports is used in this LHMP Update, the source document is referenced throughout this Plan document. The data was

also used in determining the capability of the community in being able to implement certain mitigation strategies. Appendix B, References, provides a detailed list of references used in the preparation of this LHMP Update.

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 on the Planning Area. Starting with the 2014 LHMP, natural hazards of concern were added, deleted, and modified for this 2020 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 Planning Area. Geographic information system (GIS) was used to display, analyze, and quantify hazards and vulnerabilities.

The HMPC also conducted a capability assessment to review and document the County's current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing government 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 risks and vulnerabilities identified.

Also addressed in the risk assessment of this 2020 LHMP is an assessment of the County's floodplain management program and participation in the National Flood Insurance Program (NFIP), including a discussion of their continued compliance with NFIP requirements.

A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 4 Risk Assessment.

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 strategy is included 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 first draft of the Plan was developed. This complete draft was provided for HMPC review and comment via a Dropbox web link. Other agencies were invited to comment on this draft as well. HMPC and agency comments were integrated into the 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 the Cal OES and FEMA Region IX to review and approve, contingent upon final adoption by the County BOS.

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 this 2020 LHMP Update, the Update was adopted by the County BOS 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, most of the HMP's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. 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 hazard mitigation in Plumas County, which is addressed further in Chapter 7.

Implementation and Maintenance Process: 2014

The 2014 Plumas County Local Hazard Mitigation Plan Update included a process for Plan maintenance and implementation of the mitigation strategy as well as formal updates to the Plan document. The 2014 process called for annual reviews of the existing LHMP with updates made to reflect new policies, changed conditions, mitigation priorities, and the implementation of mitigation strategies. In addition, the 2014 process called for a formal Plan update as required by DMA regulations every 5 years. Although these 2014 maintenance requirements were not systematically followed, this 2020 LHMP Update, once complete, will meet the DMA formal update requirements.

While systematic annual reviews of the 2014 LHMP were not carried out, the 2014 LHMP was integrated into other planning mechanisms in the County. Table 3-5 lists the planning mechanism the 2014 LHMP was integrated in to.

Table 3-5 Incorporation of Plumas County 2014 LHMP into Other “Planning Mechanisms”

Planning Mechanism 2014 LHMP Was Incorporated or Implemented Through	Details
Plumas County Community Wildfire Protection Plan (CWPP), July 2019	The CWPP wildfire hazard mitigation strategies serve as a complement to the County’s LHMP. Wildfire mitigation measures from the 2014 LHMP were paralleled in the CWPP update, including, but not limited to wildfire public outreach and education such as addressing PRC 4290 and PRC 4291, defensible space assistance for vulnerable populations, evacuation planning, community based fuels reduction initiatives, and roof replacement projects addressing structure ignitability.
Plumas County Living with Fire Publication (Summer 2020)	Living with Fire was produced by the Plumas County Fire Safe Council with financial support from CAL FIRE and contributions from Plumas County Office of Emergency Services and Plumas National Forest. Among a number of wildfire resources for County residents to use and take action, this publication offers wildfire evacuation information and links to the Plumas County community evacuation maps found on the County’s OES website that were developed, in-part, through implementing a 2014 LHMP wildfire mitigation strategy.
Upper Feather River Integrated Regional Water Management Plan Update, 2016	The Integrated Regional Water Management (IRWM) Plan is an implementation plan for the management of water resources throughout the Upper Feather River (UFR) Watershed. The 2014 LHMP was incorporated through data and information from the hazard profiles. The IRWM Plan concluded that within the UFR Plan area, wildfire, flooding, drought, and infrastructure failures are the primary water-related hazards and that the highest fuel hazard is along the Feather River Canyon. For example, IRWM Plan Objective 1, restore natural hydrologic functions, discusses reducing peak flood intensities that support potential benefits of reduced costs for flood damage repair; IRWM Plan Objective 2, reduce potential for catastrophic wildland fires in the region, seeks to implement projects that reduce forest fuels; and IRWM Plan Objective 11, coordinate management of recharge areas and protect groundwater resources, supports and offers strategies for the protection and monitoring of groundwater recharge areas for improving drought control and preparedness within the watershed.
Emergency Operations Plan (adopted 2016, updated 2018, 2020)	2014 LHMP data from the hazard profiles and evacuation mapping mitigation work was incorporated into EOP annex updates.
Evacuation Planning	2014 LHMP mitigation action under the wildfire hazard (WF-8) directed the preparation of evacuation maps for high risk communities. The County’s OES website includes several wildfire evacuation maps that provide suggested emergency wildland fire evacuation routes, many of which were developed post 2014 LHMP. Maps for Eastern Plumas County communities, Mohawk Valley communities, American Valley areas, Indian Valley, Chester/Lake Almanor, and La Porte/Little Grass Valley are available at https://www.plumascounty.us/2414/Wildfire-Evacuation-Maps .

The Plan implementation and maintenance process as set forth in the 2014 LHMP have been updated for this LHMP Update. The revised implementation and maintenance process for this Plumas County 2020 LHMP Update is set forth in Chapter 7 of this Plan document. A strategy for continued public involvement for this LHMP Update process is also included in Chapter 7.



Chapter 4 Risk Assessment

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 to 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 describes why some hazards have been omitted from further consideration.
- **Section 4.2: Plumas County Assets at Risk** identifies the property values; populations; critical facilities; and cultural, historical, and natural resources at risk. This information is not hazard specific and covers the entire Plumas County Planning Area.
- **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 Planning Area. The hazard profile also describes previous occurrences of hazard events and the likelihood of future occurrences. The vulnerability assessment evaluates the Planning Areas’ exposure to natural hazards; considering assets at risk, critical facilities, future development trends, and, where possible, estimates potential hazard losses.
- **Section 4.4: Capability Assessment** inventories existing local mitigation activities and policies, regulations, plans, and projects that pertain to mitigation and can affect net vulnerability.

This risk assessment covers the entire geographical extent of unincorporated Plumas County area (i.e., the Plumas County Planning Area), and does not include the City of Portola which is covered under its own LHMP. Additionally, 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 2014 risk assessment. Information from the 2014 LHMP 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 this Plan.

4.1 Hazard Identification

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 assessment 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 this Plan:

- California Office of Emergency Services (Cal OES)
- HMPC input
- National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database
- 2014 Plumas County LHMP
- 2018 State of California Hazard Mitigation Plan
- 2019 City of Portola Local Hazard Mitigation Plan (Draft)
- FEMA Disaster Declaration Database

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 Cal OES, FEMA, the NOAA NCDC database, 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 2018 California State Hazard Mitigation Plan was consulted to evaluate the applicability of hazards of concern to the State, to the Plumas County Planning Area. Building upon this effort, hazards from the 2014 Plumas County LHMP were also identified, and comments explain how

hazards were updated from the 2014 plan. All hazards from the 2014 Plan were profiled in this LHMP Update. New hazards include localized flooding (broken out from the Flood hazard), levee failure, pandemic, and tree mortality. Water shortage was added to the drought hazard.

Table 4-1 Plumas County Hazard Identification and Comparison from 2014 LHMP

2020 Hazards	2014 Hazards	Comment
Avalanche	Avalanche (part of geologic hazards)	This hazard was broken out and more detail was added to the hazard profile and the vulnerability assessment.
Climate Change	Climate Change	Added additional information in both the hazard profiled and the vulnerability assessment.
Dam Failure	Dam Failure	Additional analysis was performed using the updated Cal OES and California Division of Safety of Dams (DSOD) hazard rating classes.
Drought and Water Shortage	Drought	Water shortage was added and a greater discussion of vulnerability to both drought and water shortage was added.
Earthquake (including liquefaction)	Earthquake (part of geologic hazards)	Liquefaction was added. A detailed Hazus run for the County was performed and added to the vulnerability assessment.
Flood: 1%/0.2% annual chance	Floods: 100/500 year	Additional analysis was added in the vulnerability assessment, including an update of values, populations, and critical facilities at risk.
Flood: Localized/Stormwater	—	New hazard
Landslide, Mudslide, and Debris Flows	Landslides (part of geologic hazards)	This hazard was broken out and more detail was added to the hazard profile and the vulnerability assessment.
Levee Failure	—	New hazard
Pandemic	—	New hazard
Severe Weather: Extreme Heat	Severe Weather (consolidated hazard)	This hazard was broken out and more detail was added to the hazard profile and the vulnerability assessment.
Severe Weather: Heavy Rains and Storms	Severe Weather (consolidated hazard)	This hazard was broken out and more detail was added to the hazard profile and the vulnerability assessment.
Severe Weather: High Winds and Tornadoes	Severe Weather (consolidated hazard)	This hazard was broken out and more detail was added to the hazard profile and the vulnerability assessment.
Severe Weather: Winter Storm and Freeze	Severe Weather (consolidated hazard)	This hazard was broken out and more detail was added to the hazard profile and the vulnerability assessment.
Tree Mortality	—	New hazard
Volcano	Volcanoes (part of geologic hazards)	Similar analysis was performed.

2020 Hazards	2014 Hazards	Comment
Wildfire	Wildfire	Additional analysis was added in the vulnerability assessment, including an update of values, populations, and critical facilities at risk.

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

Table 4-2 Plumas County – Excluded Hazards

Hazard Excluded	Why Excluded
Tsunami	The County is not on the coast.
Air Pollution	The County did consider this a hazard for this Plan, it is dealt with in other planning mechanisms in the County. Smoke is discussed in the wildfire hazard.
Coastal Flooding, Erosion, and Sea Level Rise	The County is not on the coast.
Energy Shortage and Energy Resilience	The County did consider this a hazard, it is dealt with in other planning mechanisms in the County.
Natural Gas Pipeline Hazards	The County did not consider this a hazard due to the low number of gas pipelines traversing the County.
Oil Spills	The County did not consider this a hazard, as there are few pipelines or oil wells in the County.
Radiological Accidents	There are no areas in the County at risk to this hazard.
Subsidence	There are few areas of the County where subsidence is a risk. In addition, most subsidence is related to drought and water shortage, and will be discussed in that hazard profile and vulnerability assessment.
Cyber Threats	The County did consider this a hazard, but it is dealt with in other planning mechanisms in the County.
Airline Crashes	There have been few past occurrences in the County of airplane crashes. This is not a hazard to be included in the LHMP.
Civil Disturbance	The County did consider this a hazard, but it is dealt with in other planning mechanisms in the County.
Well Stimulation and Hydraulic Fracking	This is not occurring in the County.

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 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact on the 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, crop, and economic damage. The ability of a community 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 by the HMPC to prioritize those hazards of greatest significance to the Plumas County Planning Area, enabling the County to focus resources where they are most needed.

Table 4-3 Plumas County Hazard Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Avalanche	Limited	Highly Likely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	—
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water shortage	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Significant	Occasional/ Unlikely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Levee Failure	Limited	Unlikely	Limited	Medium	Medium
Pandemic	Extensive	Likely	Critical	Medium	Low
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/ Unlikely	Limited	Medium	Low
Severe Weather: Winter Storms and Freeze	Extensive	Highly Likely	Negligible	Medium	Medium
Tree Mortality	Significant	Likely	Limited	Medium	High
Volcano	Extensive	Unlikely	Catastrophic	Low	Low
Wildfire	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					

4.1.2. Disaster Declaration History

One method the HMPC 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.

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 by the FEMA and Cal OES and compiled in chronological order in Table 4-4. A review of state declared disasters indicates that Plumas County received 23 state declarations between 1950 and 2020. Of the 23 state declarations: 16 were associated with severe winter storms, heavy rains, or flooding; 2 were for drought; 1 were from economic disasters, 1 was from pandemic, and 3 were for wildfire. A review of federal disasters shows 21 federal disaster declarations. Of these 21 federal declarations: 15 were associated with severe winter storms, heavy rains, or flooding, 4 for wildfire, 1 was from pandemic, 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 State and Federal Disaster Declarations, 1950-2020

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2020	Bear Fire	Fire	Fire	FM-5363	–	9/9/2020
2020	California Wildfires	Fire	Fire	DR-4458	–	8/22/2020
2020	Covid-19	Pandemic	Pandemic	DR-4482	3/4/2020	1/20/2020
2017	California Severe Winter Storms, Flooding, Mudslides	Flood	Storms	DR-4308	–	4/1/2017
2017	California Severe Winter Storms, Flooding, Mudslides	Flood	Storms	DR-4301	–	2/14/2017
2014	California Drought	Drought	Drought	GP 2014-13	1/17/2014	–
2008	Wildfires	Fire	Fire	EM-3287	–	6/28/2008

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	–	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	–	9/13/2005
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–
1999	California Wildfires	Fire	Fire	EM-3140	8/26/1999	9/1/1999
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97- 1/31/97	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	DR-1046	Proclaimed	3/12/1995
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95- 3/14/95	1/13/1995
1993	California Severe Storm, Winter Storm, Mud & Landslides, Flooding	Flood	Storms	DR-979	–	2/3/1993
1992	1992 Late Winter Storms	Flood	Storms	DR-979	1/7/93 - 2/19/93	1/15/1993
1987	1987 Wildland Fires	Fire	Fire	GP	9/10/1987, 9/3/1987	–
1986	1986 Storms	Flood	Storms	DR-758	2/18-86- 3/12/86	2/18/1986
1980	April Storms	Flood	Storms	–	4/1/1980	–
1977	1977 Drought	Drought	Drought	EM-3023	1/20/1977	–
1970	1970 Northern California Flooding	Flood	Flood	DR 283	1/27/1970 - 3/2/1970	2/16/1970
1969	California Severe Storms, Flooding	Flood	Storms	DR-253	1/23/69, 1/25/69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	1/26/1969
1964	1964 Late Winter Storms	Flood	Storms	DR-183	12/22/64, 12/23/64, 12/28/64, 1/5/65, & 1/14/65	12/24/1964

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1963	1963 Floods and Rains	Flood	Storms	DR-145	2/7/63, 2/26/63, 2/29/63, & 4/22/63	2/25/63
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	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	OCD 50-01	11/21/1950	–

Source: Cal OES, FEMA

Table 4-5 Plumas County – State and Federal Disaster Declarations Summary 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1977, 2014	0	–
Economic	1	2001	0	–
Fire	3	1960, 1987, 1999	4	1999, 2008, 2020 (twice)
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1963 (twice), 1964, 1969, 1970, 1980, 1986, 1992, 1995 (twice), 1996, 1997	15	1955, 1958, 1963, 1964, 1969, 1970, 1986, 1992, 1993, 1995 (twice), 1997, 2006, 2017 (twice)
Hurricane	0	–	1	2005
Pandemic	1	2020	1	2020
Totals	23	–	21	–

Source: Cal OES, FEMA

Disasters since 2014

As detailed above, there have been five federal disaster declarations and two state disaster declarations since the 2014 plan:

- 2014 Drought (state)
- 2017 Flood (two federal)
- 2020 Pandemic (state and federal)
- 2020 Wildfires (two federal)

EOC Activations since 2014

There have been six EOC activations since 2014:

- January 2 – 12, 2017 – Winter Storm Event
- February 1 – 12, 2017 – Winter Storm Event
- July 30 – August 17, 2017 – Minerva Fire Activation
- November 8 – November 28, 2018 – CAMP Fire Activation
- March 18, 2020 to current – Pandemic
- August 27, 2020 to current – North Complex and Bear Fires

4.2 Plumas County Assets at Risk

As a starting point for analyzing the Plumas County Planning Area’s vulnerability to identified hazards, the HMPC used a variety of data to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur, this section describes significant assets at risk in the Planning Area. Data used in this baseline assessment included:

- Values at risk;
- Critical facility inventory;
- Cultural, historical, and natural resources; and
- Growth and development trends.

Data Sources

Data used to support this assessment included the sources listed below. Where data and information from these studies, plans, reports, and other data sources were used, the source is referenced as appropriate throughout this vulnerability assessment.

- 2019-2024 Plumas County Housing Element
- 2019-2024 Plumas County Housing Element Background Report
- 2017 Climate Change and Health Profile Report – Plumas County
- CalAtlas
- California Department of Finance
- California Department of Fish and Wildlife
- California Department of Parks and Recreation Office of Historic Preservation
- California Department of Water Resources Proposition 84 Integrated Regional Water Management
- California Natural Diversity Database
- Hazus MH 4.2
- Plumas County 2035 General Plan Conservation Open Space Element
- Plumas County 2035 General Plan Land Use Element
- Plumas County Building Department
- Plumas County GIS Department
- Plumas County Planning Department
- Plumas County’s February 2020 Assessor Data
- State of California Department of Conservation
- US Census Bureau

4.2.1. Values at Risk

Parcel Inventory and Assessed Values

This analysis captures the values associated with assessed values located within Plumas County. The February 2020 Plumas County Parcel/Assessor's data, obtained from Plumas County, was used for as the basis of this analysis. This data provided by Plumas County represents best available data.

Understanding the total assessed value of Plumas County is a starting point to understanding the overall value of identified values at risk in the County. When the total assessed values are combined with potential values associated with other community assets such as public and private critical infrastructure, historic and cultural resources, and natural resources, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the County.

Methodology

Plumas County's February 2020 Assessor Data and the County's GIS parcel data were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the County. This data provides the land, improved, and 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 countywide mapping and analysis of values at risk. The Plumas County GIS parcel data contained 26,056 parcels for the County and the City of Portola. This plan focuses on the unincorporated Plumas County, and therefore the GIS parcel data exclusively contained 24,406 parcels.

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 County. 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 infrastructure improvements are of greatest concern. As such, it is critical to note a specific limitation to the assessed values data within the County, 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 most likely low and may not reflect current market or true potential loss values for properties within the County.

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.

The February 2020 GIS parcel and Assessor data was obtained to perform the spatial analysis. GIS was used to convert the parcel polygons into centroids representing each record in the assessor database. For the purposes of this analysis, the centroids which were not coincident in locations were re-positioned to overlay on the corresponding polygons so that each assessor record (with a unique assessor parcel number) was spatially positioned on the corresponding parcel. In addition, multiple parcels polygons in the GIS data were constructed as multi-part features, of which only one centroid was representative of each parcel polygon. The position of the centroids may result in less accurate hazard analysis overlay results. The data did not contain duplicate records.

Property Use Categories

Plumas County's GIS data contained land use designations which provide detailed descriptive information about how each property is generally used, such as agricultural, commercial, government, industrial, institutional, recreational, residential, and right of way. The land use codes from County assessor data were refined and categorized into ten property use categories and linked back to the Plumas County Assessor data. The final property use categories for Plumas County are:

- Agricultural
- Commercial
- Federal Lands
- Government
- Industrial
- Institutional
- Miscellaneous
- Recreational
- Residential
- ROW/Utilities

Once the land use descriptions were grouped into categories, the number of total and improved parcels, as well as land, improved, and personal property values were inventoried for the County by property use.

Estimated Content Replacement Values

Plumas County's 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 were utilized to develop more accurate loss estimates for all mapped hazard analyses. FEMA's CRV factors estimate value as a percent of improved structure value by property use. Table 4-6 shows the breakdown of the different property uses in the County and their estimated CRV factors.

Table 4-6 Plumas County – 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	Government	100%

Plumas County Property Use Categories	Hazus Property Use Categories	Hazus Content Replacement Values
Government	Government	100%
Industrial	Industrial	150%
Institutional	Institutional	100%
Miscellaneous	–	100%
Recreational	Other	100%
Residential	Residential	50%
ROW/Utilities	Other	100%

Source: Hazus

Plumas County Values at Risk Results

Values associated with land, improved structures, and personal property, were identified and summed in order to determine assessed values at risk in the Plumas County Planning Area. Together, the land, improved structure, and personal property 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 values at risk in the Planning Area.

Table 4-7 shows the values or exposure for Plumas County and the City of Portola (using CRV multipliers from Table 4-6). This table is important as potential losses to the County include structure contents. In addition, loss estimates contained in the hazard vulnerability sections of this Chapter will use calculations based on these values, including content replacement values. Portola is included here to show how much of Plumas County's values lie in the unincorporated County as well as the values in the City. The hazard specific tables in each hazard will not include an analysis of Portola values at risk, as they are not a participating jurisdiction to this LHMP Update.

Table 4-7 Plumas County and City of Portola – Values at Risk 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	1,650	1,021	\$30,134,780	\$99,138,500	\$884,356	\$60,746,025	\$190,903,661
Unincorporated Plumas County	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068
Grand Total	26,056	14,757	\$1,316,277,574	\$2,532,230,278	\$19,518,751	\$1,455,307,126	\$5,323,333,729

Source: Plumas County February 2020 Parcel/ Assessor's Data

The values for unincorporated Plumas County are broken out by property use and are provided in Table 4-8. The remainder of the analysis by hazard in this Chapter will focus on these values at risk in the unincorporated County.

Table 4-8 Unincorporated Plumas County – Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Agricultural	1,985	278	\$105,940,628	\$23,866,908	\$2,293,939	\$23,866,908	\$155,968,383
Commercial	867	609	\$68,665,448	\$198,890,953	\$9,768,708	\$198,890,953	\$476,216,062
Federal Lands	214	0	\$0	\$0	\$0	\$0	\$0
Government	590	0	\$143,742	\$0	\$0	\$0	\$143,742
Industrial	147	84	\$9,699,636	\$45,102,146	\$314,544	\$67,653,219	\$122,769,545
Institutional	87	45	\$1,884,400	\$12,698,132	\$79,905	\$12,698,132	\$27,360,569
Miscellaneous	129	0	\$8,119	\$0	\$0	\$0	\$8,119
Recreational	522	97	\$14,115,908	\$30,370,139	\$1,429,945	\$30,370,139	\$76,286,131
Residential	18,805	12,623	\$1,085,684,913	\$2,122,163,500	\$4,747,354	\$1,061,081,750	\$4,273,677,517
ROW/Utilities	1,060	0	\$0	\$0	\$0	\$0	\$0
Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: Plumas County February 2020 Parcel/Assessor's Data

4.2.2. Critical Facility Inventory

The Plumas County worked with members of the HMPC and Plumas County Disaster Council to develop a definition of critical facilities for the Plumas County Planning Area. 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 Pacific Gas & Electric (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 – Plumas Sierra County Fairgrounds, Quincy Veterans Hall, and Chester Veterans Memorial Hall.
- ✓ 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.

A summary of critical facilities in the Plumas County Planning Area can be found in Figure 4-1 and Table 4-9. Table 4-10 details critical facilities by category. Additional details of individual critical facilities can be found in Appendix F of this Plan.

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 4-1 Plumas County Planning Area – Critical Facilities

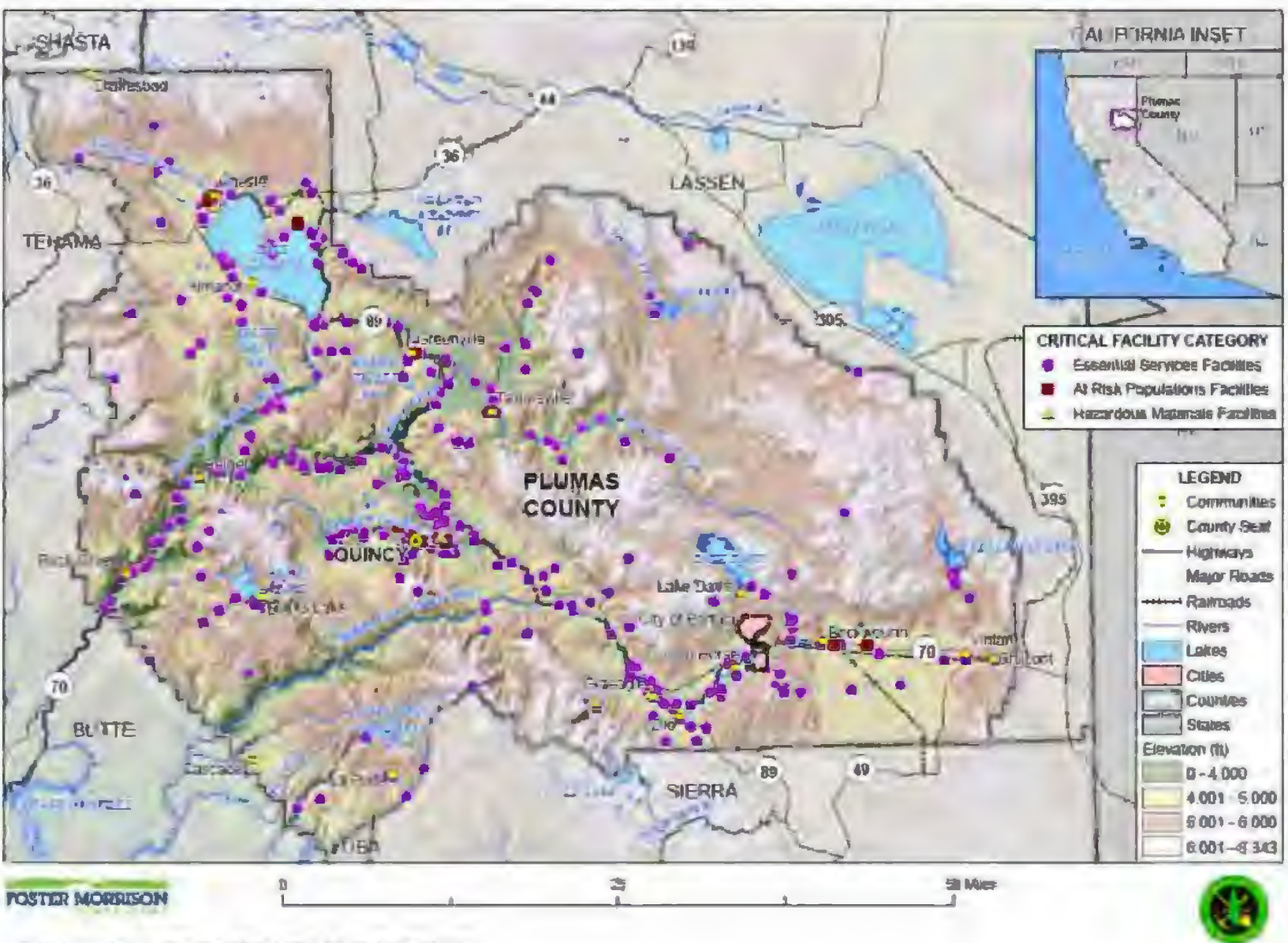


Table 4-9 Plumas County Planning Area – Critical Facility Summary

Critical Facility Category	Facility Count
Essential Services Facilities	773
At Risk Populations Facilities	38
Hazardous Materials Facilities	4
Grand Total	815

Source: Plumas County GIS

Table 4-10 Plumas County Planning Area – Critical Facilities by Facility Type

Critical Facility Category	Critical Facility Type	Facility Count
Essential Services Facilities	Communication Sites and Facilities	494
	Designated Emergency Shelter	3
	Emergency Medical	13
	Emergency Response	5
	Essential Government Operations	14
	Public Safety	42
	Public Utility Plant and Substation Facilities	84
	Transportation Lifeline Systems	118
	Total	773
At Risk Populations Facilities	Nursing, Congregate, or Assisted Living	3
	School	35
	Total	38
Hazardous Materials Facilities	Industrial	1
	Unknown	3
	Total	4
Grand Total		815

Source: Plumas County GIS

4.2.3. Cultural, Historical, and Natural Resources

Assessing Plumas County’s vulnerability to disasters also involves inventorying the cultural, historical, and natural resource assets of the area. This information 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.
- In the event of a disaster, an accurate inventory of cultural, historical and natural resources allows for more prudent care in the disaster’s immediate aftermath when the potential for additional impacts is 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, for example, wetlands and riparian and sensitive habitats which help absorb and attenuate floodwaters and thus support overall mitigation objectives.

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 4-11.

Table 4-11 Plumas County Planning Area – Historical Resources

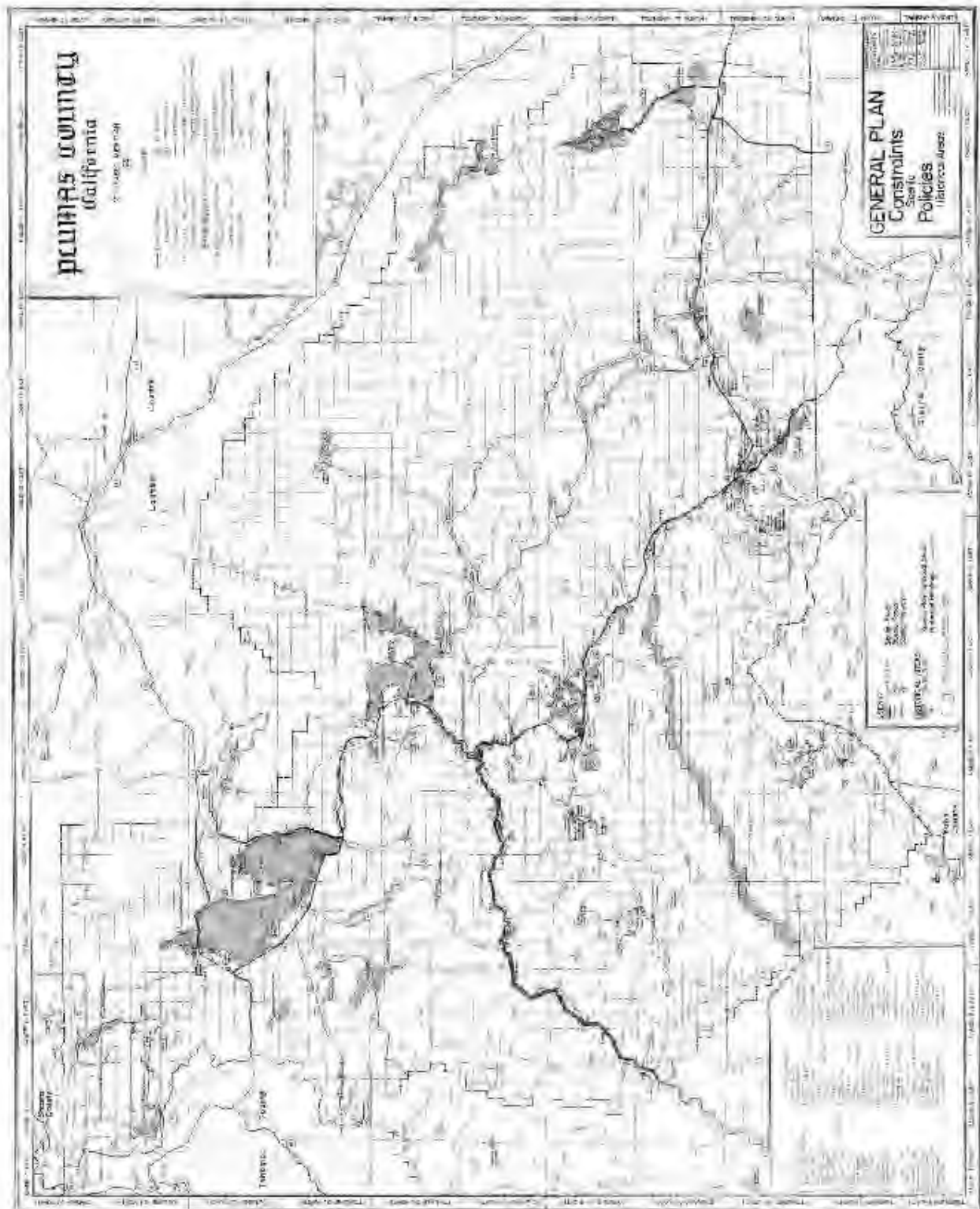
Resource Name (Plaque Number)	National Register	State Landmark	California Register	Point of Interest	Date Listed	City/Community
Beckwourth Pass (336)		X			8/8/1939	Chilcoot
Buck's Lake (197)		X			6/20/1935	Quincy

Resource Name (Plaque Number)	National Register	State Landmark	California Register	Point of Interest	Date Listed	City/Community
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
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, <http://ohp.parks.ca.gov/>

In addition, Plumas County maintains a map of historical areas. This can be seen on Figure 4-2. A close up of the list in the lower right corner of Figure 4-2 is shown on Figure 4-3.

Figure 4-2 Plumas County – Historical Areas



Source: Plumas County

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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.

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 assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetland 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 include 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 4-12. Appendix E list 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 4-12 Plumas County Planning Area – Summary of Special Status Species

Type	Number
Animals - Amphibians	6
Animals - Birds	30
Animals - Fish	3
Animals - Insects	9
Animals - Mammals	21
Animals – Mollusks	5
Animals – Reptiles	1
Community – Terrestrial	5
Plants - Bryophytes	6
Plants - Lichens	1
Plants – Vascular	137

Source: California Natural Diversity Database

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 as well as the California Department of Fish and Wildlife. Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service (USFWS) 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.

The US Fish and Wildlife Service has mapped wetlands areas throughout the United States. Figure 4-4 shows the wetlands areas in the County. These areas are detailed in Table 4-13 by wetland type.



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Table 4-13 Plumas County Planning Area – Wetlands Areas by Area Type

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Freshwater Emergent Wetland	3,536	45,904
Freshwater Forested/Shrub Wetland	3,753	11,686
Freshwater Pond	537	730
Lake	116	37,796
Riverine	480	2,959
Other	32	25
Grand Total	8,454	99,098

Source: US Fish and Wildlife Service

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

Farmlands are important considerations in rural counties in California.

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. Plumas County has approximately 72,000 acres under Williamson Act contracts and 4,500 acres under the Farmland Security Zone. Of the qualifying acreage in Agricultural Preserve zoning, approximately 78% is under contract. Plumas County is not mapped as part of the California Department of Conservation's Farmland Mapping and Monitoring Program, with the exception of the Sierra Valley. These are shown on Figure 4-5. The County is not currently entertaining contracts due to the loss of subvention funding from the State.

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4.2.4. Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past 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. Information from the Plumas County General Plan Housing Element, the California Department of Finance, and the US Census Bureau form the basis of this discussion.

Current Status and Past Populations

The estimated population of Plumas County (both incorporated communities and the unincorporated County) for January 1, 2019 was 19,979 (of which 17,803 were in the unincorporated County), representing a two-fold increase from 11,548 people in 1940. Table 4-14 illustrates the pace of population growth in Plumas County dating back to 1940. Growth in the County occurred in the 1970s, with other decades seeing small growth and small losses.

Table 4-14 Plumas County Planning Area - Population Growth 1940-2019

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%
2019	19,979	-0.1%

Sources: 2014-2019 Plumas County Housing Element Background Report, California Department of Finance, US Census Bureau

Special Populations and Disadvantaged Communities

There are certain categories of households in Plumas County that, because of their physical or economic condition, require particular housing, space, or support services. Special needs households include the elderly, persons with mobility and/or self-care limitations, large families, families with female heads of household, farmworkers, homeless or families with insecure housing that includes persons in need of emergency shelter, and student resident housing. Some of these increase the risk of hazards. These are discussed below.

- **Senior Households** – many elderly people have physical disabilities and dependence needs that limit their mobility and increase their need for accessible health care and transportation. It is not uncommon for the elderly to have higher poverty rates even though Social Security and other retirement benefits provide a guaranteed minimum income. As of 2017, the American Community Survey estimated there were 4,364 seniors age 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.

- **Persons with Disabilities** – 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. Residents of Plumas County have a relatively high rate of disability. About 17 percent of the total population (5 years old or older) has some type of disability, and more than half of those are below the age of 65.
- **Farmworkers** – Migrant farmworkers, many of whom speak Spanish, work seasonally in Plumas County. Language barriers can make announcements of hazards and evacuations more difficult.
- **Homeless** – 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, which is a slight decrease of 23 from the 2016 Point-in-Time count, which identified 1,272 homeless. The vast majority (806 people) of the homeless counted in 2019 were unsheltered while only 443 people had access to shelter. 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. 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. Program examples include emergency motel sheltering, mental health transitional housing, Pathways Home (Housing First Model for transitioning offenders), emergency and transitional housing for youth, Ohana House in Quincy (emergency and transitional housing for adults age 18+), and Plumas House (transitional sober living environment for men). The Sierra Safe Program in Loyalton (Sierra County) provides emergency shelter through the women’s shelter under correct criteria and/or motels. Plumas County provides emergency shelter service through use of County buildings and facilities. During the Camp Fire disaster in Paradise, Butte County, Plumas County provided temporary emergency shelters in the Chester Memorial Hall, the Quincy Veteran’s Hall, and the Plumas-Sierra County Fairgrounds in Quincy. The 2020 point-in-time homeless count in Plumas County conducted in January identified 107 homeless individuals. The survey is done by Plumas Crisis Intervention and Resource Center

The HMPC 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.

CA DWR Special Population and Disadvantaged Community Mapping

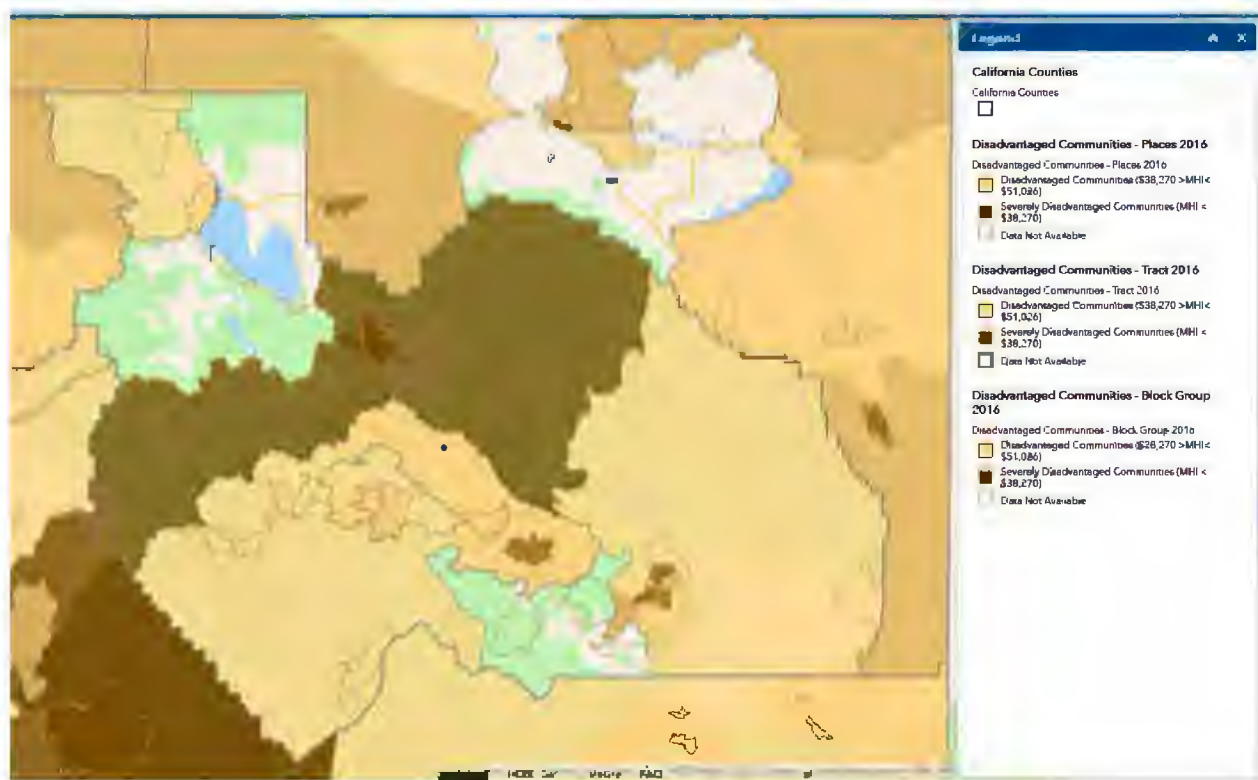
CA DWR has developed a web-based application to assist local agencies and other interested parties in evaluating disadvantaged community (DAC) status throughout the State, using the definition provided by Proposition 84 Integrated Regional Water Management (IRWM) Guidelines (2015). The DAC Mapping

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
- Census Block Group

Only those census geographies that meet the 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 (PRC Section 75005(g)). In addition, those census geographies having an annual MHI that is less than 60 percent of the Statewide annual MHI are shown as "Severely Disadvantaged Communities" (SDAC). The DAC map for Plumas County is shown in Figure 4-6.

Figure 4-6 Plumas County – Disadvantaged Communities



Source: CA DWR

Climate Change and Health Profile Report – Plumas County

The 2017 Climate Change and Health Profile Report for Plumas County was done by the California Department of Public Health and the University of California-Davis. The report noted that there are special populations in the County.

In 2010, the age-adjusted death rate in Plumas County was higher than the state average. Pooled with several nearby counties (Nevada and Sierra), nearly 41% of adults (44,447) reported one or more chronic health conditions like heart

disease, diabetes, asthma, severe mental stress, or high blood pressure in 2012. In 2012, 14% of adults reported having been diagnosed with asthma (pooled for Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, and Trinity Counties). In 2012 approximately 18% of adults were obese (pooled for Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, and Trinity Counties; statewide average was 25%). In 2012, nearly 74% of residents aged 5 years and older had a mental or physical disability (statewide average was 10%).

In 2005-2010, there was an annual average of 5 heat-related emergency room visits and an age-adjusted rate of 22 emergency room visits per 100,000 persons (the statewide age-adjusted rate was 10 emergency room visits per 100,000 persons).

Among climate-vulnerable groups in 2010 were 883 children under the age of 5 years and 4,154 adults aged 65 years and older. In 2010, there were approximately 277 people living in nursing homes, dormitories, and other group quarters where institutional authorities would need to provide transportation in the event of emergencies.

Social and demographic factors and inequities affect individual and community vulnerability to the health impacts of climate change. In 2010, 1% of households (101) did not have a household member 14 years or older who spoke English proficiently (called linguistically isolated; statewide average was 10%). In 2010, approximately 8% of adults aged 25 years and older had less than a high school education (statewide average was 19%).

In 2010, 12% of the population had incomes below the poverty level (the statewide average was 14%). Nineteen percent of households paid 50% or more of their annual income on rent or a home mortgage (statewide average was 22%). In 2012, approximately 46% (pooled for Del Norte, Lassen, Modoc, Plumas, Sierra, Siskiyou, and Trinity Counties) of low-income residents reported they did not have reliable access to a sufficient amount of affordable, nutritious food (called food insecurity; statewide average was 42%).

In 2010, Plumas County had approximately 1,236 outdoor workers whose occupation increased their risk of heat illness. In 2010, roughly 4% of households did not own a vehicle that could be used for evacuation (statewide average was 8%).

In 2009, approximately 92% of households were estimated to lack air conditioning, a strategy to counter adverse effects of heat (statewide average was 36%). In 2011, tree canopy, which provides shade and other environmental

benefits, was present on 30% of the county's land area (statewide average was 8%).

Development since 2014 Plan

The Plumas County Building Department tracks total building permits issued since 2014 for unincorporated Plumas County. A summary of this development is shown in Table 4-15. Development by known flood, fire, and other hazard areas is shown in Table 4-16. All development in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas, were completed in accordance with all current and applicable development codes and standards and should be adequately protected. 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 4-15 Plumas County Development 2014-2019 Summary

Property Use	2015	2016	2017	2018	2019
Residential	43	64	38	57	52
Commercial	5	0	2	2	6
Industrial	0	2	0	3	1
Total	48	66	40	62	59

Source: Plumas County Building Department and Planning Department, April 2020

Table 4-16 Plumas County Development in Hazard Zones since 2014

Property Use	1% Annual Chance Flood	Wildfire Risk Area	Other
Residential	5	254	0
Commercial	1	15	0
Industrial	0	6	0
Other	0	0	0
Total	6	275	0

Source: Plumas County Building Department and Planning Department

Future Development

Future development in the County is discussed in the sections below.

Population Projections

As indicated in the previous section, Plumas County had been steadily growing from 1940 to 2010, with a recent slowing in population growth. Long term forecasts by the California Department of Finance project population growth in Plumas County continuing through the 2060. Table 4-17 shows the population projections for the County as a whole through 2060. Based on this data, population growth continues to gradually decline through 2060.

Table 4-17 Population Projections for Plumas County (incorporated and unincorporated), 2020-2060

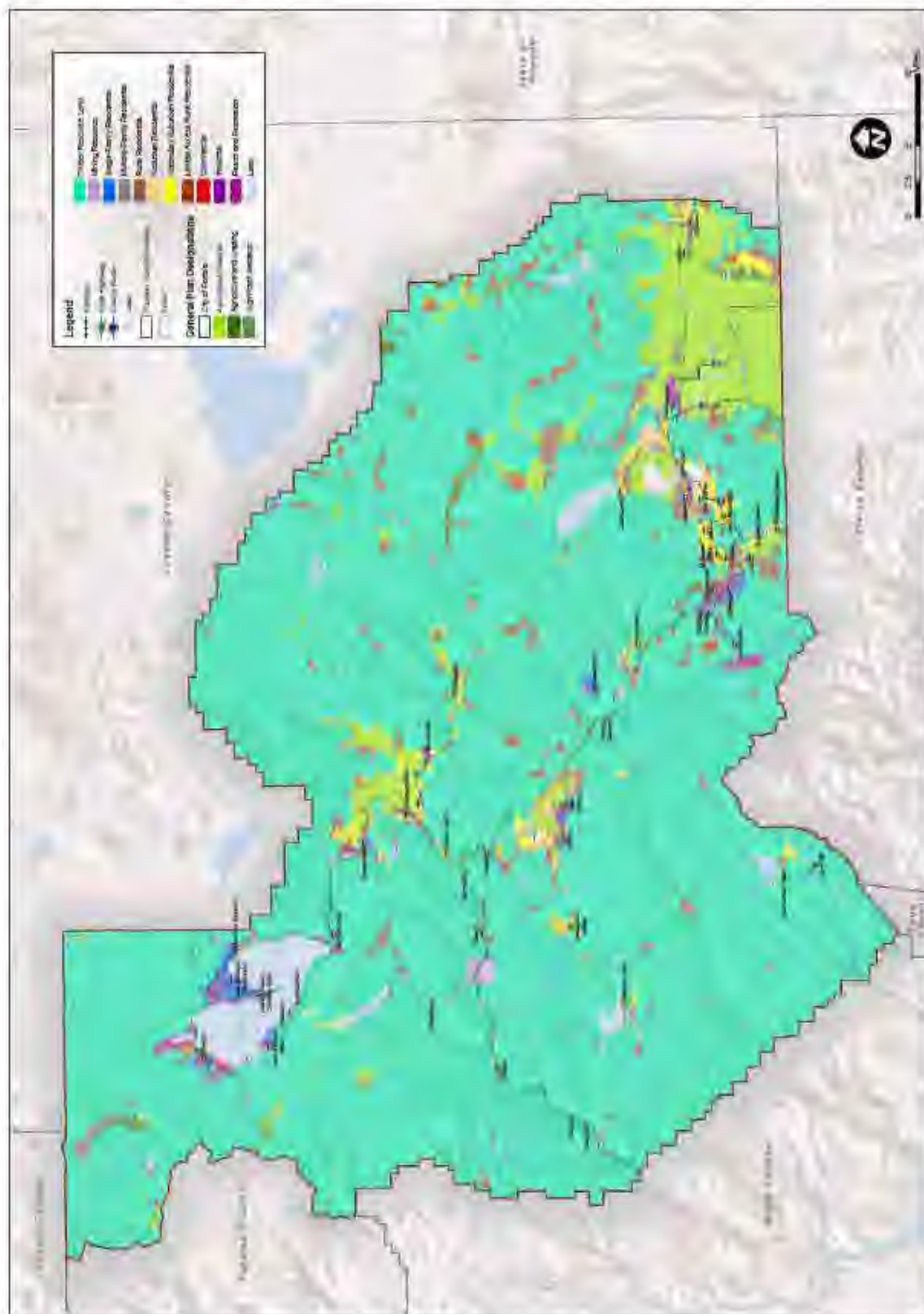
	2020	2030	2040	2050	2060
Plumas County	18,997	18,600	17,397	16,558	16,639

Source: 2019-2024 Plumas County Housing Element

Future 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 2035 General Plan Land Use Element. Figure 4-7 is sourced from this section.

Figure 4-7 Plumas County General Plan Land Use



Source: Plumas County 2016 General Plan Land Use Element

Future Development Area Analysis

The Plumas County Planning & Building Services noted that there are parcels being considered for future development in the County. These locations come from a variety of sources and make up the future development analysis areas:

- **3-R and 7-R** – The purpose of the Single-Family Residential Zones (2-R, 3-R, 7-R) is to provide for dwelling units in prime opportunity single-family residential areas with provisions for compatible uses.
- **AP** – The purpose of the Agricultural Preserve Zone (AP) is to provide land use regulations consistent with the intent of the Plumas County Williamson Act program for agricultural preserves.
- **C-2** – The purpose of the Periphery Commercial Zone (C-2) is to provide for major commercial uses near large population centers with provisions for adequate access and parking.
- **I-2** – The purpose of the Light Industrial Zone (I-2) is to provide for light industry where access is available to transportation routes, transportation facilities, and public service facilities and where surrounding land use and the environmental setting will permit most light industrial uses without major adverse impacts.
- **M-R** – The purpose of the Multiple-Family Residential Zone (M-R) is to provide for dwelling units in multiple-family residential areas with provisions for compatible uses.
- **R-10** – The purpose of the Rural Zone (R-10) is to provide for dwelling units at the ratio of ten (10) to twenty (20) acres per dwelling unit with provisions for compatible uses.
- **Rec-1** – The purpose of the Recreation Zones (Rec-P, Rec-1, Rec-3, Rec-10, Rec-20) is to provide for the development of prime recreation site with dwelling unit density compatible with the opportunity area in which the prime recreation site is located and to provide for multiple uses of prime recreation sites in a manner supportive of recreational uses.
- **S-3** – The purpose of the Secondary Suburban Zone (S-3) is to provide for dwelling units at the ratio of three (3) to ten (10) acres per dwelling unit with provisions for compatible uses.

Future Development GIS Analysis

The above areas were provided by Plumas County in mapped GIS format. Using GIS, the following methodology was used in determining parcel counts and values associated with future development in the Plumas County Planning Area. The February 2020 Plumas County Parcel/Assessor's data and data from the County planning department were used as the basis for the County's inventory of parcels and acres of future development areas. The Plumas County Planning Department provided a table containing the assessor parcel numbers (APNs) for the 1,075 parcels representing the different future development projects or areas. Using the GIS parcel spatial file and the APNs, the future development projects were mapped. These areas can be seen on Figure 4-8 and detailed in Table 4-18.

Figure 4-8 Plumas County Planning Area – Future Development Areas

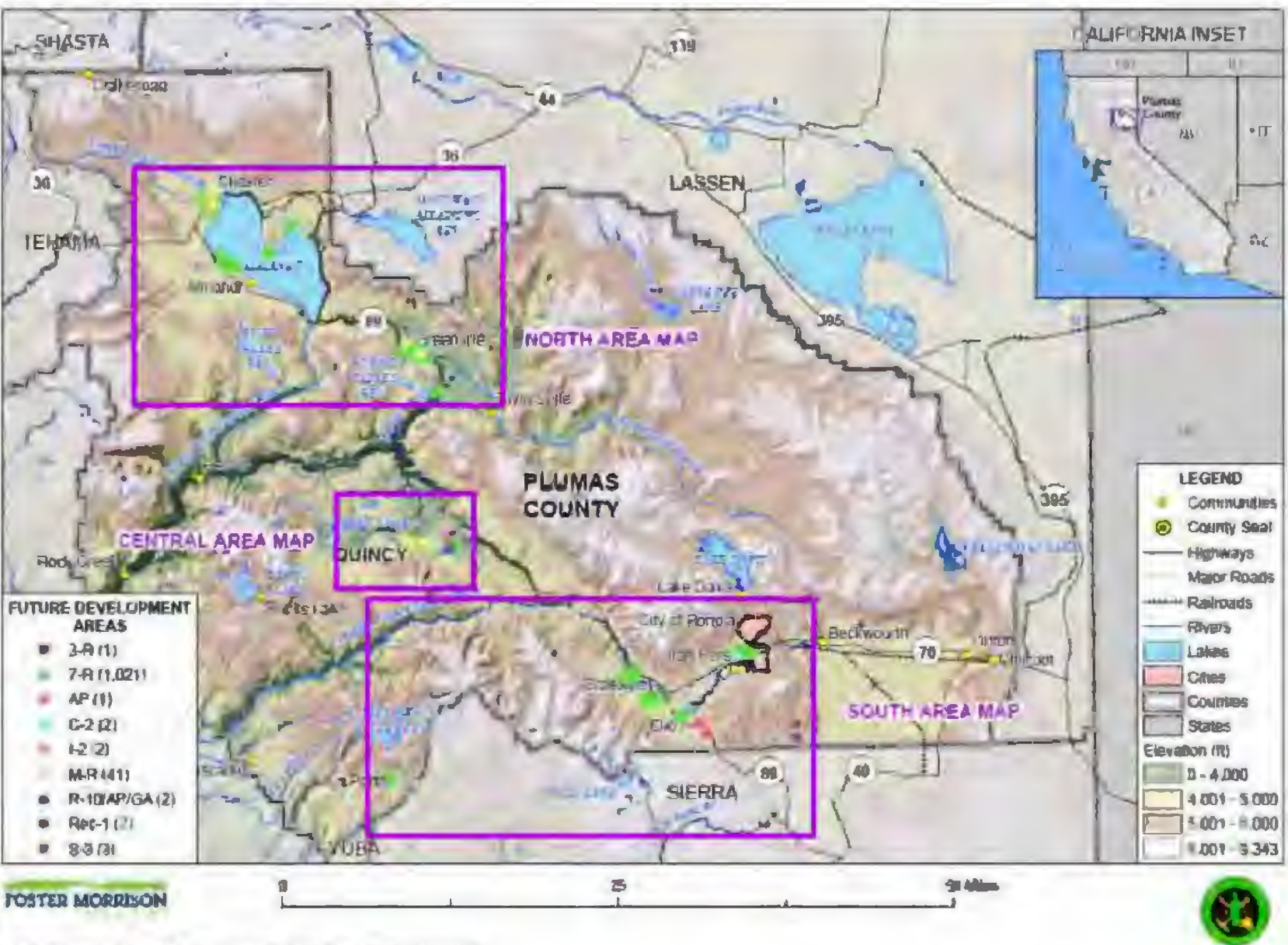


Table 4-18 Unincorporated Plumas County – Future Development Area Parcel and Acre Counts

Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
3-R	1		9.010
7-R	1021	391	504.007
AP	1		4.010
C-2	2		6.730
I-2	2	1	15.930
M-R	41	8	114.572
R-10	2	1	1,108.880
Rec-1	2	1	13.840
S-3	3	1	56.270
Grand Total	1,075	403	1,833.249

Source: Plumas County GIS

In order to view these sites more clearly, the County was broken up into three regions – north, central, and south. Maps and analysis were created to show future development by region. This can be seen on Figure 4-9, Figure 4-10, and Figure 4-11, as well as in Table 4-19. The analysis in the hazard vulnerability discussions in Section 4.3 below will follow this three region format.

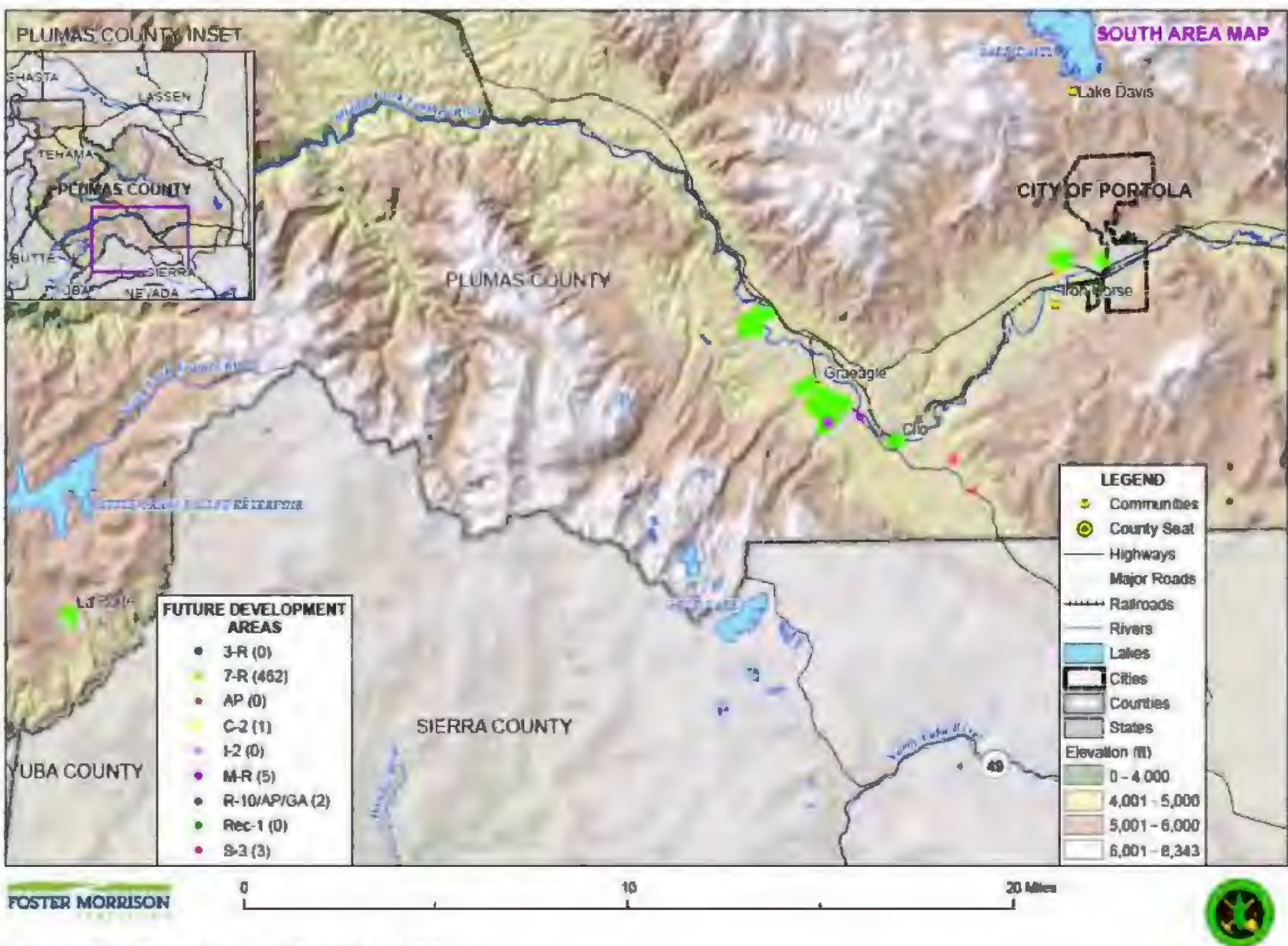
Figure 4-9 Plumas County North – Future Development Areas



Figure 4-10 Central Plumas County – Future Development Areas



Figure 4-11 Plumas County South – Future Development Areas



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 03/01/2020

Table 4-19 Plumas County – Future Development in North, Central, and South Areas by Parcel Count and Acres

Future Development/Map Area	Total Parcel Count	Improved Parcel Count	Total Acres
North Area			
7-R	498	190	299.059
M-R	15	3	13.610
Rec-1	2	1	13.840
North Area Total	515	194	326.509
Central Area			
3-R	1		9.010
7-R	61	22	29.963
AP	1		4.010
C-2	1		2.870
I-2	2	1	15.930
M-R	21	4	33.320
Central Area Total	87	27	95.103
South Area			
7-R	462	179	174.985
C-2	1		3.860
M-R	5	1	67.642
R-10	2	1	1,108.880
S-3	3	1	56.270
South Area Total	473	182	1,411.637
Grand Total	1,075	403	1,833.249

Source: Plumas County Planning and Building Services

4.3 Hazard Profiles and Vulnerability Assessment

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.

Requirement §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.

Requirement §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.

Requirement §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.

Requirement §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. These hazard profiles set the stage for the Vulnerability Assessment, where the vulnerability is quantified for each of the hazards.

Hazard Profiles

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. Where known, this includes information on the hazard location, extent, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical hazard events, including location, impacts, and damages where known. Hazard research, historical incident worksheets and other input from the HMPC were used to capture information on past occurrences.
- **Frequency/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 (if applicable). The possible ramifications of climate change on each hazard are discussed.

Vulnerability Assessment

With Plumas County’s hazards identified and profiled, a vulnerability assessment was conducted to describe the vulnerability and impact that each hazard would have on the County. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to identified hazards and estimates potential losses. This section focuses on the vulnerabilities of the Plumas County Planning Areas (i.e., unincorporated Plumas County) as a whole.

An estimate of the vulnerability of the Plumas County Planning Area to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. 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.

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 buildings 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 community facilities, historic structures, and valued natural resources. Together, this information conveys the impact, or vulnerability, of that area to that hazard.

The vulnerability assessment identified five hazards in the Planning Area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These five hazards are dam failure, earthquake, flood, landslide, and wildfire. The vulnerability of the flood (1%/0.2% annual chance), landslide, and wildfire hazards were analyzed using GIS and County parcel and assessor data.

FEMA's loss estimation software, HAZUS-MH, was used to analyze the County's vulnerability to earthquakes.

For dam failure, flood (1%/0.2% annual chance), landslide, and wildfire, the following elements were inventoried for each community, to the extent possible, to quantify vulnerability in identified hazard areas:

- General vulnerability and hazard-related impacts, including impacts to life, safety, and health
- Values at risk (i.e., types, numbers, and value of land and improvements)
- Population at risk
- Critical facilities at risk
- Overall community impact
- Future development/development trends within the identified hazard area

The vulnerability and potential impacts from 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:

- Avalanche
- Climate Change
- Drought and Water Shortage
- Flood: Localized/Stormwater
- Levee Failure
- Pandemic
- Tree Mortality
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Winds and Tornadoes
- Severe Weather: Winter Storm and Freeze
- Volcano

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 County'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 and HMPC members is integrated into this section with information from other data sources. The data sources listed below formed the basis for this Hazard Profiles and Vulnerability section of this 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.

- 2018 California State Hazard Mitigation Plan
- ArkStorm at Tahoe - Stakeholder Perspectives on Vulnerabilities and Preparedness for an Extreme Storm Event in the Greater Lake Tahoe, Reno and Carson City Region. 2014.
- Bureau of Land Management
- CA DWR Best Available Maps
- CAL FIRE GIS datasets

- Cal OES
- Cal-Adapt
- Cal-Adapt – Annual Average of Acres Burned
- Cal-Adapt – Extended Drought Scenarios
- Cal-Adapt – Number of Extreme Heat Days by Year
- Cal-Adapt – Precipitation: Decadal Averages Map
- California Adaptation Planning Guide
- California Climate Adaptation Strategy (CAS) – 2014
- California Department of Water Resources
- California Department of Water Resources (CA DWR) Division of Safety of Dams
- 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 Office of Emergency Services – Dam Inundation Data
- California’s Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.
- 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>.
- Climate Change and Health Profile Report – Plumas County
- County staff
- Existing plans and studies
- Feather River Bulletin, Wednesday January 29, 1997
- FEMA
- FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes
- FEMA’s HAZUS-MH 4.2 GIS-based inventory data
- Fettig, C.J. 2012. Forest health and bark beetles. In: North, M.P., ed. Managing Sierra Nevada forests. Gen. Tech. Rep. PSW-GTR-237. Albany, CA : U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station: 13–22
- Integrated Regional Water Management Plan
- IPCC Fifth Assessment Synthesis Report (2014)
- KCRA News Report
- Kenward, Alyson PhD, Adams-Smith, Dennis, and Raja, Urooj. Wildfires and Air Pollution – The Hidden Health Hazards of Climate Change. Climate Central. 2013.
- Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.
- Liu, J.C., Mickley, L.J., Sulprizio, M.P. et al. Climatic Change. 138: 655. doi:10.1007/s10584-016-1762-6. 2016.
- Multi-Hazard Identification and Risk Assessment, FEMA 1997
- National Drought Mitigation Center
- National Drought Mitigation Center – Drought Impact Reporter
- National Integrated Drought Information System
- National Levee Database
- National Oceanic and Atmospheric Administration’s National Climatic Data Center
- National Park Service

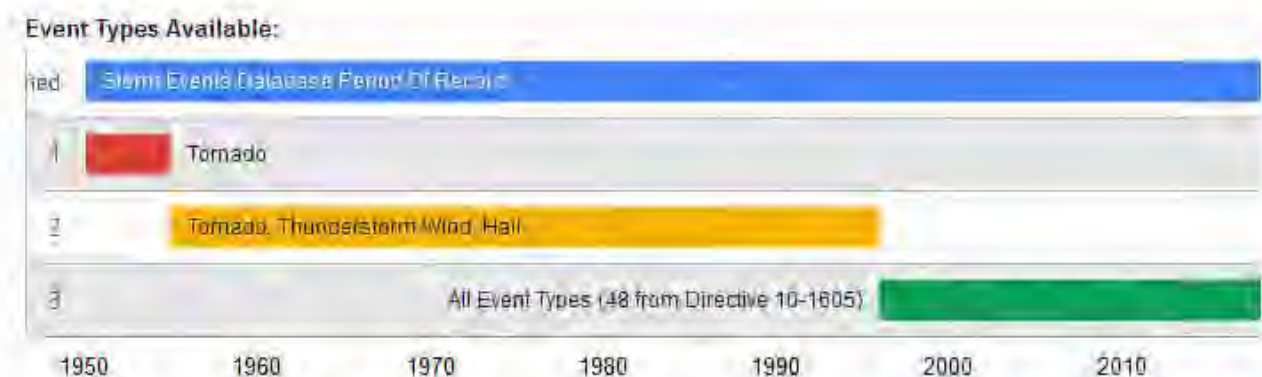
- National Park Service – Historic American Buildings Survey and Historic American Engineering Record
- National Weather Service
- Natural Resource and Conservation Service
- NOAA Storm Prediction Center
- Pacific Gas and Electric Company
- Personal interviews with planning team members and staff from the County
- Plumas County 2014 Local Hazard Mitigation Plan
- Plumas County 2019-2024 Housing Element
- Plumas County 2019 Community Wildfire Protection Plan
- Plumas County 2035 General Plan Conservation Element
- Plumas County 2035 General Plan Land Use Element
- Plumas County 2035 General Plan Public Health & Safety Element
- Plumas County 2035 General Plan Water Resources Element
- Plumas County Agriculture Commissioner
- Plumas County Assessor's Office
- Plumas County Building Department
- Plumas County Digital Flood Insurance Rate Map March 2, 2005
- Plumas County Flood Insurance Study March 2, 2005
- Plumas County GIS
- Plumas County Novel Coronavirus website
- Plumas County Road Department
- Plumas Eureka Community Services District
- Proceedings of the National Academy of Sciences
- Public Health Alliance of Southern California
- Public Policy Institute of California
- Science Magazine
- Sierra Avalanche Center
- Sierra Nevada Photos website
- Statewide GIS datasets from other agencies such as Cal OES, FEMA, USGS, CGS, Cal Atlas, and others
- Stephens, S.L., Collins, B.M., Fettig, C.J., Finney, M.A., Hoffman, C.M., Knapp, E.E., North, M.P., Safford, H. and Wayman, R.B., 2018. Drought, tree mortality, and wildfire in forests adapted to frequent fire. *BioScience*, 68(2), pp.77-88.
- The Storm of '86 by Robert Moon, Feather River Publishing, Quincy, CA 1986
- U.S. Census Bureau 2010 Household Population Estimates
- U.S. Fish and Wildlife Service
- U.S. Fish and Wildlife Service's National Wetlands Inventory maps
- U.S. Forest Service GIS datasets
- U.S. Geological Survey
- U.S. Geological Survey Landslide Maps
- U.S. Occupational Safety and Health Administration
- United States Geological Survey Open File Report 2015-3009
- University of California
- US Army Corps of Engineers
- US Department of Agriculture

- US Farm Service Agency
- US Fish and Wildlife Service
- US Geological Survey: Volcanic Ash: Effect & Mitigation Strategies
- USDA Forest Service Region 5
- USGS Bulletin 1847
- USGS – A Sight “Fearfully Grans” – Eruptions of Lassen Peak California, 1914 to 1917
- USGS National Earthquake Information Center
- USGS Publication 2014-3120
- Vaisala National Lightning Detection Network
- Western Regional Climate Center
- World Health Organization
- Written descriptions of inventory and risks provided by Plumas County
- Yubanet.com

4.3.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs throughout the Plumas County Planning Area as localized storms that bring heavy rains and floods; severe cold, snow, and winter weather; extreme heat, and strong winds. The NOAA’s NCDC has been tracking severe weather since 1950. Their Storm Events Database contains data on the following events shown on Figure 4-12.

Figure 4-12 NCDC Storm Events Database Period of Record



Event Types Available:

Add more info about event types here. Link to collections page/tab when referencing data collection source

1. Tornado: From 1950 through 1954, only tornado events were recorded.

2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the [Unformatted Text Files](#).

3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in [NWS Directive 10-1605](#).

Source: NCDC

The NCDC's 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 632 severe weather events that occurred in Plumas County between January 1, 1950, and September 30, 2019. Table 4-20 summarizes these events.

*Table 4-20 NCDC Severe Weather Events for Plumas County 1950-9/30/2019**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	1	0	0	0	0	\$0	\$0
Cold/Wind Chill	3	0	0	0	0	\$0	\$0
Debris Flows	5	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
Flash Flood	3	0	0	0	0	\$0	\$0
Flood	10	0	0	1	0	\$3,140,000	\$0
Freezing Fog	1	0	0	0	0	\$0	\$0
Hail	19	0	0	0	0	\$100	\$5,000
Heavy Rain	47	0	0	0	0	\$1,000	\$0
Heavy Snow	280	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	2	0	0	0	0	\$25,100	\$0
Thunderstorm Wind	2	0	0	0	0	\$675,000	\$0
Wildfire	9	0	0	0	0	\$22,775,000	\$0
Winter Storm	117	0	0	0	0	\$150,000	\$0
Winter Weather	31	0	0	0	0	\$0	\$0
Total	632	1	0	2	0	\$29,284,700	\$0

Source: NCDC

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

The NCDC table above summarize severe weather events that occurred in Plumas County. Only a few of the events actually resulted in state and federal 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. The value in this data is that it provides data depicting the County's "big picture" hazard environment.

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

- Extreme Heat
- Heavy Rains and Storms
- High Winds and Tornadoes
- Winter Storm and Freeze

It was noted by the HMPC that severe weather has taken out all the communications towers, including 911 systems, during past storm events.

For purposes of this Plan, the Quincy Co-op weather station (elevation: 3,410 feet above mean sea level (msl)) was used to illustrate and inform the severe weather hazards. This station was chosen due to its length of record (1895 to 2016).

4.3.2. Severe Weather: Extreme Heat

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect 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. Extreme heat conditions can also compound the effects of other hazards, such as drought and wildfire and can contribute to increases in tree mortality. Extreme heat can also affect agriculture in Plumas County. During times of high heat, low humidity, and winds, PG&E can issue a Public Safety Power Shutdown (PSPS) for the County.

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, chronic invalids, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions.

Location and Extent

Extreme heat events occur on a regional basis. Extreme heat can occur in any location of the County, though it is more prevalent in the lower elevations of the County. All portions of the County are at some risk to extreme heat. Extreme heat occurs throughout the Planning Area primarily during the summer months. The Western Regional Climate Center (WRCC) maintains data on weather normal and extremes

in the western United States. Information from the representative weather station introduced in Section is summarized below.

Quincy Weather Station, Period of Record 1895 to 2016 (Elevation of 3,410 above msl)

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 4-13 shows the average daily high temperatures and extremes for the County. Table 4-21 shows the record high temperatures by month for the County.

Figure 4-13 Plumas County—Daily Temperature Averages and Extremes

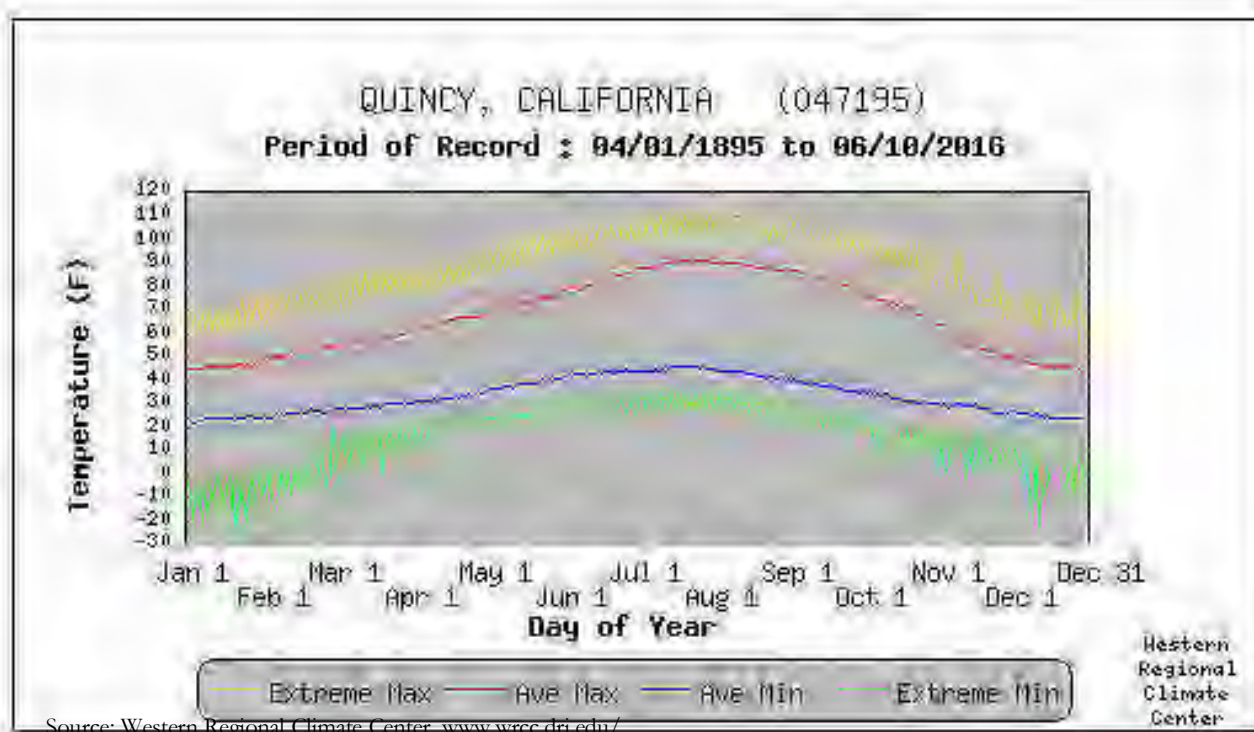


Table 4-21 Plumas County – Record High Temperatures

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

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 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 National Weather Service (NWS) has in place a system or scale 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 4-22.

Table 4-22 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 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.

NCDC Events

The NCDC data showed no extreme heat incidents for Plumas County since 1993.

Hazard Mitigation Planning Committee Events

Members of the HMPC recalled the following events:

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 of the County.

Climate Change and Extreme Heat

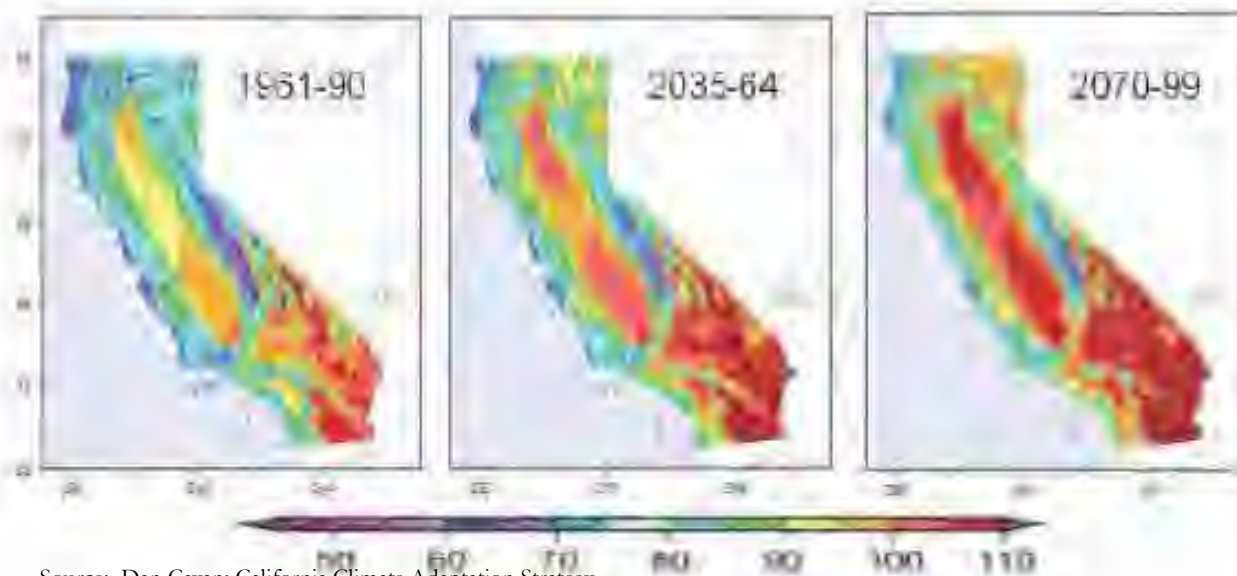
Climate change and its effect on extreme heat in the County has been discussed utilizing three sources:

- California Climate Adaptation Strategy (CAS) – 2014
- Climate Change and Health Profile Report – Plumas County
- Cal-Adapt

Climate Adaptation Strategy

The California Climate Adaptation Strategy (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 4-14.

Figure 4-14 California Historical and Projected Temperature Increases – 1961 to 2099



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 2014 CAS report and the 2018 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.

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.

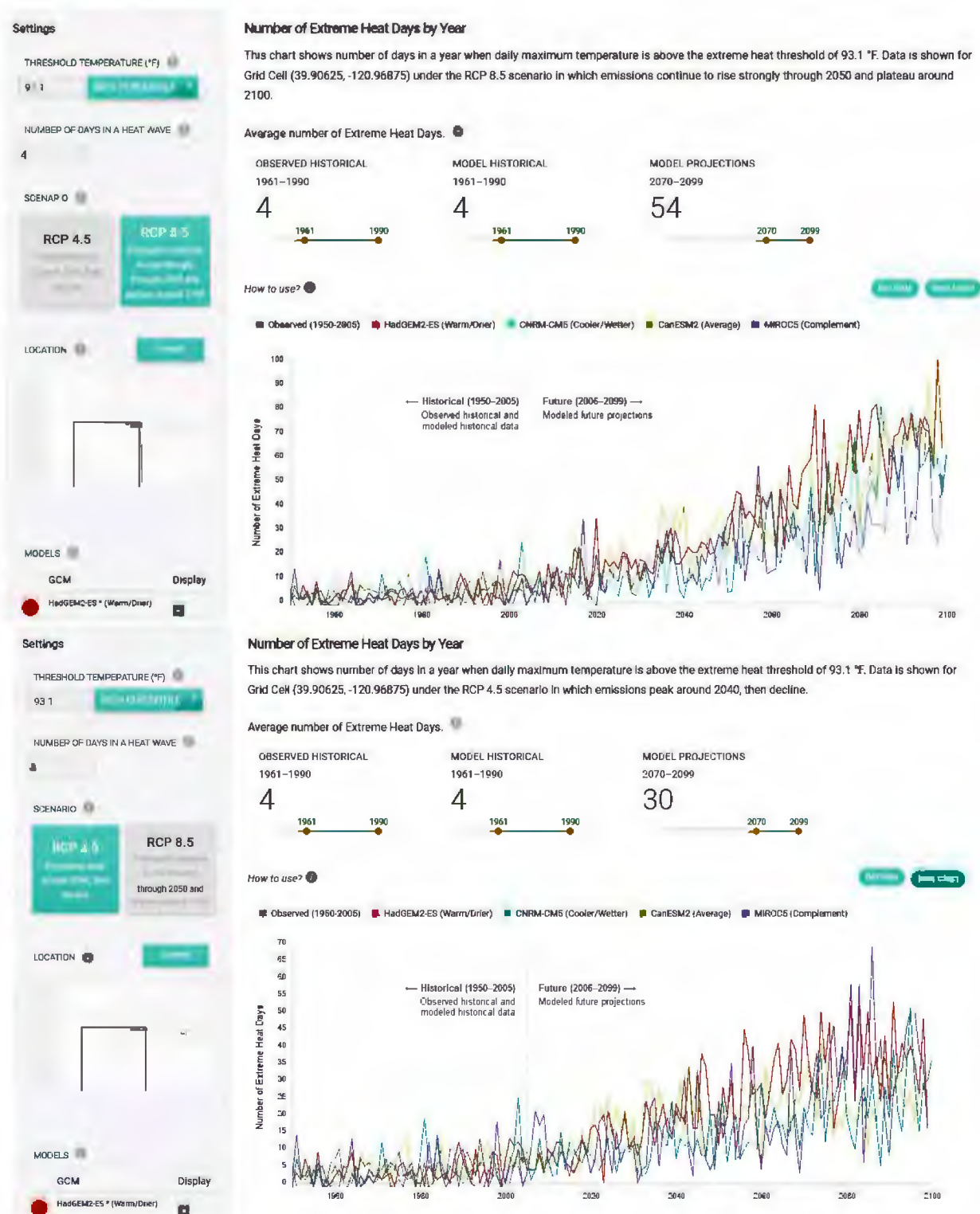
Cal-Adapt

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 (using the quad that contains the Quincy) are shown in Figure 4-15. It shows the following:

- The upper chart shows number of days in a year when daily maximum temperature is above the extreme heat threshold of 90.0°F. Data is shown for Plumas County under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.
- The lower chart shows number of days in a year when daily maximum temperature is above the extreme heat threshold of 90.0 °F. Data is shown for Plumas County under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

Figure 4-15 Plumas County – Future Temperature Estimates in Low and High Emission Scenarios



Source: Cal-Adapt – Number of Extreme Heat Days by Year

Vulnerability Assessment

Vulnerability—Medium

Extreme heat happens in Plumas County each year. Extreme heat rarely affects buildings in the County, but affects the population inside the County. Heat can cause stress to agricultural crops and livestock in the County. Extreme heat dries out vegetation in the County, creating greater risks from wildfires. Heat, combined with low humidity and high winds, can cause PG&E or Plumas-Sierra Rural Electric Cooperative (PSREC) to issue a PSPS event for the County.

Impacts from Extreme Heat

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 disadvantage in California. Factors such as those bulleted above were combined to show what areas are at greater risk to hazards like extreme heat. This is shown on Figure 4-16.

Figure 4-16 Health Disadvantage Index by California Census Tract



Source: Public Health Alliance of Southern California

Vulnerable populations to extreme heat include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment

- Individuals with impaired mobility

In addition to vulnerable populations, pets and livestock are at risk to extreme heat. Extreme heat also causes greater wildfire risk, which is discussed in Section 4.3.18.

Future Development

As the County shifts in demographics, more residents will become senior citizens. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary. Future development may also need to consider changes to both the length of wildfire season and the increasing hazards of wildfire (discussed in more detail in 4.3.18).

4.3.3. Severe Weather: Heavy Rains and Storms

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

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.

Storms in the lower elevations of the Plumas County Planning Area are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. In the upper elevations, these storms can drop large amounts of snow (discussed in Section 4.3.5). 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.

The severe weather hazard is broken down in the following sections into:

- Heavy Rain and Storms
- Hail
- 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 of 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.

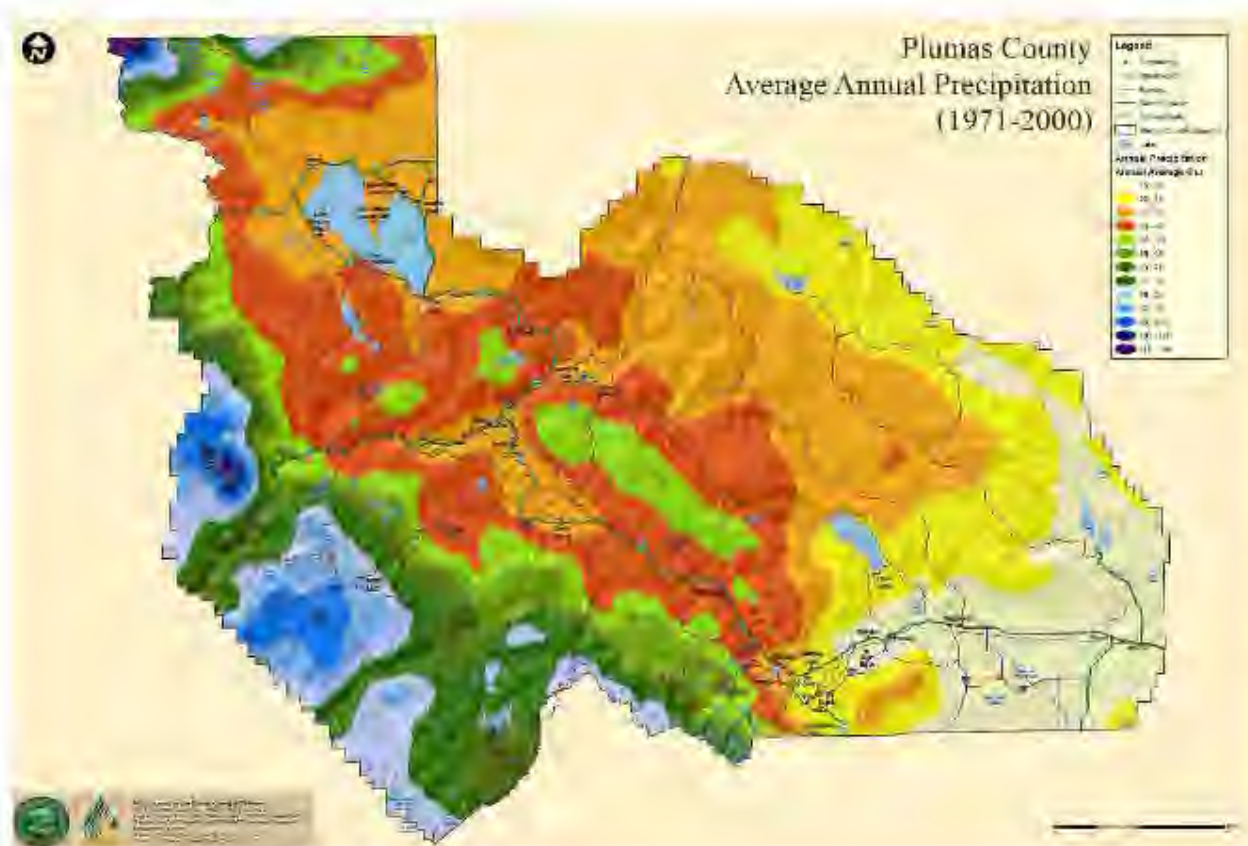
According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. As storms continue to increase in intensity, the limited drainage infrastructure has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

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 floodflows, and small runoff volume. In small drainage basins such as Portola Tributary, cloudbursts can produce peak flows substantially larger than those of general rainstorms.

Location and Extent

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 4.3.5). 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 4-17. Most of these rains occur during the winter months, as discussed below.

Figure 4-17 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.

Information from the WRCC weather station in Plumas County previously discussed in Section 4.1 is summarized below.

Plumas County—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 4-18. Daily average and extreme precipitations are shown in Figure 4-19.

Figure 4-18 Plumas County—Monthly Average Total Precipitation

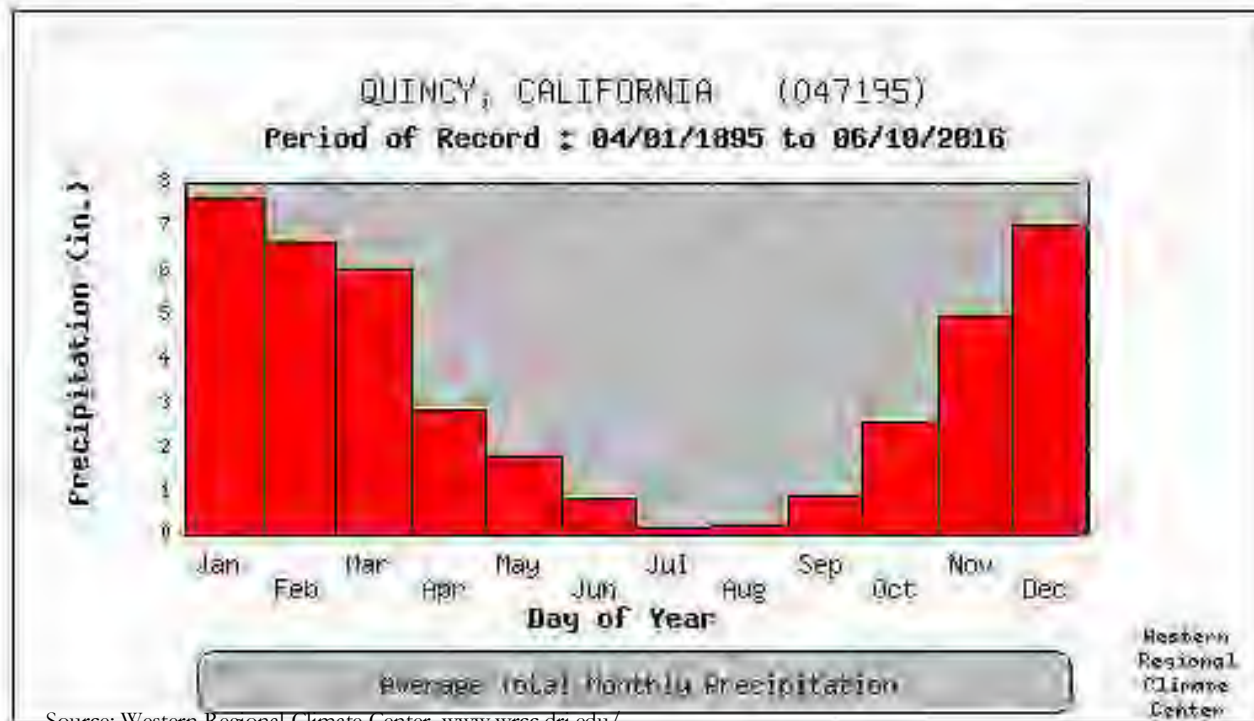
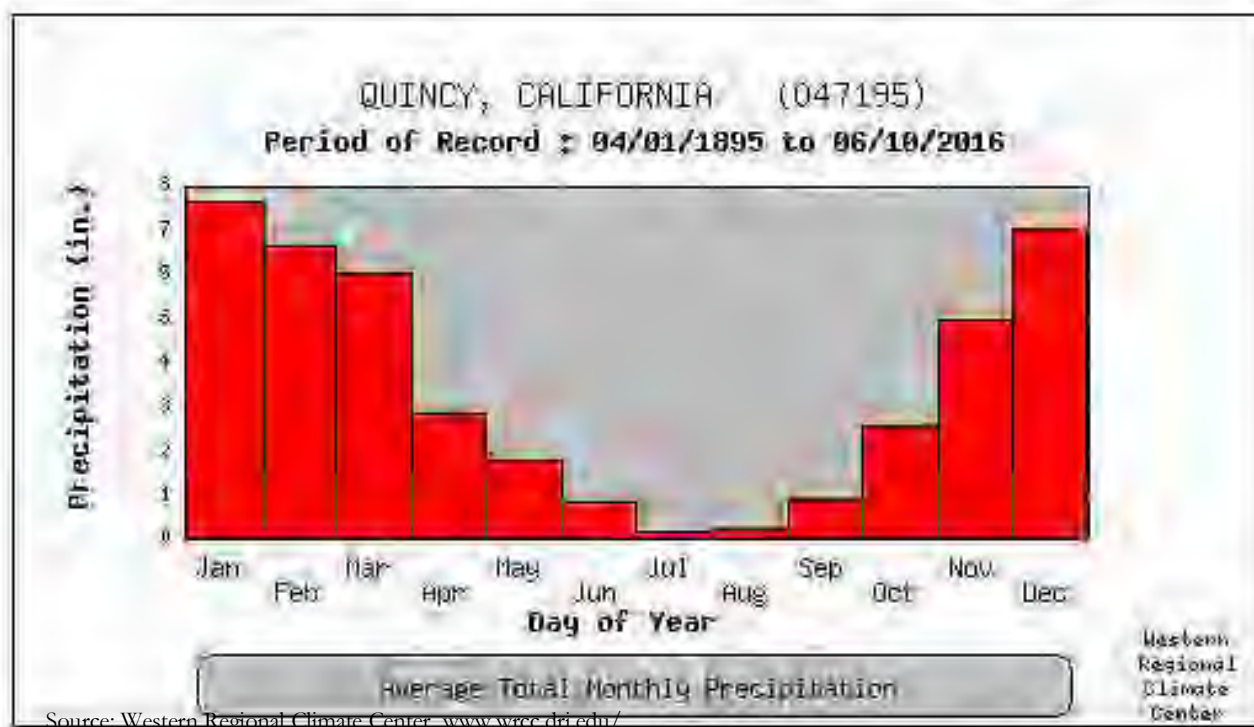
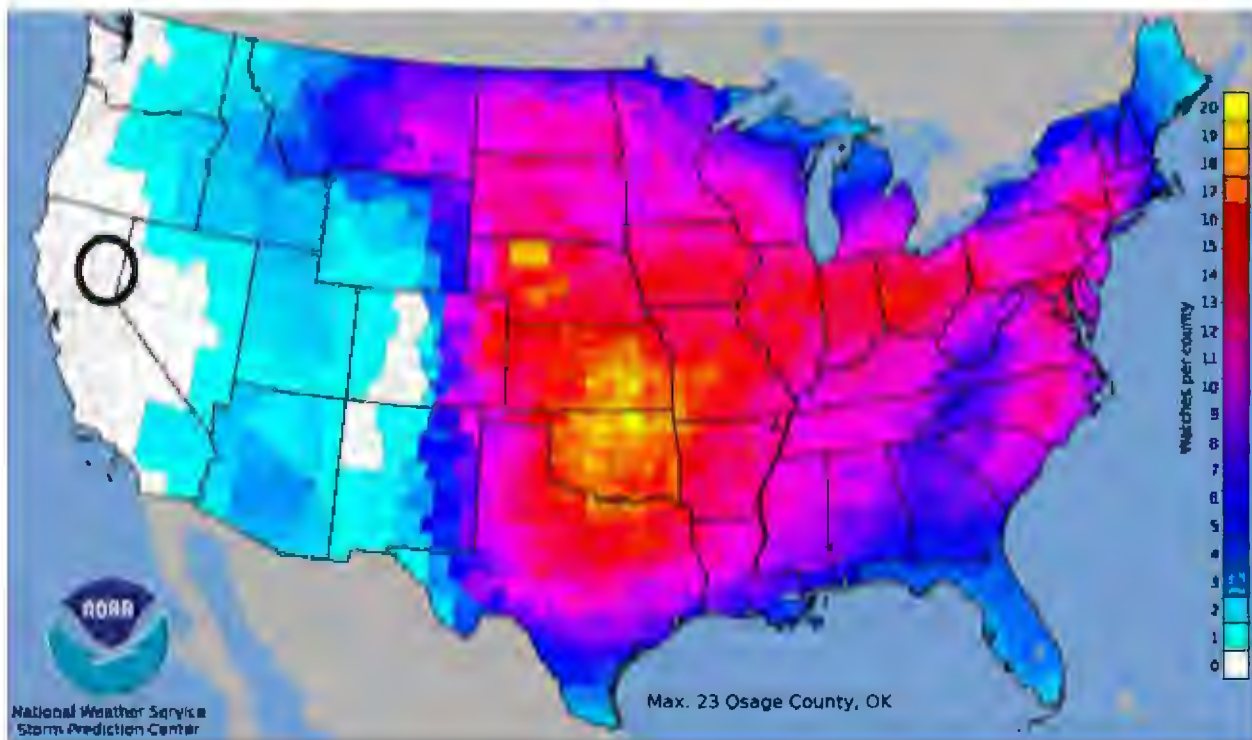


Figure 4-19 Plumas County—Daily Average and Extreme Precipitation



The NOAA Storm Prediction Center tracks thunderstorm watches on a county basis. Figure 4-20 shows thunderstorm watches in Plumas County and the United States for a 20-year period between 1993 and 2012, the most recent map available.

Figure 4-20 Plumas County – Average Thunderstorm Watches per Year (1993 to 2012)



Source: NOAA Storm Prediction Center, map retrieved 11/25/2019

Hail

Hail can occur throughout the Plumas County Planning Area during storm events, though it is rare. 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 4-23 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-23 Hailstone Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball

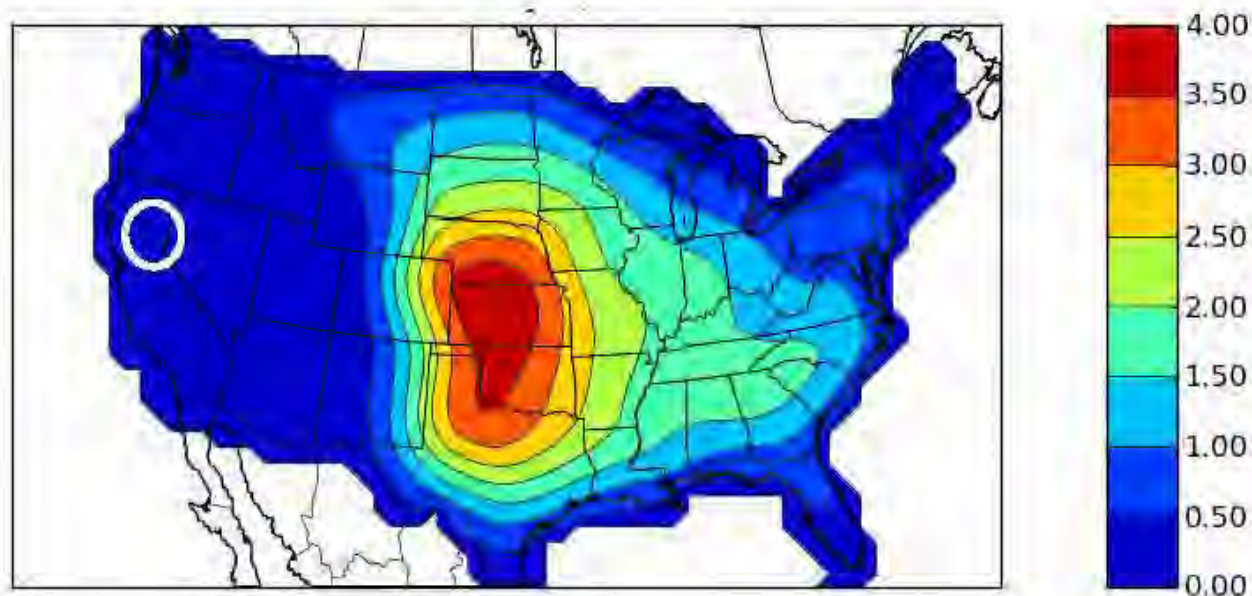
Average Diameter	Corresponding Household Object
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

Location and Extent

Hail events can occur in any location of the County. All portions of the County are at risk to hail. 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 4-21 shows the average days each year where hail of greater than 1" in diameter occurred during a 20-year period from 1990 to 2009. The most recent map available.

Figure 4-21 Plumas County – Average Hail Days per Year (1990 to 2009)



Source: National Weather Service, map retrieved 11/25/2019

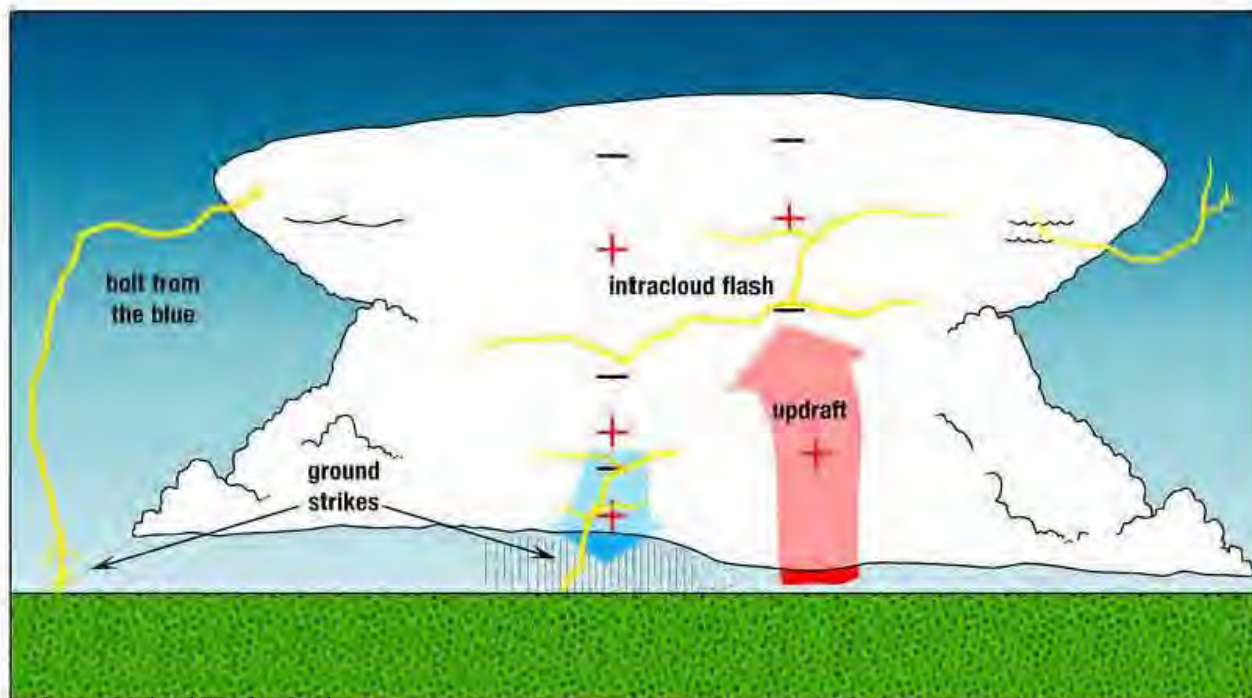
Lightning

Lightning can occur throughout the County both during and outside of 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 4-22). 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 4-22 Cloud to Ground Lightning



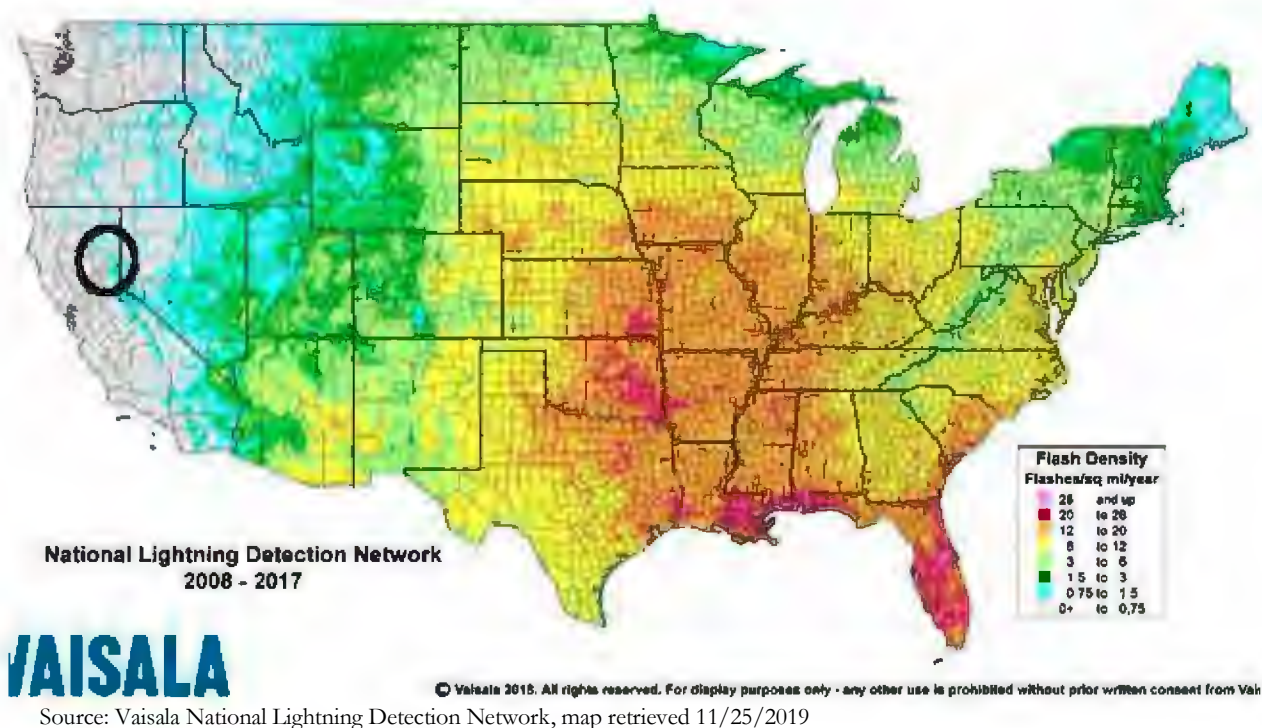
Source: National Weather Service

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 4.3.18.

Location and Extent

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 rare in the County, as discussed in the extent section below. Lightning in the County can occur both during and outside of 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. Vaisala maintains the National Lightning Detection Network. It tracks cloud to ground lightning incidences in the United States. Figure 4-23 shows lightning incidences in the County and the rest of the United States from 2008 to 2017, the most recent map date available.

Figure 4-23 Plumas County – Lightning Incidence Map 2008 to 2017



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 resulted in a state or federal disaster declaration are shown in Table 4-24.

Table 4-24 Plumas County – Disaster Declarations from Heavy Rain and Storms (and Floods) 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1963 (twice), 1964, 1969, 1970, 1980, 1986, 1992, 1995 (twice), 1996, 1997	15	1955, 1958, 1963, 1964, 1969, 1970, 1986, 1992, 1993, 1995 (twice), 1997, 2006, 2017 (twice)

Source: FEMA, Cal OES

NCDC Events

The NCDC data recorded 67 hail, heavy rain, and lightning incidents for Plumas County since 1950. A summary of these events is shown in Table 4-25. More detail, where available, for these events is discussed below the table. Additional events of heavy rain and storms are also discussed in the NCDC table in the flood profile in Section 4.3.11.

Table 4-25 NCDC Severe Weather Events in Plumas County 1950–9/30/2019*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	19	0	0	0	0	\$100	\$5,000
Heavy Rain	47	0	0	0	0	\$1,000	\$0
Lightning	1	0	0	0	0	\$0	\$0
Total	67	0	0	0	0	\$1,100	\$0

Source: NCDC

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

1991 - A member of the HMPC from Viera Ranch noted that in March of 1991, 19.5 inches of rain fell. There was .25 inch hail on July 18. On July 19 lightning strikes hit power lines in East Quincy. It knocked out electronic equipment at the Ranch. On October 26, there was 2.8 inches of rain in one day.

1992 – A member of the HMPC from Viera Ranch noted that from February 11-20, 6.3 inches of rain fell.

June 26, 2000 – Trained spotter reported 1/2 to 3/4 inch hail in Greaeagle. The hail was approximately 4 inches deep and caused an estimated \$100 in damage.

April 3, 2002 – One inch diameter hail was reported by two storm spotters in Portola, CA.

July 22, 2003 – The California Highway Patrol reported golf ball size hail along California State Highway 70 between Vinton and Beckwourth in eastern Plumas County. This hail also damaged alfalfa fields in the area.

October 19, 2007 – a strong cold front moved through the northern and central Sierra and western Nevada. Strong wind and locally heavy rainfall accompanied the cold front. A trained weather spotter reported a storm total of 1.25 inches of rainfall at Sloat. A total of 5.13 inches of rain fell 5 miles south of Twain.

May 28, 2009 – Strong thunderstorms occurred across the eastern Sierra and western Nevada the afternoon and evening. A trained weather spotter reported 1-inch diameter hail in Cromberg.

June 30, 2009 – The Plumas County Sheriff's Department reported that a woman was struck by lightning at her home in Portola. She was transported by helicopter to the U.C. Davis Medical Center. She never regained consciousness and died from her injuries on June 11th.

July 28, 2009 – an upper level low pressure system on the coast coupled with an unstable atmosphere brought isolated thunderstorms over the mountains of interior northern California. Hail was reported locally in western Plumas County each day. A Co-operative observer estimated hail from dime to penny sized.

July 29, 2009 – an upper level low pressure system on the coast coupled with an unstable atmosphere brought isolated thunderstorms over the mountains of interior northern California. Hail was reported locally in western Plumas County each day. Lassen Volcanic National Park rangers reported quarter sized hail.

May 5, 2013 – A thunderstorm developed over the Sierra mountains near Downieville around 1:30 pm PDT and was reported to produce hail for over 30 minutes near Bucks Lake in Plumas County (between 3:20 pm and 4:00 pm). It became severe around 3:30 pm PDT with measured hail of 1 inch. The thunderstorm weakened after 4:00 pm.

July 2, 2015 – Nickel sized hail reported just east of Sloat. Nickel sized hail was also reported 4 miles west of Portola. There was 1.43 inches of rainfall that fell over an hour.

July 7, 2015 - Penny sized hail fell, along with wind gusts estimated at 40-50 mph. About an inch of rain fell in 20 minutes.

July 21, 2015 – Accumulating nickel-sized hail was reported near the Lake Davis Dam.

December 3, 2015 – There were 1.5 inches of heavy rain in Quincy. Gusty winds damaged small limbs.

December 12, 2015 – There were 1.66 inches of rain reported over 12 hours. The observer was located in Quincy.

March 12, 2016 – Reported total rainfall of 3.5 inches since it began the previous afternoon.

October 14, 2016 – There were 1.83 inches of rain measured, 12 hour total.

October 15, 2016 – There were 2.51 inches of rain measured, 6 hour total.

October 30, 2016 – There were 1.53 inches measured, 12 hour total.

January 3, 2017 – There were 1.99 inches of rain over 6 hours.

January 6, 2017 – There were 13.39 of rain measured at La Porte. The duration of the heavy rain event was 72 hours. There was 3.99 of rain measured, 72 hour storm total.

January 7, 2017 – There were 11.25 inches measured at Bucks Lake. The duration of the heavy rain event was 72 hours.

January 10, 2017 – There were 1.50 of rain measured over 5 hours 1 E of Quincy.

February 8, 2017 – There were 2.30 of rain measured over 24 hours, 6.16 over 72 hours.

August 2, 2017 – Golf ball hail was reported southeast of Quincy, in the vicinity of the Minerva Fire.

November 15, 2017 – There was 8.21 of rain reported at 2 NE American House over 72 hours. RAWS sensor at Denten Creek measured 2.79 inches of rain from 15 November 0715PST to 16 November 0715PST.

March 1, 2018 – The 24 hour total rainfall was 1.60. Some wet snow mixed in at times.

March 13, 2018 – Mesonet station DVSC1, Lake Davis reported 0.75 inches of rain from 13 March 1400PST to 14 March 0500PST.

March 20, 2018 – Mesonet station GRZC1, 4 miles northeast of Cromberg reported 3.02 inches of storm total rainfall from 20 March 0600PST to 23 March 0600PST. Mesonet station ANTC1 near Antelope Lake reported 3.32 inches of storm total rainfall from 20 March 0600PST to 23 March 0600PST.

April 6, 2018 – COOP observer station PRAC1, Portola reported 0.84 inches of rainfall in a 24 hour period from 6 April 0700PST to 7 April 0700PST. Mesonet station DVSC1, Lake Davis (elevation 5,768 feet) reported 1.32 inches of rainfall in a 24-hour period from 6 April 0700PST to 7 April 0700PST. Mesonet station KRKC1, 6 miles west-southwest of Antelope Lake (elevation 7,297 feet) reported 1.84 inches of rainfall in a 24-hour period from 6 April 10:00PST to 7 April 10:00PST.

May 24, 2018 – Mesonet station MWKC1, 1 mile east of Blairsden (elevation 5,149 feet) reported 1.25 inches of rainfall in a 24-hour period from 24 May 0834PST to 25 May 0834PST. COOP observer measured 0.97 inches of rainfall in a 24-hour period from 24 May 0914PST to 25 May 0914PST.

July 15, 2018 – Heavy rain from an isolated thunderstorm brought a rock slide covering the west bound lane of Highway 70. Radar estimates suggested locally 0.45 of rain within 1 hour.

July 21, 2018 - A trained weather spotter reported hail 0.75 inches in diameter and heavy rain 4 miles west-northwest of Frenchman Lake.

October 3, 2018 – Mesonet station DVSC1 near Lake Davis (elevation 5,768 feet) reported 0.94 inches of rainfall in an 18-hour period from 3 October 1100PST to 4 October 0500PST.

November 21, 2018 – CO-OP Observer PRAC1, Portola, reported 0.92 inches of heavy rain in a 24-hour period from 21 November 0800PST to 22 November 0800PST.

December 24, 2018 – There were 1.03 inches of rain over 12 hours in East Quincy. Mesonet station ANTC1 near Antelope Lake reported 1.16 inches of rainfall in a 24-hour period from 24 December 0700PST to 25 December 0700PST. Mesonet elevation 5026 feet MSL. Mesonet MWKC1 1 mile east of

Blairsdon reported 0.76 inches of rainfall over a 24-hour period from 24 December 0700PST to 25 December 0700PST.

January 9, 2019 – A spotter reported a 12 hour rainfall total of 0.82.

January 16, 2019 – Mesonet DVSC1 near Lake Davis reported 2.16 inches of rainfall in a 24-hour period from 16 January 0800PST to 17 January 0800PST. Mesonet elevation 5768 feet MSL. Mesonet ANTC1 near Antelope Lake reported 2.24 inches of rainfall in a 24-hour period from 16 January 0800PST to 17 January 0800PST. Mesonet elevation 5026 feet MSL. There was a 12-hour total of 2.1 of rain. Slush from earlier snow was blocking street drains with ponding water observed.

February 25, 2019 – Heavy rain, 3.48 inches in 12 hours, 5.12 inches in 24 hours.

Hazard Mitigation Planning Committee Events

HMPC also noted the following events:

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.

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 rain and 21.5 inches 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 saw 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.
- **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 of rain fell. March 26th saw 3.52 inches of rain.

Likelihood of Future Occurrence

Highly Likely – Based on NCDC data and HMPC input, 67 heavy rain and storm incidents over a 71-year period (1950-2020) equates to a severe storm event every 1.06 years. As noted, this database likely doesn't capture all heavy rain, hail, and lightning events. Severe weather is a well-documented seasonal occurrence that will continue to occur often in the Plumas County Planning Area.

Climate Change and Heavy Rains and Storms

Climate change and its effect on flood near the City has been discussed by three sources:

- CAS – 2014
- Cal-Adapt

CAS

According to the 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.

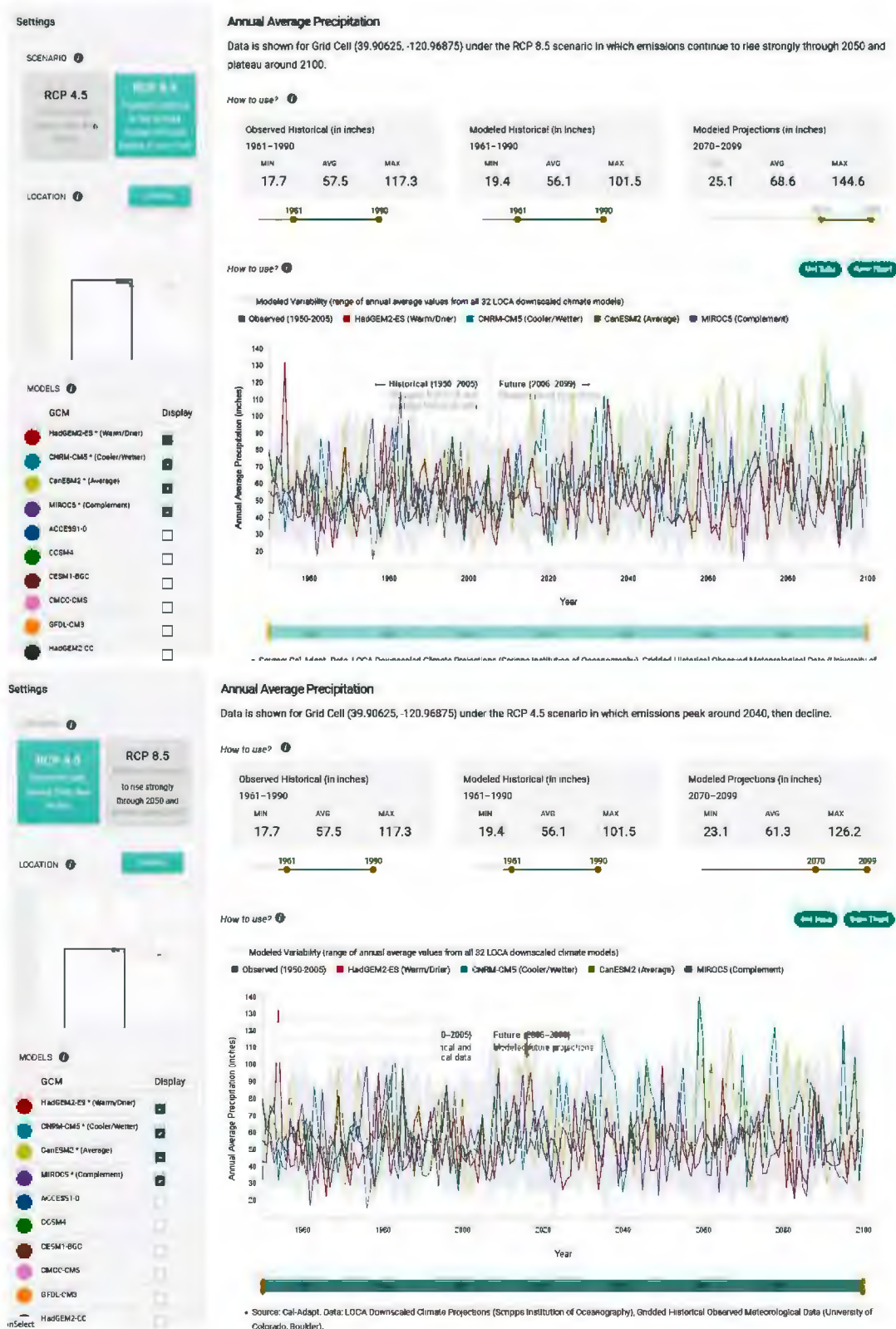
Cal-Adapt

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.

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 precipitation estimates from Cal-Adapt for the Plumas County Planning (using the quad that contains the City of Quincy) are shown in Figure 4-24.. It shows the following:

- The upper chart shows annual averages of observed and projected precipitation values for the selected area on map under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100. 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 4.5 scenario in which emissions peak around 2040, then decline. 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 4-24 Plumas County– Future Precipitation Estimates: High and Low Emission Scenarios



Source: Cal-Adapt – Precipitation: Decadal Averages Map

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data, severe weather is an annual occurrence in Plumas County. Impacts can be felt by both the population of the County as well as the structures that have been built in the County. Many of the impacts from heavy rains and storms are discussed in other sections of this Plan (Section 4.3.8 Dam Failure, Section 4.3.11 Flood, Section 4.3.12 Localized Flood, Section 4.3.13 Landslide, and Section 4.3.14 Levee Failure)

Impacts

Impacts from heavy rains include damages to property and infrastructure. This includes: downed trees, damaged utility structures and infrastructures; power outages; road damages and blockages; hail damage to crops, buildings, and automobiles, and lightning damages to homes, critical infrastructure, and people. However, actual damage associated with the primary effects of severe weather have been somewhat limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact on the County. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this plan (Section 4.3.11 Flood: 1%/0.2% Annual Chance, Section 4.3.12 Flood: Localized Stormwater, Section 4.3.8 Dam Failure, Section 4.3.14 Levee Failure, and Section 4.3.18 Wildfire).

Future Development

Homes built in the County are built to existing building codes that generally withstand heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand lightning, hail and thunderstorm winds. Backup power sources for all critical facilities should be incorporated into all new facilities. Properly located, designed, and constructed, future losses to new development should be minimal.

4.3.4. Severe Weather: High Winds and Tornadoes

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

This section includes a description and location and extent discussion for both high winds and tornadoes, respectively.

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 embers 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.

Location and Extent

The entire Plumas County 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 4-25 shows the Beaufort wind scale.

Figure 4-25 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 4-26 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.

Figure 4-26 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 anywhere within the Plumas County Planning Area, primarily during the rainy 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 4-27 illustrates the potential impact and damage from a tornado.

Figure 4-27 Potential Impact and Damage from a Tornado

Figure 2-2 Potential Impact of a tornado

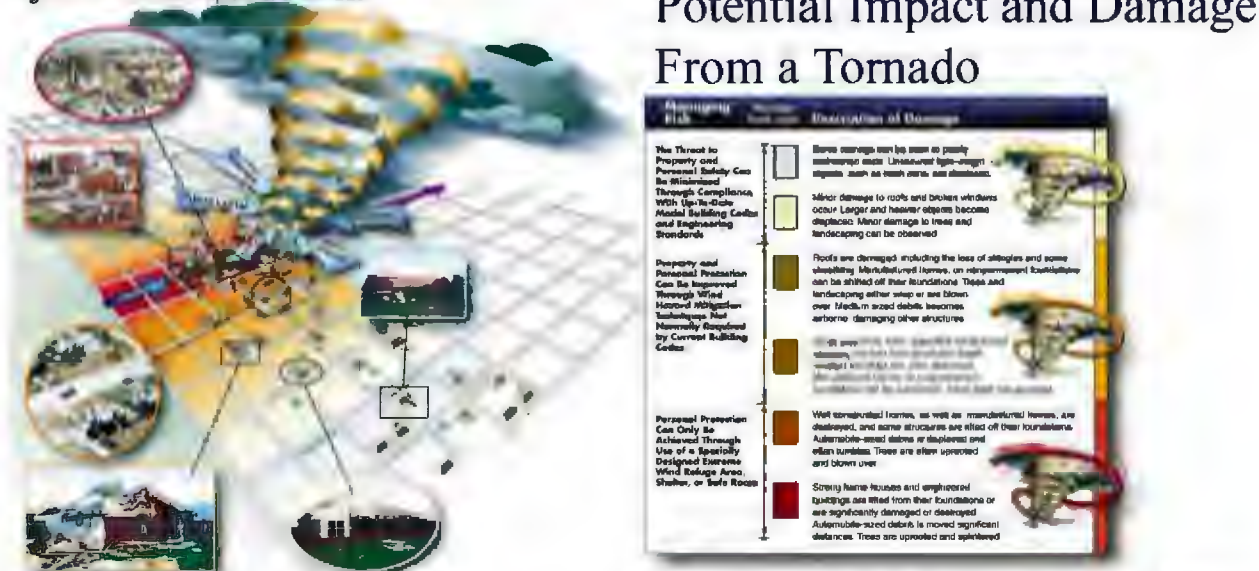


Figure 2-2 Potential damage table for impact of a tornado

Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

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. The HMPC also noted that tornado associated with fire conditions have now been documented in Plumas County as well.

Location and Extent

Tornadoes, while rare, can occur at locations in the lower elevations County. 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 4-26 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-27 shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 4-26 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.

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
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.
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 4-27 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.

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.

NCDC Events

The NCDC data recorded 92 high wind incidents for Plumas County since 1955. No tornado events were recorded. A summary of these events is shown in Table 4-28. More detail on these events can be found below the table. Due to the high number of high wind events, only those events that were identified as causing damages in the County were included.

*Table 4-28 NCDC High Wind and Tornado Events in Plumas County 1955-9/30/2019**

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	2	0	0	0	0	\$25,100	\$0
Thunderstorm Wind	2	0	0	0	0	\$675,000	\$0
Total	92	0	0	1	0	\$2,945,600	\$0

Source: NCDC

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

November 21, 1998 – High winds blew over tractor-semitrailer on Hwy 395 north of Reno. Winds estimated between 55-60kts. No serious injuries reported. \$1,000 in damages were reported.

February 6, 1999 – Winds estimated to be over 60 mph causing roof damage to homes in Pittville. \$2,000 in damages were reported.

February 18, 1999 – Semi tractor-trailer blown over on Highway 395 near Janesville, causing \$5,000 in damages. No injuries reported.

November 7, 2002 – A storm spotter reported scattered property damage from strong winds estimated at over 80 mph. Most damage occurred on the west side of Sierra Valley in eastern Sierra County, CA. In addition to numerous downed trees, two barns were destroyed, one damaging a combine. Falling tree limbs damaged several parked vehicles and buildings in the towns of Sierraville and Clio. \$150,000 in damages were reported.

December 26, 2006 – Wind gusts estimated at 70 knots (80 mph) knocked containers off of a train near Beckwourth, causing \$50,000 in damages.

January 4, 2008 – A 75 mph wind was reported at the Pike County Lookout RAWS automated weather station, which is 2 miles southeast of Brush Creek Reservoir. Numerous buildings were damaged due directly to the wind and/or to flying debris and falling trees and branches. Power was out to hundreds of customers for up to seven days. \$114,000 in damages were reported.

March 12, 2010 – Wind brought a tree and power lines down near the intersection of Almanor Drive and Pole Line Road.

March 2, 2012 – Wind damage was focused on Lake Almanor Peninsula and Lake Almanor West with reports of trees into 3 homes, downed power lines, a propane release and other damages. Major damage was done to one home, minor damage to 2 other homes on the Peninsula. Three vehicles were damaged including a Sheriff Deputy patrol car. Many residents suffered mud and debris problems in yards and driveways. Highway 32 was closed near the causeway due to a debris flow across the roadway.

June 3, 2015 -Wind brought a tree and power lines down near the intersection of Almanor Drive and Pole Line Road. Wind damage was focused on Lake Almanor Peninsula and Lake Almanor West with reports of trees into 3 homes, downed power lines, a propane release and other damages. Major damage was done

to one home, minor damage to 2 other homes on the Peninsula. Three vehicles were damaged including a Sheriff Deputy patrol car. Many residents suffered mud and debris problems in yards and driveways. Highway 32 was closed near the causeway due to a debris flow across the roadway.

HMPC Events

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 4-28. Total initial damage estimates in the County exceeded \$3 million.

Figure 4-28 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 4-29 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 4-29 Plumas County – 2015 Wind Event Damage



January 7th and 8th, 2017 – Heavy rains and winds caused issues in the County. 6.12 inches 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, 99 wind incidents over a 65-year period (1955-2019) 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 and High Winds

According to the 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.

Vulnerability Assessment

Vulnerability—Medium

Plumas County is subject to potentially destructive straight-line 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. Straight line and tornadoes winds are primarily a public safety and economic concern. Structures, agriculture (crops and livestock), and the citizens of the County are at risk to high winds and tornadoes.

Impacts

Windstorms and tornadoes can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind or tornado events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered.

Impacts from straight line winds and tornadoes include:

- Increased wildfire risk
- Increased chance of PSPS event
- Erosion (soil loss)
- Dry land farming seed loss
- Windblown weeds
- Downed trees
- Downed crops
- Power line impacts and economic losses from power outages
- Occasional building damage, primarily to roofs

Campers, mobile homes, barns, and sheds and their occupants are particularly vulnerable as windstorm events in the region can be sufficient in magnitude to overturn these lighter structures. Livestock that may

be contained in these structures may be injured or killed, causing economic harm to the rancher who owns both the structure and the livestock. Overhead power lines are vulnerable and account for the majority of historical damages. State highways can be vulnerable to high winds and dust storms, where high profile vehicles may be overturned by winds and lowered visibility can lead to multi-car accidents. The greatest threat to Plumas County from wind is not from damage from the winds themselves, but from the spread of wildfires during windy days, and now from the periodic PSPS events.

Future Development

Future development projects should consider windstorm and tornado hazards at the planning, engineering and architectural design stage with the goal of reducing vulnerability. 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, has resulted in an increasingly large volume of risk information that is available to people when tornadoes and high winds threaten. Development trends in the County are not expected to increase vulnerability to this hazard.

4.3.5. Severe Weather: Winter Storm and Freeze

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

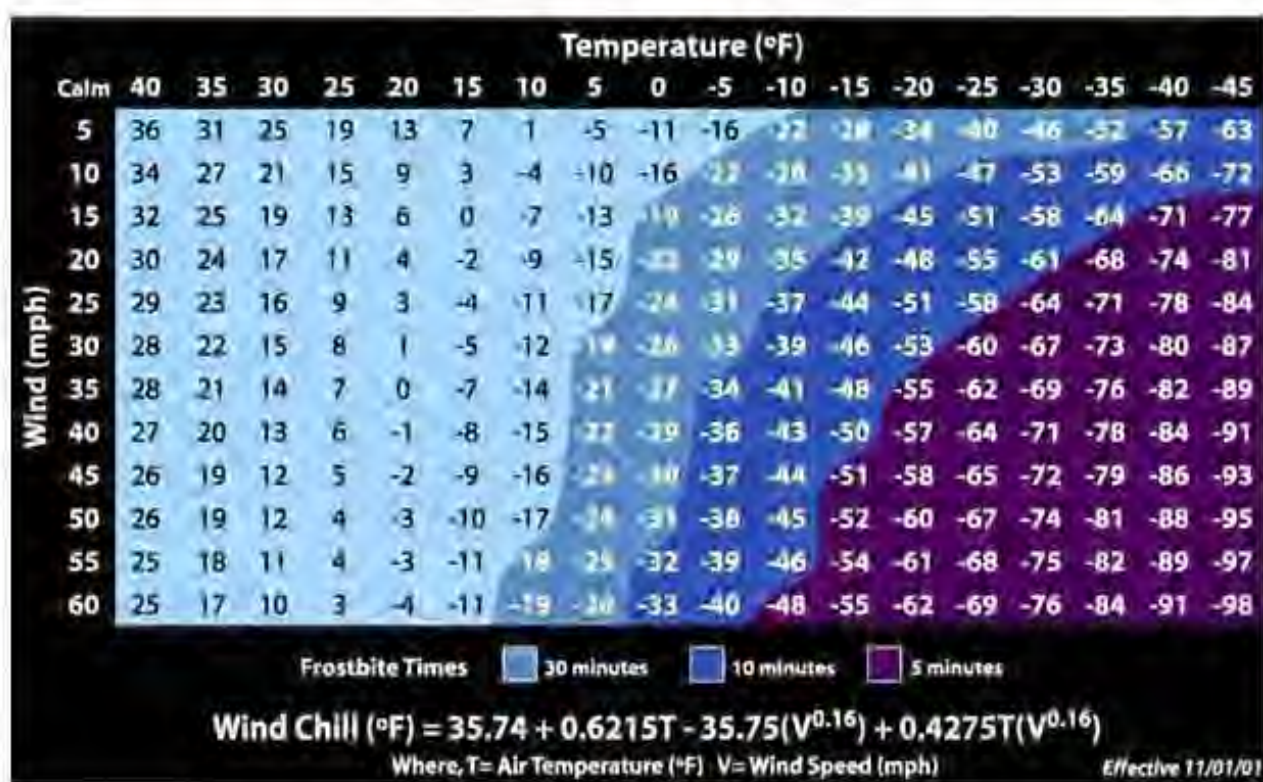
Plumas County is located in the Sierra Nevada region of the State of California. Severe weather affects all areas of Plumas County but differs significantly by region. Throughout areas of the county there are significant variations in the average temperature and amount of precipitation received due to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

Storms in the lower elevations of the Plumas County Planning Area are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail.

According to the NWS and the WRCC, extreme cold often accompanies a winter storm 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.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-30), 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.

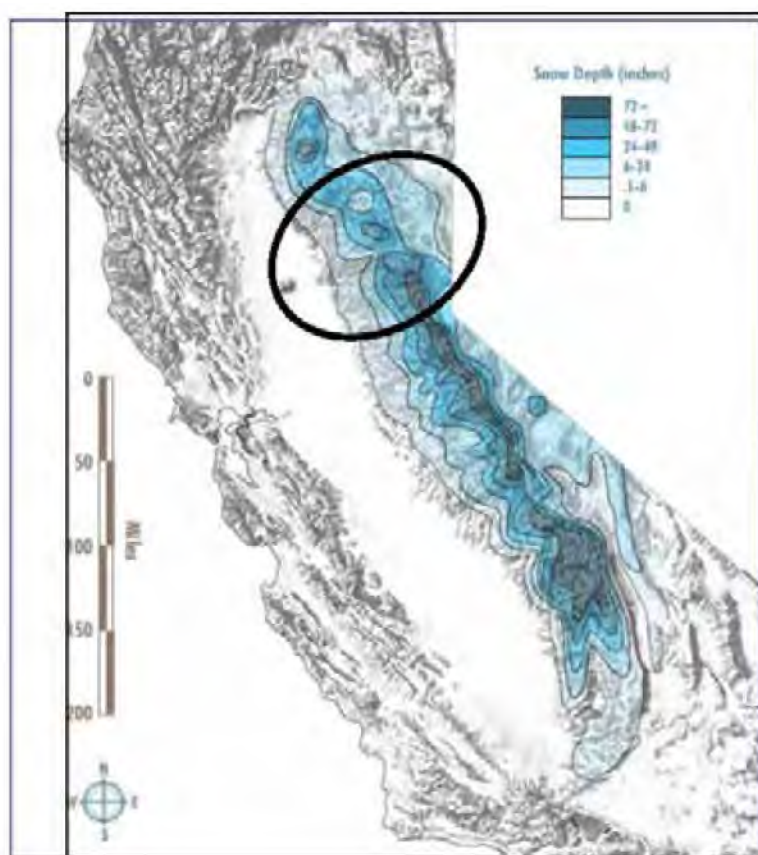
Figure 4-30 Wind Chill Temperature Chart



Source: National Weather Service

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.sierranavadaphotos.com/geography/snow_depth.asp. Retrieved March 2020.

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. 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.

Information on cold and winter storms from the WRCC coop station for the County is shown below.

Plumas County— 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 4-29 shows the record low temperatures by month for western Plumas County. Average daily temperatures for Plumas County are shown in Figure 4-32.

Figure 4-32 Plumas County— Daily Temperature Averages and Extremes

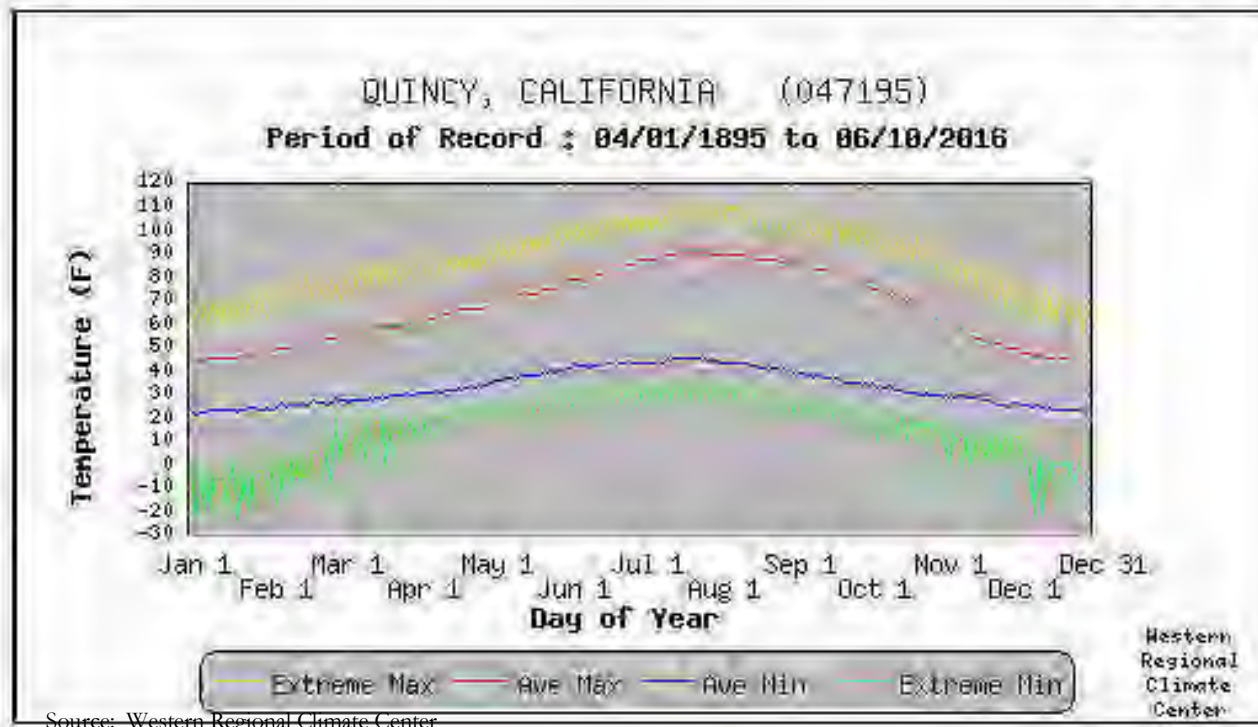


Table 4-29 Plumas County – Record Low Temperatures 1895 to 2016

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

According to the WRCC, average snowfall of the County is 55.1 inches, as shown in Figure 4-33. 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 4-34.

Figure 4-33 Plumas County—Snowfall Averages and Extremes

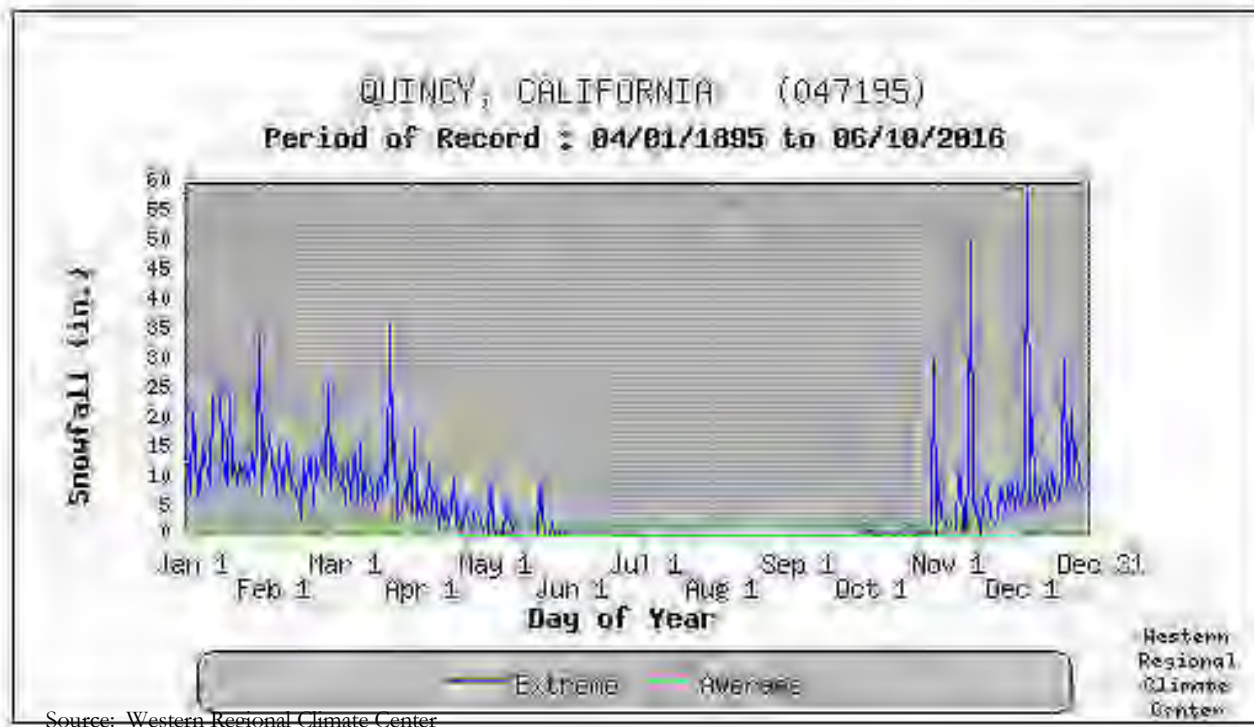
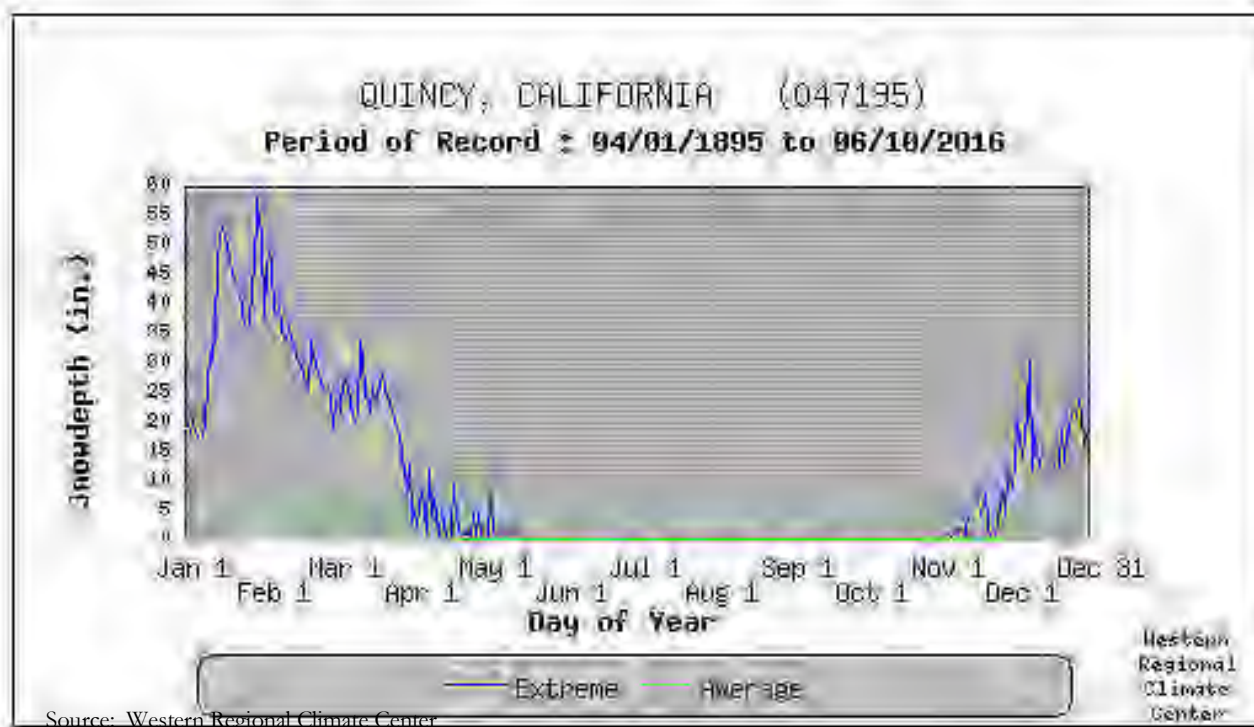


Figure 4-34 Plumas County—Snow Depth Averages and Extremes



Location and Extent

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 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.

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. 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 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. Figure 4-35 and Figure 4-36 show the probabilities in the County of freeze for both spring and fall.

Figure 4-35 Plumas County – Spring Freeze Probabilities

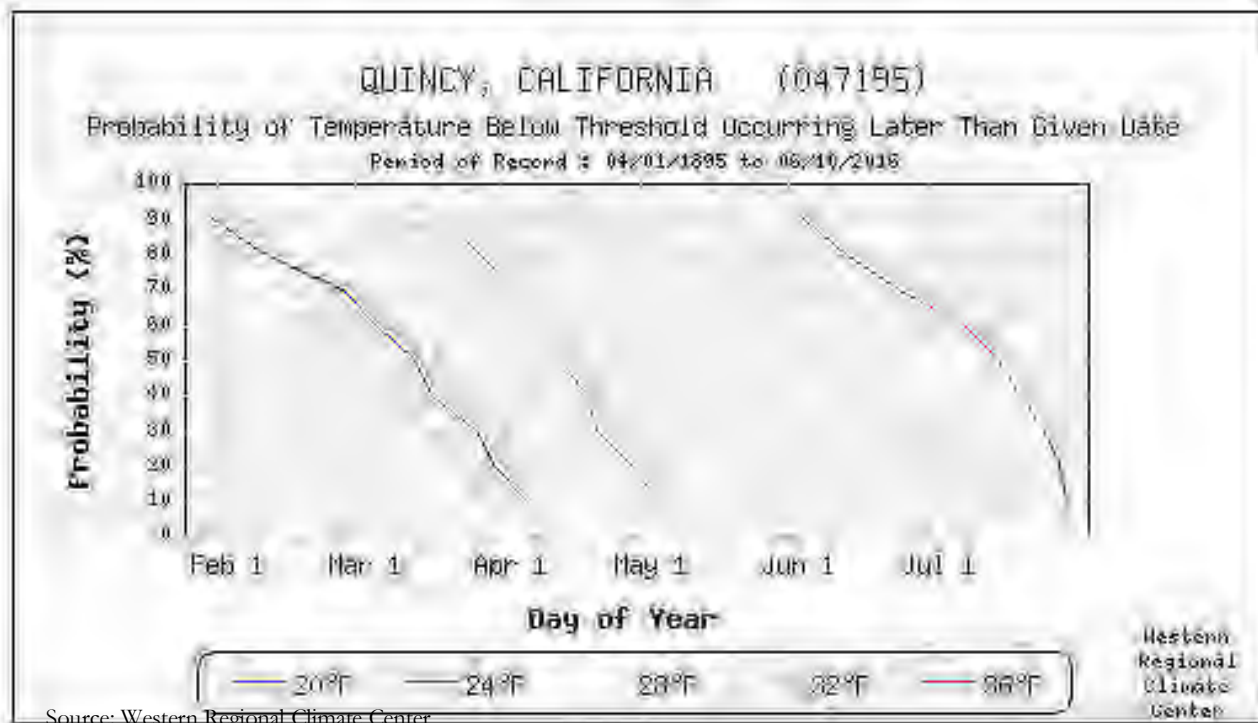
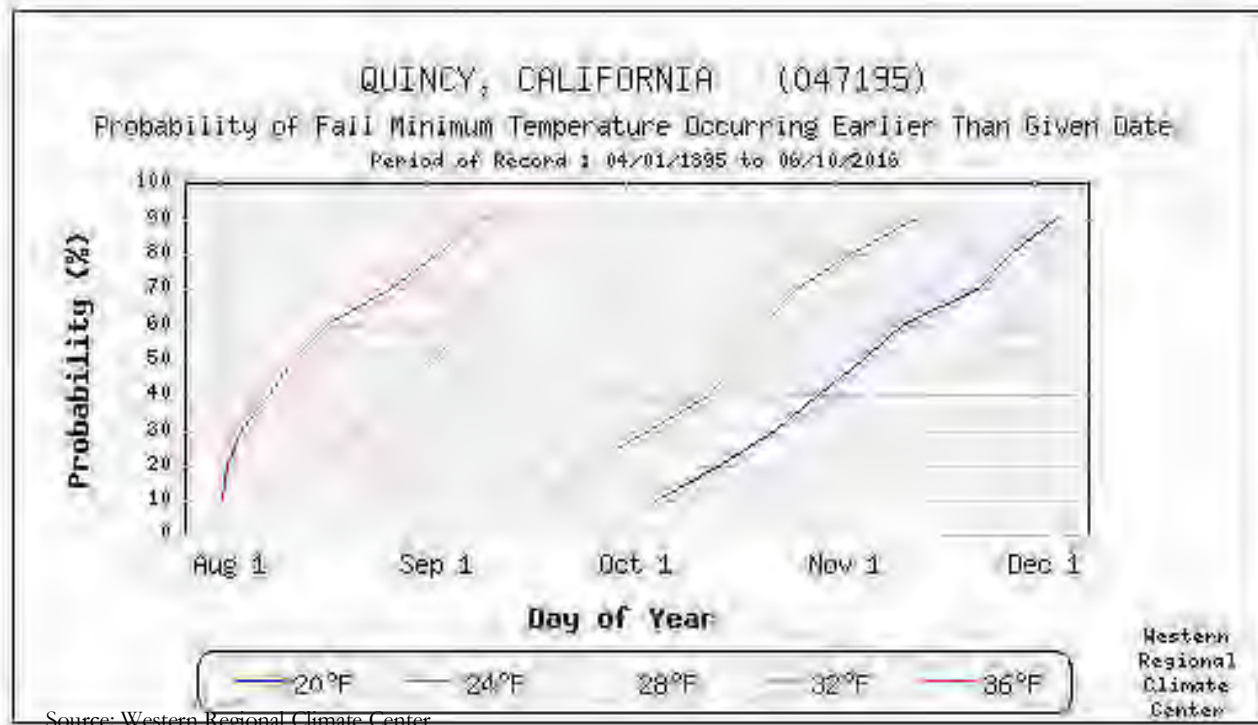


Figure 4-36 Plumas County – Fall Freeze Probabilities



Source: Western Regional Climate Center

Past Occurrences

Disaster Declaration History

The County has had no past federal or state disaster declarations for extreme cold and freeze, as shown on Table 4-4.

NCDC Events

The NCDC reports 434 events of past extreme cold and freeze for Plumas County since 1996 as shown on Table 4-30. Due to the large number of events, only events where damages were identified as occurring in the County are delineated below the table.

*Table 4-30 NCDC Winter Storm and Freeze Events for Plumas County 1996-9/30/2019**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	1	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	280	1	0	0	0	\$220,000	\$0
Ice Storm	1	0	0	0	0	\$0	\$0
Winter Storm	117	0	0	0	0	\$150,000	\$0

Plumas County

4-69

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Winter Weather	31	0	0	0	0	\$0	\$0
Total	434	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

12/20/1996 – The NCDC has no information about this storm, other than stating that 1 person died due to it.

1/22/1997 - The NCDC has no information about this storm, other than stating that \$200,000 in damages occurred.

March 2, 2009 – A cold winter storm brought one to five feet of storm total snow accumulation to the higher mountains of the southern Cascades and to the northern Sierra Nevada. Snow levels dropped to near 4,000 feet during the latter part of the storm. Gusty winds brought reduced visibilities and broad drifting of snow. This system also generated thunderstorms in the Central Valley bringing heavy rain, flash flooding, and other severe effects. Large amounts of hail were reported over Shasta and Glenn Counties, larger than quarter size and more than 6 inches deep in some areas. Flash flooding and slides closed Highway 70 with minor flooding over a number of rural roads. Numerous car accidents from wet roads were reported across the area, as well as trees falling from a combination of wet ground and wind. CHP closed the west bound lane of Highway 70 in the Rich Bar area due to a rockslide resulting from heavy rainfall on a burn area. Storm total snowfall reports: 5 miles WSW of Beckwourth - 24 inches; 5 miles west of Portola, 20 inches; 3 miles northwest of Janesville - 19 inches; 2 miles WNW of Cromberg - 15 inches; and 2 miles northwest of Blairsden - 12 inches. Passes across the northern Sierra were nearly impassible with many accidents reported. \$20,000 in damages were reported from this event.

February 25, 2019 – Heavy snow fell, impacting travel on mountain roads with chain controls and delays. There was 7 inches of new snow at Quincy.

HMPC Events

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 4-37 City of Chester 1951-1952 Snow Event



Source: Plumas County

Figure 4-38 1993 Storm Damage of Store in Quincy



Source: KCRA News Report

Figure 4-39 City of Chester 2001 Snow Event



Source: Plumas County

- 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 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.
- On **June 15, of 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 year 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**.

Likelihood of Future Occurrence

Highly Likely—Extreme cold and freeze are likely to continue to occur annually in the Plumas County Planning Area. In a typical year, minimum temperatures fall below 32°F on 166.9 days in the County. This equates to a likelihood of future occurrences being considered highly likely.

Climate Change and Freeze and Snow

According to the 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.

Vulnerability Assessment

Vulnerability—Medium

Extreme cold and freeze events happen in Plumas County each year. It can impact both structures and populations in Plumas County. Like most weather events, periods of heavy snow occur on an annual basis in the higher elevations of the County. Snow removal is an ongoing issue in the upcountry areas of the upper elevations of the County. Snow removal is constant.

Impacts

Extreme cold and freeze events happen in Plumas County each year. Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

Of significant concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. The residents of nursing homes and elder care facilities are especially

vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold and freeze. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold.

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. Strong winds combined with intense snowstorms can knock down trees, utility poles and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings, significantly increasing the likeliness of serious vehicle accidents. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures and ice can cause accidents and road closures and can cause significant damage to the agricultural industry. Also of concern as described above is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow. Extreme cold can affect agricultural products and cattle in the County. Freeze damages reduce the values of agricultural crops.

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 County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the County shifts resulting in a larger number of senior citizens in the Planning Area. Many of the residents of Plumas County are self-sufficient and accustomed to rural living.

4.3.6. Avalanche

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

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 4-40.

Figure 4-40 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

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 Genessee (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

There have been no federal or state disaster declarations related to avalanche in Plumas County, as shown in Table 4-4.

NCDC Events

The NCDC database shows no avalanche events in Plumas County since 1993.

HMPC 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 4-41. 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 4-41 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.

Likelihood of Future Occurrence

Highly Likely – Given the topography and amount of snow falling on an annual basis in Plumas County, avalanches will continue to occur. The loss of life due to an avalanche is usually due to people recreating in remote areas at the wrong time. Avalanche warnings are posted after winter storms; therefore, information is available to reduce the risk to those in avalanche prone areas.

Climate Change and Avalanche

According to the CAS, climate change may exacerbate the avalanche hazard in the County. Avalanches stemming from a weather pattern of heavy snowfalls followed by thawing may increase – a dangerous combination that can be expected with climate change.

Vulnerability Assessment

Vulnerability—Low

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 (located throughout the County) and where wind-blown snow is common. The combination of steep slopes, abundant snow, weather, snowpack, and a trigger to cause movement create avalanches. In Plumas County, there is not significant development in these areas.

Impacts

Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

Future Development

The County noted that future development is unlikely to occur in avalanche prone areas.

4.3.7. Climate Change

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect 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. Secondary impacts include changes in precipitation patterns, the global water cycle, melting glaciers and ice caps, and rising sea levels. According to the Intergovernmental Panel on Climate Change (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. 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.

Climate change adaptation is a key priority of the State of California. The 2018 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.

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 4-32 provides a summary of Cal-Adapt Climate Projections for the North Central Valley Region.

Table 4-32 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

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 impacts of climate change 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 each year, and the winter rains of 2018 were more intense.

Likelihood of Future Occurrence

Likely – Climate change is virtually certain to continue without immediate and effective global action. According to NASA, 2017 and 2019 were two of the hottest years on record. Without significant global action to reduce greenhouse gas (GHG) emissions, the IPCC concludes in its Fifth Assessment Synthesis Report (2014) 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 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.

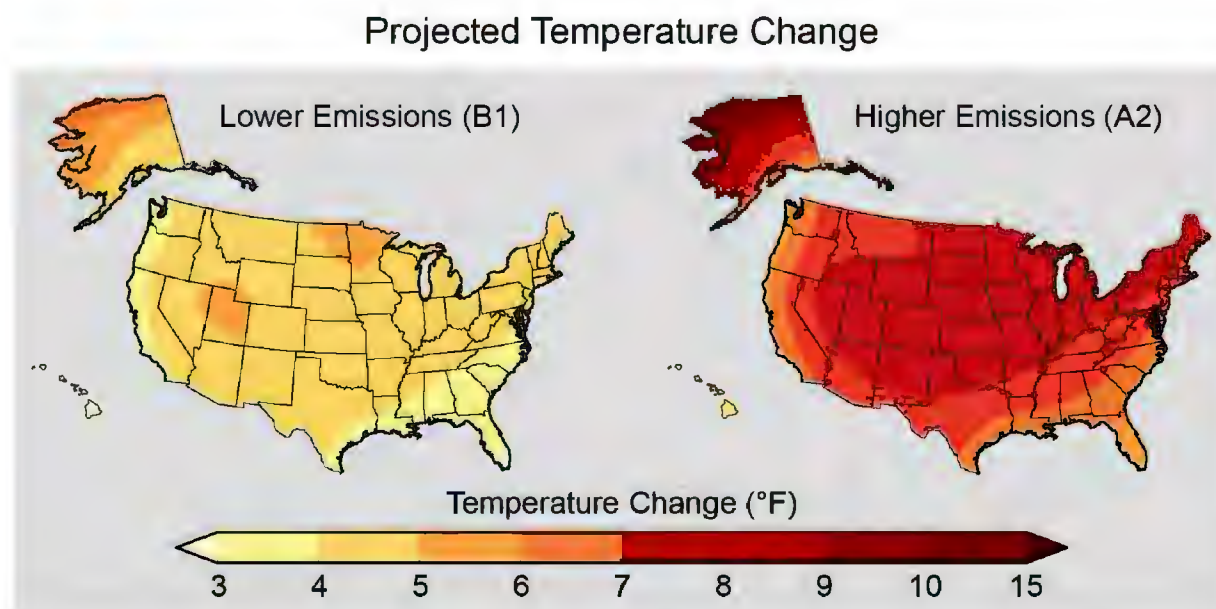
Key Uncertainties Associated with Climate Projections

- 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 4-42.

Figure 4-42 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 2014 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 Assessment

Vulnerability—Medium

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. The APG prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change.

The APG: Defining Local and Regional Impacts focuses on understanding the ways in which climate change can affect a community. According to this APG, climate change impacts (temperature, precipitation, sea level rise, ocean acidification, and wind) affect a wide range of community structures, functions and populations. These impacts further defined by regional and local characteristics are discussed by secondary impacts and seven sectors found in local communities: Public Health, Socioeconomic, and equity impacts; Ocean and Coastal Resources; Water Management; Forest and Rangeland; Biodiversity and Habitat; Agriculture; and Infrastructure.

Plumas County Climate Change Impacts

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

California's APG: Understanding Regional Characteristics provides input on adaptation considerations for the North Sierra Region. As detailed in this guide, climate change has the potential to disrupt many features that characterize the region, including ecosystems health, snowpack, and the tourist economy. Specific regional impacts include the following:

Ecosystems and Biodiversity. Exacerbated by new development in the region, climate change can cause habitats to shift, creating conditions that stress ecosystems and endemic species. Timber practices, also compounded by climate change, has resulted in forests with trees of similar age, lacking snags and underbrush, further reducing the diversity of the habitat. The Sierra's aquatic and riparian systems are one of the most altered habitats in the region through past development and water diversion activities. Continued changes in hydrologic flow regimes and increased temperatures will further stress these systems regional habitats supporting many special-status species.

Snowpack and Flooding. Climate-related decrease in snowpack can have significant consequences on the areas that depend on this water. In addition, a decrease in snowpack can increase impacts from flooding, landslide, and loss of economic base related to a drop in tourism. Recreation and tourism are likely to suffer due to lower water levels in waterways and reservoirs and declining snowpack. This can result in fewer ski days and impacts to hotels, restaurants, and second home development. Increases in flood events can further stress the region and increase flood related impacts and damages.

Wildfire. The North Sierra Region is already challenged through past fire suppression combined with the large number of structures that have been built throughout the WUI areas. Climate change is projected to result in large increases in wildfire frequency and size which will further compound the wildfire problem. In addition, potential impacts following fires, such as heavy rains causing landslide and erosion in post-burn areas can have significant consequences on waterways and entire watersheds.

Public Health, Socioeconomic, and Equity Impact. The foothills of the North Sierra Region show higher ozone levels and increased temperatures causing vulnerable populations to be at greater risk to these issues. In addition to the elderly population found in this region, people who work and play outdoors are also vulnerable.

In addition to the APG, a report from the Proceedings of the National Academy of Sciences (PNAS) states that some of the recent fire impacts may have been attributed to climate change. The PNAS report posits that climate influences wildfire potential primarily by modulating fuel abundance in fuel-limited environments, and by modulating fuel aridity in flammability-limited environments. Increased forest fire activity across the western United States in recent decades has contributed to widespread forest mortality, carbon emissions, periods of degraded air quality, and substantial fire suppression expenditures. Those most vulnerable to high levels of ozone and particulate matter include people who work or spend a lot of time outdoors, such as residents of this region who are employees of the tourist industry. Households eligible for energy utility financial assistance programs are an indicator of potential impacts. These households may be more at risk of not using cooling appliances, such as air conditioning, due to associated energy costs.

Future Development

Plumas County in general could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations could be expected to impact demand for housing and other development. For example, sea level rise may disrupt economic activity and housing in coastal communities, resulting in migration to inland urban areas. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected

to occur here. While there are currently no formal studies of specific migration patterns expected to impact the 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.

Climate change, coupled with shifting demographics and market conditions, could impact both the location of desired developments and the nature of development. Demand may increase for smaller dwellings that are less resource intensive, more energy efficient, easier to maintain and can be more readily adapted or even moved in response to changing conditions. Compact, mixed-use and infill developments that can help residents avoid long commutes and vulnerabilities associated with the transportation system will likely continue to grow in popularity. The value of open space and pressure to preserve it will likely increase, due in part to its restorative, recreational, environmental and habitat benefits but also for its ability to sequester carbon, help mitigate the accumulation of greenhouse gas in the atmosphere and slow down the global warming trend. Higher flood risks, especially if coupled with increased federal flood insurance rates, may decrease market demand for housing and other types of development in floodplains, while increased risk of wildfires may do the same for new developments in the urban-wildland interface. Flood risks may also inspire new development and building codes that elevate structures while maintaining streetscapes and neighborhood characteristics.

Climate change will stress water resources. Water is an issue in every region, but the nature of the potential impacts varies. Drought, related to reduced precipitation, increased evaporation, and increased water loss from plants, is an important issue in many U.S. regions, especially in the West. Floods, water quality problems, and impacts on aquatic ecosystems and species are likely to be amplified by climate change. Declines in mountain snowpack are important in Plumas County the Sierra Nevada Mountains and across the state, where snowpack provides vital natural water storage and supply. The ability to secure and provide water for new development requires on-going monitoring and assurances. It is recommended that the ability to provide a reliable water supply from the appropriate water purveyor, continue to be in the conditions for project approval, and such assurances shall be verified and in place prior to issuing building permits.

Similarly, protecting and enhancing water supply will also need to be addressed. California's Sustainable Groundwater Management Act (SGMA) will contribute to addressing groundwater and aquifer recharge needs. Good groundwater management will provide a buffer against drought and climate change, and contribute to reliable water supplies regardless of weather patterns. California depends on groundwater for a major portion of its annual water supply, and sustainable groundwater management is essential to a reliable and resilient water system. Protection of critical recharge areas should be addressed across the County in the respective Groundwater Management Plans. Further, these plans should include provisions that guide development or curtail development in areas that would harm or compromise recharge areas.

Climate change will affect transportation. The transportation network is vital to the County and the region's economy, safety, and quality of life. While it is widely recognized that emissions from transportation have impacts on climate change, climate will also likely have significant impacts on transportation infrastructure and operations. Examples of specific types of impacts include softening of asphalt roads and warping of railroad rails; damage to roads; flooding of roadways, rail routes, and airports from extreme events; and interruptions to flight plans due to severe weather. Climate change impacts considered in the plan include: extreme temperatures; increased precipitation, runoff and flooding;

increased wildfires; and landslides. Although landslides are not a direct result of climate change, these events are expected to increase in frequency due to increased rainfall, runoff, and wildfire. These events have the potential to cause injuries or fatalities, environmental damage, property damage, infrastructure damage, and interruption of operations. During flood events, these trails serve as secondary transportation facilities when roadways are blocked or otherwise impassable. During Hurricane Sandy, bicycles were one of the primary modes used to deliver food and water to residents stranded in their homes due to flood. Including dual or multi-purpose facilities and amenities as part of all new development provides not just desirable community amenities but critical infrastructure for climate resiliency.

Climate change will affect land uses and planning. Climate change coupled with shifting demographics and market conditions, could impact both the location of desired developments and the nature of development. Demand may increase for smaller dwellings that are less resource intensive, more energy efficient, easier to maintain and can be more readily adapted or even moved in response to changing conditions. Compact, mixed-use and infill developments that can help residents avoid long commutes and vulnerabilities associated with the transportation system will likely continue to grow in popularity. The value of open space, urban greening, green infrastructure, tree canopy expansion and pressure to preserve it will likely increase, due in part to its restorative, recreational, environmental, and habitat, and physical and mental health benefits but also for its ability to sequester carbon and cool the surrounding environment.

Climate change will affect Utilities. California is already experiencing impacts from climate change such as an increased number of wildfires, sea level rise and severe drought. Utility efforts to deal with these impacts range from emergency and risk management protocols to new standards for infrastructure design and new resource management techniques. Utilities are just beginning to build additional resilience and redundancy into their infrastructure investments from a climate adaptation perspective, but have been doing so from an overall safety and reliability perspective for decades. Significant efforts are also being made in those areas that overlap with climate change mitigation such as diversification of resources, specifically the addition of more renewables to the portfolio mix, as well as implementation of demand response efforts to curb peak demand. Efforts are also under way to upgrade the distribution grid infrastructure, which should add significant resilience to the grid as well. Next, they will issue a guidance document that expands upon the vulnerability assessments phase and includes plans for resilience solutions including cost/benefit analysis methodologies. The outcomes of this work will help to inform next steps on how infrastructure, the grid and other related operations will be modified to address climate change. New development will have to adapt and incorporate these new approaches as they evolve. Existing and new development will be affected from impacts that includes not only diminished capacity from all of the utility assets from generation to transmission and distribution, but also the cost consequences resulting from prevention, replacement, outage, and energy loss. These have the potential for greatly impacting not just residential development but commercial and industrial and all utility users.

Addressing Urban Heat Islands and Heat Events. New development will contribute to urban heat island (UHI) impacts and will need to incorporate urban greening methods into all aspects of development; interior and exterior of buildings, surrounding environment and beyond. New development will need to reduce its impacts to the overall UHI impacts affecting the county and surrounding region. On-going and expanding heat wave awareness and assistance will also affect new development. During heat waves in Plumas County, a heat alert is issued and news organizations are provided with tips on how vulnerable people can protect themselves. Programs used by health departments to engage with thousands of block captains to

check on elderly and other vulnerable residents, along with public cooling places extending their hours, or local businesses welcoming residents into their businesses for purposes of staying cool are examples of programs and services that will be necessary. Other programs to consider that could further involve hospitals and clinics are operating a “heatline” with nurses or other healthcare professionals ready to assist callers with heat-related health problems. In addition, continued funding for weatherization, reduced utility rates and similar programs that offers assistance to elderly, low-income residents to install roof insulation, solar, trees and cool surfaces to save energy and lower indoor temperatures.

4.3.8. Dam Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect 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; and/or
- Failure of upstream dams on the same waterway.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Electric generating facilities and transmission lines could also be damaged and affect life support systems in communities outside the immediate hazard area. Associated water supply, water quality and health concerns could also be an issue. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

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. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Dams and reservoirs have been built throughout California to supply water for agriculture and domestic use, to allow for flood control, as a source of hydroelectric power, and to serve as recreational facilities. The storage capacities of these reservoirs range from a few thousand acre feet to five million acre-feet. The water from these reservoirs eventually makes its way to the Pacific Ocean by way of several river systems.

The California Department of Water Resources (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. CA DWR, DOSD assigns hazard ratings to large dams within the State. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. 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, and Cal OES, there are 22 dams in Plumas County that were constructed for flood control, storage, treatment impoundments, electrical generation, and recreational purposes that fall under the jurisdiction of the DSOD (jurisdictional dams described above). Of these 22 jurisdictional dams in the County, 2 were rated as extremely high, 14 is rated as High Hazard, 4 as Significant Hazard, and 2 as Low Hazard. Figure 4-43 identifies the dams located in the Plumas County Planning Area. Table 4-33 gives information on each of the dams in the County that fall under DOSD jurisdiction. Table 4-34 shows the dam outside of Plumas County that could affect areas inside Plumas County.

Figure 4-43 Plumas County Dam Inventory

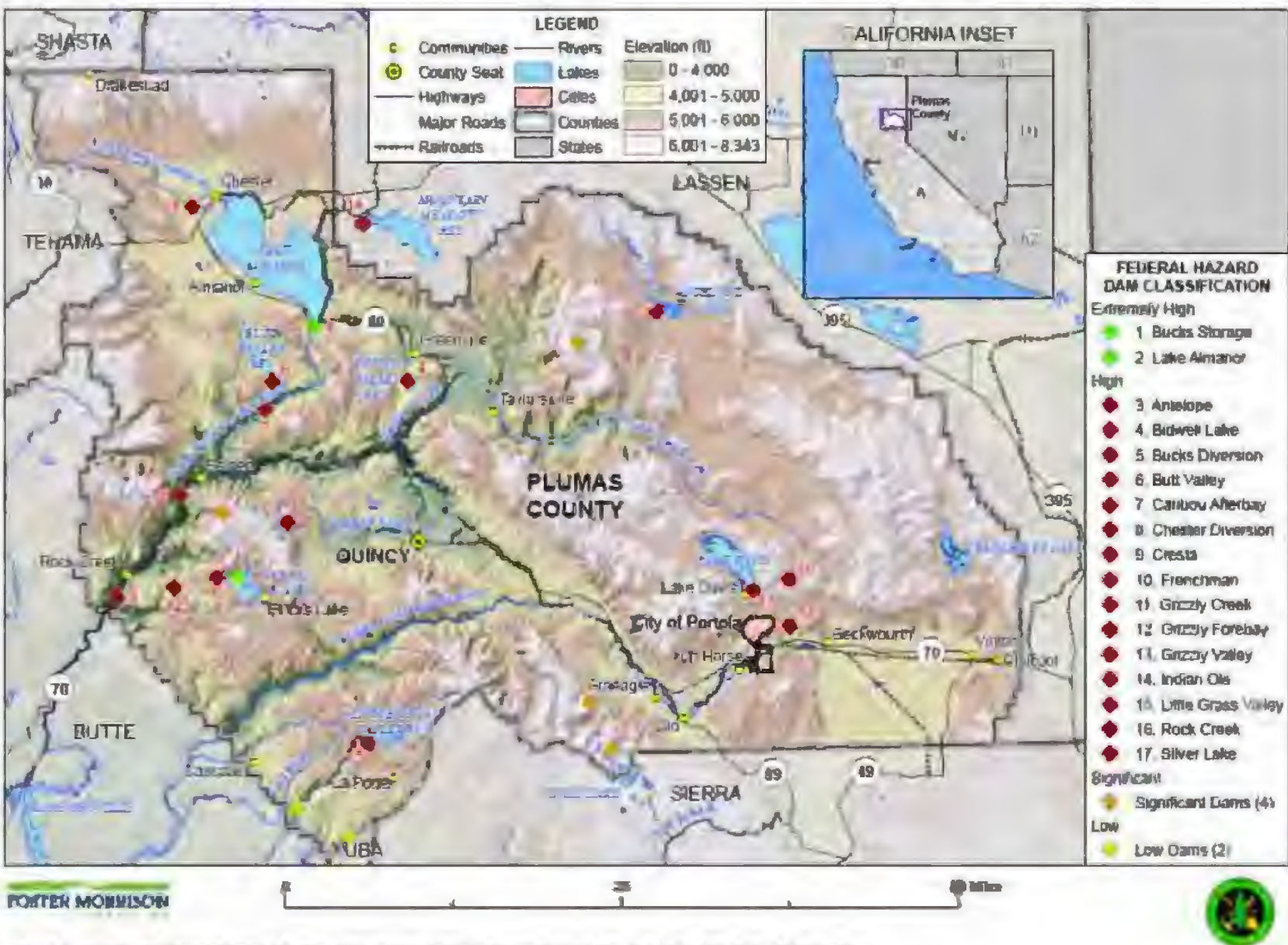


Table 4-33 Plumas County – Inventory of Dams under DSOD Jurisdiction

Name	River/Stream	Hazard Classification	Owner	Dam Type	Capacity (acre-ft)	Structural Height (ft)	Year Built
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	Extremely 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	75	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	Gracagle Water Company	Rockfill	1,478	12	1938
Lower Three Lakes	Feather River	Significant	PG&E	Rockfill	525	32	1928
Rock Creek	North Fork Feather River	High	PG&E	Gravity	4,660	120	1950

Name	River/Stream	Hazard Classification	Owner	Dam Type	Capacity (acre-ft)	Structural Height (ft)	Year Built
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

Source: Cal OES and the National Performance of Dams Program

*One Acre Foot=326,000 gallons

Table 4-34 Dams of Concern Outside Plumas County

Name	River/Stream	Hazard Classification	Owner	Dam Type	Capacity (acre-ft)	Structural Height (ft)	Year Built
Indian Ole (Lassen County)	Hamilton Creek	High	PG&E	Flashboard and Buttress	24,800	26	1924

Source: Cal OES and the National Performance of Dams Program

*One Acre Foot=326,000 gallons

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, dam failure would most probably happen in consequence of the natural disaster triggering the event. However, DOSD assigns hazard ratings to dams within the State that provides information on the potential impact should a dam fail: Low, Significant, High, and Extremely High. There is no scale with which to measure dam 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. Dam inundation flood geographic extents are discussed in Table 4-39 (for extremely high hazard dams) and Table 4-40 (for high hazard dams) in the flooded acres analysis in the vulnerability assessment of this section.

Past Occurrences

Disaster Declaration History

There have been no disasters 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

The HMPC noted no events of dam failure that have affected the County. There was an event in 2017 where the Bidwell Dam lost some bedrock on the spillway when heavy rains filled the reservoir. It has since been fixed, at a cost of approximately \$10,000.

Likelihood of Future Occurrence

Unlikely—No dam failure events have occurred in the County. Thus, based on historical data and input from the HMPC, it is unlikely that major dam failure event will occur in Plumas County.

Climate Change and Dam Failure

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—High

Dam failure flooding can occur as the result of partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. 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 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.

Impacts

Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the Planning Area. Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline critical utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

Dams of Concern

As detailed in Table 4-33, the County is most vulnerable to the following 17 dams:

Extremely High Hazard

- Bucks Storage
- Lake Almanor

High Hazard

- Antelope
- Bidwell Lake
- Bucks Diversion
- Butt Valley
- Caribou Afterbay
- Chester Diversion
- Cresta
- Frenchman
- Grizzly Creek
- Grizzly Forebay
- Grizzly Valley
- Indian Ole (Lassen County)
- Little Grass Valley*
- Rock Creek
- Silver Lake

*This dam did not have mapped dam inundation areas

Available dam inundation maps show areas that lie within the potential dam failure inundation areas, as shown in Figure 4-44.

Values at Risk

Dam inundation areas were available for 16 of the 17 dams of concern, as obtained from CA DWR, DSOD and OES, were used as the basis of this dam inundation analysis. Dams were grouped by hazard rating in order to perform analysis. The depth of flooding due to the failure of these dams is unknown.

Methodology and Results

The same methodology was used for both the extremely high hazard and high hazard dam analysis. Plumas County's February 2020 Parcel/Assessor Data, obtained from Plumas County, were used for the County inventory of parcels and values. GIS was used to for analysis on the parcel layer.. The dam inundation areas, obtained from Cal OES and DSOD, were then overlaid on the parcel layer. For the purposes of this analysis, if the dam inundation layer intersected any part of the parcel, the entire parcel was considered to be in the dam inundation area. The parcels were segregated and analyzed in this fashion for the entirety of

Plumas County. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and the GIS parcel layer.

Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the dam inundation areas due primarily to Proposition 13 and to a lesser extent properties falling under the Williamson Act.

Extremely High Hazard Dams

Dam analysis was performed for the mapped extremely high hazard dams in the County with available inundation data. This includes Lake Almanor and Bucks Storage. Figure 4-44 shows the extremely high dam inundation areas of these dams of concern for the County. Figure 4-45 zooms into the Lake Almanor dam inundation area. Figure 4-46 zooms into the Bucks Storage dam inundation area. The depth of flooding due to the failure of a dam is unknown. Table 4-35 the total parcel counts, improved parcel counts, their improved structure and land values in each extremely high hazard dam inundation areas. Table 4-36 breaks down Table 4-35 to show the property uses affected by each dam inundation area. For these tables it should be noted that:

- All dam/inundations originate within Plumas County
- Inundation cannot be summed as the inundations intersect in similar area coverage. By summing, duplication would occur.

Figure 4-44 Plumas County – Extremely High Hazard Dam Inundation Areas

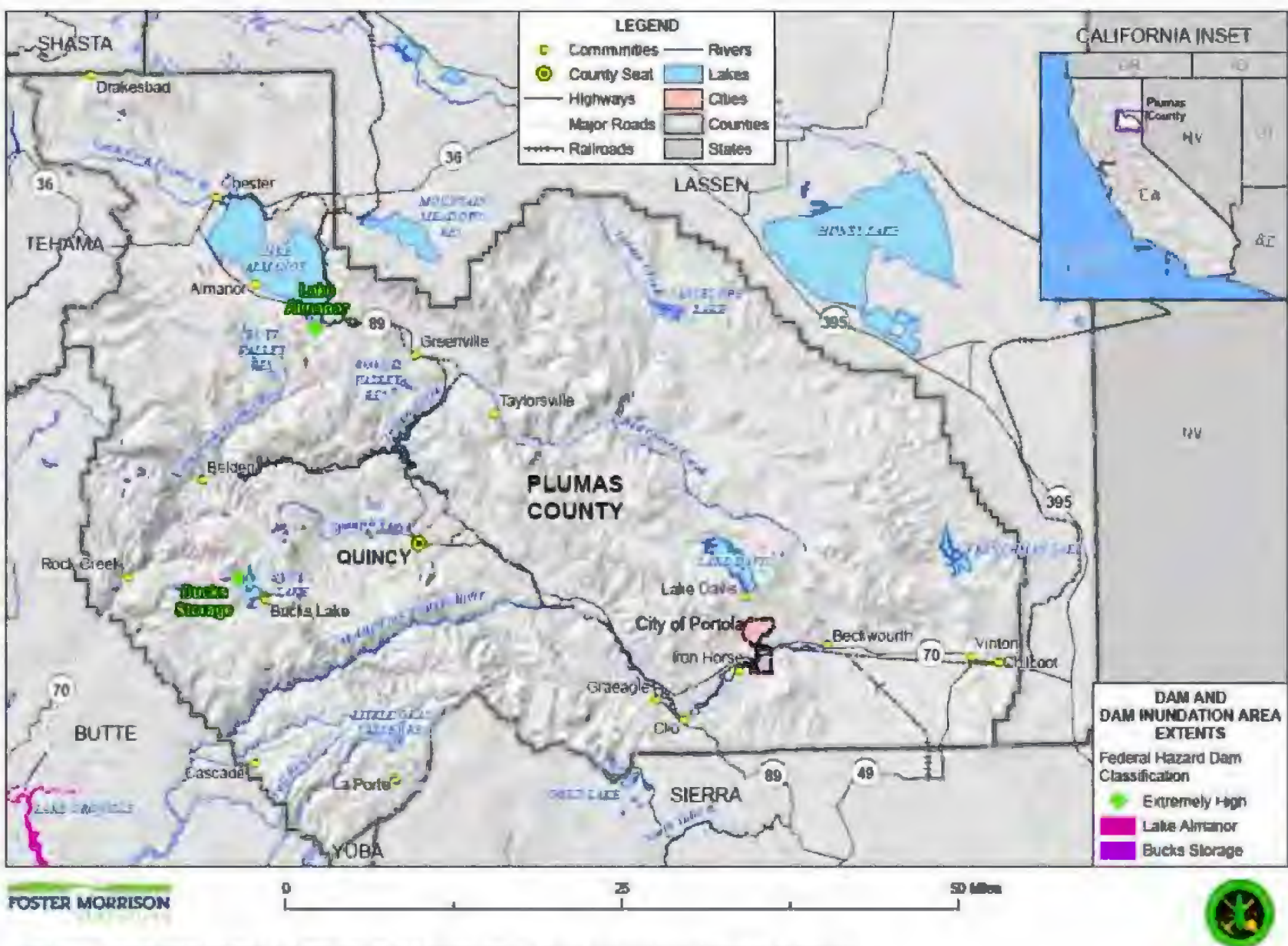


Figure 4-45 Plumas County – Lake Almanor Dam Inundation Areas

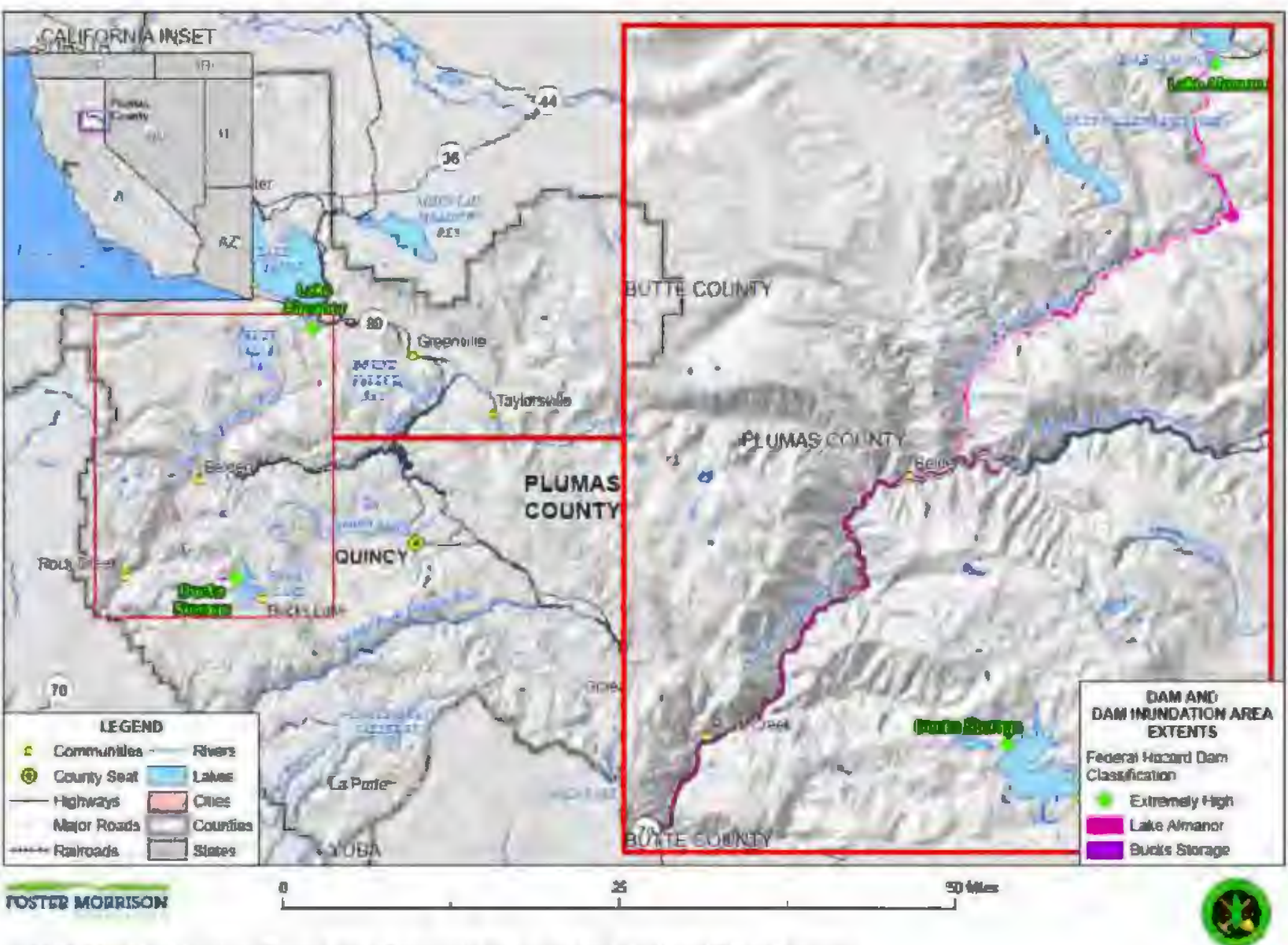


Figure 4-46 Plumas County – Bucks Storage Dam Inundation Areas

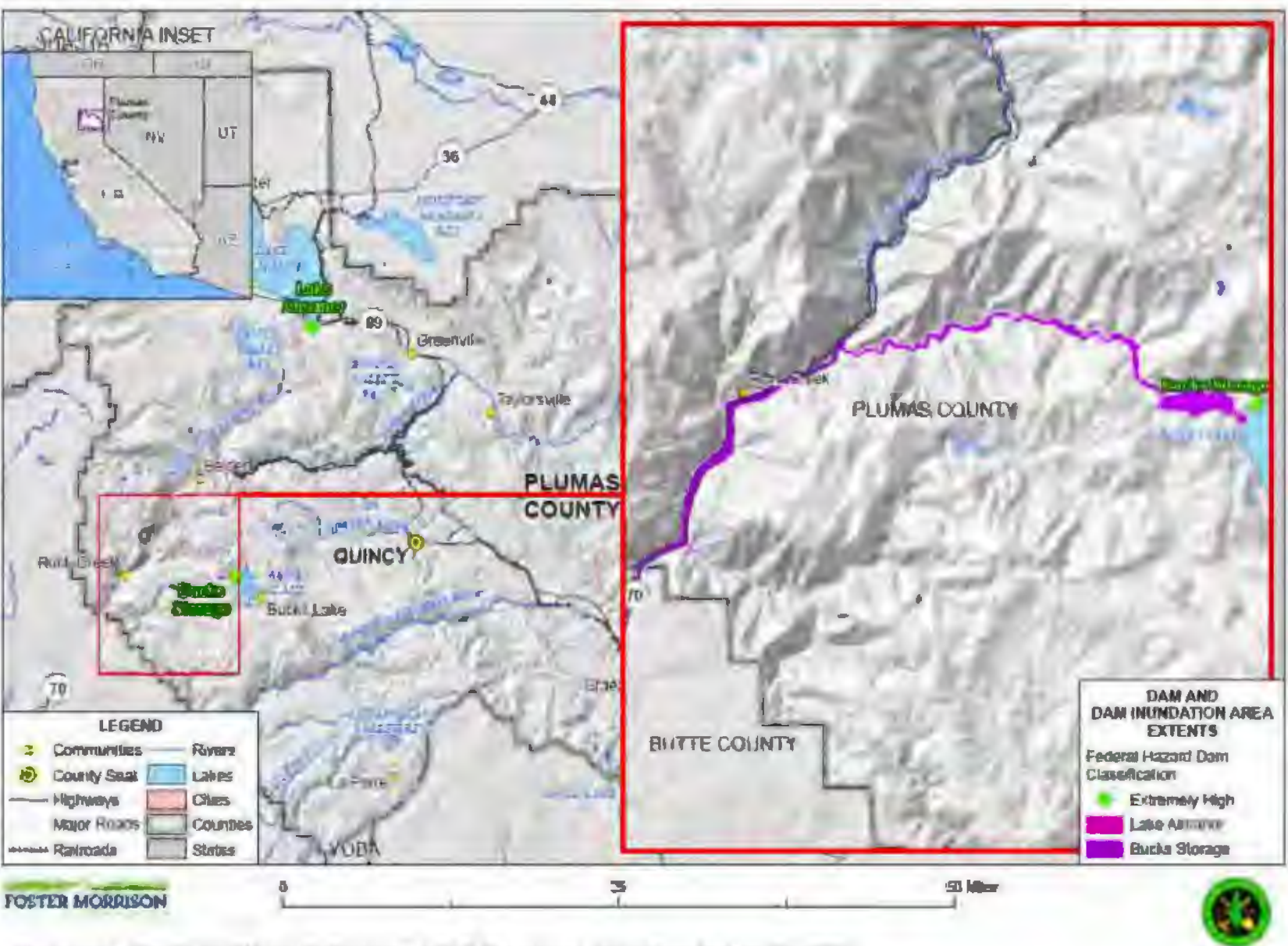


Table 4-35 Plumas County – Summary Count and Value of Parcels in the Extremely High Hazard Dam Inundation Areas

Extremely High Dam Inundation Areas	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Lake Almanor	49	19	\$1,444,281	\$2,490,148	\$43,603	\$2,100,702	\$6,078,734
Bucks Storage	8	1	\$53,508	\$29,166	\$0	\$29,166	\$111,840

Source: Plumas County February 2020 Parcel/Assessor's Data, Cal OES

Table 4-36 Plumas County – Count and Value of Parcels in the Extremely High Hazard Dam Inundation Areas by Property Use

Extremely High 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 Dam Inundation Area							
Agricultural	6	0	\$185,343	\$0	\$0	\$0	\$185,343
Commercial	4	3	\$71,064	\$1,628,278	\$38,296	\$1,628,278	\$3,365,916
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	\$3,400	\$0	\$0	\$0	\$3,400
Recreational	1	1	\$103,358	\$82,977	\$590	\$82,977	\$269,902
Residential	22	15	\$1,081,116	\$778,893	\$4,717	\$389,447	\$2,254,173
ROW/Utilities	4	0	\$0	\$0	\$0	\$0	\$0
Total	49	19	\$1,444,281	\$2,490,148	\$43,603	\$2,100,702	\$6,078,734
Bucks Storage Dam Inundation Area							
Agricultural	3	0	\$52,369	\$0	\$0	\$0	\$52,369
Commercial	1	1	\$1,139	\$29,166	\$0	\$29,166	\$59,471
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	0	0	\$0	\$0	\$0	\$0	\$0

Extremely High 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
ROW/Utilities	0	0	\$0	\$0	\$0	\$0	\$0
Total	8	1	\$53,508	\$29,166	\$0	\$29,166	\$111,840

Source: Plumas County 12/31/2018 Parcel/Assessor's Data, Cal OES

High Hazard Dams

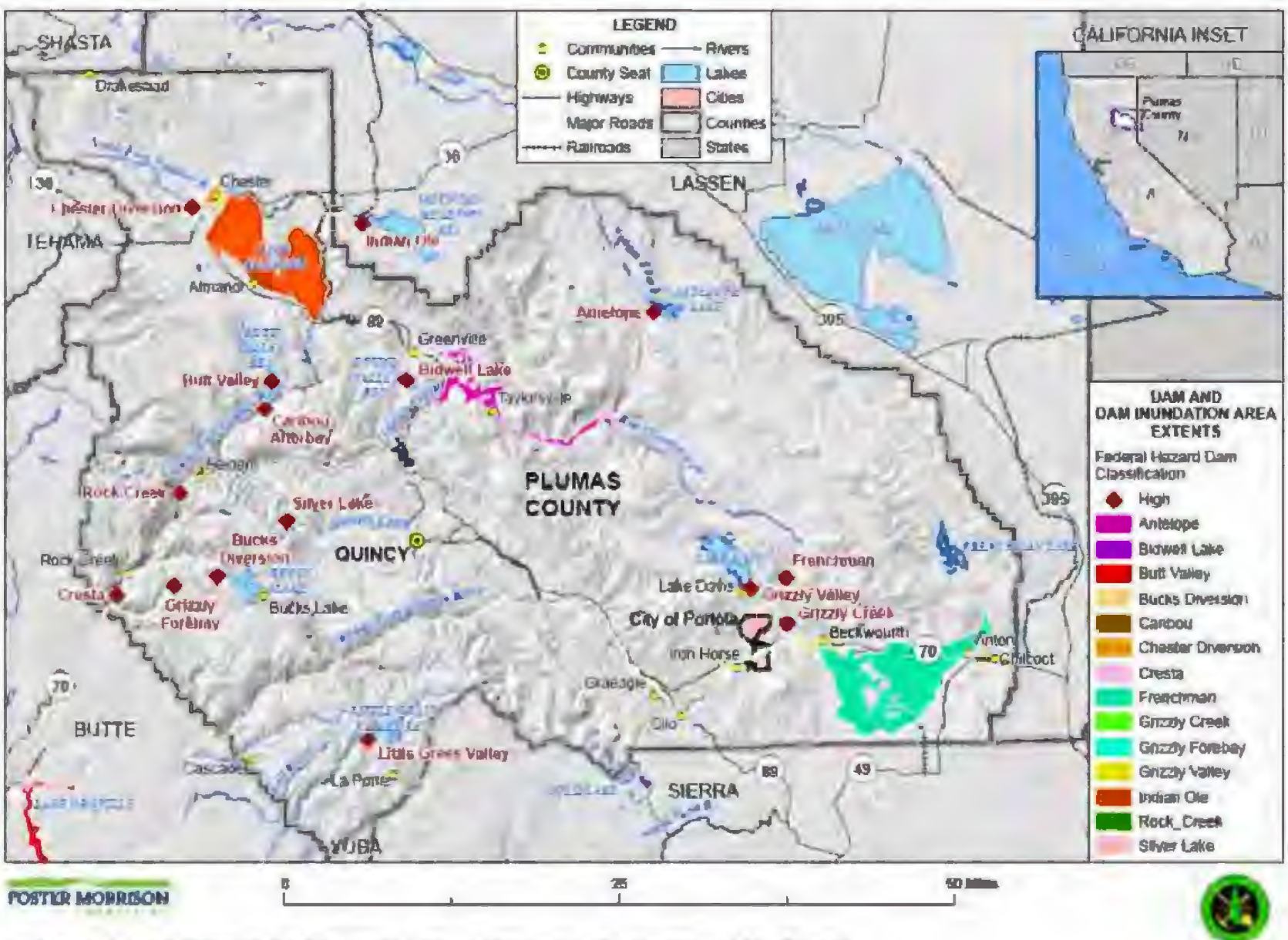
Dam analysis was performed for the mapped high hazard dams in the County with available inundation data. This includes Antelope, Bidwell Lake, Bucks Diversion, Butt Valley, Caribou Afterbay, Chester Diversion, Frenchman, Grizzly Creek, Grizzly Valley, Indian Ole (Lassen County), and Silver Lake. Figure 4-47 shows the dam inundation areas of these dams of concern for the County. Four maps were created to zoom into the areas affected by dam inundation in the County:

- Figure 4-48 show the Bidwell Lake, Butt Valley, Chester Diversion Caribou Afterbay, and Indian Ole dam inundation areas.
- Figure 4-49 show the Antelope and Bidwell Lake dam inundation areas.
- Figure 4-50 show the Butt Valley, Caribou Afterbay, Cresta, Grizzly Forebay, Rock Creek, and Silver Lake dam inundation areas.
- Figure 4-51 show the Bucks Diversion, Frenchman, Grizzly Valley, Lake Davis, and Grizzly Creek dam inundation areas. The depth of flooding due to the failure of a dam is unknown.

Table 4-37 the total parcel counts, improved parcel counts, their improved structure and land values in each high hazard dam inundation areas. Table 4-38 breaks down Table 4-37 to show the property uses affected by each dam inundation area. For these tables it should be noted that:

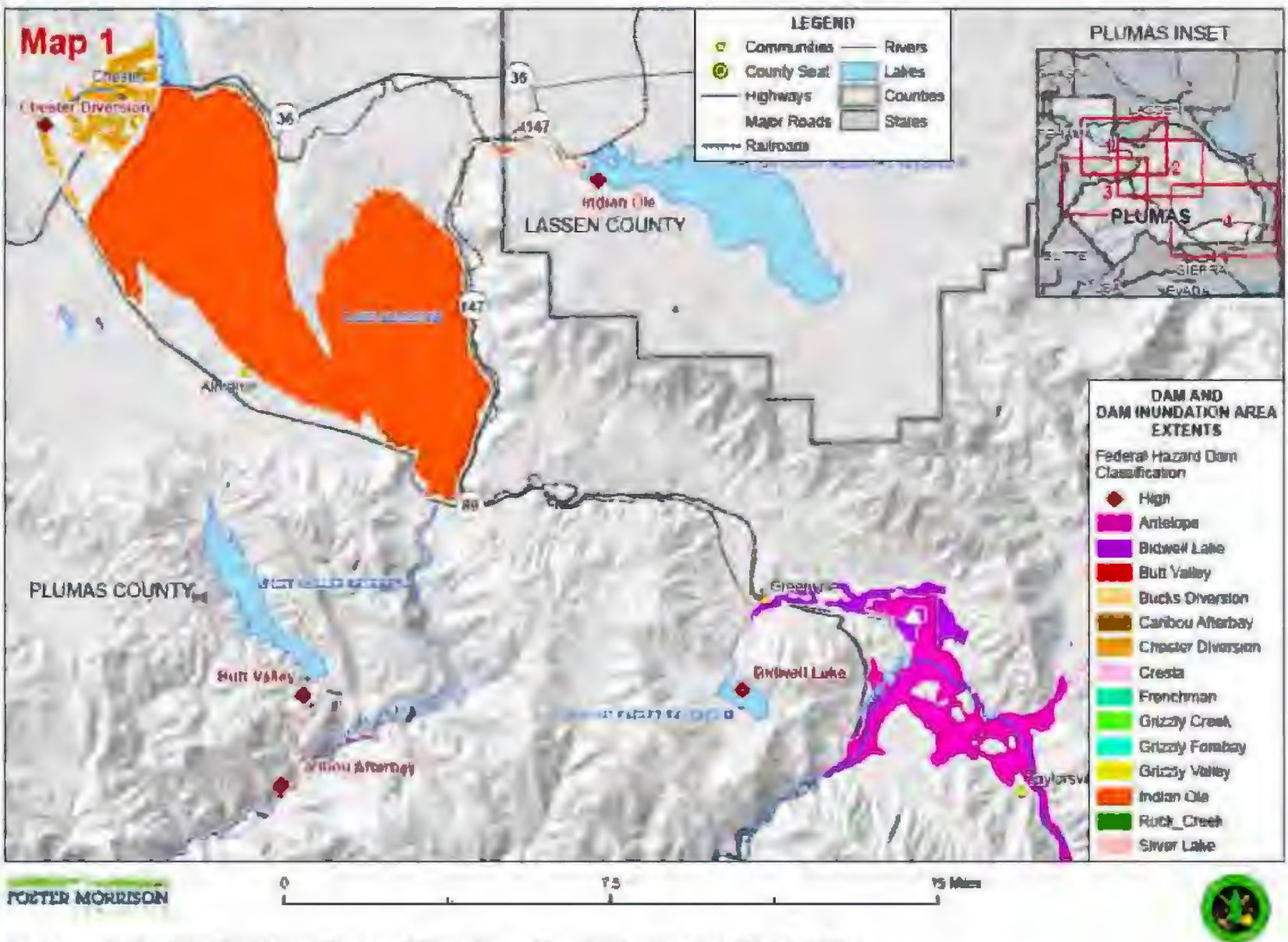
- Indian Ole is the only dam/inundation that originates outside of Plumas County in Lassen County.
- There are 15 dams classified as High and 14 are analyzed.
 - ✓ Little Grass Valley was not analyzed as no inundation dataset was available.
- Inundation cannot be summed as the inundations intersect in similar area coverage. By summing, duplication would occur.

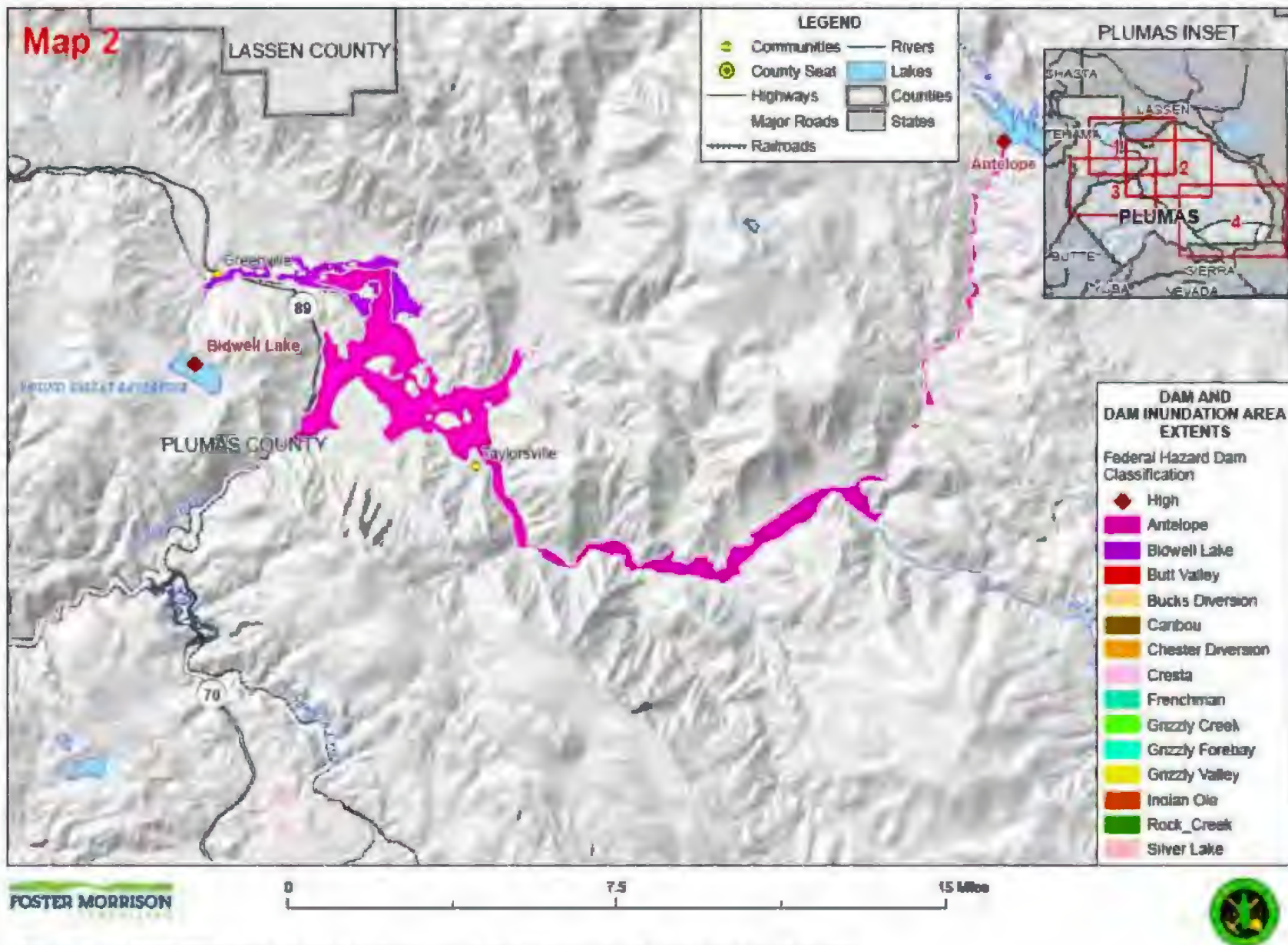
Figure 4-47 Plumas County – High Hazard Dam Inundation Areas



Data Source: Cal DWR DSD 2020, Cal OES Dam Status 10/2017, Plumas County GIS, CalAtlas, Map Date: 03/01/2020

Figure 4-48 Plumas County – High Hazard Dam Inundation Areas Map 1

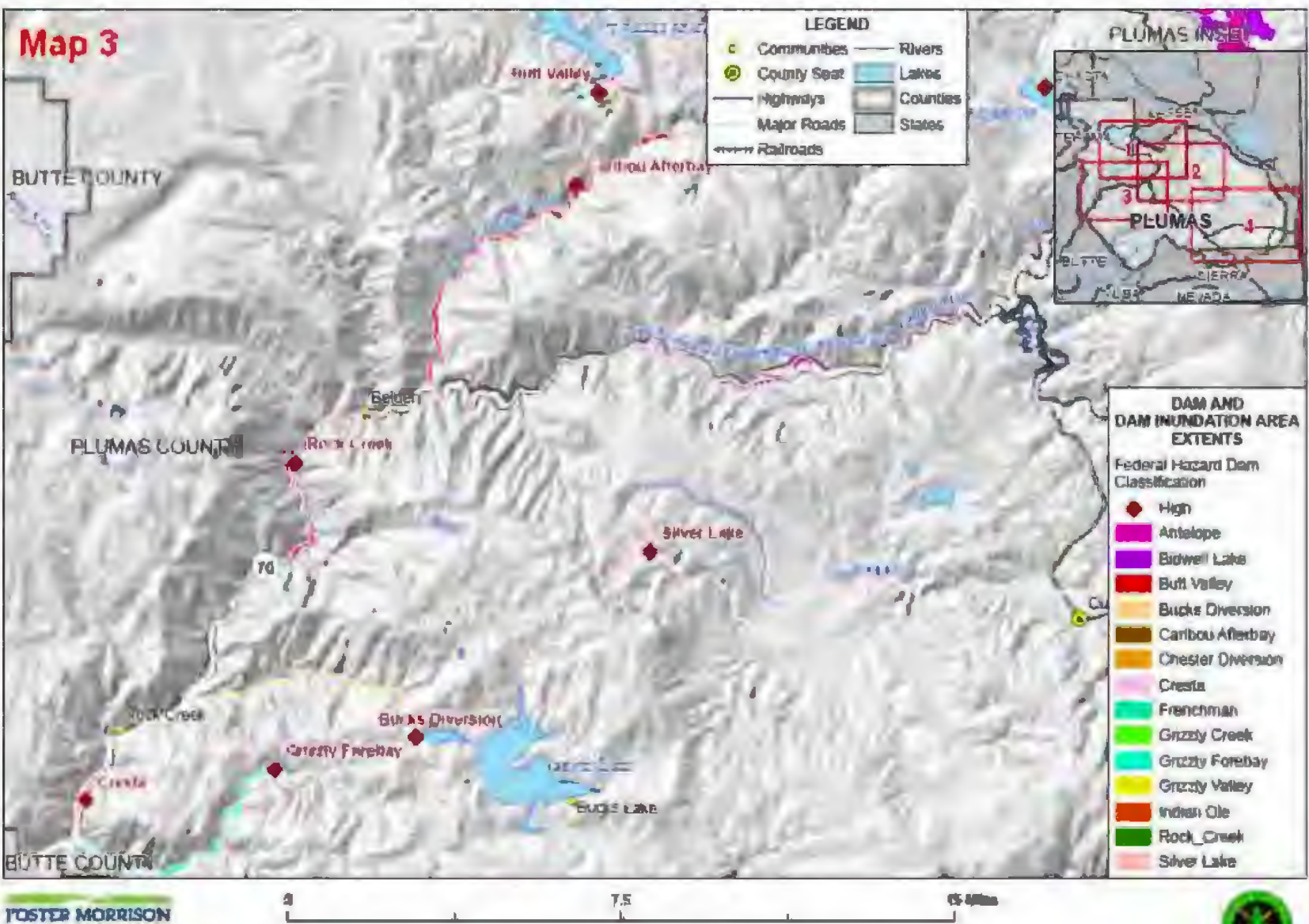




Data Source: Cal DWR DSOD 2020, Cal OES Dam Status 10/2017, Plumas County GIS, Cal-Atlas; Map Date: 03/01/2020

Figure 4-49 Plumas County – High Hazard Dam Inundation Areas Map 2

Figure 4-50 Plumas County – High Hazard Dam Inundation Areas Map 3



Data Source: Cal DWR DSOD 2020, Cal OES Dam Status 10/2017, Plumas County GIS, CalAtlas; Map Date: 03/01/2020

Figure 4-51 Plumas County – High Hazard Dam Inundation Areas Map 4

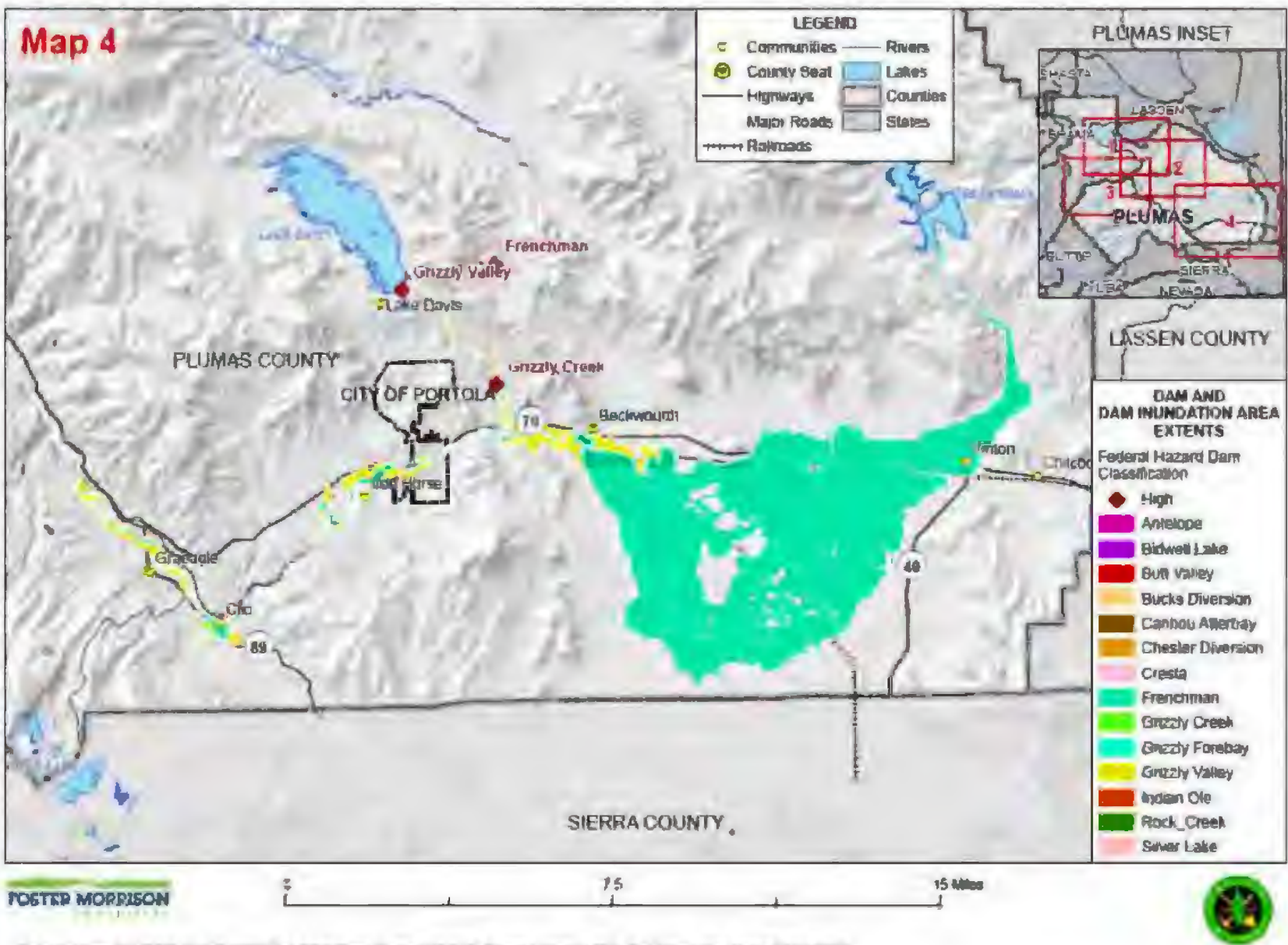


Table 4-37 Plumas County – Summary Count and Value of Parcels in the High Hazard Dam Inundation Areas

High Dam Inundation Areas	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Antelope	466	205	\$29,056,684	\$34,621,413	\$311,684	\$21,070,644	\$85,060,425
Bidwell Lake	292	145	\$13,729,580	\$15,471,505	\$359,040	\$10,583,505	\$40,143,630
Butt Valley	31	8	\$495,793	\$1,907,115	\$38,296	\$1,767,697	\$4,208,901
Bucks Diversion	8	1	\$53,508	\$29,166	\$0	\$29,166	\$111,840
Caribou Afterbay	19	4	\$140,034	\$1,725,096	\$36,580	\$1,662,104	\$3,563,814
Chester Diversion	1,527	1,149	\$60,999,682	\$163,245,377	\$1,121,040	\$107,645,203	\$333,011,302
Cresta	1	0	\$0	\$0	\$0	\$0	\$0
Frenchman	443	162	\$30,220,463	\$30,296,743	\$2,272,689	\$20,868,427	\$83,658,322
Grizzly Creek	128	38	\$7,077,882	\$10,427,936	\$193,630	\$7,511,248	\$25,210,696
Grizzly Forebay	11	0	\$83,360	\$0	\$0	\$0	\$83,360
Grizzly Valley	949	499	\$53,201,272	\$85,238,691	\$408,406	\$54,352,681	\$193,201,050
Indian Ole	190	139	\$56,836,825	\$55,140,862	\$4,818	\$27,570,431	\$139,552,936
Rock Creek	7	0	\$52,369	\$0	\$	\$0	\$52,369
Silver Lake	126	62	\$6,247,994	\$7,707,567	\$47,120	\$4,150,341	\$18,153,022

Source: Plumas County 12/31/2018 Parcel/Assessor's Data, Cal OES

Table 4-38 Plumas County – Count and Value of Parcels in the High Hazard Dam Inundation Areas by Property Use

Extremely High 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 Dam Inundation Area							
Agricultural	116	29	\$12,479,498	\$3,252,387	\$118,354	\$3,252,387	\$19,102,626
Commercial	10	8	\$1,003,347	\$3,570,734	\$53,070	\$3,570,734	\$8,197,885
Federal Lands	17	0	\$0	\$0	\$0	\$0	\$0
Government	17	0	\$0	\$0	\$0	\$0	\$0
Industrial	6	2	\$406,816	\$215,299	\$0	\$322,949	\$945,064
Institutional	0	0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	8	0	\$0	\$0	\$0	\$0	\$0

Extremely High 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	3	2	\$75,411	\$266,156	\$40,690	\$266,156	\$648,413
Residential	237	164	\$15,091,612	\$27,316,837	\$99,570	\$13,658,419	\$56,166,438
ROW/Utilities	52	0	\$0	\$0	\$0	\$0	\$0
Total	466	205	\$29,056,684	\$34,621,413	\$311,684	\$21,070,644	\$85,060,425
Bidwell Lake Dam Inundation Area							
Agricultural	43	9	\$6,438,219	\$1,263,951	\$20,144	\$1,263,951	\$8,986,265
Commercial	23	17	\$1,139,108	\$4,009,337	\$223,000	\$4,009,337	\$9,380,782
Federal Lands	2	0	\$0	\$0	\$0	\$0	\$0
Government	14	0	\$0	\$0	\$0	\$0	\$0
Industrial	9	1	\$412,047	\$1,530	\$0	\$2,295	\$415,872
Institutional	1	1	\$25,500	\$153,000	\$0	\$153,000	\$331,500
Miscellaneous	3	0	\$0	\$0	\$0	\$0	\$0
Recreational	4	2	\$90,550	\$266,156	\$40,690	\$266,156	\$663,552
Residential	154	115	\$5,624,156	\$9,777,531	\$75,206	\$4,888,766	\$20,365,659
ROW/Utilities	39	0	\$0	\$0	\$0	\$0	\$0
Total	292	145	\$13,729,580	\$15,471,505	\$359,040	\$10,583,505	\$40,143,630
Bucks Diversion Dam Inundation Area							
Agricultural	1	1	\$1,139	\$29,166	\$0	\$29,166	\$59,471
Commercial	3	0	\$0	\$0	\$0	\$0	\$0
Federal Lands	1	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	8	1	\$53,508	\$29,166	\$0	\$29,166	\$111,840
Total	1	1	\$1,139	\$29,166	\$0	\$29,166	\$59,471
Butt Valley Dam Inundation Area							
Agricultural	5	0	\$150,218	\$0	\$0	\$0	\$150,218
Commercial	4	3	\$71,064	\$1,628,278	\$38,296	\$1,628,278	\$3,365,916
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

Extremely High 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	0	0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	0	0	\$0	\$0	\$0	\$0	\$0
Recreational	0	0	\$0	\$0	\$0	\$0	\$0
Residential	8	5	\$274,511	\$278,837	\$0	\$139,419	\$692,767
ROW/Utilities	4	0	\$0	\$0	\$0	\$0	\$0
Total	31	8	\$495,793	\$1,907,115	\$38,296	\$1,767,697	\$4,208,901
Caribou Afterbay Dam Inundation Area							
Agricultural	3	0	\$52,369	\$0	\$0	\$0	\$52,369
Commercial	2	2	\$56,275	\$1,599,112	\$36,580	\$1,599,112	\$3,291,079
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
Recreational	0	0	\$0	\$0	\$0	\$0	\$0
Residential	4	2	\$31,390	\$125,984	\$0	\$62,992	\$220,366
ROW/Utilities	3	0	\$0	\$0	\$0	\$0	\$0
Total	19	4	\$140,034	\$1,725,096	\$36,580	\$1,662,104	\$3,563,814
Chester Diversion Dam Inundation Area							
Agricultural	16	1	\$622,682	\$286,000	\$0	\$286,000	\$1,194,682
Commercial	160	121	\$14,965,009	\$45,588,078	\$871,429	\$45,588,078	\$107,012,594
Federal Lands	3	0	\$0	\$0	\$0	\$0	\$0
Government	32	0	\$0	\$0	\$0	\$0	\$0
Industrial	20	13	\$1,337,211	\$2,377,952	\$8,644	\$3,566,928	\$7,290,735
Institutional	16	9	\$280,923	\$1,291,836	\$9,195	\$1,291,836	\$2,873,790
Miscellaneous	1	0	\$0	\$0	\$0	\$0	\$0
Recreational	1	1	\$135,089	\$123,211	\$0	\$123,211	\$381,511
Residential	1,189	1,004	\$43,658,768	\$113,578,300	\$231,772	\$56,789,150	\$214,257,990
ROW/Utilities	89	0	\$0	\$0	\$0	\$0	\$0
Total	1,527	1,149	\$60,999,682	\$163,245,377	\$1,121,040	\$107,645,203	\$333,011,302
Cresta Dam Inundation Area							
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

Extremely High 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
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 Dam Inundation Area							
Agricultural	87	36	\$14,085,044	\$5,474,554	\$1,908,704	\$5,474,554	\$26,942,856
Commercial	23	16	\$1,767,500	\$4,392,476	\$57,910	\$4,392,476	\$10,610,362
Federal Lands	16	0	\$0	\$0	\$0	\$0	\$0
Government	32	0	\$0	\$0	\$0	\$0	\$0
Industrial	1	0	\$76,467	\$0	\$0	\$0	\$76,467
Institutional	1	0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	15	0	\$0	\$0	\$0	\$0	\$0
Recreational	7	5	\$717,953	\$1,573,080	\$0	\$1,573,080	\$3,864,113
Residential	192	105	\$13,573,499	\$18,856,633	\$306,075	\$9,428,317	\$42,164,524
ROW/Utilities	69	0	\$0	\$0	\$0	\$0	\$0
Total	443	162	\$30,220,463	\$30,296,743	\$2,272,689	\$20,868,427	\$83,658,322
Grizzly Creek Dam Inundation Area							
Agricultural	4		\$216,582	\$0	\$0	\$0	\$216,582
Commercial	15	9	\$1,674,214	\$3,400,742	\$159,430	\$3,400,742	\$8,635,128
Federal Lands	4	0	\$0	\$0	\$0	\$0	\$0
Government	13	0	\$0	\$0	\$0	\$0	\$0
Industrial	1	0	\$76,467	\$0	\$0	\$0	\$76,467
Institutional	0	0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	4	0	\$0	\$0	\$0	\$0	\$0
Recreational	2	2	\$127,052	\$1,193,817	\$0	\$1,193,817	\$2,514,686
Residential	64	27	\$4,983,567	\$5,833,377	\$34,200	\$2,916,689	\$13,767,833
ROW/Utilities	21	0	\$0	\$0	\$0	\$0	\$0
Total	128	38	\$7,077,882	\$10,427,936	\$193,630	\$7,511,248	\$25,210,696
Grizzly Forebay Dam Inundation Area							
Agricultural	3	0	\$83,360	\$0	\$0	\$0	\$83,360

Extremely High 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
Commercial	0	0	\$0	\$0	\$0	\$0	\$0
Federal Lands	7	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	11	0	\$83,360	\$0	\$0	\$0	\$83,360
Grizzly Valley Dam Inundation Area							
Agricultural	68	21	\$9,724,805	\$1,226,940	\$0	\$1,226,940	\$12,178,685
Commercial	64	43	\$5,621,633	\$13,544,877	\$301,341	\$13,544,877	\$33,012,728
Federal Lands	16	0	\$0	\$0	\$0	\$0	\$0
Government	52	0	\$0	\$0	\$0	\$0	\$0
Industrial	24	17	\$1,801,587	\$1,936,748	\$1,040	\$2,905,122	\$6,644,497
Institutional	1	1	\$8,597	\$160,816	\$0	\$160,816	\$330,229
Miscellaneous	9	0	\$0	\$0	\$0	\$0	\$0
Recreational	53	34	\$2,170,291	\$4,660,542	\$0	\$4,660,542	\$11,491,375
Residential	568	383	\$33,874,359	\$63,708,768	\$106,025	\$31,854,384	\$129,543,536
ROW/Utilities	94	0	\$0	\$0	\$0	\$0	\$0
Total	949	499	\$53,201,272	\$85,238,691	\$408,406	\$54,352,681	\$193,201,050
Indian Ole Dam Inundation Area							
Agricultural	5	0	\$185,805	\$0	\$0	\$0	\$185,805
Commercial	4	0	\$335,539	\$0	\$0	\$0	\$335,539
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	157	139	\$56,315,481	\$55,140,862	\$4,818	\$27,570,431	\$139,031,592
ROW/Utilities	15	0	\$0	\$0	\$0	\$0	\$0
Total	190	139	\$56,836,825	\$55,140,862	\$4,818	\$27,570,431	\$139,552,936

Extremely High 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
Rock Creek Dam Inundation Area							
Agricultural	3	0	\$52,369	\$0	\$0	\$0	\$52,369
Commercial		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	7	0	\$52,369	\$0	\$0	\$0	\$52,369
Silver Lake Dam Inundation Area							
Agricultural	15	5	\$1,497,563	\$577,782	\$47,120	\$577,782	\$2,700,247
Commercial	4	1	\$169,890	\$15,333	\$0	\$15,333	\$200,556
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	83	56	\$4,580,541	\$7,114,452	\$0	\$3,557,226	\$15,252,219
ROW/Utilities	12	0	\$0	\$0	\$0	\$0	\$0
Total	126	62	\$6,247,994	\$7,707,567	\$47,120	\$4,150,341	\$18,153,022

Source: Plumas County 12/31/2018 Parcel/Assessor's Data, Cal OES

Dam Inundation - Flooded Acres

In addition to the centroid analysis used to obtain numbers of parcels and values at risk to the dam failure hazard, parcel boundary analysis was performed to obtain total acres and flooded acres by dam inundation area. The following is an analysis of inundated or flooded acres associated with dam failures and inundation areas in the County.

Methodology

GIS was used to calculate acres flooded by each Cal OES dam inundation area. The parcel layer was intersected with the Cal OES and CA DWR DSOD dam inundation area data to obtain the acres inundated

by dam. The Plumas County parcel layer and inundation areas were intersected, and each segment divided by the intersection of inundation area and parcels was calculated for acres.

Limitations

One limitation created by this type of analysis is that with respect to the improved acres analysis, improvements are uniformly found throughout the parcel, while in reality, only portions of the parcel are improved, and improvements may or may not fall within the inundated portion of a parcel; thus, areas of improvements inundated, calculated through this method, may be higher or lower than those actually seen in a similar real-world event.

Analysis Results

The following tables represent a summary and detailed analysis of total acres for each dam inundation area in the Planning Area. Table 4-39 shows the flooded acres of the Plumas County Planning Area in the inundation areas of each extremely high hazard dam. Table 4-40 shows the flooded acres of the Plumas County Planning Area in the inundation areas of each high hazard dam

Table 4-39 Plumas County – Flooded Acres from Extremely High Hazard Dams

Dam Inundation Area	Total Acres	Improved Acres	Unimproved Acres
Lake Almanor	3,346.4	69.0	3,277.4
Bucks Storage	1,291.2	1.6	1,289.5

Source: Cal OES

Table 4-40 Plumas County – Flooded Acres from High Hazard Dams

Dam Inundation Area	Total Acres	Improved Acres	Unimproved Acres
Antelope	9,558.5	2562.2	6996.3
Bidwell Lake	2,657.5	500.3	2157.2
Bucks Diversion	821.2	1.9	819.3
Butt Valley	1,648.3	29.4	1618.9
Caribou Afterbay	753.8	3.2	750.5
Chester Diversion	2,810.7	618.5	2192.3
Cresta	43.9	0.0	43.9
Frenchman	34,473.7	8735.5	25738.2
Grizzly Creek	638.3	79.5	558.8
Grizzly Forebay	700.4	0.0	700.4
Grizzly Valley	16,487.4	3202.2	13285.2
Indian Ole	25,743.4	4.8	25738.6
Rock Creek	474.6	0.0	474.6
Silver Lake	973.0	281.8	691.2

Source: Cal OES

Population at Risk

A separate analysis was performed to determine population in dam inundation areas for dams with available inundation maps. Using GIS, the dam inundation area dataset was overlaid on the improved residential parcel data. Those parcel centroids that intersect an inundation area were counted and multiplied by the Census Bureau average household size for Plumas County. Table 4-41 shows the populations at risk to dam failure flooding for extremely high hazard dams. According to this analysis, for the entire Planning Area, there is a population of 35 in extremely high hazard dam inundation areas. It is unlikely that both dams that could affect Plumas County would fail at the same time.

Table 4-41 Plumas County – Residential Population at Risk in Extremely High Hazard Dam Inundation Area

Jurisdiction	Bucks Storage		Lake Almanor	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Unincorporated County	0	0	15	35
Total	0	0	15	35

Source: Cal OES Dam Inundation Data, US Census Bureau Average Household Sizes: unincorporated Plumas County (2.32)

Table 4-42 shows the populations at risk to dam failure flooding for high hazard dams. It is unlikely that all dams that could affect Plumas County would fail at the same time.

Table 4-42 Plumas County – Residential Population at Risk in High Hazard Dam Inundation Area

Dam Inundation Area	Improved Residential Parcels	Population
Antelope	164	380
Bidwell Lake	115	267
Bucks Diversion	0	0
Butt Valley	5	12
Caribou Afterbay	2	5
Chester Diversion	1,004	2,329
Cresta	0	0
Frenchman	105	244
Grizzly Creek	27	63
Grizzly Forebay	0	0
Grizzly Valley	383	889
Indian Ole	139	322
Rock Creek	0	0
Silver Lake	56	130

Source: Cal OES Dam Inundation Data, US Census Bureau Average Household Sizes: unincorporated Plumas County (2.32)

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Plumas County to determine critical facilities in the areas affected dam failure. Using GIS, the Cal OES and CA DWR DSOD dam inundation areas were overlayed on the critical facility GIS layer. The analysis was broken up by dam hazard classification:

- Figure 4-52 shows the critical facilities and extremely high hazard dam inundation areas. Figure 4-53 and Figure 4-54 show closer views of Lake Almanor and Buck Storage dam inundation areas and the critical facilities they intersect. Table 4-43 shows a summary of critical facilities in extremely high dam inundation areas. Table 4-44 details the critical facilities in the unincorporated County that fall in extremely high dam inundation zones.
- Figure 4-55 shows the critical facilities and high hazard dam inundation areas. Table 4-45 shows a summary of critical facilities in high hazard dam inundation areas. Four maps were created to zoom into the areas affected by dam inundation in the County:
 - ✓ Figure 4-56 show the Bidwell Lake, Butt Valley, Chester Diversion Caribou Afterbay, and Indian Ole dam inundation areas.
 - ✓ Figure 4-57 show the Antelope and Bidwell Lake dam inundation areas.
 - ✓ Figure 4-58 show the Butt Valley, Caribou Afterbay, Cresta, Grizzly Forebay, Rock Creek, and Silver Lake dam inundation areas.
 - ✓ Figure 4-59 show the Bucks Diversion, Frenchman, Grizzly Valley, Lake Davis, and Grizzly Creek dam inundation areas.
 - ✓ Table 4-46 details the critical facilities in the unincorporated County that fall in high dam inundation zones.

Figure 4-52 Plumas County – Critical Facilities in Extremely High Hazard Dam Inundation Areas

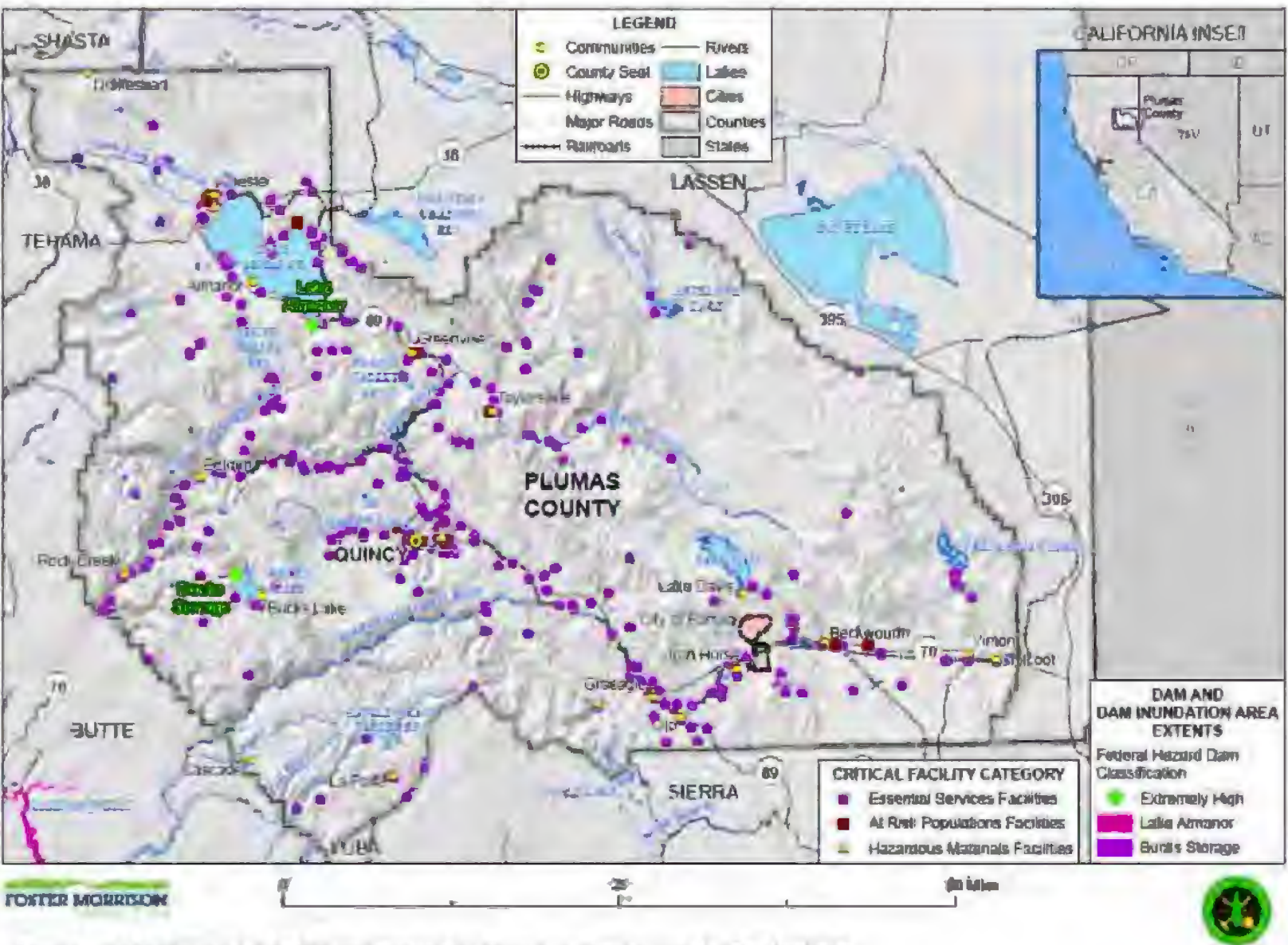
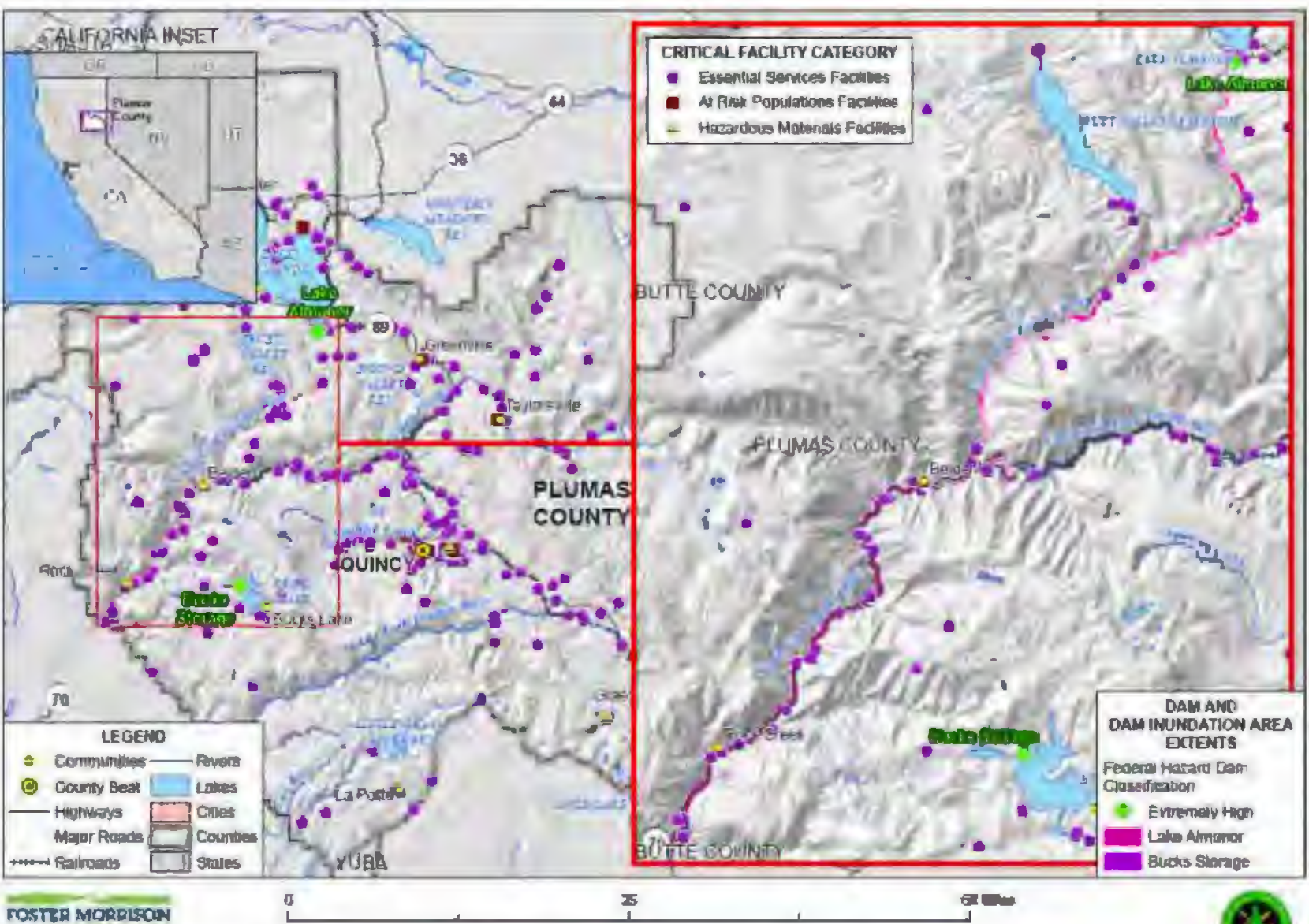


Figure 4-53 Plumas County – Lake Almanor Dam Inundation Areas and Critical Facilities





4-138

Table 4-43 Plumas County – Critical Facilities in Extremely High Hazard Dam Inundation Areas by Facility Category

Dam Inundation Area	Critical Facility Category	Facility Count
Extremely High Dam Inundation Area	Essential Services Facilities	45
	Total	45
Outside of Extremely High Dam Inundation Area	Essential Services Facilities	728
	At Risk Populations Facilities	38
	Hazardous Materials Facilities	4
	Total	770
Grand Total		815

Source: Plumas County GIS, Cal OES, DSOD

Table 4-44 Plumas County – Critical Facilities in Extremely High Hazard Dam Inundation Zones by Facility Category and Type

Dam Inundation Area	Critical Facility Category	Lake Almanor	Bucks Storage
		Facility Count	
Extremely High Dam Inundation Area	Essential Services Facilities	44	17
	At Risk Populations Facilities	0	0
	Hazardous Materials Facilities	0	0
Grand Total		44	17

Source: Plumas County GIS, Cal OES, DSOD



Figure 4-55 Plumas County – Critical Facilities in High Hazard Dam Inundation Areas

Figure 4-56 Plumas County – High Hazard Dam Inundation Areas and Critical Facilities Map
1

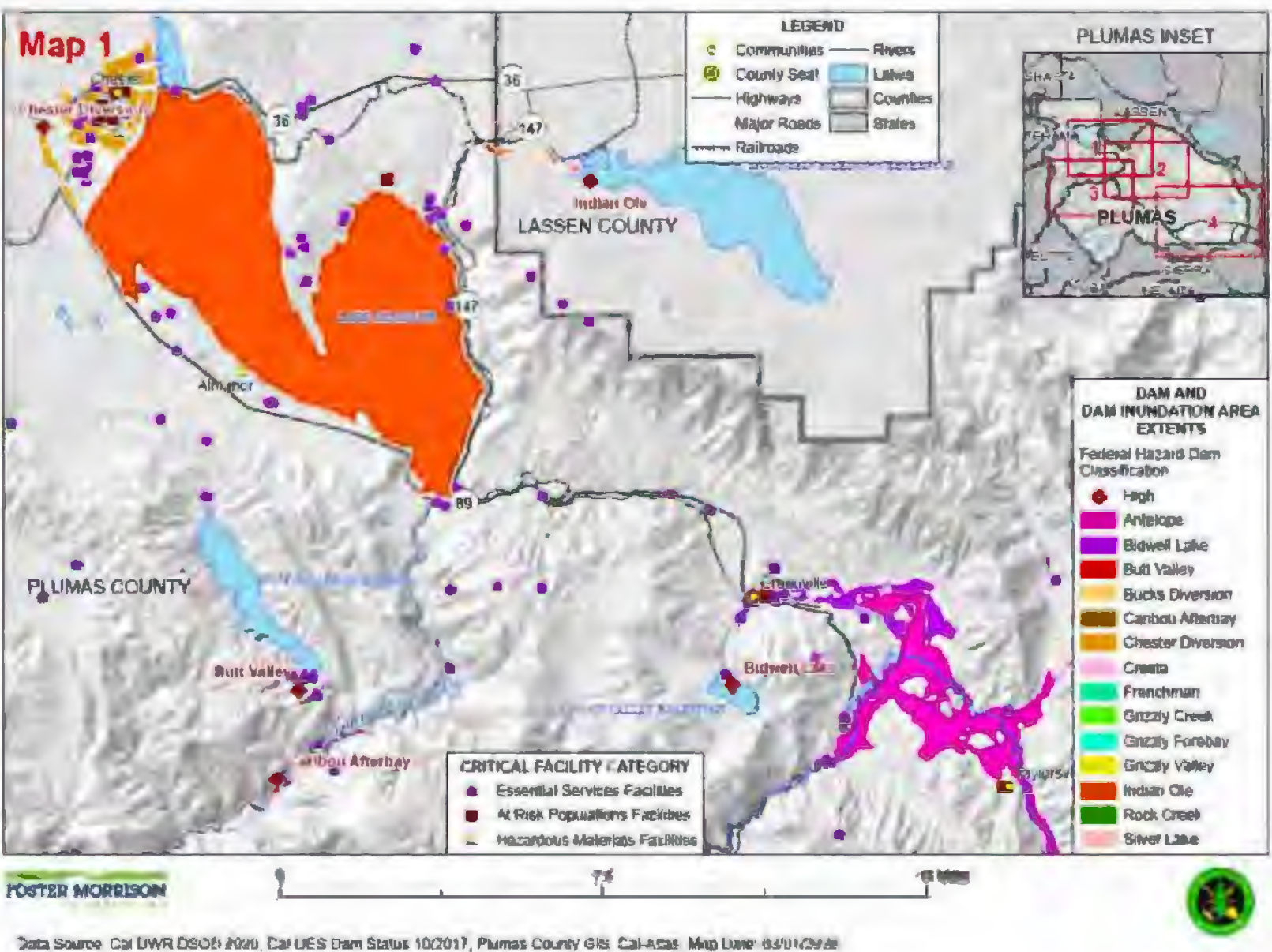


Figure 4-57 Plumas County – High Hazard Dam Inundation Areas and Critical Facilities Map
2

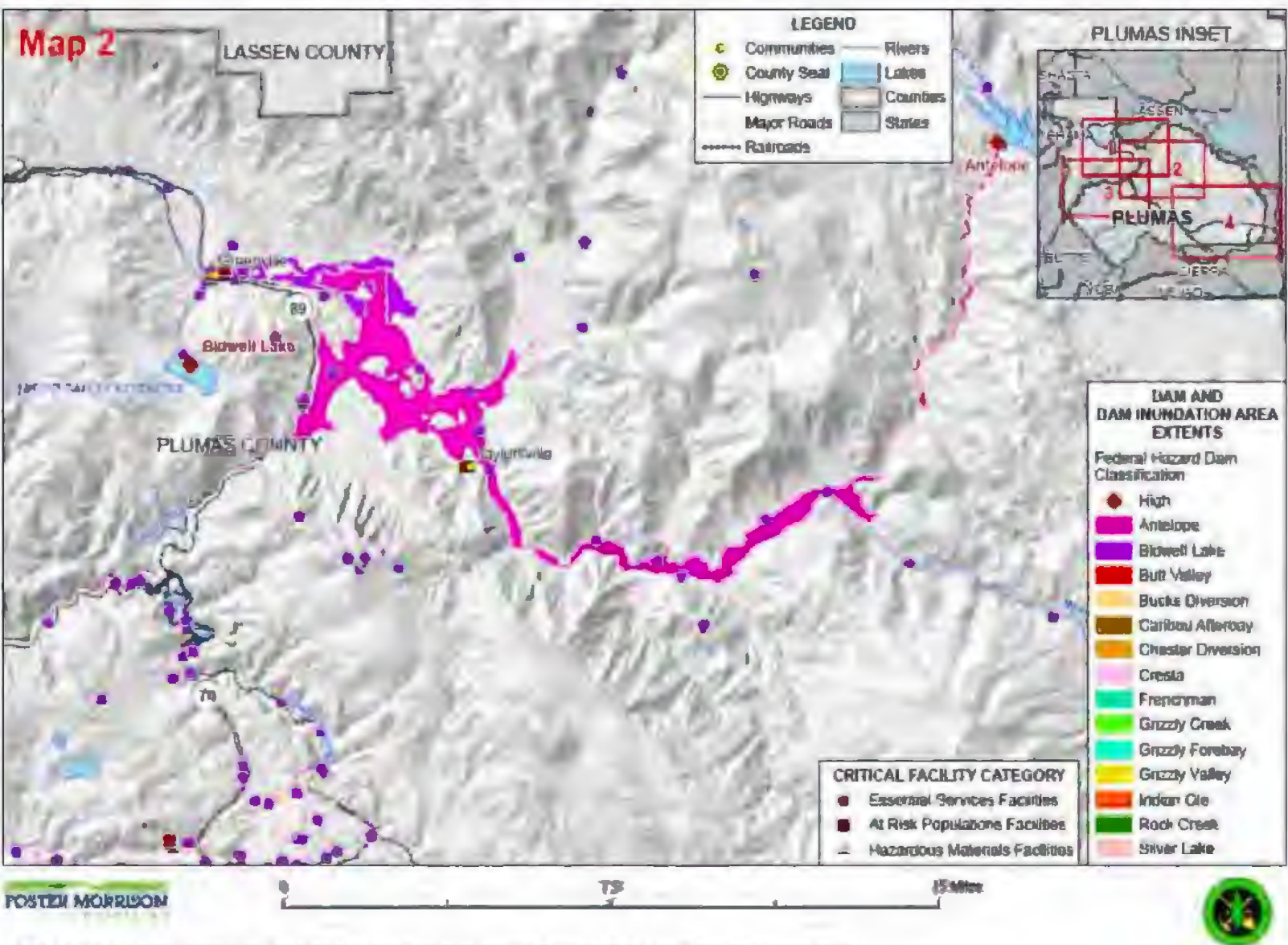


Figure 4-58 Plumas County – High Hazard Dam Inundation Areas and Critical Facilities Map

3

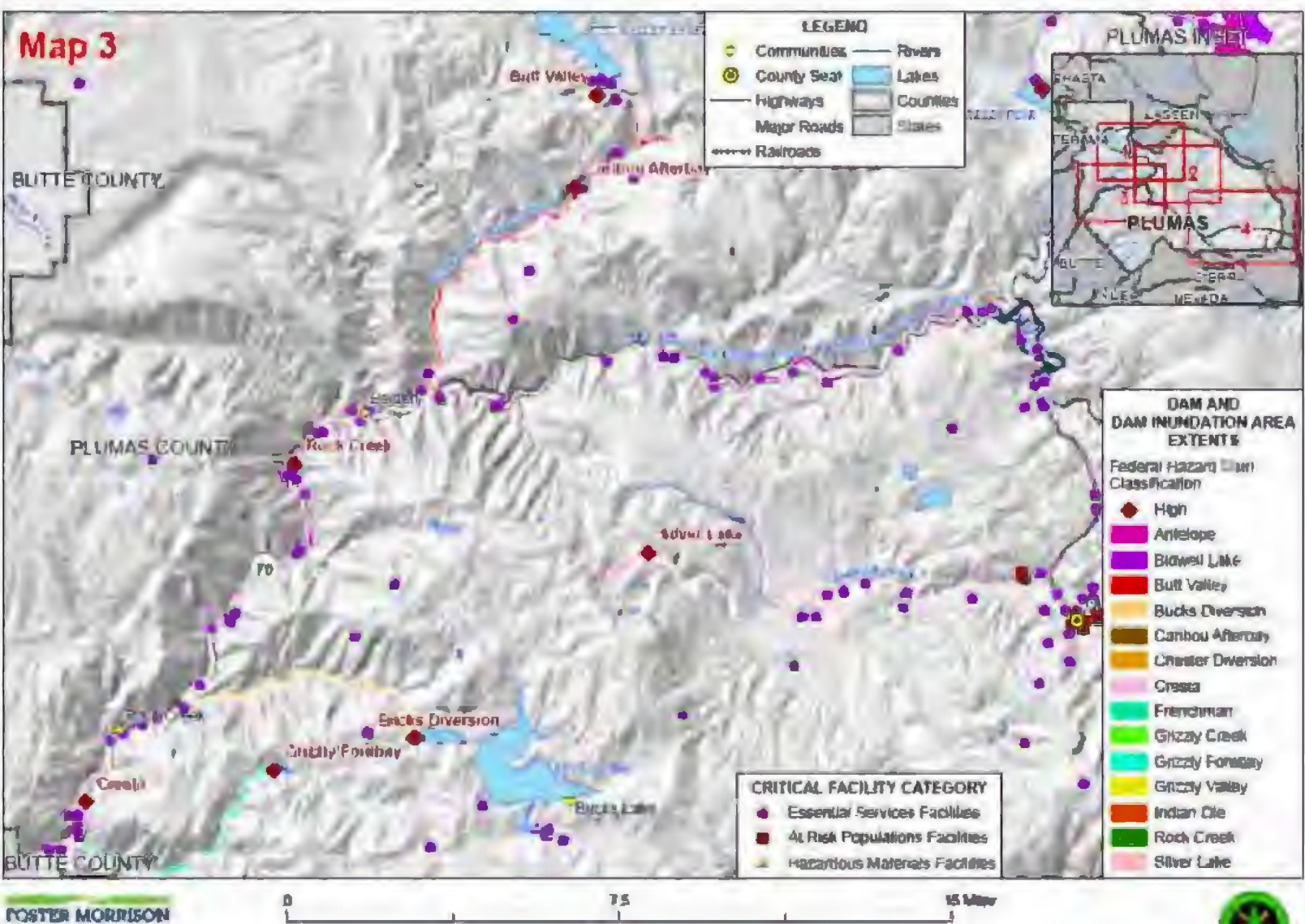


Figure 4-59 Plumas County – High Hazard Dam Inundation Areas and Critical Facilities Map

4

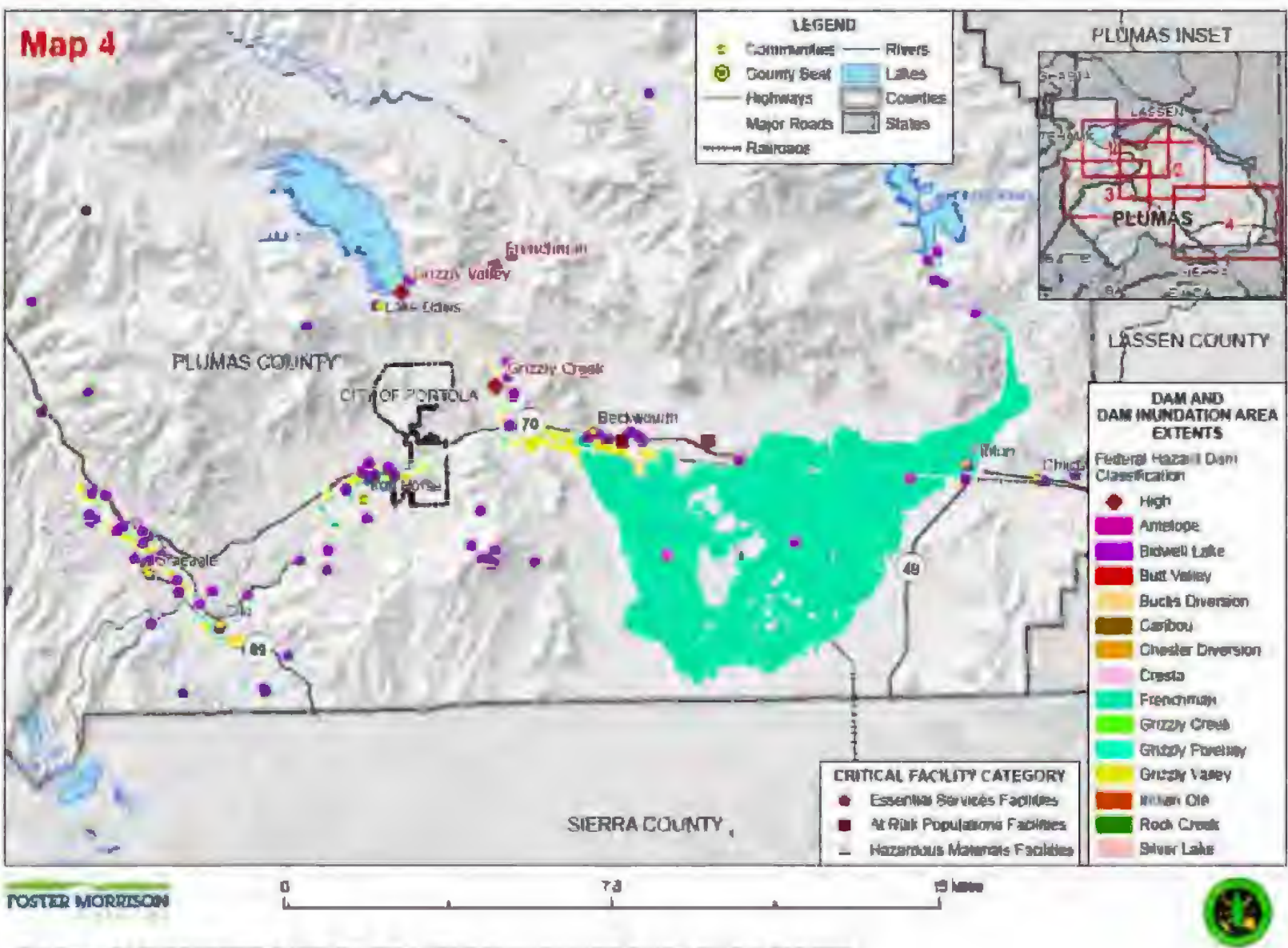


Table 4-45 Plumas County – Critical Facilities in High Hazard Dam Inundation Areas by Facility Category

Dam Inundation Area	Critical Facility Category	Facility Count
High Dam Inundation Area	Essential Services Facilities	135
	At Risk Populations Facilities	14
	Hazardous Materials Facilities	1
	Total	150
Outside of High Dam Inundation Area	Essential Services Facilities	638
	At Risk Populations Facilities	24
	Hazardous Materials Facilities	3
	Total	665
Grand Total		815

Source: Plumas County GIS, Cal OES, DSOD

Table 4-46 Plumas County – Critical Facilities in High Hazard Dam Inundation Zones by Facility Category and Type

Dam Inundation Area	Critical Facility Category	Antelope	Bidwell Lake	Butt Valley	Bucks Diversion	Caribou Afterbay	Chester Diversion	Cresta	Frenchman	Grizzly Creek	Grizzly Forebay	Grizzly Valley	Indian Ole	Rock Creek	Silver Lake
High Dam Inundation Area	Essential Services Facilities	37	11	37	8	14	32	3	15	2	1	20	4	14	11
	At Risk Populations Facilities	0	4	0	0	0	10	0	0	0	0	0	0	0	0
	Hazardous Materials Facilities	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Grand Total		37	15	37	8	14	43	3	15	2	1	20	4	14	11

Source: Plumas County GIS, Cal OES, DSOD

Overall Community Impact

Dam failure floods and their impacts vary by location and severity of any given dam failure event and will likely only directly affect certain areas of the Plumas County Planning Area during specific times. Based on the risk assessment, it is evident that dam failure floods have the potential for devastating life safety, property, environmental, and economic impacts to certain areas of the County. Impacts that are not always quantified, but can be anticipated in a large dam failure event, include:

- Injury and loss of life;

- Impacts to agricultural;
- Commercial and residential structural and property damage;
- Disruption of and damage to critical infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental health of the community.

Future Development

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.

Future Development GIS Analysis

Plumas County's February 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. The Plumas County Planning Department provided a table containing the assessor parcel numbers (APNs) for the 1,075 parcels representing the different future development projects or areas. Using the GIS parcel spatial file and the APNs, the future development projects were mapped.

For the dam inundation analysis of future development areas, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point and linked to the Assessor's data. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts and acreage within each individual dam inundation area provided by Cal OES. The County was separated into three areas. Figure 4-60 shows the dam inundation areas and future development areas in the north portion of the County. Figure 4-61 shows the dam inundation areas and future development areas in the central portion of the County. Figure 4-62 shows the dam inundation areas and future development areas in the south portion of the County. Parcels and acreages in those areas are summarized in Table 4-47, and detailed by dam inundation area in Table 4-48.

Figure 4-60 Plumas County North – Future Development in Dam Inundation Areas

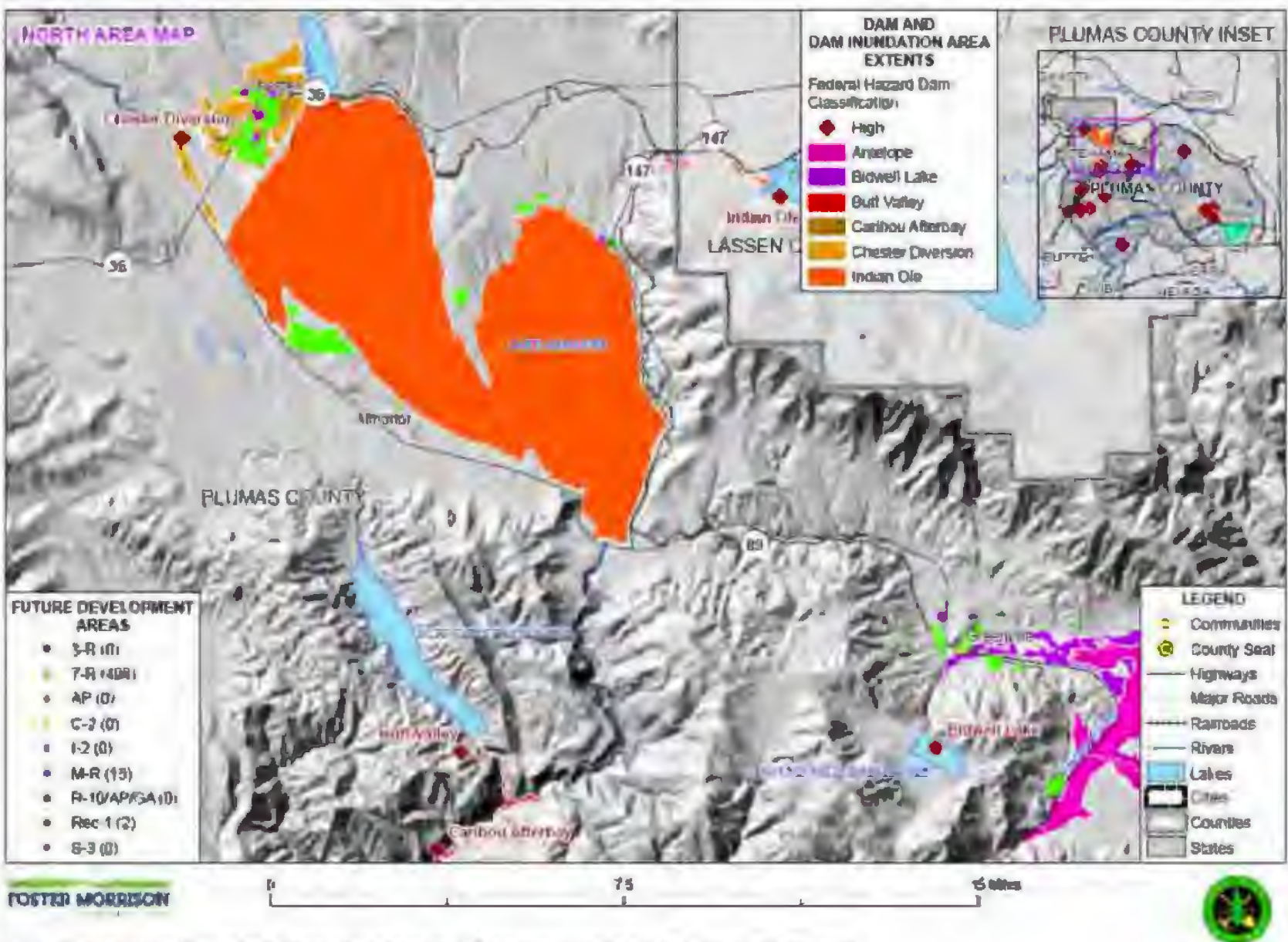


Figure 4-61 Plumas County Central – Future Development in Dam Inundation Areas

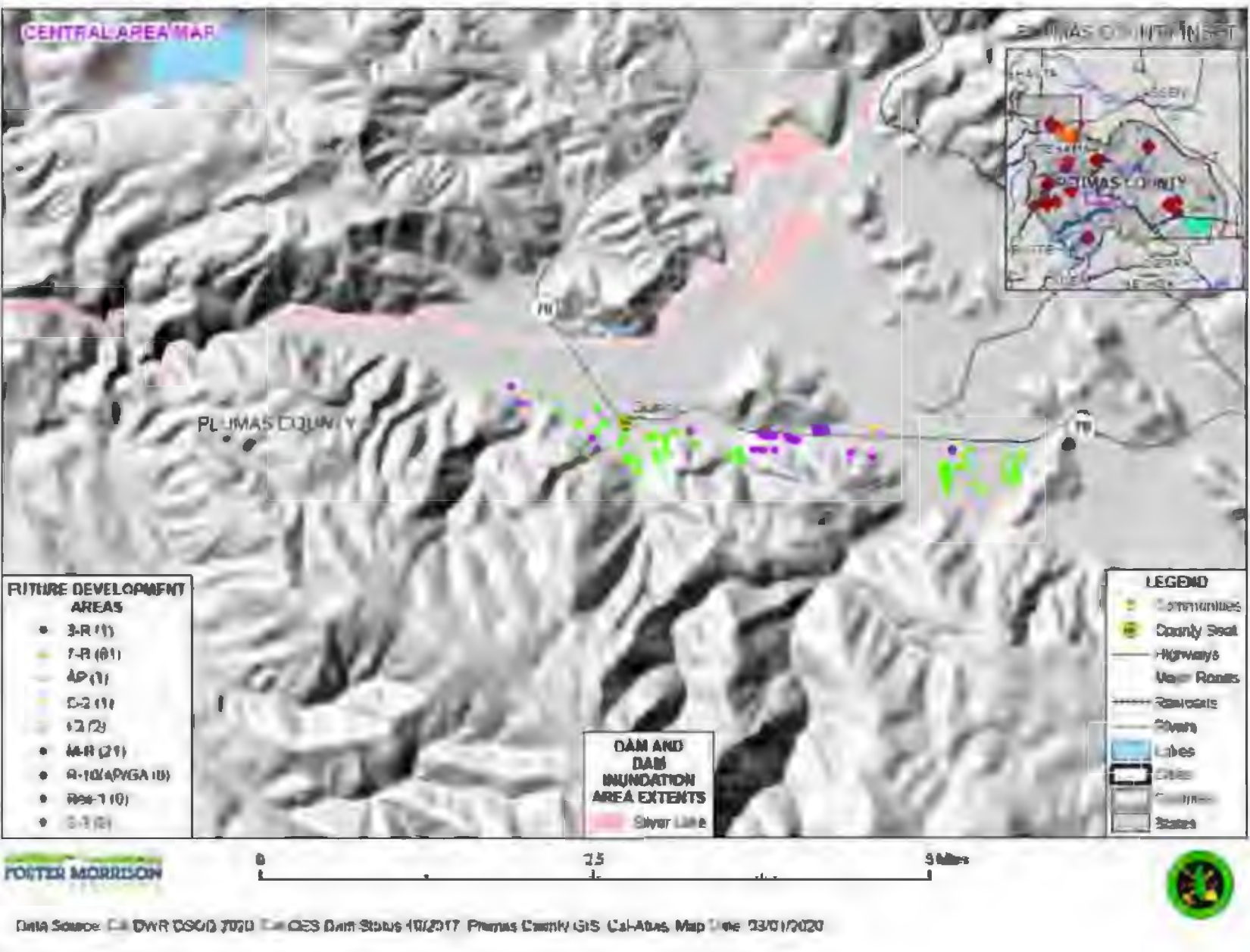


Figure 4-62 Plumas County South – Future Development in Dam Inundation Areas

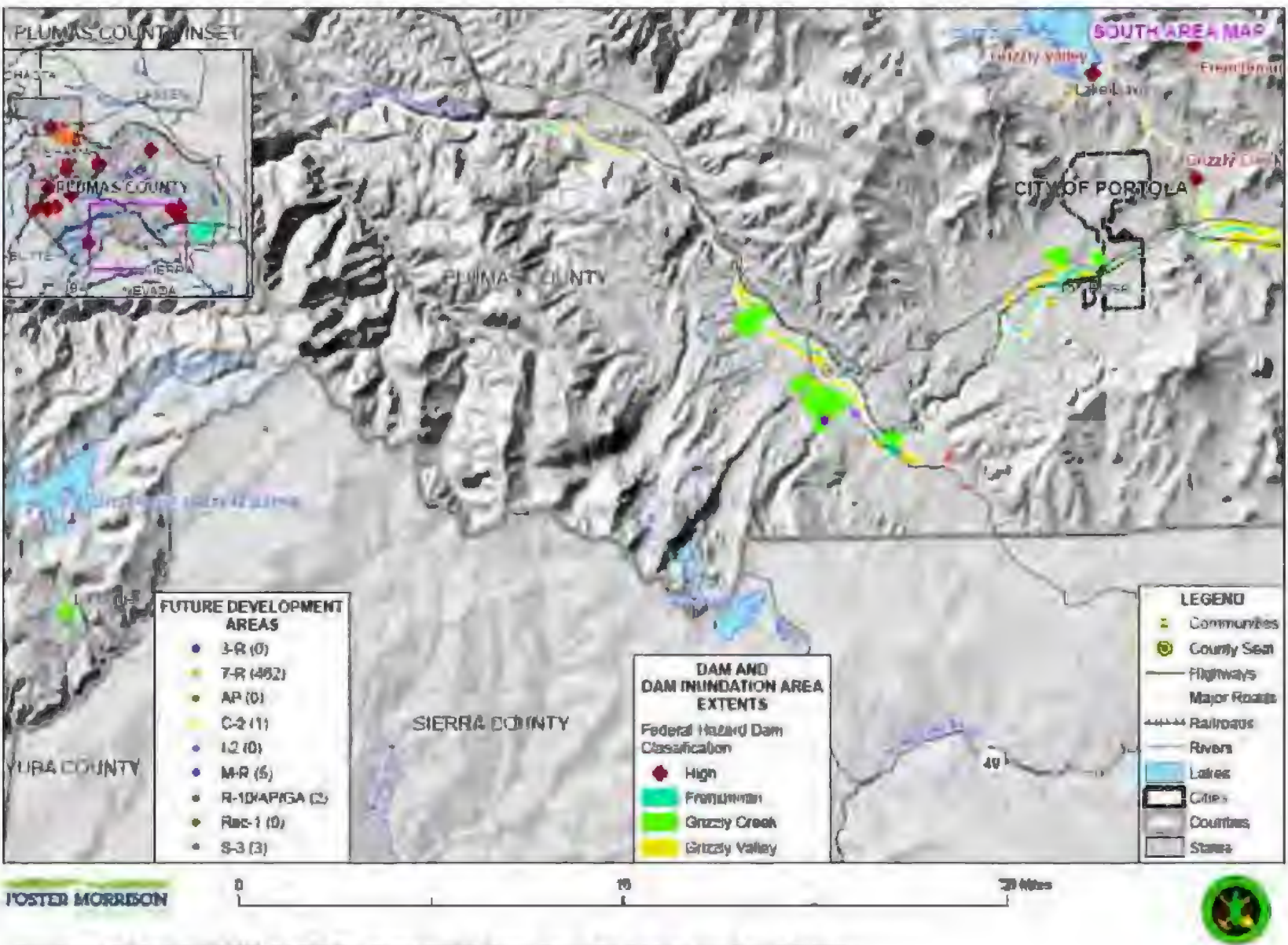


Table 4-47 Plumas County – Future Development Parcel and Acre Count Summary by Dam Hazard Class and Area

Dam Inundation Area/ Map Area / Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
High Dam Inundation Area			
North Area			
7-R	191	94	57.395
M-R	11	1	9.520
North Area Total	202	95	66.915
South Area			
7-R	20	3	12.009
South Area Total	20	3	12.009
High Dam Inundation Area Total	222	98	78.924

Source: Plumas County GIS, Cal OES

Table 4-48 Plumas County – Future Development Parcel and Acre Counts by Dam Inundation Area and Physical Area

Dam Inundation Area/ Map Area / Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
Bidwell Lake			
North Area			
M-R	1		0.510
North Area Total	1		0.510
Bidwell Lake Total	1		0.510
Chester Diversion			
North Area			
7-R	191	94	57.395
M-R	10	1	9.010
North Area Total	201	95	66.405
Chester Diversion Total	201	95	66.405
Frenchman			
South Area			
7-R	7	1	4.064
South Area Total	7	1	4.064
Frenchman Total	7	1	4.064
Grizzly Valley			
South Area			
7-R	20	3	12.009
South Area Total	20	3	12.009

Dam Inundation Area/ Map Area / Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
Grizzly Valley Total	20	3	12.009

Source: Plumas County GIS, Cal OES

4.3.9. Drought and Water Shortage

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

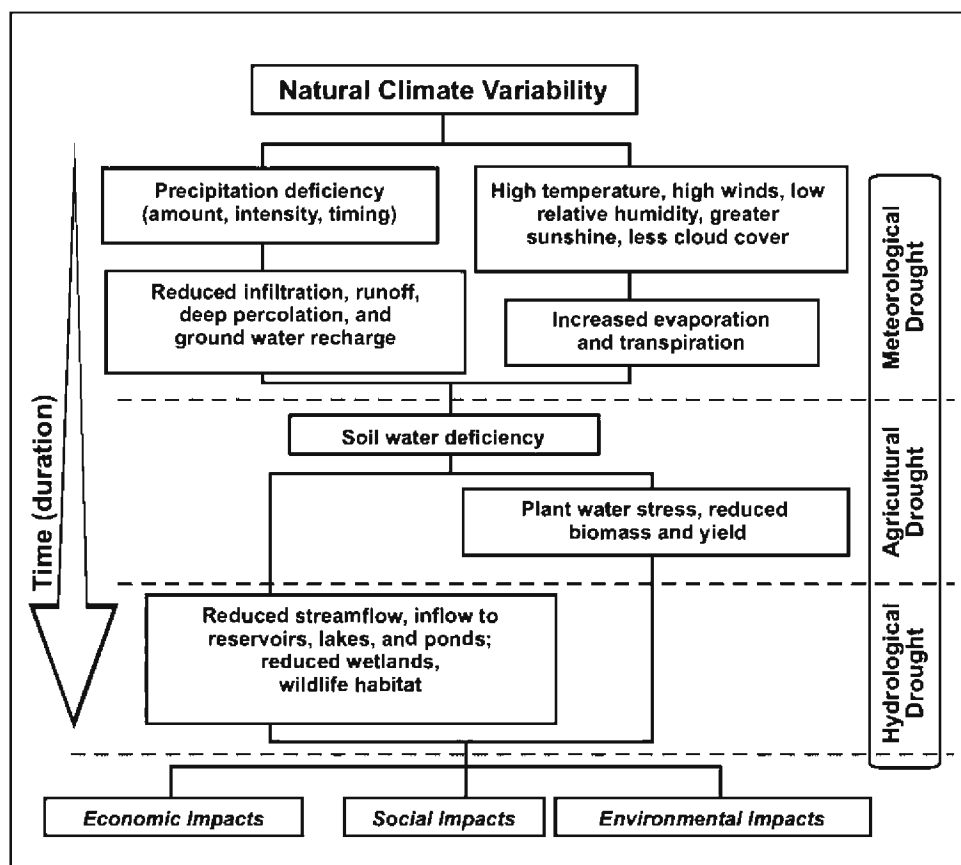
Drought

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. Water districts normally require at least a 10-year planning horizon to implement a multiagency improvement project to mitigate the effects of a drought and water supply shortage.

Drought is a complex issue involving (see Figure 4-63) 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 4-63 Causes and Impact of Drought



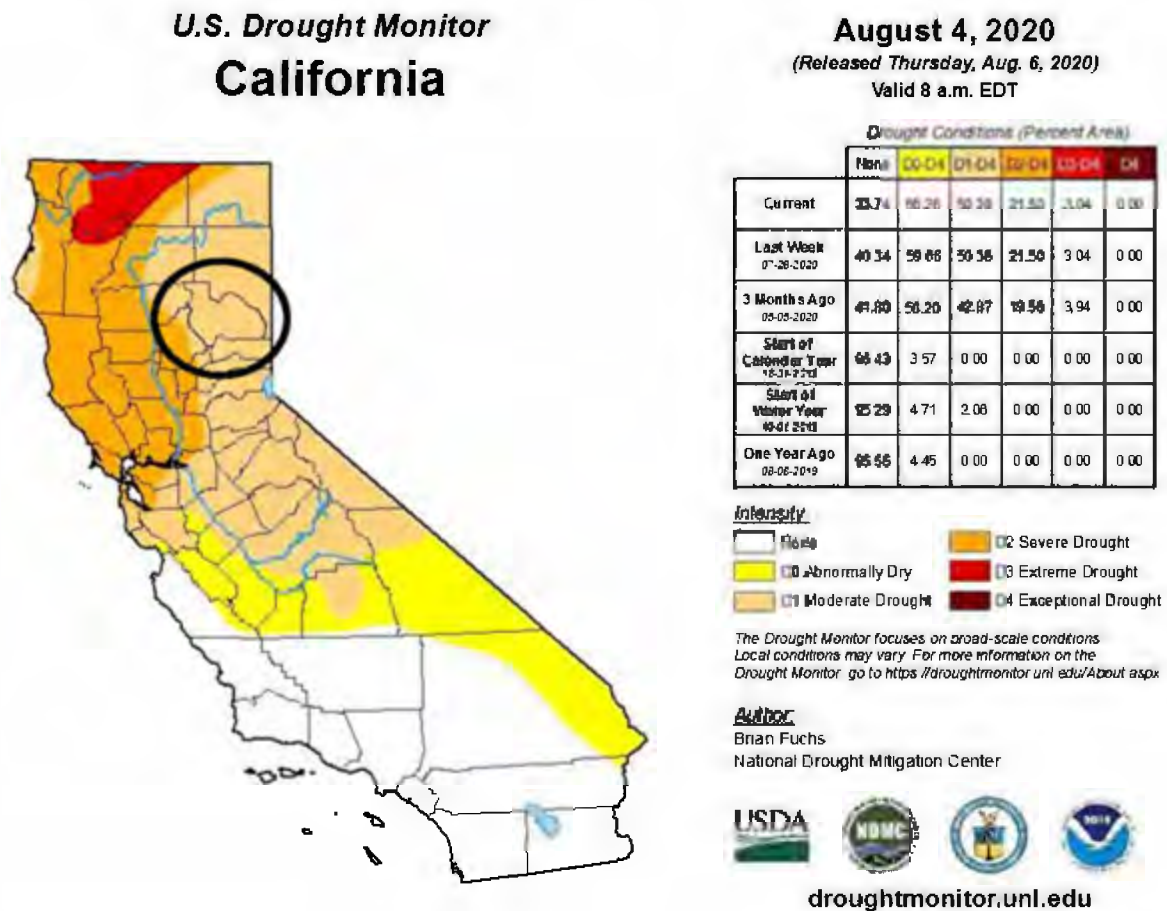
Source: National Drought Mitigation Center (NDMC)

The HMPC noted that drought can cause increased wildfire risk, discussed in Section 4.3.18. During periods of drought, subsidence can also occur, though the risk of subsidence in Plumas County is minimal.

Location and Extent

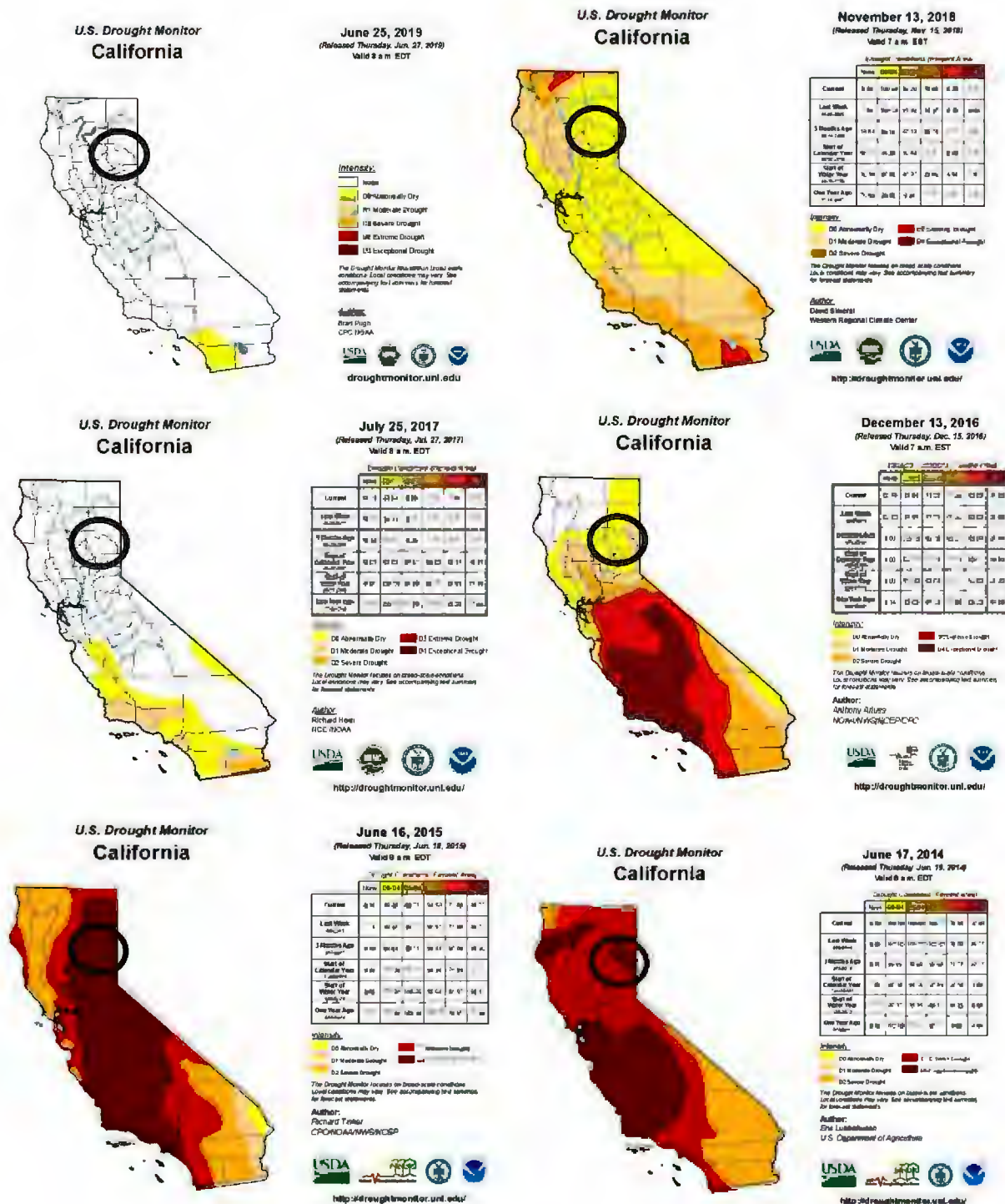
Since drought is a regional phenomenon, it affects the whole of the County. Speed of onset of drought is slow, while the duration varies from short (months) to long (years) Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this 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 drought conditions in California and Plumas County (2020) can be found in Figure 4-64. Snapshots from 2014 through 2019 is shown in Figure 4-65.

Figure 4-64 Plumas County – Current Drought Status



Source: US Drought Monitor

Figure 4-65 Previous Drought Status in Plumas County



Source: US Drought Monitor

CA 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 farming and federally protected fish habitats in California 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)

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

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.

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 the 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.

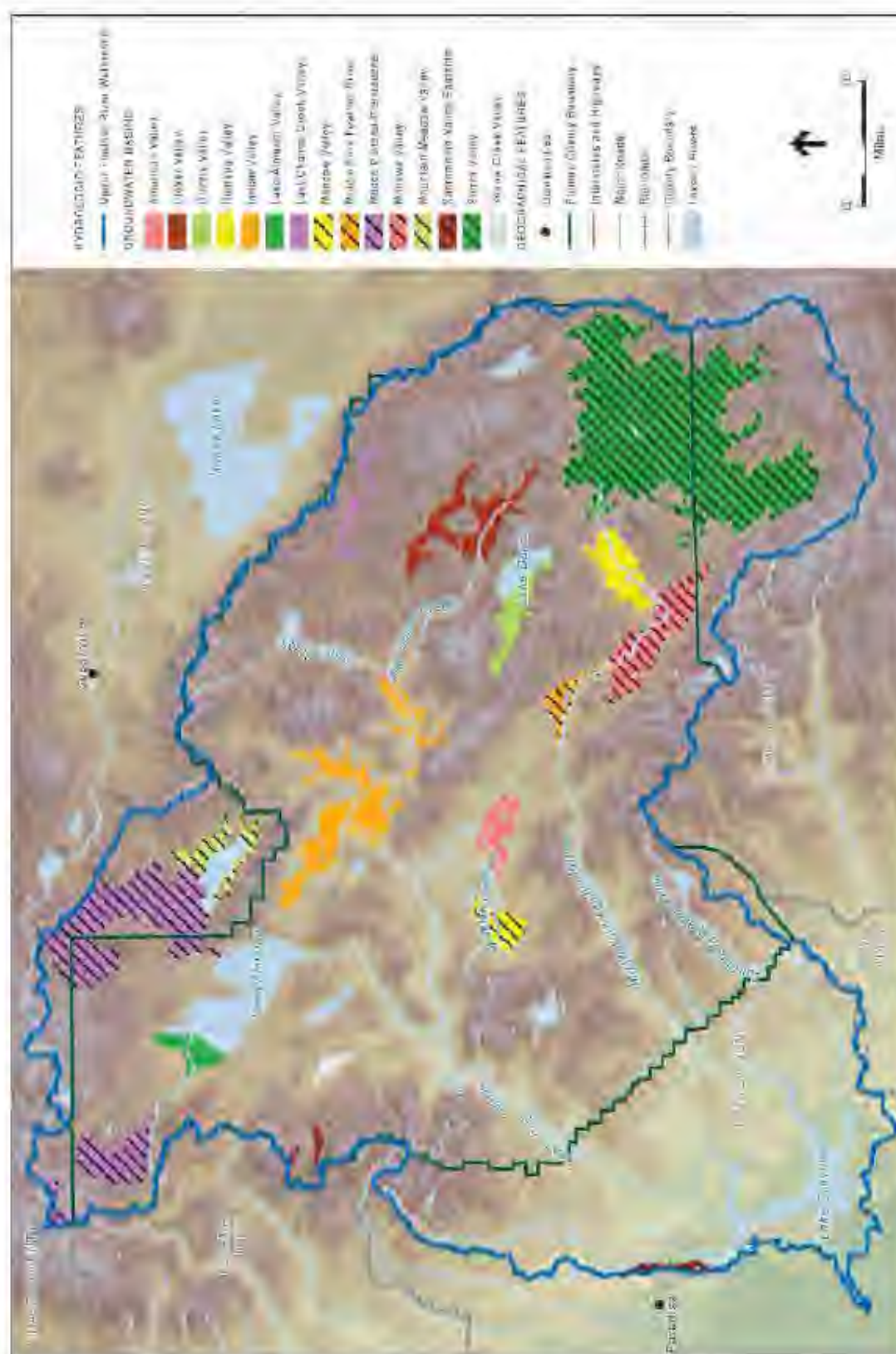
The Upper Feather River watershed covers a majority of the County (98%), which is about 72% of the watershed. The tributaries of the Upper Feather River watershed drain over 2 million acres of land in the Sierra Nevada Mountains, flowing southwest into Lake Oroville in neighboring Butte County. The Upper 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 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 4-66. 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 4-66 Plumas County – Hydrologic Features



Source: Plumas County General Plan Water Resources Element

Location and Extent

Since water shortage happens on a regional scale, the entirety of the County 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.

Past Occurrences

Disaster Declaration History

There has been one federal disaster related to drought and water shortage in Plumas County issued in 1977. There have been two state disasters related to drought and water shortage in Plumas County issued in 1977 and 2014. This can be seen in Table 4-49.

Table 4-49 Plumas County – Disaster Declarations from Drought 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1977, 2014	1	1977

Source: FEMA, Cal OES

NCDC Events

There have been 2 NCDC drought events in Plumas County, related to events in the 2014 to 2016 drought. This is likely low due to underreporting to the NCDC database. No deaths, injuries, or property damages were reported to the NCDC from these events.

*Table 4-50 NCDC Drought Events for Plumas County 1996-9/30/2019**

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 and Hazard Mitigation Planning Committee Events

Historically, California has experienced multiple severe droughts. According to CA DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Table 4-51 compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77, 1987-92, and 2007-09 droughts. Figure 4-67 depicts California's Multi-Year Historical Dry Periods, 1850-2000.

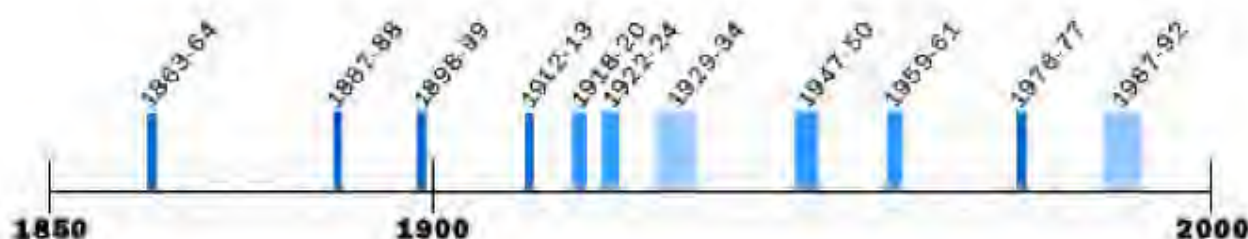
Table 4-51 Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

Drought Period	Sacramento Valley Runoff		San Joaquin Valley Runoff	
	(maf*/yr)	(percent Average 1901-96)	(maf*/yr)	(percent Average 1906-96)
1929-34	9.8	55	3.3	57
1976-77	6.6	37	1.5	26
1987-92	10.0	56	2.8	47
2007-09	11.2	64	3.7	61

Source: California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.

*maf=million acre feet

Figure 4-67 California's Multi-Year Historical Dry Periods, 1850-2000

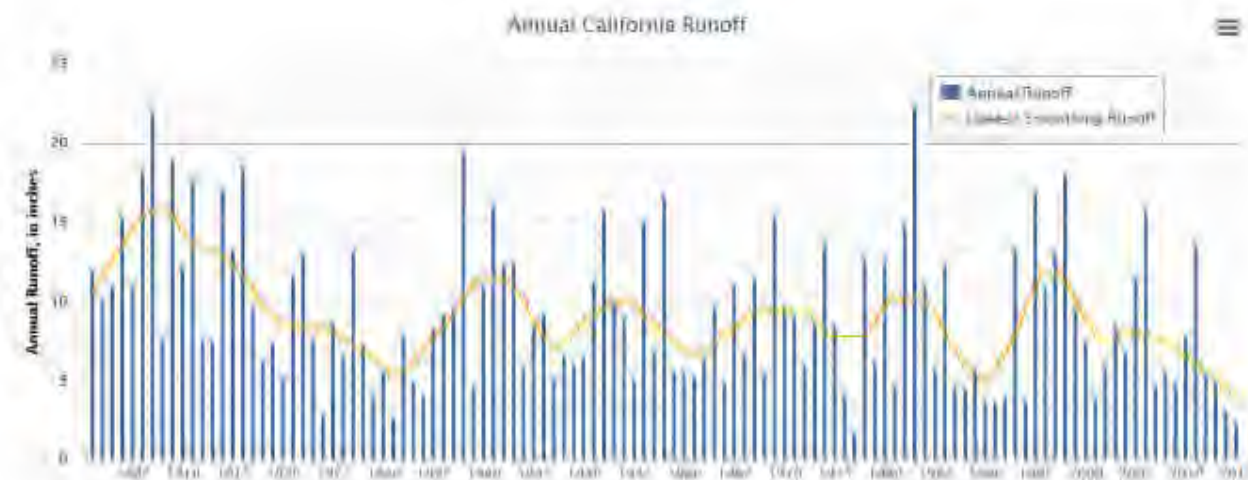


Source: California Department of Water Resources, www.water.ca.gov/

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

Figure 4-68 depicts runoff for the State from 1900 to 2015. This gives a historical context for the 2014-2015 drought to compare against past droughts.

Figure 4-68 Annual California Runoff—1900 to 2015



Source: CA DWR

The 2018 California State Hazard Mitigation Plan fleshed out the major droughts from 1900 to 2017. This 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. 31 counties were affected, resulting in \$2.67 billion in crop damages.

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, CA 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 CA 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 2012-2017 Drought

The statewide drought of 2012-2017 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. The immediate cause of California's 2014 drought can be traced to the altered route of atmospheric water vapor, which is necessary for strong winter precipitation in the state. Ordinarily, water evaporates from the ocean in the warm Tropical Pacific Ocean and winds carry that water vapor to the U.S. west coast. However, in 2014 the water vapor transport split into two branches and ended up going either north or south of California. The HMPC noted that in the Sierra Valley in 2016, severe drought caused well abandonment. 4 wells in the area went dry due to pumping sand, and one well had to be permanently abandoned. 3 new wells had to be dug, with a cost of \$250,000 each. In addition, many wells in the areas were deepened considerably to reach the lowering water tables. Additional depths varied by well, and costs were borne by local ranchers.

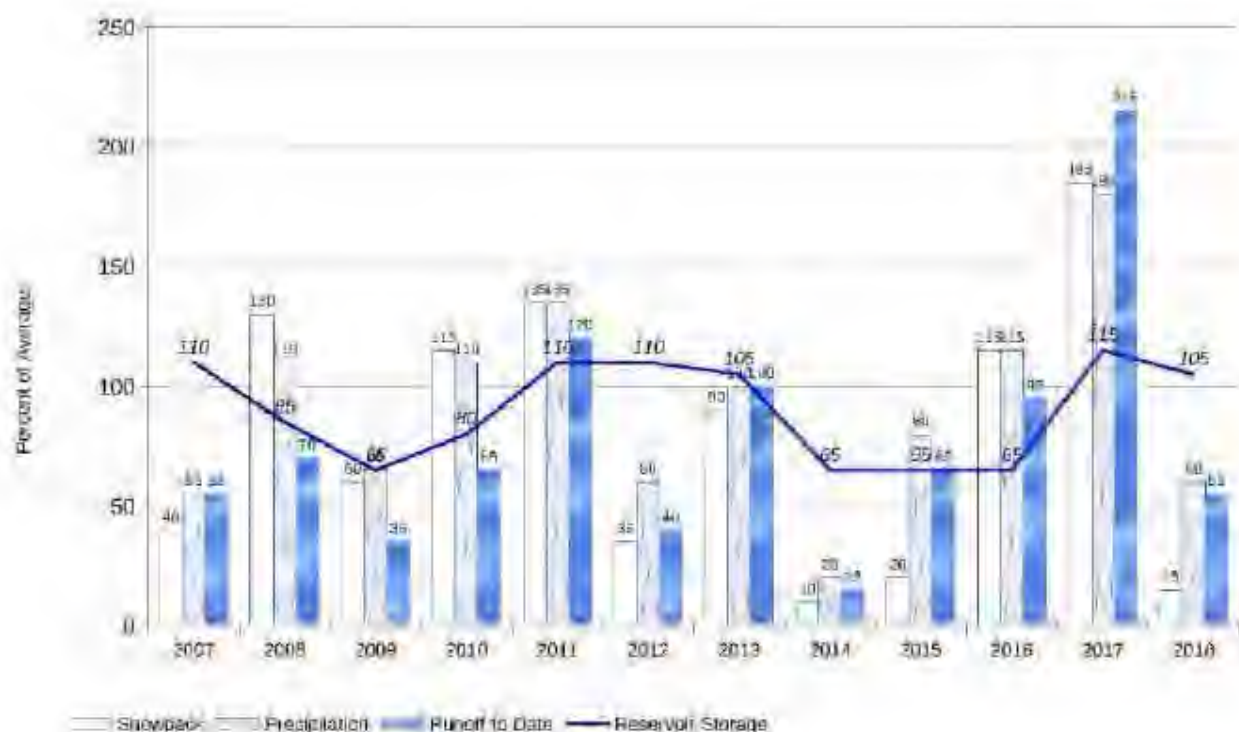
Other Events

In addition to the above, a member of the HMPC from Viera Ranch noted on **October 27th of 1999**, the Quincy area saw 145 days without rain.

Water Shortage

Figure 4-69 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 2007 and 2018. The chart illustrates the cyclical nature of weather patterns in California.

Figure 4-69 Water Supply Conditions, 2007 to 2018



Source: 2018 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.

The Sierra Valley Groundwater District provided graphs of District water levels from 1980 to 2016. These can be seen on Figure 4-70, Figure 4-71, and Figure 4-72.

Figure 4-70 Plumas County – Loyalton Water Levels 1980-2016

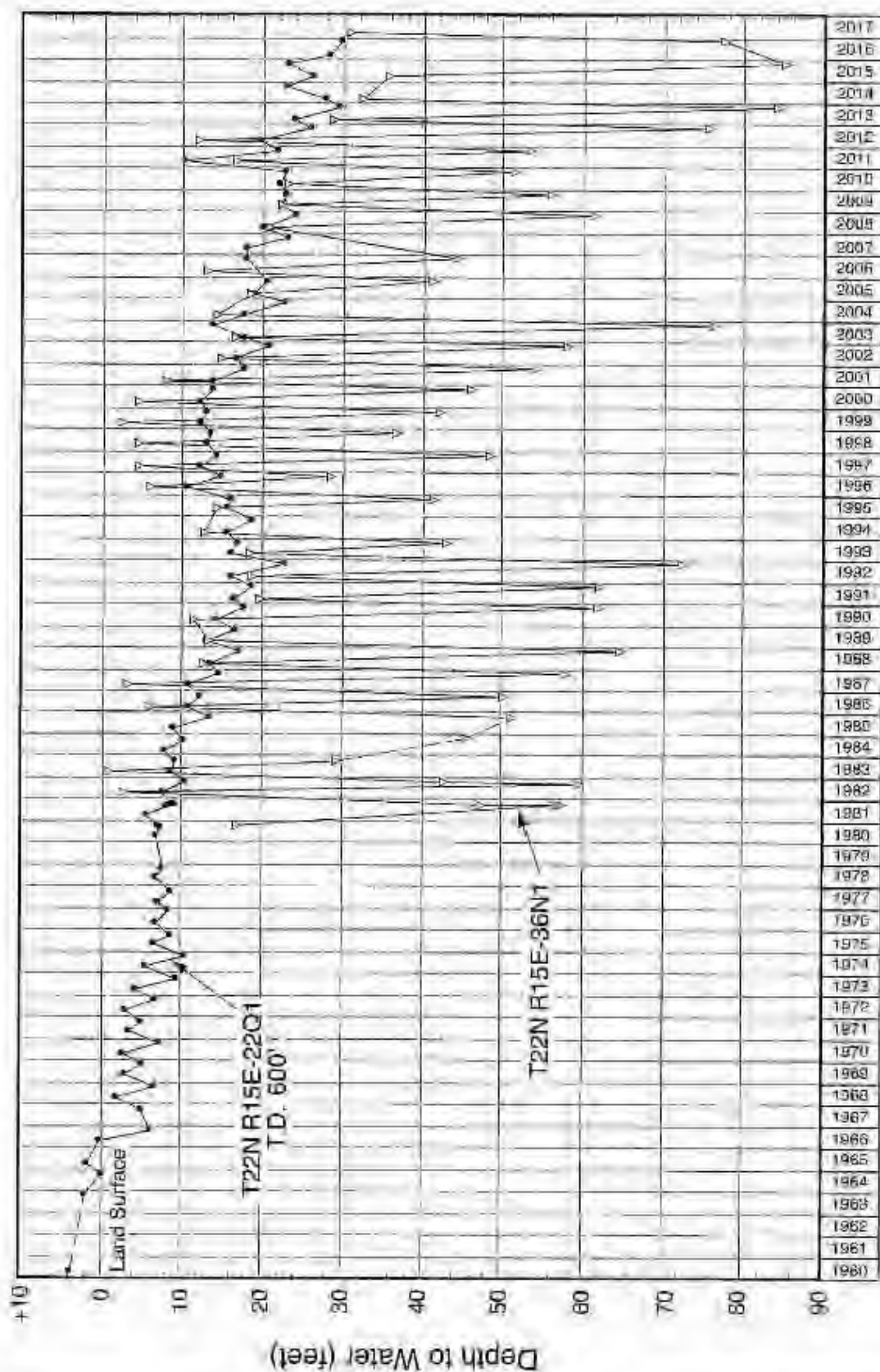


Figure 4-71 Plumas County – Vinton Water Levels 1980-2016

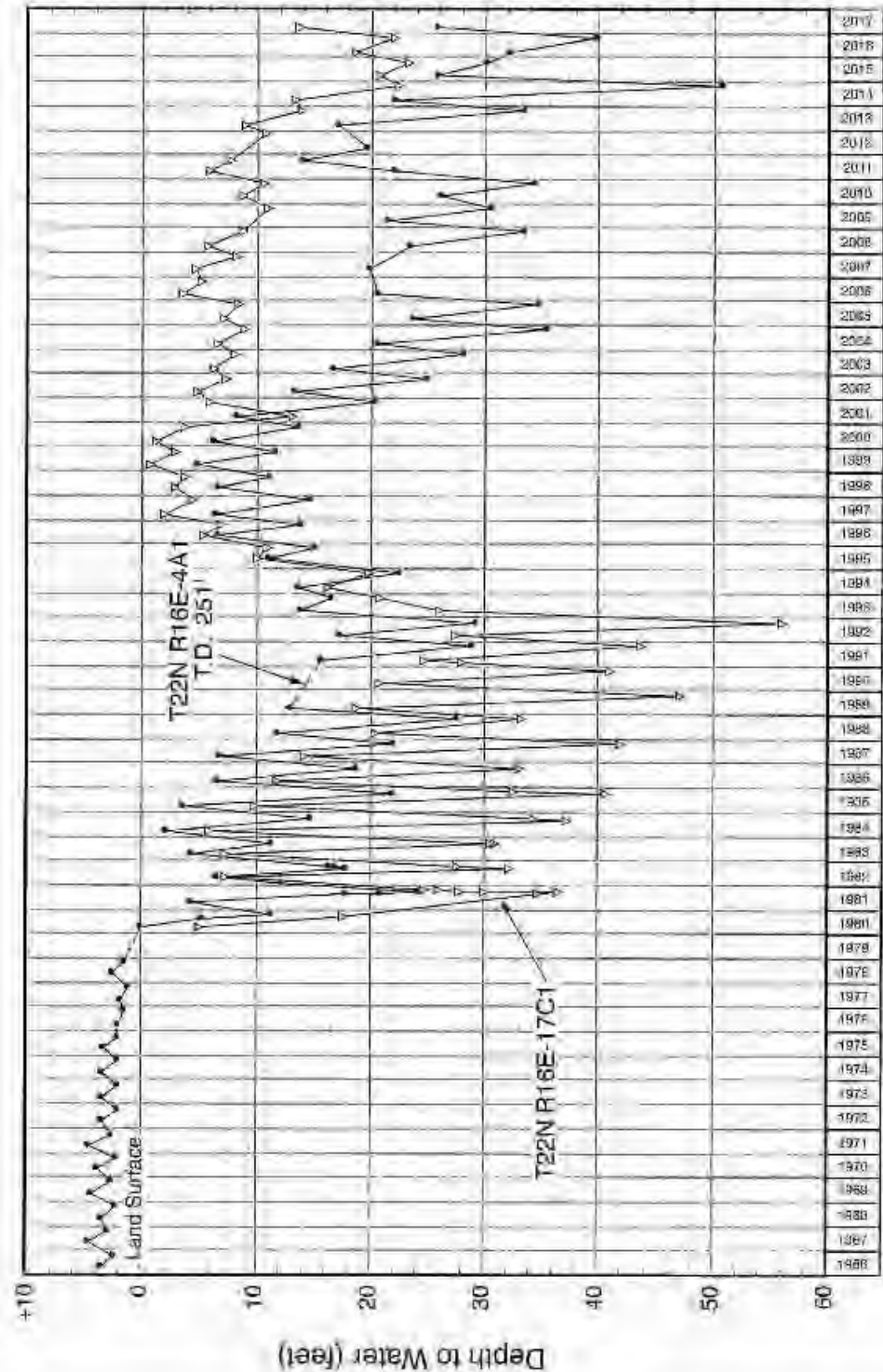
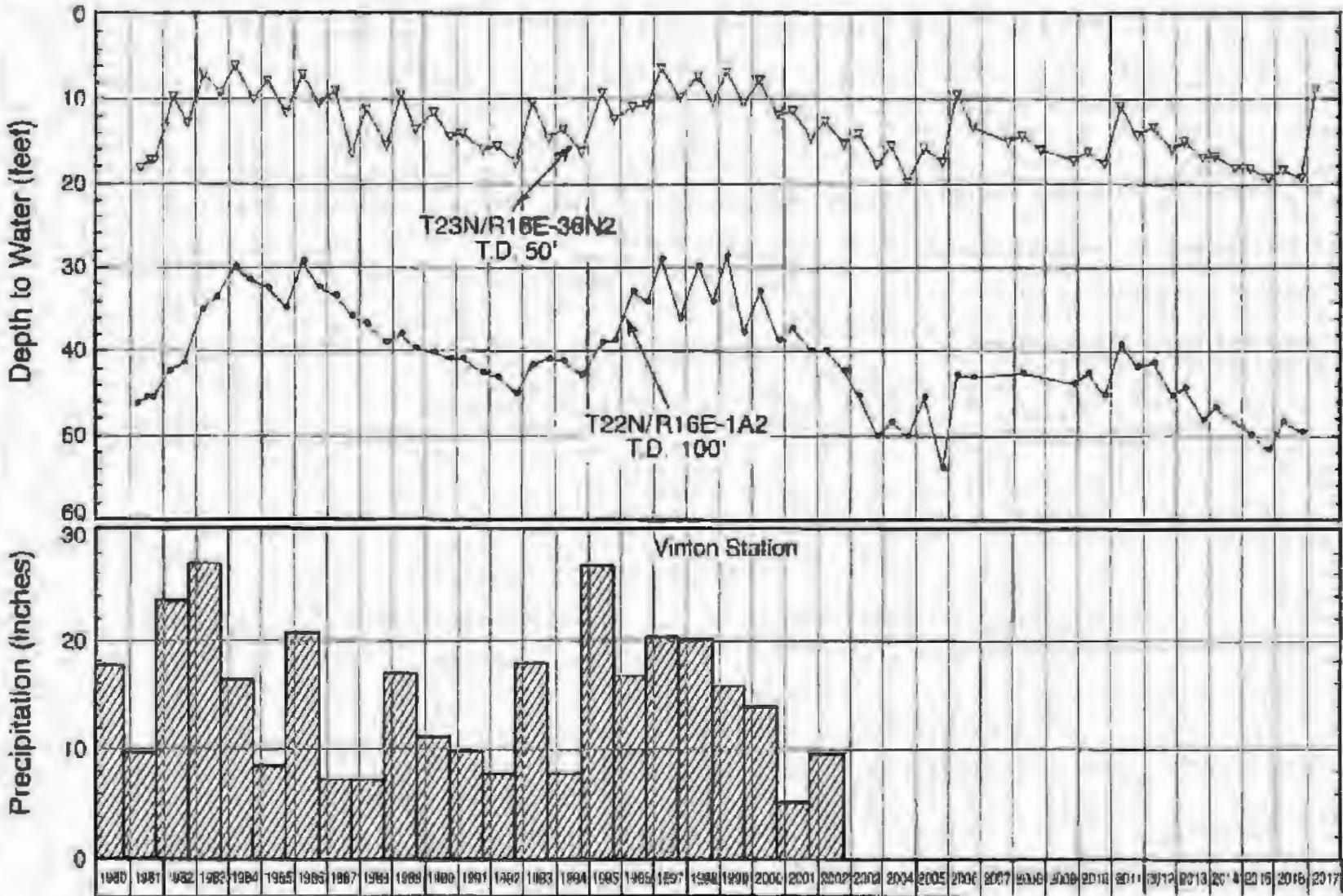


Figure 4-72 Plumas County – Chilcoot Water Levels 1980-2016



The HMPC noted that during 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.

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for the Plumas County Planning Area and region indicate there have been 5 significant droughts in the last 85 years. This equates to a drought every 17 years on average or a 5.9 percent chance of a drought in any given year. However, based on this data and given the multi-year length and cyclical nature of droughts, the HMPC determined that future drought occurrences in the Planning Area are 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.

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 2014 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.

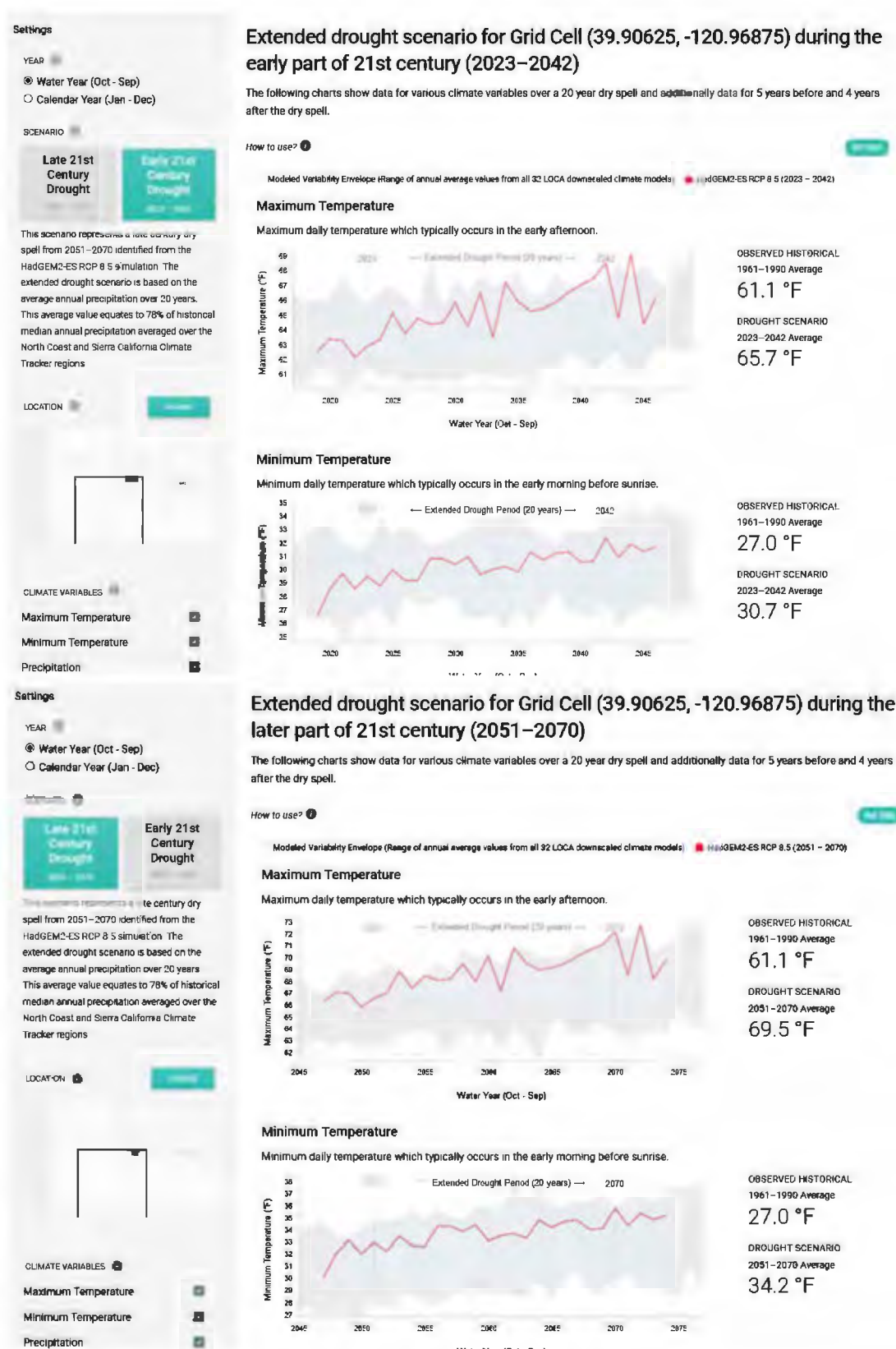
A report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

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 Quincy) derived from LOCA downscaled meteorological and hydrological simulations (Figure 4-73) – 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 20 years. This average value equates to 78% 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 78% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.

Figure 4-73 Plumas County – Future Extended Drought Scenarios



Source: Cal-Adapt – Extended Drought Scenarios

Vulnerability Assessment

Vulnerability—Medium

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 is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water. In the populated areas of the County, community service districts provide water and sewer services. In the rural areas, wells and septic systems are more prevalent.

Impacts

Based on historical information, the occurrence of drought in California, including Plumas County, 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 is often 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 Plumas County to drought is countywide, but impacts may vary and may include reduction in water supply, agricultural losses, and an increase in dry fuels.

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 4-52 show drought impacts for the Plumas County Planning Area from 1850 to March 2020. The data represented is skewed, with the majority of these impacts from records within the past ten years.

Table 4-52 Plumas County Drought Impacts

Category	Number of Impacts
General Awareness	35
Agriculture	67
Business and Industry	18
Energy	6
Fire	19
Plants & Wildlife	45
Relief, Response, and Restrictions	181
Society and Public Health	61
Tourism and Recreation	18
Water Supply and Quality	145
Total	595

Source: National Drought Mitigation Center, 1/1/1850-3/31/2020

The most significant qualitative impacts associated with drought in the Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

With a reduction in water, water supply issues based on water rights becomes more evident. Some agricultural uses are severely impacted through limited water supply, especially those with livestock. Drought and water supply issues will continue to be a concern to the Planning Area. The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Land subsidence can also occur when the groundwater table is depleted.

Recently, a draft report by CA DWR (titled Small Water Suppliers and Rural Communities at Risk of Drought and Water Shortage Vulnerability and Recommendations and Guidance to Address the Planning Needs of these Communities), sought to quantify the drought and water shortage vulnerability to rural counties, like Plumas County, in the State of California. Included in the draft report is the methodology for developing relative risk assessment scores that show where small water systems rank on an index of drought and water shortage vulnerability and recommendations on drought and water shortage vulnerability for small water systems. It is important to note that the primary benefit of this scoring exercise is to offer local and regionally-specific information to assist with drought and water shortage planning.

CA DWR developed a tool to rate drought and water shortage risk by water provider. To develop the tool, CA DWR used statewide datasets to estimate risk of drought and water shortage for small water suppliers and rural communities. CA DWR was only able to calculate relative risk scores for small water systems that had a digital service area boundary, with data available from the Water Board. CA DWR is working with the Water Board to create a process to obtain service areas boundaries for the remaining small water systems. Table 4-53 was extracted from the Excel table from the report, and shows the systems in Plumas County that were reviewed and their risk score for drought and water shortage.

Table 4-53 Plumas County – Drought and Water Shortage Risk Factors for Small Water Suppliers

System Name	County	Risk Score
FRCCSD LITTLE INDIAN CREEK	PLUMAS	50.29
CALTRANS-MASSACK REST STOP	PLUMAS	89.43
CALTRANS-L.T. DAVIS RESTSTOP	PLUMAS	65.4
CALTRANS-CHESTER SAFETY REST STOP	PLUMAS	81.47
DREAM CATCHER CAMPGROUND	PLUMAS	7.71
BIG MEADOWS SUBDIVISION	PLUMAS	38.72
COPPERCREEK CAMP	PLUMAS	93.87
FRCCSD OLD MILL RANCH	PLUMAS	69.2

System Name	County	Risk Score
KEDDIE RESORT	PLUMAS	42.17
WHITEHAWK RANCH MWC	PLUMAS	25.87
GRIZZLY LAKE CSD-DELLEKER	PLUMAS	37
GRIZZLY LAKE CSD-CROCKER/WELCH	PLUMAS	40.4
EVERGREEN MOTEL & MHP	PLUMAS	81.62
ARLINGTON HEIGHTS MHP	PLUMAS	71.24
PRATTVILLE WATER ASSN	PLUMAS	50.8
BLAIRSDEN WATER USERS ASSN	PLUMAS	79.83
JD TRAILER RANCH	PLUMAS	54.46
FEATHER RIVER RV & MHP	PLUMAS	13.63
HAMILTON BRANCH MWC	PLUMAS	37.1
FRCCSD HOT SPRINGS	PLUMAS	86.64
WEST END WATER ASSOCIATION	PLUMAS	45.88
GREENHORN CREEK CSD	PLUMAS	65.96
VALIVU ESTATES MHP	PLUMAS	70.44
GREENHAVEN HOA	PLUMAS	57.27
RED BARN MHP	PLUMAS	21.29
SOPER WHEELER CORP HOUSING #2	PLUMAS	58.27
CLIO PUBLIC UTILITY DISTRICT	PLUMAS	43.74
IVCSD CRESCENT MILLS	PLUMAS	4.51
RIVER RANCH RV PARK	PLUMAS	83.85
WALKER RANCH CSD	PLUMAS	75.19
GOLD MOUNTAIN CSD	PLUMAS	8.63
GRIZZLY RANCH CSD	PLUMAS	47.6
IVCSD-GREENVILLE	PLUMAS	6.38
CITY OF PORTOLA	PLUMAS	1.21
AMERICAN VALLEY CSD	PLUMAS	36.06
GRAEAGLE WATER COMPANY	PLUMAS	83.44
LAKE ALMANOR COUNTRY CLUB MWC	PLUMAS	12.75
WEST ALMANOR M.W.C.	PLUMAS	37.88
EAST QUINCY SERVICES DISTRICT	PLUMAS	14.74
CHESTER PUBLIC U.D.	PLUMAS	11.52
PLUMAS EUREKA CSD	PLUMAS	32.01

Source: CDAG Report

Note: It is important to note that the primary benefit of this scoring exercise is to offer local and regionally specific information to assist with drought and water shortage planning.

0 is the lowest risk and 100 is highest risk, compared to other small water suppliers

Future Development

According to the HMPC, Plumas County has access to large quantities of water through its surface water as well as through ground water. Population in the County in the future is expected to shrink (see Table 4-17), which reduces pressure on water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity to replace aging systems.

4.3.10. Earthquake

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect 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

Groundshaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by groundshaking is among the most serious seismic hazards. Damage to structures from this vibration, or groundshaking, 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.

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 the most structurally resistant to earthquake damage. Older masonry buildings without seismic reinforcement (unreinforced masonry buildings [URM]) 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 has caused severe damage to structures on level ground as a result of settling, tilting, 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.

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.

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.

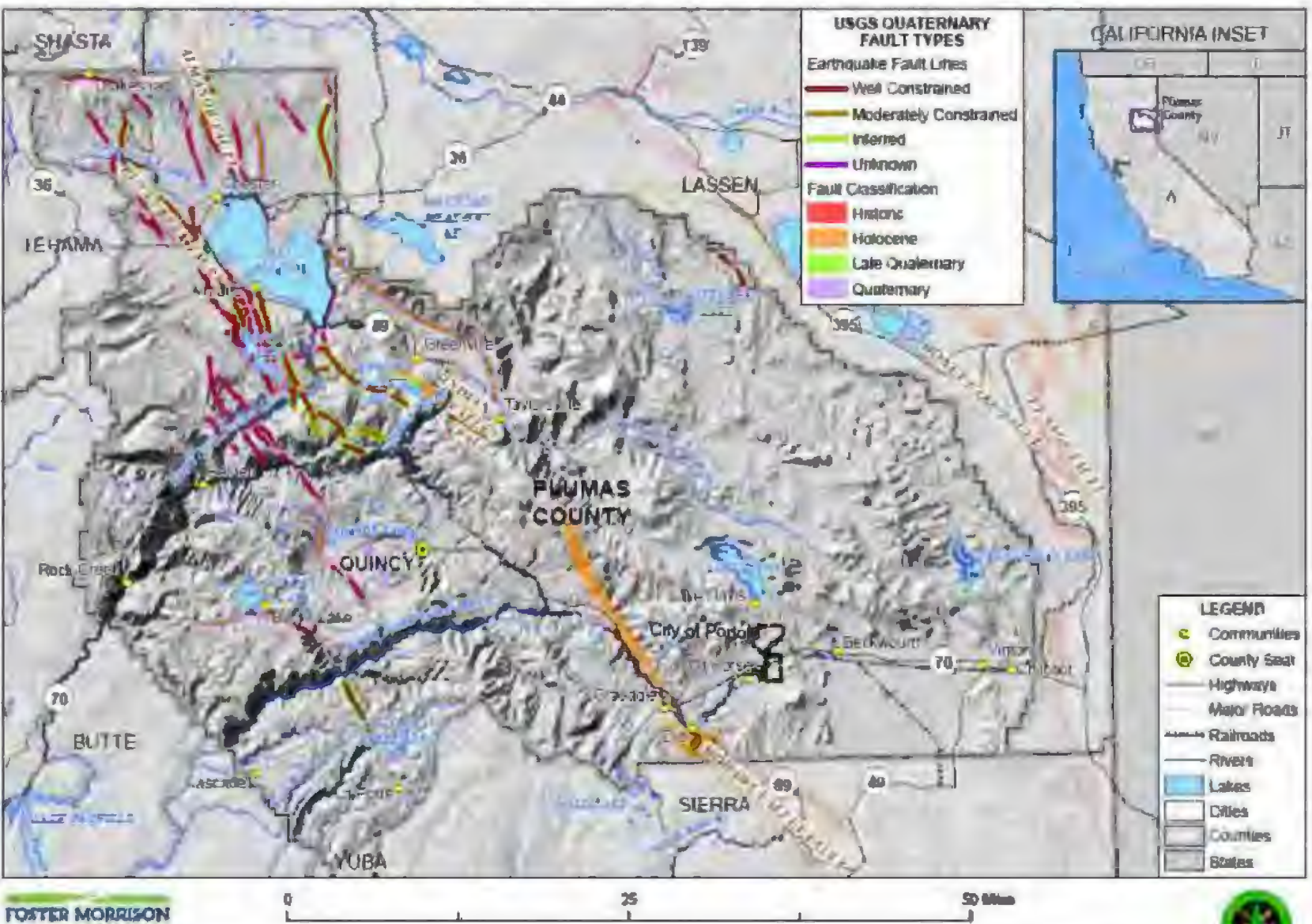
Faults

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. Figure 4-74 shows fault locations in and near Plumas County. The HMPC noted that an area of concern for the County is the Sierra Valley.

Figure 4-74 Active Faults in and near Plumas County



Data Source: CGS Alquist Field Earthquake Fault Zones 2015, USGS Quaternary Faults (July 17, 2014), Plumas County GIS, Cal-Atlas Map Date: 03/01/2020

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 4-54). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-54 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 4.3.8 Dam Failure).

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 4-55 shows the approximate distances earthquakes can be felt away from the epicenter. According to the USGS data, 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 Quincy in Plumas County. There are 41 results that are detailed in Table 4-56.

Table 4-55 Approximate Relationships between Earthquake Magnitude and Intensity

Richter Scale Magnitude	Maximum Expected Intensity*	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: United State Geologic Survey, Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

*Table 4-56 Magnitude 5.0 Earthquakes or greater within 90 Miles of Plumas County**

Date	Richter Magnitude	Location
5/24/2013	5.69	10km WNW of Greenville, California
4/26/2008	5.1	1km NW of Mogul, Nevada
8/10/2001	5.2	Northern California
11/26/1998	5.1	7km 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	0km WSW of Palermo, California
4/29/1968	5	Northern California
9/12/1966	5.91	Northern California
4/1/1959	5.6	Northern California
9/26/1953	5.3	Nevada

Date	Richter Magnitude	Location
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

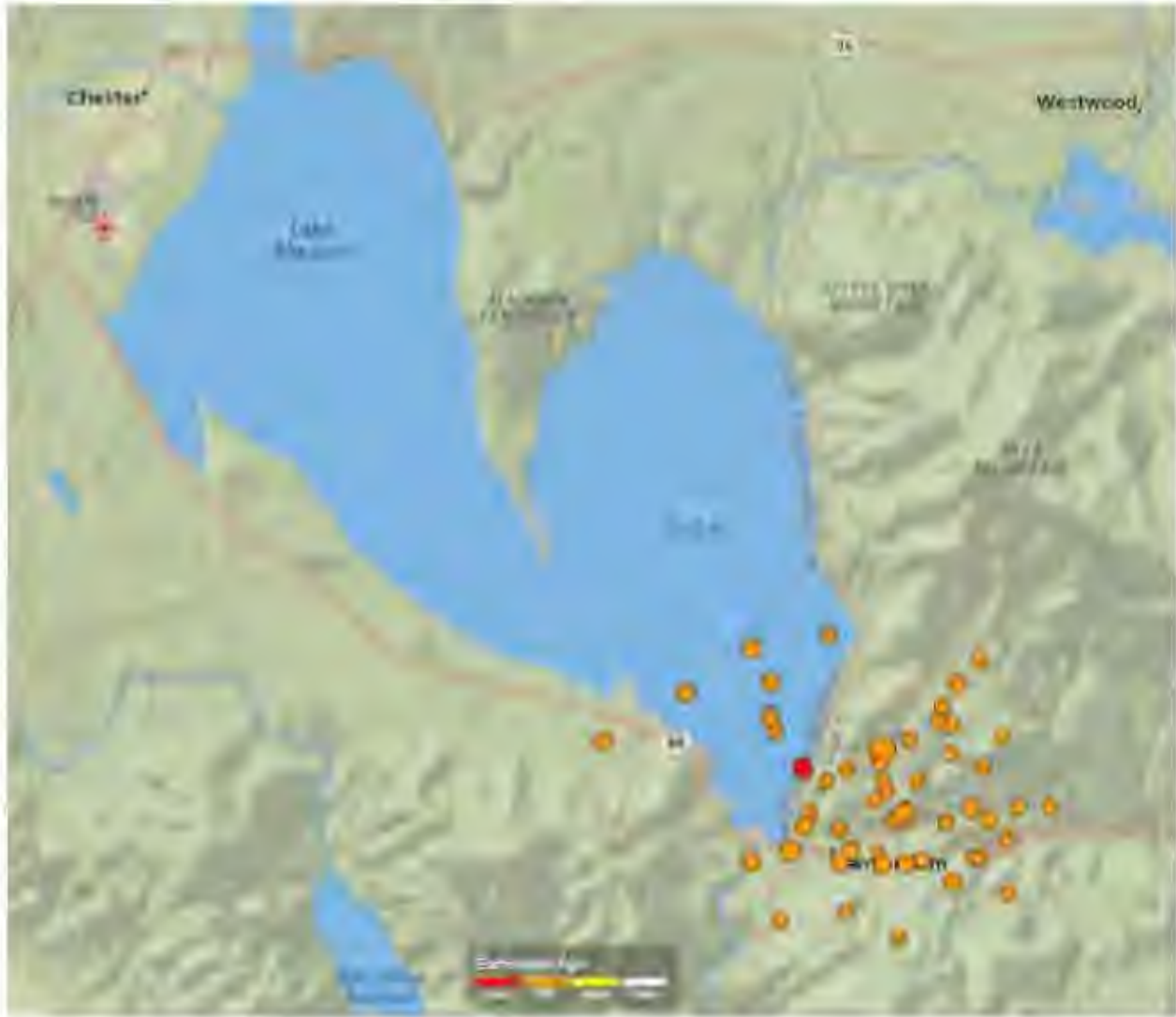
*Search dates 1/1/1850 – 4/1/2019

As shown on Table 4-56, 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 4-75 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.

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 4-76 depicts damage to a home in the Lake Almanor area.

Figure 4-75 Plumas County – May 2013 Canyon Dam Earthquakes



Source: USGS

Figure 4-76 Plumas County – Home Damaged by Canyon Dam Earthquake



Source: Plumas County

Figure 4-77 shows major historical earthquakes in California from 1769 to 2017.

Figure 4-77 Historic Earthquakes in California 1769 to 2017



Source: 2018 State of California Multi-Hazard Mitigation Plan

Hazard Mitigation Planning Committee Events

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.

The HMPC noted a press release from the **May 23, 2013** 5.7 magnitude event. On Thursday May 23, 2013, Plumas County experienced a 5.7 magnitude earthquake near Canyon Dam, near the southern end of Lake Almanor. This report updates information available as of May 24th.

- No reports of injuries due to the earthquake.
- No reports of damage to the county and state roadways. All roadways are open at this time to the public.
- Some minor damage reported in the Chester area to several businesses. However the damage will not preclude them from being open to the public.
- The damage reported to the LACC Mutual Water Company water system has been repaired but the boil water advisory is still in effect.
- Almanor North and South Campgrounds are open to the public as well as the Canyon Dam Boat Launch and Canyon Dam Day Use Area. Rocky Point Campground on Lake Almanor and Ponderosa Flat Campground on Butte Lake are open as well.
- No events have been canceled in the Lake Almanor Area due to this incident.

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.

Figure 4-78 shows interior damages done to a house in the Lake Almanor Country Club area. Figure 4-79 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 4-80 shows the exterior of a house where a chimney collapsed.

Figure 4-78 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 4-79 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 4-80 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 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>.

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 earthquake were felt.

Figure 4-81 Taylorsville Earthquakes



Source: Plumas County

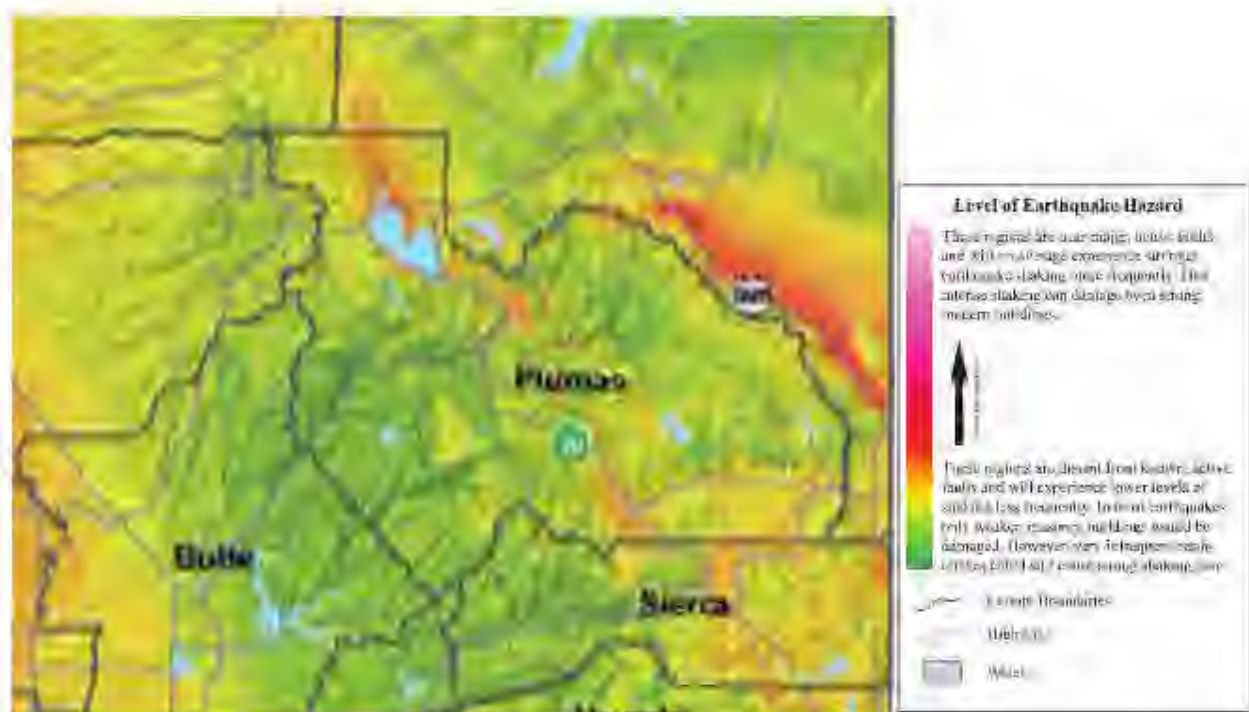
Likelihood of Future Occurrence

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.

Mapping of Future Occurrences

Maps indicating the maximum expectable intensity of ground shaking for the County are available through several sources. Figure 4-82, prepared 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. This data shows that Plumas County falls within an area of mostly low to moderate seismic risk.

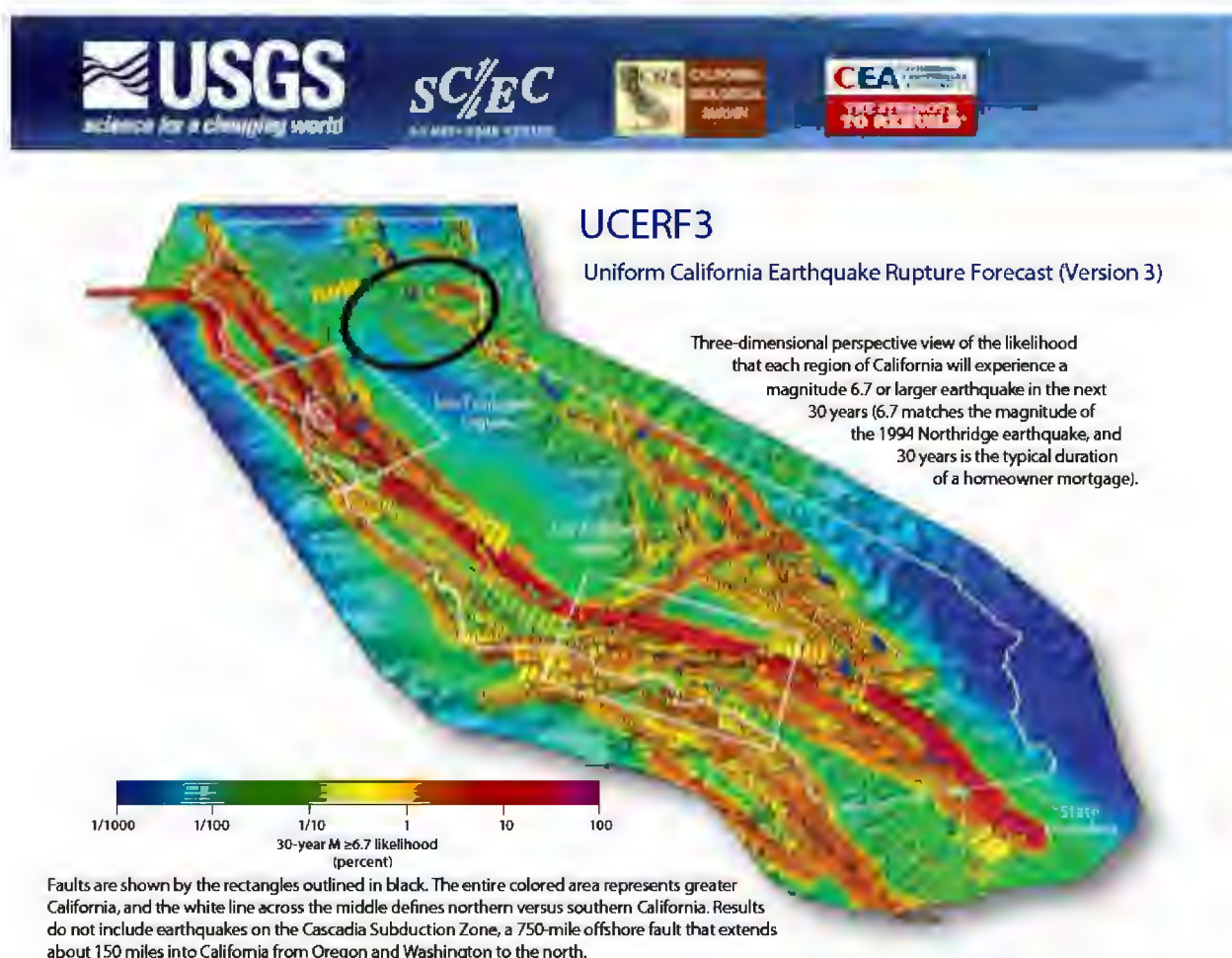
Figure 4-82 Maximum Expectable Earthquake Intensity – 2% Chance in 50 Years



Source: California Division of Mines and Geology

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 4-83 and indicates that Plumas County has a low to moderate risk of earthquake occurrence, which coincides with the likelihood of future occurrence rating of occasional.

Figure 4-83 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 changes 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 uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are within and near the County, seismic hazard mapping indicates that the County has low seismic hazard potential. Additionally, the County is not located within a delineated Alquist-Priolo Earthquake Fault Zone. The risks associated with earthquakes, such as surface fault rupture, within the County are considered low.

Ground shaking is the primary earthquake hazard. Many factors affect the survivability of structures and systems from earthquake-caused ground motions. These factors include proximity to the fault, direction of rupture, epicentral location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems. Ground motions become structurally damaging when average peak accelerations reach 10 to 15 percent of gravity, average peak velocities reach 8 to 12 centimeters per second, and when the Modified Mercalli Intensity Scale is about VII (18-34 percent peak ground acceleration), which is considered to be very strong (general alarm; walls crack; plaster falls).

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. Plumas County's mountainous terrain lies near the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region. According to maps developed by the Department of Conservation's California Geological Survey, Plumas County has potential for ground shaking from earthquakes. The seismic hazard in this area is related to faults on both sides of the California-Nevada border. The eastern, upcountry portion of the county is at greatest risk from earthquakes. Structural damage from ground shaking has not historically been reported in Plumas County.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry, as was seen in the Oroville, Coalinga, Santa Cruz, and Paso Robles earthquakes. This was seen to a certain extent in the Lake Almanor earthquake.

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.

Impacts

Impacts to the County would include damages to infrastructure (roads, bridges, railroad tracks, etc.), damages to utilities and critical infrastructure, damages to residential and commercial buildings, and possible loss of life and injuries. The HMPC also noted that there is PG&E infrastructure and dams above

the County that could affect Plumas County if they were to fail. This could also impact the water supply, as one of the main pump stations is thought to be original and has not been updated.

Estimating Potential Losses

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, two HAZUS-MH earthquake scenario was run for this 2020 LHMP Update:

- A deterministic 6.7 Honey Lake Fault Event
- A probabilistic 6.7 earthquake event

2020 Earthquake Scenarios

Deterministic 6.7 Lake Almanor Fault Earthquake Event

HAZUS-MH 4.2 was utilized to model earthquake losses for the County. Specifically, the deterministic magnitude used for Plumas County utilized a 6.7 Lake Almanor Fault magnitude earthquake, based on data from the Plumas County General Plan. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis.

The methodology for running the deterministic earthquake scenario used seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2002 update of the National Seismic Hazard Maps that are included with HAZUS-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively. The 2,500-year return period analyzes ground shaking estimates with a 2 percent probability of being exceeded in 50 years, from the various seismic sources in the area. The International Building Code uses this level of ground shaking for building design in seismic areas and is more of a worst-case scenario.

The results of the deterministic scenario are captured in Table 4-57 and shown on Figure 4-84. Key losses included the following:

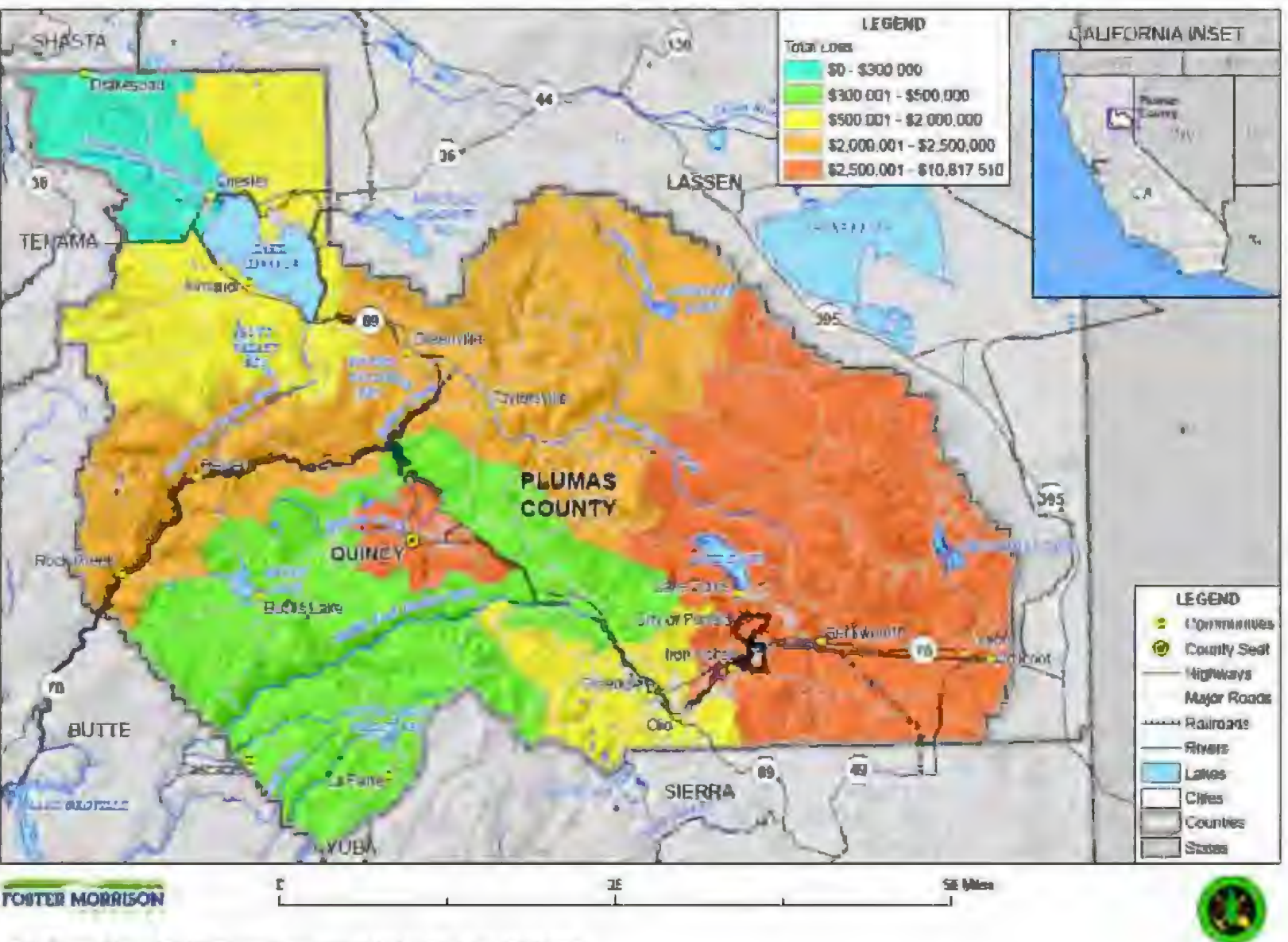
- Total economic loss estimated for the earthquake was \$28,350,000, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled \$19,750,000.
- 317 buildings in the County were at least moderately damaged. 12 buildings were completely destroyed.
- Over 56 percent of the building- and income-related losses were residential structures.
- 13 percent of the estimated losses were related to business interruptions.
- No change was observed in casualties, regardless of time of strike. All modeled casualties were 0.
- No households experienced a loss of potable water or electricity the first day after the earthquake.

Table 4-57 HAZUS-MH Earthquake Loss Estimation Probabilistic 2,500-Year Scenario Results

Type of Impact	Impacts to County from 6.7 Honey Lake Earthquake	
Total Buildings Damaged (based on 15,000 buildings)	Slight: 929 Moderate: 274 Extensive: 31 Complete: 12	
Building and Income Related Losses	\$19,750,000	
Total Economic Losses (Includes building, income and lifeline losses)	\$28,350,000	
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: 2 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	No facilities with at least moderate damage 41 potable water line breaks, 21 wastewater line breaks, and 7 natural gas line breaks	
Households without Power/Water Service (Based on 8,977 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 Power loss, Day 3: 0 Power loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	1 displaced households	
Shelter Requirements	0 persons	
Debris Generation	3,000 tons	

Source: HAZUS-MH 4.2, 2020

Figure 4-84 Plumas County – Total Loss Map from 6.7 Magnitude Lake Almanor Fault
Deterministic Hazus Earthquake Scenario



Probabilistic 6.7 Earthquake Event

HAZUS-MH 4.2 was utilized to model earthquake losses for the County. Specifically, the probabilistic magnitude used for Plumas County utilized a 6.7 magnitude earthquake. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis.

The methodology for running the probabilistic earthquake scenario used probabilistic seismic hazard contour maps developed by the USGS for the 2002 update of the National Seismic Hazard Maps that are included with HAZUS-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively. The 2,500-year return period analyzes ground shaking estimates with a 2 percent probability of being exceeded in 50 years, from the various seismic sources in the area. The International Building Code uses this level of ground shaking for building design in seismic areas and is more of a worst-case scenario.

- The results of the probabilistic scenario are captured in Table 4-58 and shown on Figure 4-85. Key losses included the following:
- Total economic loss estimated for the earthquake was \$960.2 million, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled \$663.03 million.
- 5,887 buildings in the County were at least moderately damaged. 383 buildings were completely destroyed.
- Over 67 percent of the building- and income-related losses were residential structures.
- 15 percent of the estimated losses were related to business interruptions.
- The mid-day scenario estimated the greatest number of modeled casualties with 7.
- 3,310 households experienced a loss of potable water the first day after the earthquake.
- 6,631 households experienced a loss of electricity the first day after the earthquake.

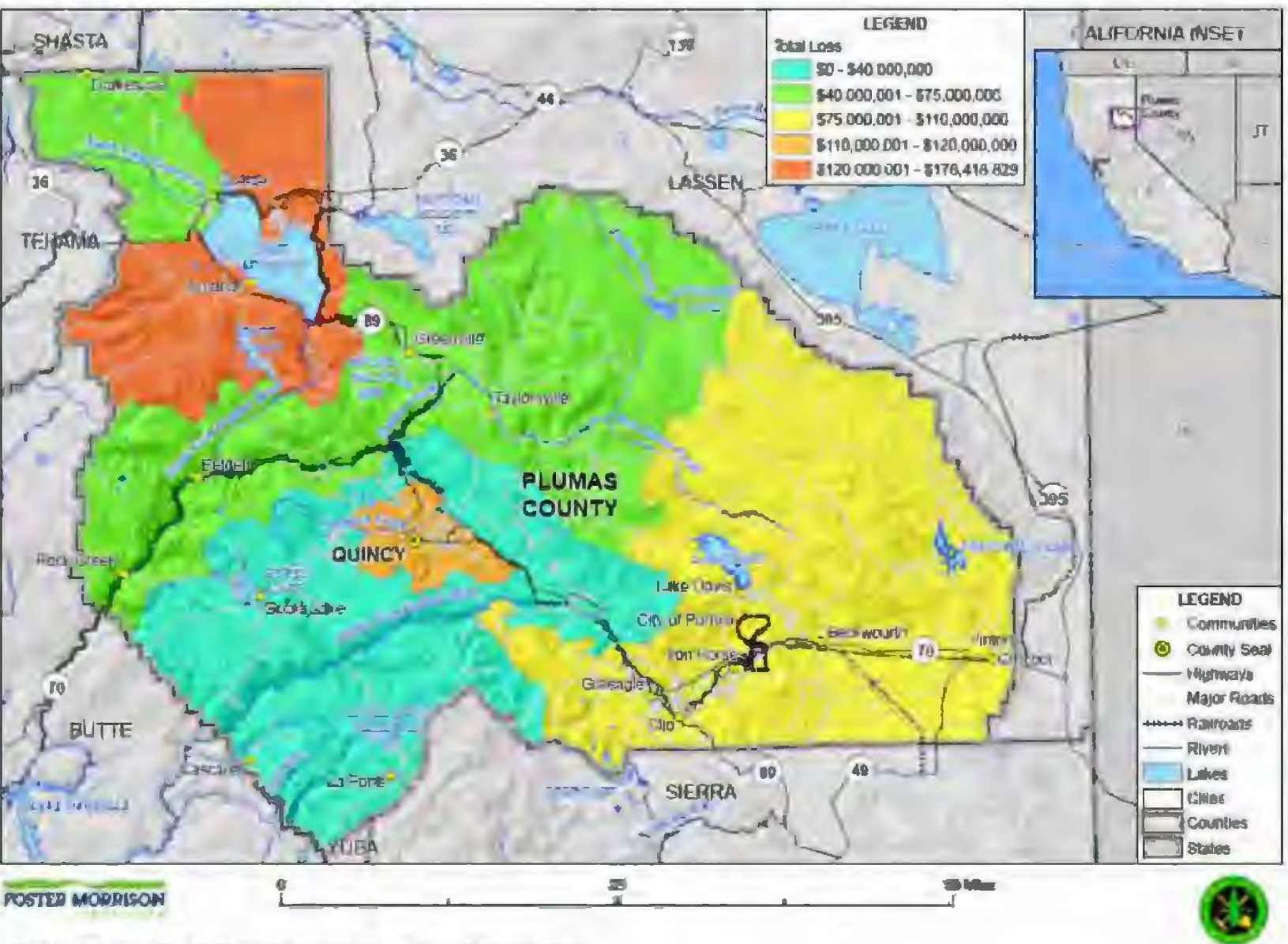
Table 4-58 HAZUS-MH Earthquake Loss Estimation Probabilistic 2,500-Year Scenario Results

Type of Impact	Impacts to County from 6.7 Deterministic
Total Buildings Damaged (based on 15,000 buildings)	Slight: 5,611 Moderate: 4,245 Extensive: 1,259 Complete: 383
Building and Income Related Losses	\$960,190,000
Total Economic Losses (Includes building, income and lifeline losses)	\$663,030,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 55 Requiring hospitalization: 10 Life threatening: 1 Fatalities: 1
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 104 Requiring hospitalization: 26

Type of Impact	Impacts to County from 6.7 Deterministic	
	Life threatening: 4 Fatalities: 7	
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 74 Requiring hospitalization: 20 Life threatening: 7 Fatalities: 5	
Damage to Transportation Systems	18 bridges and 3 airports with at least moderate damage	
Damage to Essential Facilities	None with at least moderate damage	
Damage to Utility Systems	10 facilities with at least moderate damage 1,018 potable water line breaks, 511 wastewater line breaks, and 175 natural gas line breaks	
Households without Power/Water Service (Based on 8,977 total households)	Power loss, Day 1: 6,631 Power loss, Day 3: 4,169 Power loss, Day 7: 1,751 Power loss, Day 30: 343 Power loss, Day 90: 9	Water loss, Day 1: 3,310 Power loss, Day 3: 3,107 Power loss, Day 7: 2,683 Water loss, Day 30: 273 Water loss, Day 90: 0
Displaced Households	148 displaced households	
Shelter Requirements	81 persons	
Debris Generation	114,000 tons	

Source: HAZUS-MH 4.2, 2020

Figure 4-85 Plumas County – Total Loss Map from 6.7 Magnitude Probabilistic Hazus Earthquake Scenario



Data Source: Hazus-MH 4.2, Plumas County GIS, CalAtlas; Map Date: 03/01/2020

Future Development

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

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. History clearly highlights floods as one of the primary natural hazards impacting Plumas County. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. The Plumas County Planning Area is susceptible to various types of flood events as described below.

- **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.
- **Flash flooding** – Flash flooding describes localized floods of great volume and short duration. This type of flood usually results from a 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 and thus early threat identification and warning is critical for saving lives
- **Localized/Stormwater flooding** – Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems. More on localized flooding can be found in Section 4.3.12.
- **Dam failure flooding** – Flooding from failure of one or more upstream dams is also a concern to the Plumas County Planning Area. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could

result, and there could be associated health concerns as well as problems with the identification and burial of the deceased. Dam failure is further addressed in Section 4.3.8 Dam Failure.

The 2005 FIS for Plumas County noted that, for the unincorporated County, there are no significant flood-protection measures in the study area, nor are any currently planned. The 2035 Plumas County General Plan Public Health & Safety Element noted that the County contains an extensive network of rivers and other waterways that flow out of higher elevations to the valley areas.

Location and Extent

Major Sources of Flooding

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 and Amador counties 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 the California's hydrological regions is provided in Figure 4-86.

Figure 4-86 California Hydrologic Regions



Source: 2018 State of California Hazard Mitigation Plan

The Plumas County Waterway System

Plumas County encompasses multiple rivers, streams, creeks, and associated watersheds. Plumas County is in the Feather River Watershed. Figure 4-87 illustrates the primary watersheds of Plumas County, as well as the primary waterways in the County.

Figure 4-87 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 SWP.

Land ownership in the IRWM Plan Area 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.

Floodplains

The area adjacent to a channel is the floodplain (see Figure 4-88). 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. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 4-88 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.

The HMPC noted that there are three primary conditions that contribute to major flooding. High antecedent basin moisture; high intensity, long duration rainfall; high water content snow at all elevations, 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.

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.

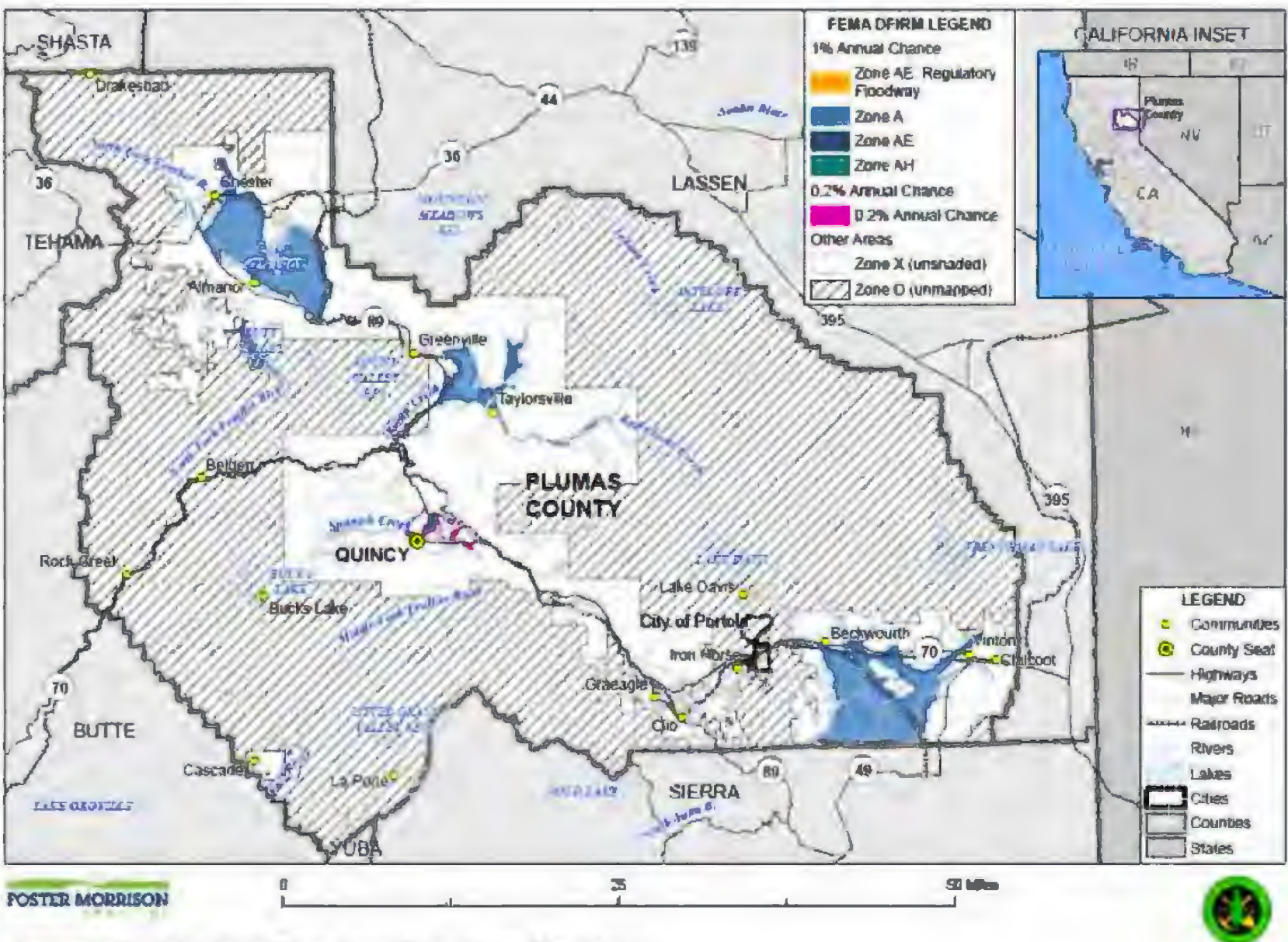
Digital Flood Insurance Rate Maps (DFIRM)

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, are dated March 2, 2005, and are being used for the flood analysis for this LHMP Update. The DFIRM is shown in Figure 4-89.

Figure 4-89 Plumas County DFIRM Flood Zones



California Floodplain Mapping

Also to be considered when evaluating the flood risks in Plumas County are various floodplain maps developed by CA 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 CA 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 CA 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 CA 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 4-90 shows the BAM for the Plumas County Planning Area.

Figure 4-90 Plumas County– Flood Awareness (Best Available) Map



Source: CA DWR, Retrieved 4/8/2020

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1% (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study).

Flood extents are usually measured in depths of flooding, geographical extent of the floodplain, as well as flood zones that a location falls in (i.e. 1% or 0.2% annual chance flood). Expected flood depths in the County vary and are not well defined. 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 flood extent from the FEMA DFIRMs is shown in Table 4-59.

Table 4-59 Plumas County – Geographical Flood Hazard Extents in FEMA DFIRM Flood Zones

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance	86,311	4.95%	15,712	21.22%	70,599	4.23%
0.2% Annual Chance	1,456	0.08%	664	0.90%	792	0.05%
Other Areas	1,655,433	94.97%	57,674	77.89%	1,597,759	95.72%
Total	1,743,200	100.00%	74,050	100.00%	1,669,150	100.00%

Source: March 2, 2005 DFIRM

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Plumas County from flooding, (including heavy rains and storms) is shown on Table 4-60.

Table 4-60 Plumas County – State and Federal Disaster Declaration from Flood 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1963 (twice), 1964, 1969, 1970, 1980, 1986, 1992, 1995 (twice), 1996, 1997	15	1955, 1958, 1963, 1964, 1969, 1970, 1986, 1992, 1993, 1995 (twice), 1997, 2006, 2017 (twice)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Table 4-61 shows events in Plumas County since 1993. Other heavy rain and storm events can be found in the Past Occurrences of the Severe Weather: Heavy Rains and Storms in Section 4.3.3. Information on events can be found below the table/

*Table 4-61 NCDC Flood Events in Plumas County 1993 to 9/30/2019**

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	10	0	0	1	0	\$3,140,000	\$0
Total	13	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

December 31, 2005 – Mainly rural flooding was reported in Plumas County. \$1,000,000 in damages were reported. No injuries or deaths were reported.

March 2, 2009 – CHP closed the west bound lane of Highway 70 in the Rich Bar area due to a rockslide resulting from heavy rainfall on a burn area. No injuries or deaths were reported.

July 30, 2014 – Heavy rain fell on the west shore of Lake Almanor. Road flooding occurred on State Highway 89 on the west side of the Lake. No injuries or deaths were reported.

July 3, 2015 – Road washout reported on Peninsula Drive on the north shore of Lake Almanor. \$100,000 in damages were reported. No injuries or deaths were reported.

January 7, 2017 – Flooding caused closure of Highway 70 near Cresta Dam on Feather River Canyon. This was due to heavy rain which necessitated the opening of the floodgates.

January 8 and 9, 2017 – The Middle Fork of the Feather River overflowed onto Highway 89 in Clio. The flooding caused a sinkhole in the road. Cal Trans estimated the damages at \$40,000. The lowest lying areas of the Sierra Valley near the Middle Fork of the Feather River were inundated due to heavy rain runoff. As the valley drains very slowly, flooding of low-lying areas continued for an extended period of time with additional flooding in February. NOTE: no damage estimates were available. Northbound lane of Highway 89 closed due to 8 inches of water in the roadway. No injuries or deaths were reported.

February 7, 2017 – The Middle Fork of the Feather River saw record flooding (a record crest at Portola on the 10th) and caused extensive structural damage in Portola, Clio, and downstream to Blairsden. Highway 89 was closed near Clio due to water over the road. Many schools were closed on the 9th in the Portola area and along the Feather River. \$2,000,000 in damages were reported for repairs to Highway 89 (per a CALTRANS report), so the actual flooding damage likely much higher. No injuries or deaths were reported.

Hazard Mitigation Planning Committee Events

Localized and regional 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 4-91.

Figure 4-91 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 form 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 4-92), bridges were destroyed (see Figure 4-93 and Figure 4-108), 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 4-92 1986 Railroad Bed Flood Damages



Source: 'The Storm of '86 by Robert Moon, Feather River Publishing, Quincy, CA 1986

Figure 4-93 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 4-94 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 4-95 Erosion from Floodwaters Cause Home to fall into Indian Creek



Source: Feather River Bulletin, Wednesday January 29, 1997

Figure 4-96 Damage to Home in Genesee from 1997 Flood



Source: Feather River Bulletin, Wednesday January 29, 1997

Figure 4-97 Sloat Bridge Damage from 1997 Flood



Source: Plumas County Road Department

Figure 4-98 Damage to CA-70 near Tobin



Source: Feather River Bulletin, Wednesday January 29, 1997

Figure 4-99 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 4-100). Erosion caused the loss of half a backyard requiring the owner to reinforce the riverbank bordering

the property (see Figure 4-101). 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 4-100 Plumas County 2017 Flooding in the Plumas Eureka Community Services District



Source: Plumas Eureka Community Services District

Figure 4-101 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 for 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 4-102 2017 Flooding – Arlington Bridge



Source: Plumas County Agriculture Commissioner

Figure 4-103 2017 Road Flooding



Source: Plumas County Agriculture Commissioner

Figure 4-104 2017 Flooding – Flooded Meadow



Source: Plumas County Agriculture Commissioner

Figure 4-105 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 4-106 and Figure 4-107.

Figure 4-106 Plumas County – LaPorte Road Washout



Source: Plumas County

Figure 4-107 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

2019

Indian Valley had snow on rain events that caused flooding.

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.

Climate Change and Flood

According to the CAS, climate change may affect flooding in Plumas County. 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. Future precipitation projections were shown in Figure 4-24 in Section 4.3.3. 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 changes warms the atmosphere enabling it to hold more water.

Vulnerability Assessment

Vulnerability—High

Flooding is a significant problem in Plumas County. 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.

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.

The HMPC noted that often the discharge of water is less of an issue during flood events than the sediment and debris that comes with it.

Impacts

Predominantly, the effects of flooding are generally confined to areas near the waterways of the County. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat. This threatens structures in the floodplain. Structures can also be damaged from trees falling as a result of water-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. 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. People may be swept away in floodwaters, causing injuries or deaths.

Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even 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. This is one reason 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.

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 and hogs 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.

Flood Hazard Assessment

This risk assessment for the Plumas County LHMP Update assessed the flood hazard specific to Plumas County. This included an evaluation of multiple flood hazards including the Special Flood Hazard Area

(SFHA) shown on the DFIRM; Repetitive Loss (RL) Areas; localized, stormwater flooding areas; other areas that have flooded in the past, but not identified on the DFIRM; other areas of shallow flooding identified through other studies and sources; levee failure flooding; dam failure flooding; and mudflow flooding especially in significant post-burn areas. This comprehensive flood risk assessment included an assessment of less-frequent flood hazards, areas likely to be flooded, and flood problems that are likely to get worse in the future as a result of changes in floodplain development and demographics, development in the watershed, and climate change. Existing studies, maps, historical data, and federal, state, and local community expertise and knowledge contributed to this current flood assessment for Plumas County. An evaluation of the success of completed and ongoing flood control projects and associated maintenance aspects contributed to this flood hazard assessment and the resulting flood mitigation strategy for the Plumas County Planning Area. This flood risk assessment for this LHMP Update also includes an assessment of future flooding conditions based on historic development in the floodplains and proposed future development as further described throughout this plan. The flood vulnerability assessment that follows focuses on the flood hazard based on FEMA DFIRMs.

Flood Analysis

The Plumas County Planning Area has mapped FEMA flood hazard areas. GIS was used to determine the possible impacts of flooding within the County and how the risk varies across the unincorporated County. The following methodology was followed in determining improved parcel counts and values at risk to the 1% annual chance flood event and 0.2% annual chance flood events.

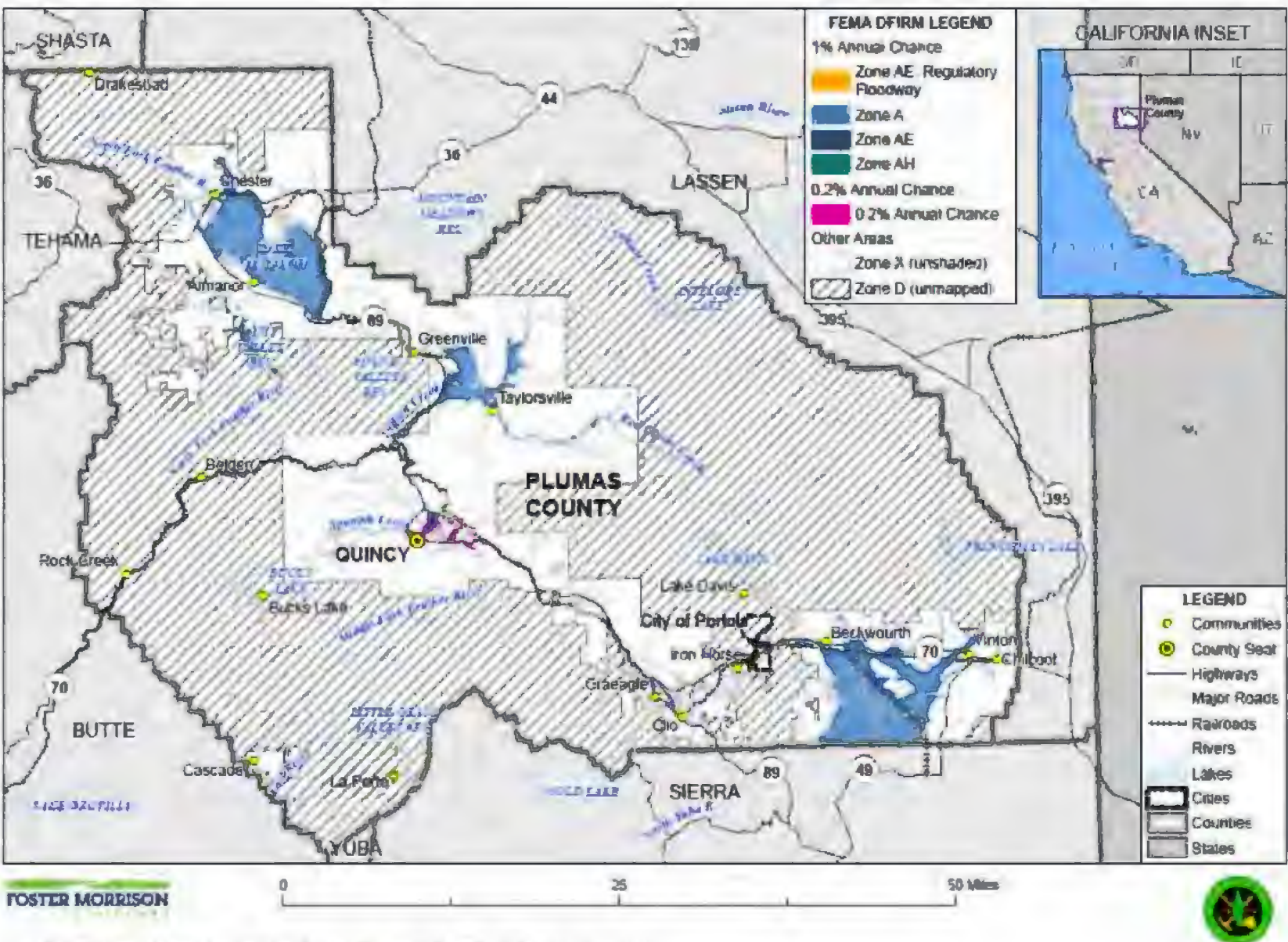
Plumas County has a FEMA effective DFIRM dated 3/2/2005, which was obtained from the National Flood Hazard Layer to perform the flood analysis. Each of the DFIRM flood zones that begins with the letter ‘A’ depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-62 explains the difference between DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the County. The effective DFIRM maps for the Plumas County Planning Area are shown on Figure 4-108.

Table 4-62 Plumas County Planning Area – DFIRM Flood Hazard Zones

Flood Zone	Description
A	1% annual chance flood: No base flood elevations provided
AE	1% annual chance flood: Base flood elevations provided
AE Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided
AH	1% annual chance flood: shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone.
Shaded X	500-year Flood: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood
D	Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted.
X (unshaded)	No flood hazard

Source: FEMA

Figure 4-108 Plumas County – DFIRM Flood Zones



Values at Risk and Flood Loss Estimates Analysis

Quantifying the values at risk and estimating losses within mapped FEMA floodplains in the County is an important element in understanding the risk and vulnerability of the Plumas County Planning Area to the flood hazard.

Methodology

Plumas County's February 2020 Parcel and Assessor Data, obtained from Plumas County, was used as the basis for the county inventory of parcels, values, and acres. Plumas County has a FEMA DFIRM dated 3/2/2005 which was utilized 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 create a centroid, or point representing the center of the parcel polygon. DFIRM flood data was then overlaid on the parcel layer. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned the flood zone for the entire parcel. The parcels were segregated and analyzed in this fashion for Plumas County. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and the GIS parcel layer.

Analysis on values at risk to floods in the County is provided for Plumas County in the below results section.

Limitations

It also should be noted that the resulting flood analysis estimates may actually be more or less than that presented in the below tables as the County may include structures located within the 1% or 0.2% annual chance floodplain that are elevated at or above the level of the base flood elevation, according to local floodplain development requirements. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the floodplain due primarily to Proposition 13, and to a lesser extent, properties falling under the Williamson Act.

Flood Loss Estimate

The loss estimate for flood is based on the total of improved and contents value. Improved parcels include those with improved structure values identified in the Assessor's database. 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 are only present to show the value of the land associated with each flood zone.

The property use categories for the County (derived from zoning code descriptions) were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards, using FEMA Hazus methodologies as previously described in Section 4.3.1. The CRVs were added to the improved parcel values.

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 percent 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 the flood hazard analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard.

Values at Risk and Flood Loss Estimates Results

The end result of the values at risk and flood loss estimates analysis is an inventory of the numbers, types, and values of parcels and estimated losses subject to the flood hazard by flood zone. Table 4-63 and Table 4-64 contain flood analysis results for Plumas County. These tables show the number of parcels and values at risk to the 1% and 0.2% annual chance event for Plumas County. Table 4-63 shows a summary of the value of improved parcels by 1% and 0.2% annual chance flood zones in the Planning Area. Table 4-64 shows the values in each flood zone for the Planning Area.

Table 4-63 Plumas County – Count and Value of Parcels by 1% and 0.2% Flood Zone*

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	1,074	557	\$83,853,658	\$97,424,438	\$610,506	\$56,902,792
0.2% Annual Chance Flood Hazard**	865	722	\$34,045,279	\$171,252,912	\$5,523,716	\$149,981,027
Other Areas	22,467	12,457	\$1,168,243,857	\$2,164,414,428	\$12,500,173	\$1,187,677,283
Grand Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101

Source: FEMA 3/2/2005 DFIRM, Plumas County February 2020 Parcel/Assessor's 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 4-64 Plumas County – Count and Value of Parcels by 1% and 0.2% Flood Zone 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	178	48	\$23,474,135	\$4,174,666	\$192,753	\$4,174,666	\$32,016,220
Commercial	21	12	\$1,323,409	\$3,013,201	\$55,930	\$3,013,201	\$7,405,741

Flood Zone / Property Use /	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Federal Lands	5	0	\$0	\$0	\$0	\$0	\$0
Government	44	0	\$0	\$0	\$0	\$0	\$0
Industrial	15	6	\$814,135	\$517,278		\$775,917	\$2,107,330
Institutional	3	0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	16	0	\$0	\$0	\$0	\$0	\$0
Recreational	14	9	\$1,062,417	\$1,021,456	\$40,690	\$1,021,456	\$3,146,019
Residential	554	389	\$48,938,889	\$73,717,178	\$171,782	\$36,858,589	\$159,686,438
ROW/Utilities	50	0	\$0	\$0	\$0	\$0	\$0
Zone A Total	900	464	\$75,612,985	\$82,443,779	\$461,155	\$45,843,829	\$204,361,748
Zone AE							
Agricultural	18	6	\$1,663,325	\$748,278	\$116,430	\$748,278	\$3,276,311
Commercial	17	12	\$1,950,417	\$2,462,219	\$22,670	\$2,462,219	\$6,897,525
Government	6		\$0	\$0	\$0	\$0	\$0
Industrial	4	4	\$356,557	\$1,806,216	\$0	\$2,709,324	\$4,872,097
Miscellaneous	1		\$0	\$0	\$0	\$0	\$0
Residential	73	59	\$3,470,562	\$8,425,398	\$10,251	\$4,212,699	\$16,118,910
ROW/Utilities	7	\$0	\$0	\$0	\$0	\$0	\$0
Zone AE Total	126	81	\$7,440,861	\$13,442,111	\$149,351	\$10,132,520	\$31,164,843
Zone AE Floodway							
Agricultural	4	1	\$186,417	\$278,307	\$0	\$278,307	\$743,031
Commercial	2	1	\$32,168	\$36,030	\$0	\$36,030	\$104,228
Government	1	0	\$0	\$0	\$0	\$0	\$0
Industrial	1	0	\$3,050	\$0	\$0	\$0	\$3,050
Miscellaneous	1	0	\$0	\$0	\$0	\$0	\$0
Residential	28	5	\$266,865	\$401,395	\$0	\$200,698	\$868,958
ROW/Utilities	3	0	\$0	\$0	\$0	\$0	\$0
Zone AE Floodway Total	40	7	\$488,500	\$715,732	\$0	\$515,035	\$1,719,267
Zone AH							
Agricultural	1		\$8,011	\$0	\$0	\$0	\$8,011
Government	1		\$0	\$0	\$0	\$0	\$0
Residential	6	5	\$303,301	\$822,816	\$0	\$411,408	\$1,537,525
Zone AH Total	8	5	\$311,312	\$822,816	\$0	\$411,408	\$1,545,536
1% Annual Chance Flood Hazard Total	1,074	557	\$83,853,658	\$97,424,438	\$610,506	\$56,902,792	\$238,791,394

Flood Zone / Property Use /	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
0.2% Annual Chance Flood Hazard**							
Agricultural	9	2	\$1,119,037	\$18,214		\$18,214	\$1,155,465
Commercial	95	79	\$8,616,158	\$59,674,019	\$5,032,583	\$59,674,019	\$132,996,779
Government	8	0	\$0	\$0	\$0	\$0	\$0
Industrial	18	9	\$1,201,722	\$33,840,138	\$293,260	\$50,760,207	\$86,095,327
Institutional	4	3	\$184,884	\$1,336,633	\$7,310	\$1,336,633	\$2,865,460
Miscellaneous	1	0	\$0	\$0	\$0	\$0	\$0
Residential	695	629	\$22,923,478	\$76,383,908	\$190,563	\$38,191,954	\$137,689,903
ROW/Utilities	35	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard Total	865	722	\$34,045,279	\$171,252,912	\$5,523,716	\$149,981,027	\$360,802,934
Other Areas							
Zone X (unshaded)							
Agricultural	900	137	\$43,752,919	\$13,716,587	\$1,984,756	\$13,716,587	\$73,170,849
Commercial	672	470	\$52,261,790	\$125,139,516	\$4,261,892	\$125,139,516	\$306,802,714
Federal Lands	69	0	\$0	\$0	\$0	\$0	\$0
Government	300	0	\$40,471	\$0	\$0	\$0	\$40,471
Industrial	108	65	\$7,302,295	\$8,938,514	\$21,284	\$13,407,771	\$29,669,864
Institutional	80	42	\$1,699,516	\$11,361,499	\$72,595	\$11,361,499	\$24,495,109
Miscellaneous	52	0	\$0	\$0	\$0	\$0	\$0
Recreational	194	76	\$11,277,845	\$17,415,056	\$1,388,665	\$17,415,056	\$47,496,622
Residential	14,599	9,883	\$906,178,994	\$1,785,129,983	\$3,504,013	\$892,564,992	\$3,587,377,982
ROW/Utilities	819	0					
Zone X (unshaded) Total	17,793	10,673	\$1,022,513,830	\$1,961,701,155	\$11,233,205	\$1,073,605,421	\$4,069,053,611
Zone D							
Agricultural	875	84	\$35,736,784	\$4,930,856	\$0	\$4,930,856	\$45,598,496
Commercial	60	35	\$4,481,506	\$8,565,968	\$395,633	\$8,565,968	\$22,009,075
Federal Lands	140	0	\$0	\$0	\$0	\$0	\$0
Government	230	0	\$103,271	\$0	\$0	\$0	\$103,271
Industrial	1	0	\$21,877	\$0	\$0	\$0	\$21,877
Miscellaneous	58	0	\$8,119	\$0	\$0	\$0	\$8,119
Recreational	314	12	\$1,775,646	\$11,933,627	\$590	\$11,933,627	\$25,643,490
Residential	2,850	1,653	\$103,602,824	\$177,282,822	\$870,745	\$88,641,411	\$370,397,802
ROW/Utilities	146	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 D Total	4,674	1,784	\$145,730,027	\$202,713,273	\$1,266,968	\$114,071,862	\$463,782,130
Other Areas Total	22,467	12,457	\$1,168,243,857	\$2,164,414,428	\$12,500,173	\$1,187,677,283	\$4,532,835,741
Unincorporated Plumas County Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068
Grand Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: FEMA 3/2/2005 DFIRM, Plumas County February 2020 Parcel/Assessor's 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 floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood also includes all parcels in the 1% annual chance floodplain.

Table 4-65 shows a summary table of loss estimates by 1% and 0.2% annual chance flood zone for the Plumas County Planning Area. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located in the Planning Area) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator that a community may have more difficulties recovering from a flood. The County should keep in mind that the loss ratio could increase with additional development in the 1% and 0.2% annual chance flood zone, unless development is elevated in accordance with the local floodplain management ordinance.

Table 4-65 Plumas County – Flood Loss Estimate

Flood Zone	Total Parcel Count*	Improved 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	1,074	557	\$83,853,658	\$97,424,438	\$610,506	\$56,902,792	\$154,937,736	\$30,987,547	0.92%
0.2% Annual Chance Flood Hazard**	865	722	\$34,045,279	\$171,252,912	\$5,523,716	\$149,981,027	\$326,757,655	\$65,351,531	1.94%
Grand Total	1,939	1279	\$117,898,937	\$268,677,350	\$6,134,222	\$206,883,819	\$481,695,391	\$96,339,078	2.86%

Source: FEMA 3/2/2005 DFIRM, Plumas County February 2020 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual flood zone, 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 also includes all parcels in the 1% annual chance flood zone.

According to the information in Table 4-63 through Table 4-65, the Plumas County Planning Area has 557 improved parcels and roughly \$155 million of structure and contents value in the 1% annual chance flood zone. There are an additional 722 improved parcels and roughly \$327 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 0.92% (1% annual chance) and 1.94% (0.2% annual chance) indicates that while the Plumas County Planning Area has values at risk in the floodplain, flood losses would be limited compared to the total built environment and the community would likely be able to recover adequately.

Flooded Acres

In addition to the centroid analysis used to obtain numbers of parcels and values at risk to flood hazards, parcel boundary analysis was performed to obtain total acres and flooded acres by flood zone for each parcel. The parcel layer was intersected with the FEMA DFIRM data to obtain the acres flooded. The following is an analysis of flooded acres in the County.

Methodology

GIS was used to calculate acres flooded by FEMA flood zones and property use categories. The Plumas County parcel layer and FEMA DFIRM were intersected, and each segment divided by the intersection of flood zone and parcels was calculated for acres. This process was conducted for 1% and 0.2% annual chance floodplain areas, with each segment being defined by zone type (A, AE, 0.2% Annual Chance, and X) and acres. The resulting data tables with flooded acreages were then imported into a database and linked back to the original parcels, including total acres by parcel number. Once this was completed, each parcel contained acreage values for flooded acre by zone type within the parcel. In the tables below, the 1% and 0.2% annual chance flood zones are summarized and then split out by property use, their total flooded acres, total improved acres, and percent of improved acres that are flooded.

Limitations

One limitation created by this type of analysis is that improvements are uniformly found throughout the parcel, while in reality, only portions of the parcel are improved, and improvements may or may not fall within the flood zone portion of a parcel; thus, areas of improvements flooded calculated through this method may be higher or lower than those actually seen in a similar real-world event.

The following tables represent a summary and detailed analysis of total acres for each FEMA DFIRM flood zone in the Planning Area. Table 4-66 gives summary information for the Planning Area by 1% and 0.2% annual chance flood zone for the entire Plumas County Planning Area. In all of these tables, the Other Areas are areas (Zone X Unshaded – areas outside mapped flood hazard areas) where there is no mapped flood hazard area.

Table 4-66 Plumas County– Flooded Acres Summary

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	32,142	1.84%	11,168	15.08%	20,974	1.26%
Commercial	315	0.02%	234	0.32%	81	0.00%
Federal Lands	1,632	0.09%	0	0.00%	1,632	0.10%
Government	1,602	0.09%	0	0.00%	1,602	0.10%
Industrial	117	0.01%	49	0.07%	68	0.00%
Institutional	2	0.00%	0	0.00%	2	0.00%
Miscellaneous	10,762	0.62%	0	0.00%	10,762	0.64%
Recreational	246	0.01%	204	0.28%	42	0.00%
Residential	6,292	0.36%	3,279	4.43%	3,013	0.18%
ROW/Utilities	31,090	1.78%	0	0.00%	31,090	1.86%
Zone A Total	84,200	4.83%	14,933	20.17%	69,267	4.15%
Zone AE						
Agricultural	759	0.04%	295	0.40%	464	0.03%
Commercial	97	0.01%	40	0.05%	57	0.00%
Federal Lands	5	0.00%	0	0.00%	5	0.00%
Government	36	0.00%	0	0.00%	36	0.00%
Industrial	4	0.00%	3	0.00%	2	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	31	0.00%	0	0.00%	31	0.00%
Recreational	0	0.00%	0	0.00%	0	0.00%
Residential	701	0.04%	319	0.43%	382	0.02%
ROW/Utilities	67	0.00%	0	0.00%	67	0.00%
Zone AE Total	1,701	0.10%	656	0.89%	1,045	0.06%
Zone AE Floodway						
Agricultural	179	0.01%	43	0.06%	136	0.01%
Commercial	11	0.00%	3	0.00%	8	0.00%
Federal Lands	20	0.00%	0	0.00%	20	0.00%
Government	13	0.00%	0	0.00%	13	0.00%
Industrial	8	0.00%	0	0.00%	8	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	13	0.00%	0	0.00%	13	0.00%
Recreational	0	0.00%	0	0.00%	0	0.00%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Residential	129	0.01%	66	0.09%	62	0.00%
ROW/Utilities	22	0.00%	0		22	0.00%
Zone AE Floodway Total	395	0.02%	114	0.15%	281	0.02%
Zone AH						
Agricultural	5	0.00%	0	0.00%	5	0.00%
Commercial	0	0.00%	0	0.00%	0	0.00%
Federal Lands	0	0.00%	0	0.00%	0	0.00%
Government	0	0.00%	0	0.00%	0	0.00%
Industrial	0	0.00%	0	0.00%	0	0.00%
Institutional	0	0.00%	0	0.00%	0	0.00%
Miscellaneous	0	0.00%	0	0.00%	0	0.00%
Recreational	0	0.00%	0	0.00%	0	0.00%
Residential	9	0.00%	9	0.01%	1	0.00%
ROW/Utilities	1	0.00%	0	0.00%	1	0.00%
Zone AH Total	15	0.00%	9	0.01%	7	0.00%
1% Annual Chance Flood Hazard Total	86,311	4.95%	15,712	21.22%	70,599	4.23%
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	328	0.02%	161	0.22%	167	0.01%
Commercial	194	0.01%	91	0.12%	103	0.01%
Federal Lands	1	0.00%	0	0.00%	1	0.00%
Government	92	0.01%	0	0.00%	92	0.01%
Industrial	36	0.00%	17	0.02%	19	0.00%
Institutional	7	0.00%	5	0.01%	2	0.00%
Miscellaneous	0	0.00%		0.00%	0	0.00%
Recreational	0	0.00%		0.00%	0	0.00%
Residential	677	0.04%	390	0.53%	287	0.02%
ROW/Utilities	121	0.01%		0.00%	121	0.01%
Zone X (shaded) Total	1,456	0.08%	664	0.90%	792	0.05%
0.2% Annual Chance Flood Hazard Total	1,456	0.08%	664	0.90%	792	0.05%

Flood Zone / Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Other Areas						
Zone X (unshaded)						
Agricultural	150,630	8.64%	15,045	20.32%	135,584	8.12%
Commercial	2,964	0.17%	1,789	2.42%	1,176	0.07%
Federal Lands	196,195	11.25%	0	0.00%	196,195	11.75%
Government	42,174	2.42%	0	0.00%	42,174	2.53%
Industrial	550	0.03%	246	0.33%	304	0.02%
Institutional	258	0.01%	42	0.06%	216	0.01%
Miscellaneous	11,895	0.68%	0	0.00%	11,895	0.71%
Recreational	1,526	0.09%	1,125	1.52%	401	0.02%
Residential	52,434	3.01%	26,152	35.32%	26,282	1.57%
ROW/Utilities	11,434	0.66%	0	0.00%	11,434	0.68%
Zone X (unshaded) Total	470,060	26.97%	44,400	59.96%	425,660	25.50%
Zone D						
Agricultural	124,641	7.15%	4,747	6.41%	119,894	7.18%
Commercial	543	0.03%	368	0.50%	176	0.01%
Federal Lands	785,943	45.09%	0	0.00%	785,943	47.09%
Government	230,894	13.25%	0	0.00%	230,894	13.83%
Industrial	114	0.01%	0	0.00%	114	0.01%
Institutional	0	0.00%	0	0.00%	0	
Miscellaneous	20,946	1.20%	0	0.00%	20,946	1.25%
Recreational	3,233	0.19%	269	0.36%	2,964	0.18%
Residential	17,332	0.99%	7,891	10.66%	9,441	0.57%
ROW/Utilities	1,727	0.10%	0	0.00%	1,727	0.10%
Zone D Total	1,185,373	68.00%	13,274	17.93%	1,172,099	70.22%
Other Areas Total	1,655,433	94.97%	57,674	77.89%	1,597,759	95.72%
Grand Total	1,743,200	100.00%	74,050	100.00%	1,669,150	100.00%

Source: FEMA DFIRM 3/2/2005, Plumas County February 2020 Parcel/Assessor's Data

Insurance Coverage, Claims Paid, and Repetitive Losses

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 March 2, 2020, there were 140 policies in force in the unincorporated County, resulting in \$32,883,100 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.

Based on this analysis of insurance coverage, Plumas County has values at risk to the 1% and 0.2% annual chance and greater floods. Of the 577 improved parcels within the 1% annual chance flood zone, 88 (or 15.8 percent) of those parcels maintain flood insurance. This can be seen on Table 4-67.

Table 4-67 Plumas County – 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
Unincorporated County	557	88	15.8%

Source: FEMA DFIRM 3/2/2005, Plumas County February 2020 Parcel/Assessor's Data

Population at Risk

A separate analysis was performed to determine populations that reside in flood zones. Using GIS, the DFIRM Flood dataset was overlayed on the improved residential parcel data. Those parcel centroids that intersect a flood zone were counted and multiplied by the Census Bureau average household size; and tabulated by flood zone (see Table 4-68). According to this analysis, there is a population of 1,028 in the 1% annual chance flood zone, and 1,459 in the 0.2% annual chance flood zone.

Table 4-68 Plumas County – Residential Population at Risk to 1% and 0.2% Annual Chance Flooding

Jurisdiction	1% Annual Chance		0.2% Annual Chance*	
	Improved Residential Parcels*	Population at Risk	Improved Residential Parcels*	Population at Risk
Unincorporated Plumas County	443	1,028	629	1,459
Total	443	1,028	629	1,459

Source: FEMA DFIRM 3/2/2005, US Census Bureau Average Household Sizes: unincorporated Plumas County (2.32)

*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

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Plumas County and all jurisdictions to determine critical facilities in the 1% and 0.2 annual chance floodplains. Using GIS, the DFIRM flood zones were overlayed on the critical facility GIS layer. Figure 4-109 shows critical facilities, as well as the DFIRM flood zones. Table 4-69 summarizes the critical facilities in the County by DFIRM flood zone.

Table 4-70 details critical facilities by facility type and count for the Planning Area. Details of critical facility definition, type, name and address by flood zone are listed in Appendix F.

Figure 4-109 Plumas County – Critical Facilities in DFIRM Flood Zones

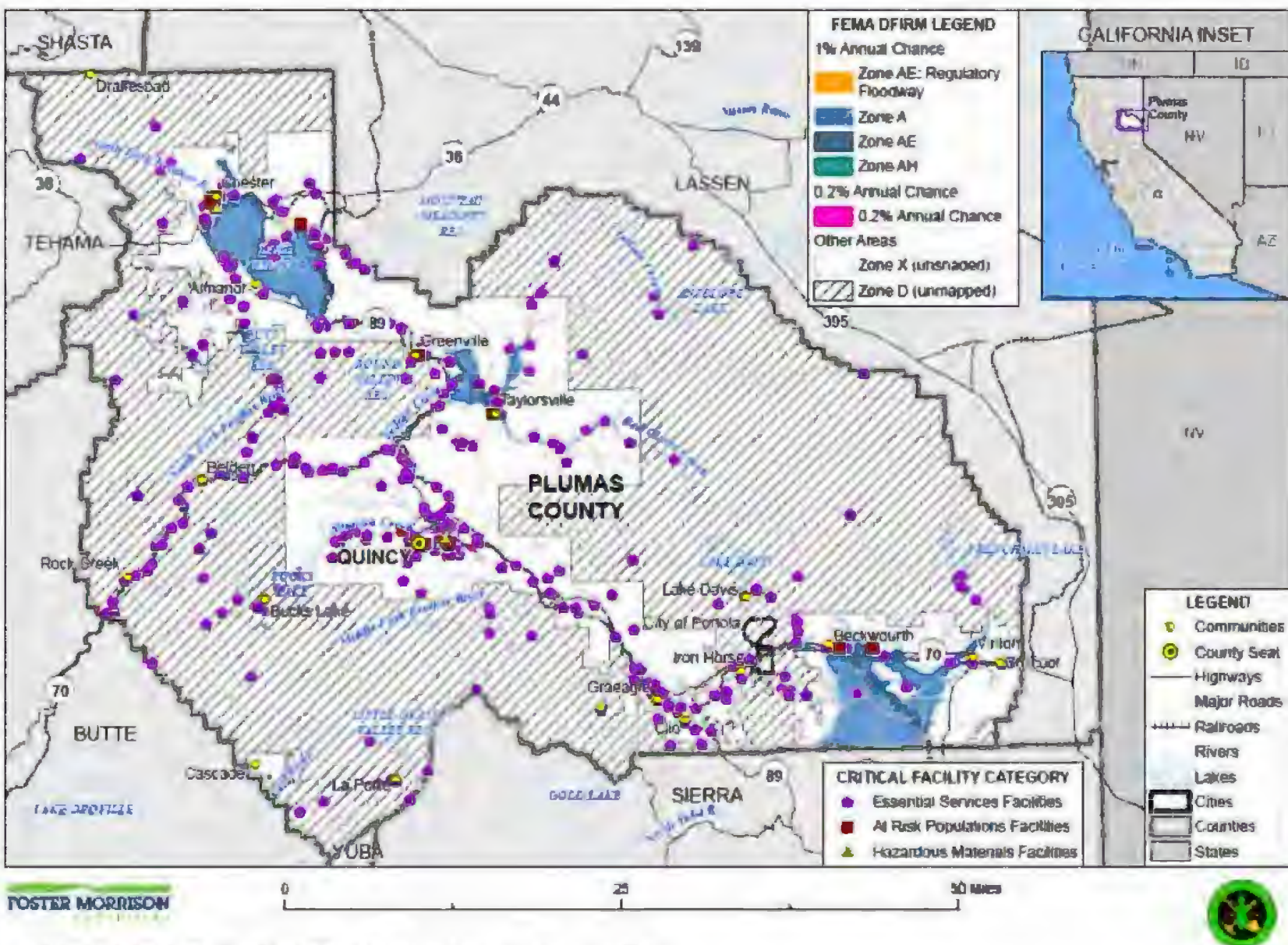


Table 4-69 Plumas County – Summary of Critical Facilities in DFIRM Flood Zones

Flood Zones	Critical Facility Category	Facility Count
1% Annual Chance Flood Hazard	Essential Services Facilities	81
	Total	81
0.2% Annual Chance Flood Hazard	Essential Services Facilities	25
	Hazardous Materials Facilities	1
	Total	26
Other Areas	Essential Services Facilities	667
	At Risk Populations Facilities	38
	Hazardous Materials Facilities	3
	Total	708
Grand Total		815

Source: Plumas County GIS, FEMA 3/2/2005 DFIRM

Table 4-70 Plumas County – Critical Facilities in DFIRM Flood Zones by Facility Category

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
1% Annual Chance Flood Hazard		
Zone AE Floodway	Essential Services Facilities	
	<i>Transportation Lifeline Systems</i>	
	Bridge - State Hwy	1
	Bridge (Local) - Category A	2
	Bridge (Local) - Category C	3
	Transportation Lifeline Systems Total	6
	Essential Services Facilities Total	6
	Total	6
Zone AE	Essential Services Facilities	
	<i>Communication Sites and Facilities</i>	
	Fixed Microwave	2
	Land Mobile Private	2
	<i>Communication Sites and Facilities Total</i>	4
	<i>Public Utility Plant and Substation Facilities</i>	
	Electric Sub-Station	1
	Propane Station	3
	Wastewater Treatment Plant	1
	Water Treatment Plant	1
	<i>Public Utility Plant and Substation Facilities Total</i>	6
	<i>Transportation Lifeline Systems</i>	
	Bridge - State Hwy	1

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
	<i>Transportation Lifeline Systems Total</i>	<i>1</i>
	Essential Services Facilities Total	11
	Total	11
Zone A	Essential Services Facilities	
	<i>Communication Sites and Facilities</i>	
	Fixed Microwave	4
	Land Mobile Commercial	1
	Land Mobile Private	15
	<i>Communication Sites and Facilities Total</i>	<i>20</i>
	<i>Public Safety</i>	
	Fire Station	3
	Public Safety Total	3
	<i>Public Utility Plant and Substation Facilities</i>	
	Community Services District	1
	Electric Sub-Station	1
	Power Plant	2
	<i>Public Utility Plant and Substation Facilities Total</i>	<i>4</i>
	<i>Transportation Lifeline Systems</i>	
	Airport	1
	Bridge - State Hwy	8
	Bridge (Local) - Category A	4
	Bridge (Local) - Category B	5
	Bridge (Local) - Category C	17
	<i>Transportation Lifeline Systems Total</i>	<i>35</i>
	Essential Services Facilities Total	62
	Total	62
Zone AH	Essential Services Facilities	
	<i>Communication Sites and Facilities</i>	
	Land Mobile Private	1
	Communication Sites and Facilities Total	1
	<i>Emergency Medical</i>	
	Wellness Center	1
	Emergency Medical Total	1
	Essential Services Facilities Total	2
	Total	2
1% Annual Chance Flood Hazard Total		81

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
0.2% Annual Chance Flood Hazard		
Zone X (shaded)	Essential Services Facilities	
	<i>Communication Sites and Facilities</i>	
	Antenna Structure Registration	3
	Fixed Microwave	2
	Land Mobile Private	11
	Unknown	1
	Communication Sites and Facilities Total	17
	<i>Public Safety</i>	
	Fire Station	1
	Public Safety Total	1
	<i>Public Utility Plant and Substation Facilities</i>	
	Community Services District	1
	Electric Sub-Station	1
	Power Plant	1
	Propane Station	2
	Wastewater Treatment Plant	1
	Public Utility Plant and Substation Facilities Total	6
	Transportation Lifeline Systems	
	Airport	1
	Transportation Lifeline Systems Total	1
	Essential Services Facilities Total	25
	Hazardous Materials Facilities	
	<i>Industrial</i>	
	Timber Products	1
	Industrial Total	1
	Hazardous Materials Facilities Total	1
	Total	26
0.2% Annual Chance Flood Hazard Total		26
Other Areas		
Zone X (unshaded)	Essential Services Facilities	
	<i>Communication Sites and Facilities</i>	
	AM	1
	Antenna Structure Registration	24
	Cellular	2
	Fixed Microwave	63
	FM	11

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
	Land Mobile Commercial	3
	Land Mobile Private	144
	Paging	2
	Repeater	4
	TV NTSC	1
	Unknown	2
	<i>Communication Sites and Facilities Total</i>	<i>257</i>
	<i>Designated Emergency Shelter</i>	
	Shelter	3
	<i>Designated Emergency Shelter Total</i>	<i>3</i>
	<i>Emergency Medical</i>	
	Clinic	3
	Home Health Agency/Hospice	1
	Hospital	2
	Pharmacy	4
	Wellness Center	2
	<i>Emergency Medical Total</i>	<i>12</i>
	<i>Emergency Response</i>	
	Fire Station	2
	<i>Emergency Response Total</i>	<i>2</i>
	<i>Essential Government Operations</i>	
	County Offices including Courts	1
	Plumas Co. Planning, Building, Engineering	1
	Plumas County Assessor	1
	Plumas County Child Support Services	1
	Plumas County Facility Services	1
	Plumas County Jail	1
	Plumas County Probation	1
	Plumas County Public Works	1
	Plumas County Public Works Yard	4
	Public, Behavioral & Envr. Health; Social Serv	1
	<i>Essential Government Operations Total</i>	<i>13</i>
	<i>Public Safety</i>	
	Fire Station	27
	Law Enforcement	4
	OES	1
	Public Health Dept.	1

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
	<i>Public Safety Total</i>	<i>33</i>
	<i>Public Utility Plant and Substation Facilities</i>	
	Community Services District	13
	Electric Sub-Station	11
	Power Plant	2
	Propane Station	3
	Public Utility District	3
	Wastewater Treatment Plant	3
	Water Treatment Plant	6
	<i>Public Utility Plant and Substation Facilities Total</i>	<i>41</i>
	<i>Transportation Lifeline Systems</i>	
	Airport	2
	Bridge - State Hwy	14
	Bridge (Local) - Category A	5
	Bridge (Local) - Category B	5
	Bridge (Local) - Category C	5
	Heliport	4
	<i>Transportation Lifeline Systems Total</i>	<i>35</i>
	Essential Services Facilities Total	396
	At Risk Populations Facilities	
	<i>Nursing, Congregate or Assisted Living</i>	
	Assisted Living Facility	2
	Nursing	1
	<i>Nursing, Congregate or Assisted Living Total</i>	<i>3</i>
	<i>School</i>	
	Adult	2
	Combined	10
	Day Care Center	9
	Elementary	7
	Infant Center	1
	Middle	1
	Post Secondary	1
	Secondary	4
	School Total	35
	<i>At Risk Populations Facilities Total</i>	<i>38</i>
	Hazardous Materials Facilities	
	<i>Unknown</i>	

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
	Community Services District	1
	Public Utility District	1
	Wastewater Treatment Plant	1
	Unknown Total	3
	Hazardous Materials Facilities Total	3
	Total	437
Zone D	Essential Services Facilities	
	Communication Sites and Facilities	
	Antenna Structure Registration	3
	Cellular	4
	Fixed Microwave	85
	FM	1
	Land Mobile Commercial	3
	Land Mobile Private	95
	Paging	1
	Repeater	2
	Unknown	1
	Communication Sites and Facilities Total	195
	Emergency Response	
	Fire Station	3
	Emergency Response Total	3
	Essential Government Operations	
	Plumas County Public Works Yard	1
	Essential Government Operations Total	1
	Public Safety	
	Fire Station	5
	Public Safety Total	5
	Public Utility Plant and Substation Facilities	
	Community Services District	2
	Electric Sub-Station	16
	Power Plant	7
	Water Treatment Plant	2
	Public Utility Plant and Substation Facilities Total	27
	Transportation Lifeline Systems	
	Bridge - State Hwy	15
	Bridge (Local) - Category A	7
	Bridge (Local) - Category B	7

Flood Zones	Critical Facility Category / Critical Facility Type	Facility Count
	Bridge (Local) - Category C	10
	Heliport	1
	<i>Transportation Lifeline Systems Total</i>	<i>40</i>
	Essential Services Facilities Total	271
	Total	271
Other Areas Total		708
Grand Total		815

Source: Plumas County GIS, FEMA 3/2/2005 DFIRM

Overall Community Impact

Floods and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the County during specific times. Natural areas, such as wetlands and riparian areas within the floodplain, often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for Plumas County. Based on the risk assessment, it is evident that floods will continue to have potentially devastating economic impacts to certain areas of the County. However, many of the floods in the County are minor, localized flood 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 and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental health of the community.

Future Development and Future Flood Conditions

This section provides an analysis of the flood hazard and proposed future development within the County based on FEMA DFIRMs and also discusses considerations in evaluating future flooding conditions.

Future Development: General Considerations

Communities that participate in the NFIP adopt regulations and codes that govern development in special flood hazard areas 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 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 2015, and later, 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. Also to be considered in reducing flooding in areas of existing and future development is to promote implementation of stormwater program elements and erosion and sediment controls, including the clearing of vegetation from natural and man-made drains that are critical to flood protection. Both native and invasive species can clog drains, and reduce flows of floodwaters, which slow that natural drainage process and can exacerbate flooding.

Future Development: GIS Analysis

Plumas County's February 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. The Plumas County Planning Department provided a table containing the assessor parcel numbers (APNs) for the 1,075 parcels representing the different future development projects or areas. Using the GIS parcel spatial file and the APNs, the future development projects were mapped.

For the flood analysis of future development areas, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point and linked to the Assessor's data. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts and acreage within each FEMA DFIRM flood zone. The County was separated into three areas. No future development areas intersected DFIRM flood zones in the north portion of the County, as such no map was created. Figure 4-110 shows the DFIRM flood zones and future development areas in the central portion of the County. Figure 4-111 shows the DFIRM flood zones and

future development areas in the south portion of the County. Parcels and acreages in the DFIRM flood zones are summarized in Table 4-71, and detailed by detailed DFIRM area in Table 4-72.

Figure 4-110 Plumas County Central – Future Development Areas in FEMA DFIRM Flood Zones

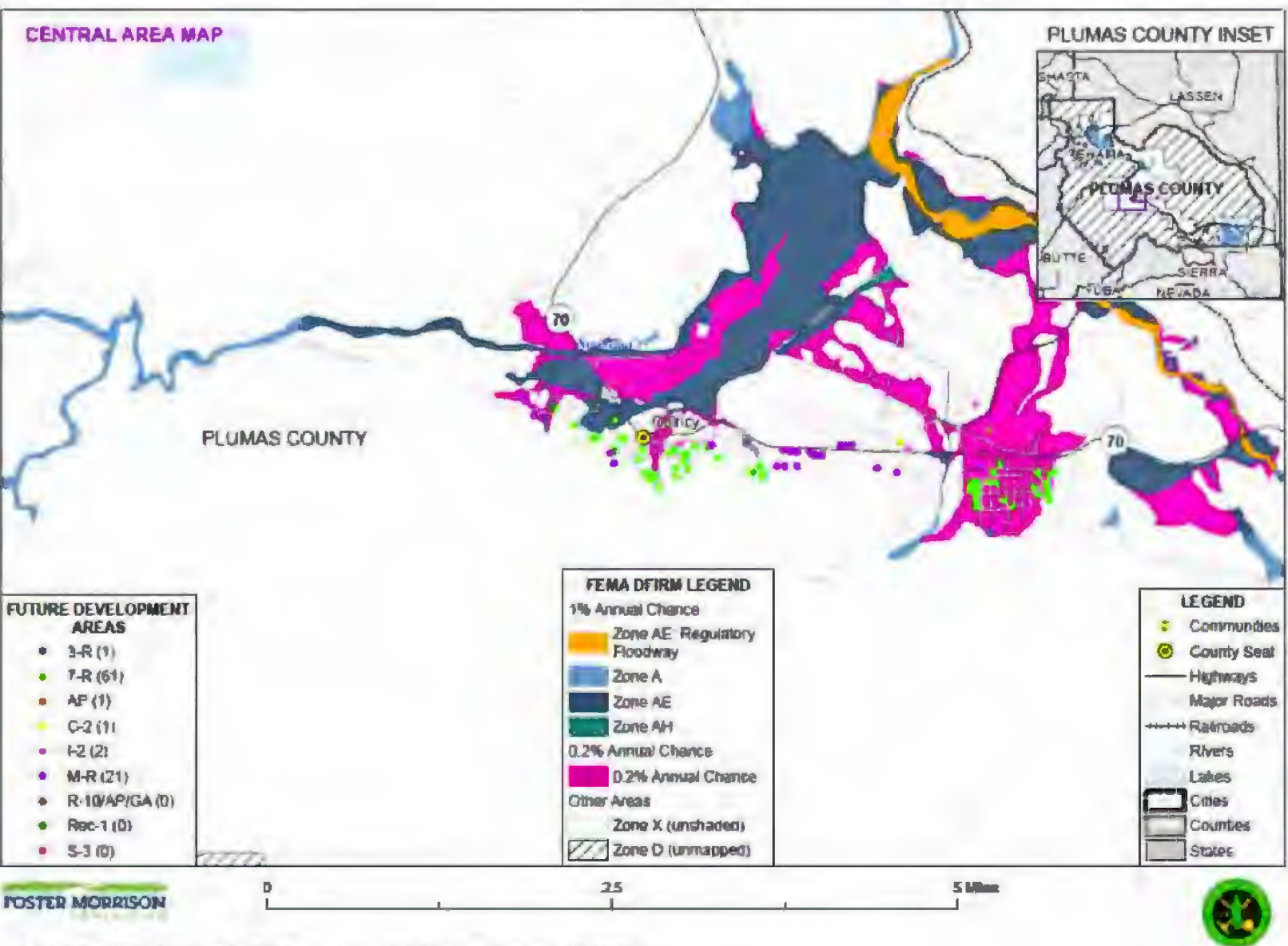


Figure 4-111 Plumas County South – Future Development Areas in FEMA DFIRM Flood Zones

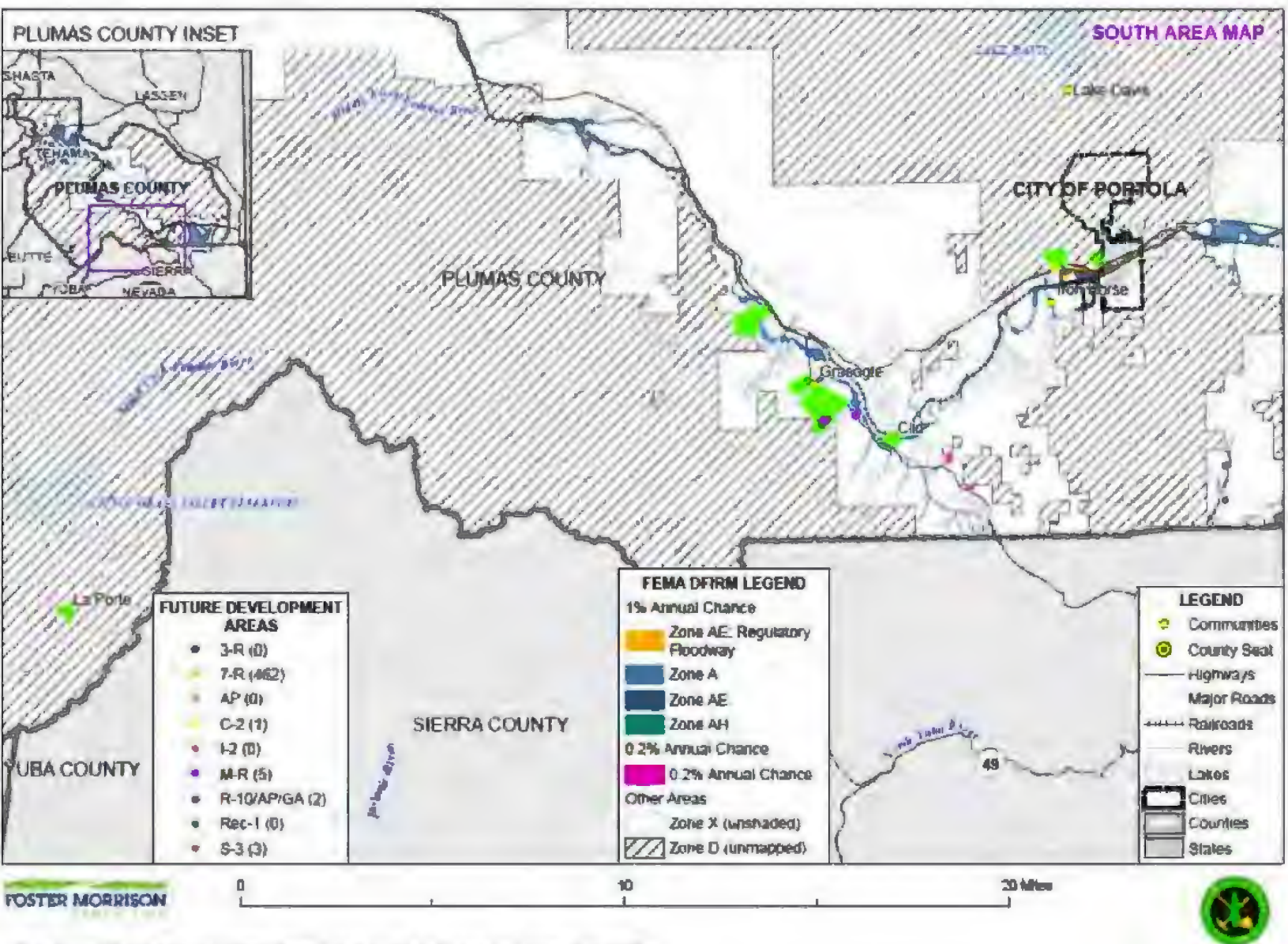


Table 4-71 Plumas County – Future Development Parcel and Acre Counts in Summary DFIRM Flood Zones

Map Area / Flood Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
North Area			
1% Annual Chance Flood Hazard	4	3	3.160
Other Areas	511	191	323.349
North Area Total	515	194	326.509
Central Area			
1% Annual Chance Flood Hazard	1		1.032
0.2% Annual Chance Flood Hazard	32	12	24.085
Other Areas	54	15	69.986
Central Area Total	87	27	95.103
South Area			
1% Annual Chance Flood Hazard	10	2	6.328
Other Areas	463	180	1,405.309
South Area Total	473	182	1,411.637
Grand Total	1,075	403	1,833.249

Source: Plumas County GIS, FEMA DFIRM 3/2/2005

Table 4-72 Plumas County – Future Development Parcel and Acre Counts in Detailed DFIRM Flood Zones

Map Area / Flood Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
North Area			
1% Annual Chance Flood Hazard			
7-R	4	3	3.160
1% Annual Chance Flood Hazard Total	4	3	3.160
Other Areas			
7-R	494	187	295.899
M-R	15	3	13.610
Rec-1	2	1	13.840
Other Areas Total	511	191	323.349
North Area Total	515	194	326.509
Central Area			
1% Annual Chance Flood Hazard			
7-R	1	0	1.032

Map Area / Flood Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
1% Annual Chance Flood Hazard Total	1	0	1.032
0.2% Annual Chance Flood Hazard			
3-R	1	0	9.010
7-R	27	12	8.095
AP	1	0	4.010
M-R	3	0	2.970
0.2% Annual Chance Flood Hazard Total	32	12	24.085
Other Areas			
7-R	33	10	20.836
C-2	1	0	2.870
I-2	2	1	15.930
M-R	18	4	30.350
Other Areas Total	54	15	69.986
Central Area Total	87	27	95.103
South Area			
1% Annual Chance Flood Hazard			
7-R	10	2	6.328
1% Annual Chance Flood Hazard Total	10	2	6.328
Other Areas			
7-R	452	177	168.657
C-2	1	0	3.860
M-R	5	1	67.642
R-10	2	1	1,108.880
S-3	3	1	56.270
Other Areas Total	463	180	1,405.309
South Area Total	473	182	1,411.637
Grand Total	1,075	403	1,833.249

Source: Plumas County GIS, FEMA DFIRM 3/2/2005

Future Flood Conditions: The Effects of Climate Change

The effects of climate change on future flood conditions should also be considered. While the risk and associated short and long-term impacts of climate change are uncertain, experts in this field tend to agree that among the most significant impacts include those resulting from increased heat and precipitation events that cause increased frequency and magnitude of flooding. Changes associated with climate change and flooding could be significant given the higher elevations in the County where winter snow could turn to more significant rain events. Increases in damaging flood events will cause greater property damage, public

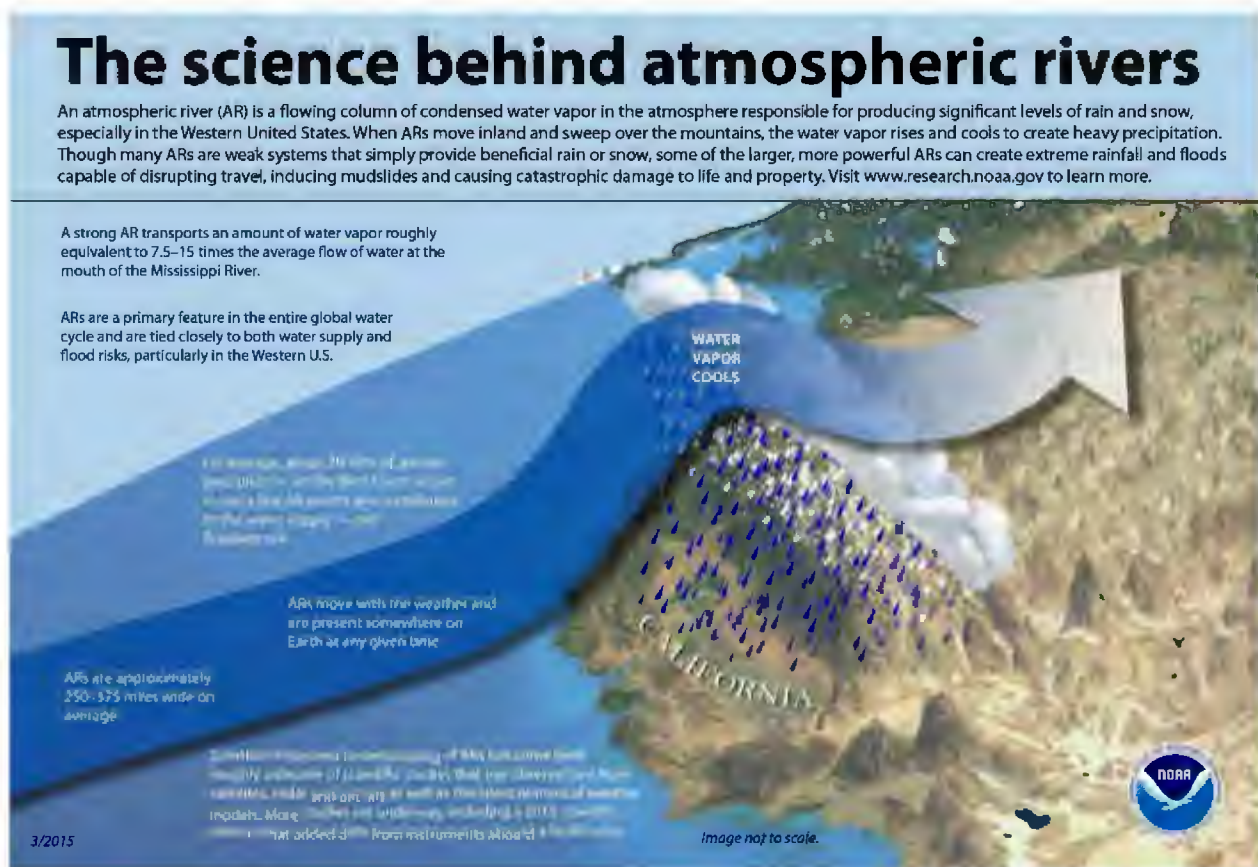
health and safety concerns displacement, and loss of life. In addition, an increase in the magnitude and severity of flood events can lead to potential contamination of potable water and contamination of food crops given the agricultural industry in the County. Displacement of residents can include both temporary and long-term displacement, increase in insurance rates or restriction of coverage in vulnerable areas.

Plumas County will continue to study the risk and vulnerability associated with future flood conditions, both in terms of future growth areas and other considerations such as climate change, as they evaluate and implement their flood mitigation and adaptation strategy for the Plumas County Planning Area.

Future Flood Conditions: Atmospheric Rivers

Plumas County and the rest of Northern California can 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 4-112.

Figure 4-112 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.

Future Flood Conditions: ARkStorm Scenario

Also to be considered in evaluating potential “worst case” future flood conditions, is the ARkStorm Scenario. Although much attention in California’s focuses on the “Big One” as a high magnitude earthquake, there is the risk of another significant event in California – a massive, statewide winter storm. The last such storms occurred in the 19th century, outside the memory of current emergency managers, officials, and communities. However, massive storms are a recurring feature of the state, the source of rare but inevitable disasters. The USGS Multi Hazards Demonstration Project’s (MHDP) developed a product called ARkStorm, which addressed massive U.S. West Coast storms analogous to those that devastated California in 1861-1862. Over the last decade, scientists have determined that the largest storms in California are the product of phenomena called Atmospheric Rivers, and so the MHDP storm scenario is called the ARkStorm, for Atmospheric River 1000 (a measure of the storm’s size).

Scientific studies of offshore deposits in northern and southern California indicate that storms of this magnitude and larger have occurred about as often as large earthquakes on the southern San Andreas Fault. Such storms are projected to become more frequent and intense as a result of climate change. This scientific effort resulted in a plausible flood hazard scenario to be used as a planning and preparation tool by hazard mitigation and emergency response agencies.

For the ARkStorm Scenario, experts designed a large, scientifically realistic meteorological event followed by an examination of the secondary hazards (e.g., landslides and flooding), physical damages to the intense winter storms of 1861-62 that left California’s Central Valley impassible. Storms far larger than the ARkStorm, dubbed megastorms, have also hit California at least six times in the last two millennia.

The ARkStorm produces precipitation in many places exceeding levels experienced on average every 500 to 1,000 years. Extensive flooding in many cases overwhelms the state’s flood protection system, which is at best designed to resist 100- to 200-year runoffs (many flood protection systems in the state were designed for smaller runoff events). The Central Valley experiences widespread flooding. Serious flooding also occurs in Orange County, Los Angeles County, San Diego, the San Francisco Bay Area, and other coastal

communities. In some places, winds reach hurricane speeds, as high as 125 miles per hour. Hundreds of landslides occur, damaging roads, highways, and homes. Property damage exceeds \$300 billion, most of it from flooding. Agricultural losses and other costs to repair lifelines, dewater flooded islands, and repair damage from landslides brings the total direct property loss to nearly \$400 billion, of which only \$20 to \$30 billion would be recoverable through public and commercial insurance. Power, water, sewer, and other lifelines experience damage that takes weeks or months to restore. Flooding evacuation could involve over one million residents in the inland region and Delta counties.

A storm of ARkStorm's magnitude has important implications: 1) it raises serious questions about the ability of existing national, state, and local disaster policy to handle an event of this magnitude; 2) it emphasizes the choice between paying now to mitigate, or paying a lot more later to recover; 3) innovative financing solutions are likely to be needed to avoid fiscal crisis and adequately fund response and recovery costs; 4) responders and government managers at all levels could be encouraged to conduct self-assessments and devise table-top exercises to exercise their ability to address a similar event; 5) the scenario can be a reference point for application of FEMA and Cal OES guidance connecting federal, state, and local natural hazards mapping and mitigation planning under the NFIP and Disaster Mitigation Act of 2000; and 6) common messages to educate the public about the risk of such an extreme event could be developed and consistently communicated to facilitate policy formulation and transformation.

Figure 4-113 depicts an ARkStorm modeled scenario showing the potential for flooding primarily in the Central Valley as the result of a large storm. In Plumas County, the modeled scenario suggests the County does not fall within the impacted area of this ARkStorm model scenario.

Figure 4-113 Projected ARkStorm Flooding in California



Source: USGS ARkStorm

4.3.12. Flood: Localized Flooding

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect 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 County 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

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. 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. Localized flooding often has a short duration.

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. Figure 4-108 provides a summary of the primary localized flooding problems in the Sierra Valley. See Table 4-73 through Figure 4-117 for photos of localized flooding in the Sierra Valley.

Table 4-73 Sierra Valley Localized Flooding Issues

Area	Issues
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
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
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
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
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.

Source: Plumas County 2014 LHMP, HMPC

Figure 4-114 High Water Mark from 1992 Flood Event on Rocky Point Road



Source: Plumas County 2014 LHMP

Figure 4-115 Sierra Valley Marble Hot Springs Road – Localized Flood Area



Source: Plumas County 2014 LHMP

Figure 4-116 Rocky Point Road – Shoulder Erosion from Localized Flooding



Source: Plumas County 2014 LHMP

Figure 4-117 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 the 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 4-74 provides a summary of the primary localized flooding issues in Indian Valley: Figure 4-118 through Figure 4-122 provide photos and descriptions of localized Indian Valley flooding issues.

Table 4-74 Summary of Indian Valley Localized Flooding Issues

Area	Issues
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
Cassidy's Turn	Shows high water mark from 1997 flood
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, flooding is caused by saturation of adjacent agricultural fields
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
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
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
Genesee Road @ Little Grizzly Creek	Flooding can close road cutting off access for 15-20 homes

Source: Plumas County 2014 LHMP

Figure 4-118 Indian Valley Localized Flooding – North Valley Road crossing Williams Creek where Culverts often Clog with Debris



Source: Plumas County 2014 LHMP

Figure 4-119 Indian Valley Localized Flooding – Ponding area of Stampfli Lane has Poor Drainage and Floods Annually



Source: Plumas County 2014 LHMP

Figure 4-120 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 4-121 Indian Valley Localized Flooding – Residential Structure in Crescent Mills built at Drain Point of Basin Experiences Repeated Flooding



Source: Plumas County 2014 LHMP

Figure 4-122 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 4-75 provides a summary of the primary localized flooding issues in American Valley. Figure 4-123 through Figure 4-132 provides photos and descriptions of American Valley localized flooding issues.

Table 4-75 American Valley Localized Flooding Issue Summary

Area	Issues
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
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.

Area	Issues
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
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
Old Sewer Plant (at bike path)	Drainage path takes 90-degree turn into culverts underneath bike path Water drains poorly and overtops path
West's Ranch Road (at CA-70)	Road needs to be elevated and larger pipes installed
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
Chandler Road (West)	Beddell Ranch and Green Bridge areas often flood Easy fix is to elevate road and install culverts where needed
Oakland Camp Road	Floods from intersection with Chandler Road to Oakland Camp gate Easy fix is to elevate road and install culverts where needed
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
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
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
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

Source: Plumas County 2014 LHMP

Figure 4-123 American Valley Localized Flooding – Storm Grate behind Les Schwab Becomes Clogged with Debris Causing Flooding



Source: Plumas County 2014 LHMP

Figure 4-124 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 4-125 American River Localized Flooding – Lindan Avenue in 2012



Source: Member of HMPC (Marty Walters)

Figure 4-126 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 4-127 American Valley Localized Flooding – Flood Water from Hentschel’s Flows Across Street and into School.



Source: Plumas County 2014 LHMP

Figure 4-128 American Valley Localized Flooding – Water Overtops Drainage at Culverts Where Forced to take 90-degree Right Turn.



Source: Plumas County 2014 LHMP

Figure 4-129 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 4-130 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 4-131 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 4-132 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 river banks, 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.

Past Occurrences

Disaster Declarations

There are no identified state or federal disaster declarations specifically related to 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

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 4-133 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—With respect to the localized, stormwater flood issues, the potential for flooding may increase as storm water is channelized due to land development. Such changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels.

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.

Members of the HMPC noted that climate change is already affecting the County in low lying areas - American Valley and Indian Valley. Many of these areas are experiencing more rain on snow events, that can cause overloading of stormwater flow ditches.

Vulnerability Assessment

Vulnerability—Medium

Historically, the Plumas County Planning Area has been at risk to flooding primarily during the winter and spring months when stream systems in the County swell with heavy rainfall. Localized flooding also occurs throughout the Planning Area at various times throughout the year with several areas of primary concern unique to each community. Plumas County tracks localized flooding areas as shown above.

Impacts

Localized flooding can cause damage to roads, infrastructure and utilities, as well as to buildings in the County. Temporary road closures due to localized flooding can be a significant issue in the County. In addition to flooding and road closures, damage to these areas during heavy storms includes, pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. Impacts to property and life safety from localized flooding would be more limited. Local community service districts have seen infiltration and inflow into sewer systems during heavy rain and localized flooding events.

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 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.

4.3.13. Landslides, Mudslides, and Debris Flows

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas. Landslide events can be determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard. Another type of landslide, debris flows, also occur in some areas of the County. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate. Debris flows also occur in post-wildfire burn areas.

Landslides often accompany or follow other natural hazard events, such as floods, wildfires, or earthquakes. A discussion on the effects of wildfire on landslides is included in the wildfire profile in Section 4.3.18. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

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.

Location and Extent

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. The USGS maps areas of landslide potential. Figure 4-134 shows the USGS Landslide Incidence and Susceptibility Areas in the County.

Figure 4-134 Landslide Incidence and Susceptibility Areas



The legend on Figure 4-134 shows the measurement system that the USGS uses to show the possible magnitude of landslides. It is a combination of slope class and rock strength. 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. 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:

- Arlington Road
- Gold Lake Forest Highway
- Quincy-LaPorte Road
- Bucks Lake Road
- Big Creek Road
- North Valley Road
- Mill Creek at SR70

The 2001 Landslide Incidence and Susceptibility data was obtained for the Plumas County Planning Area. According to the landslide layer obtained by the USGS there landslide incidence ranges from low to moderate in the Planning Area. Geographical extents of the USGS landslide incidence and susceptibility areas in the Plumas County Planning Area are shown on Table 4-76.

Table 4-76 Plumas County Planning Area – Geographical Extents of Landslide Incidence and Susceptibility Areas

Landslide Incidence and Susceptibility	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
High	0	0.0%	0	0.0%	0	0.0%
Moderate	147,993	8.49%	1,258	1.70%	146,734	8.79%
Low	1,595,207	91.51%	72,792	98.30%	1,522,415	91.21%
Total	1,743,200	100.00%	74,050	100.00%	1,669,150	100.00%

Source: USGS

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated with landslides in Plumas County, as shown in Table 4-4.

NCDC Events

The NCDC contains no records for landslides in Plumas County.

Hazard Mitigation Planning Committee Events

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 4-135 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 mudslide 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 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.

Climate Change and Landslide and Debris Flows

According to the 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

Landslides in Plumas County include a wide variety of processes resulting in downward and outward movement of soil, rock, and vegetation. Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines.

Although this hazard also includes related issues such as mudslides and debris flows, available mapped hazard data was limited to landslides; thus, the remainder of this section is focused on the landslide vulnerability.

Impacts

Impacts from landslides in the County can vary greatly. In unpopulated areas, landslides have little effect. However, if landslides occur in populated areas, damages can be sustained by buildings, critical facilities, infrastructure, and injuries, and in extreme cases deaths, can occur. Landslide can affect ingress and egress routes. Many locations in the County have limited ingress and egress routes. Cutting off one of these routes can cause multiple issues, from issues with elderly and those who are sick, to limiting emergency response to hazards from police, fire, and other County entities.

Values at Risk

Landslides can affect the built environment of Plumas County. GIS was used to analyze these possible effects. A methodology and the results of the analysis follow.

Methodology

The landslide incidence and susceptibility data are a digital version of U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States dated 2001. The map and digital data delineate areas in the conterminous United States where large numbers of landslides have occurred and areas which are susceptible to landsliding.

The 2001 Landslide Incidence and Susceptibility data was obtained for the Plumas County Planning Area. According to the landslide layer obtained by the USGS there landslide incidence ranges from low to moderate in the County. Most of the County falls in the low, with small amounts in the falling in the moderate areas. The County's parcel layer was used as the basis for the inventory of all parcels within Plumas County. GIS was used to overlay the landslide hazard layer onto the parcel layer centroids, and where the landslide zones intersected a parcel centroid, it was assigned with that hazard zone for the entire parcel.

Values at Risk Results

The USGS landslide layer was overlaid with the Plumas County parcel layer in GIS to obtain results. Table 4-77 summarizes and Table 4-78 details and illustrates the potential estimated damages to Plumas County Planning Area from properties in the USGS Landslide Incidence and Susceptibility Area, including FEMA contents replacement values. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the landslide incidence and susceptibility areas due primarily to Proposition 13 and to a lesser extent properties falling under the Williamson Act.

Table 4-77 Plumas County – County and Value of Parcels in Landslide Susceptibility Areas

Landslide Susceptibility and Incidence Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
High	0	0	\$0	\$0	\$0	\$0	\$0
Moderate	287	108	\$10,766,678	\$12,339,625		\$6,294,506	\$29,400,809
Low	24,119	13,628	\$1,275,376,116	\$2,420,752,153	\$18,634,395	\$1,388,266,596	\$5,103,029,260
Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: USGS, Plumas County February 2020 Parcel/Assessor's Data

Table 4-78 Plumas County – Count and Value of Parcels in Landslide Susceptibility and Incidence Areas by Property Use

Landslide Susceptibility and Incidence Area / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Moderate							
Agricultural	113	3	\$3,336,325	\$165,284	\$0	\$165,284	\$3,666,893
Commercial	1	1	\$60,712	\$71,751	\$0	\$71,751	\$204,214
Federal Lands	15	0	\$0	\$0	\$0	\$0	\$0
Government	4	0	\$39,680	\$0	\$0	\$0	\$39,680
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	1	1	\$72,439	\$12,351	\$0	\$12,351	\$97,141
Residential	144	103	\$7,257,522	\$12,090,239	\$0	\$6,045,120	\$25,392,881
ROW/Utilities	6	0	\$0	\$0	\$0	\$0	\$0
Moderate Total	287	108	\$10,766,678	\$12,339,625	\$0	\$6,294,506	\$29,400,809
Low							
Agricultural	1,872	275	\$102,604,303	\$23,701,624	\$2,293,939	\$23,701,624	\$152,301,490

Landslide Susceptibility and Incidence Area / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Commercial	866	608	\$68,604,736	\$198,819,202	\$9,768,708	\$198,819,202	\$476,011,848
Federal Lands	199	0	\$0	\$0	\$0	\$0	\$0
Government	586	0	\$104,062	\$0	\$0	\$0	\$104,062
Industrial	147	84	\$9,699,636	\$45,102,146	\$314,544	\$67,653,219	\$122,769,545
Institutional	87	45	\$1,884,400	\$12,698,132	\$79,905	\$12,698,132	\$27,360,569
Miscellaneous	126	0	\$8,119	\$0	\$0	\$0	\$8,119
Recreational	521	96	\$14,043,469	\$30,357,788	\$1,429,945	\$30,357,788	\$76,188,990
Residential	18,661	12,520	\$1,078,427,391	\$2,110,073,261	\$4,747,354	\$1,055,036,631	\$4,248,284,637
ROW/Utilities	1,054	0	\$0	\$0	\$0	\$0	\$0
Low Total	24,119	13,628	\$1,275,376,116	\$2,420,752,153	\$18,634,395	\$1,388,266,596	\$5,103,029,260
Plumas County Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068
Grand Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: USGS, Plumas County February 2020 Parcel/Assessor's Data

It should be noted that maps and analysis represent analyses based on best available data. There have been past occurrences of landslides in areas not shown to be at risk to landslide. Generally, landslide risk maps detail areas prone to slope failure; the maps rarely include the runout areas where the failed slope will go. By way of example, a landslide on March 22, 2014, killed 43 people when it wiped out a rural neighborhood in Oso, northeast of Seattle. While the failed slope area was mapped as prone to landslides, the runout area was not. It was the runout area that resulted in devastating loss. Thus, mapping of landslide susceptible areas should be considered as one part of the equation. Damages to the area that could be inundated by such slope failure should also be considered by communities.

Populations at Risk

Those residential parcel centroids that intersect the landslide risk areas were counted and multiplied by the 2010 Census Bureau average household factors for Plumas County. This is shown in Table 4-79. According to this analysis, there is a total population of 239 residents in the Plumas County Planning Area are risk to moderate incidence or greater landslide.

Table 4-79 Plumas County –Residential Parcels and Population by Landslide Incidence and Susceptibility Areas

Landslide Incidence and Susceptibility Area	Improved Residential Parcels	Population at Risk
High	0	0
Moderate	103	239

Landslide Incidence and Susceptibility Area	Improved Residential Parcels	Population at Risk
Total	103	239

Source: USGS, US Census Bureau Average Household Sizes: and unincorporated Plumas County (2.32)

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Plumas County to determine critical facilities in the landslide potential areas. Using GIS, USGS Landslide Incidence and Susceptibility Areas were overlayed on the critical facility GIS layer. Figure 4-136 shows critical facilities, as well as the landslide potential areas. Table 4-80 summarized critical facilities in landslide potential areas. Table 4-81 details critical facilities by facility type and count in the moderate or higher landslide potential areas for the County. Details of critical facility definition, type, name and address by flood zone are listed in Appendix F.

Table 4-80 Plumas County – Summary of Critical Facilities in Landslide Incidence and Susceptibility Areas

Landslide Susceptibility and Incidence Area	Critical Facility Category	Facility Count
Low	Essential Services Facilities	718
	At Risk Populations Facilities	38
	Hazardous Materials Facilities	4
	Total	760
Moderate	Essential Services Facilities	55
	Total	55
Grand Total		815

Source: Plumas County GIS, USGS

Table 4-81 Plumas County – Critical Facilities in Moderate or Higher Landslide Incidence and Susceptibility Areas by Facility Type

Landslide Susceptibility and Incidence Area	Critical Facility Category	Facility Count
Moderate	Essential Services Facilities	
	<i>Communication Sites and Facilities</i>	
	Antenna Structure Registration	2
	Cellular	1
	Fixed Microwave	20
	Land Mobile Private	15
	Repeater	1
	<i>Communication Sites and Facilities Total</i>	39
	<i>Public Utility Plant and Substation Facilities</i>	
	Community Services District	1
	Electric Sub-Station	5
	Power Plant	2
	<i>Public Utility Plant and Substation Facilities Total</i>	8
	<i>Transportation Lifeline Systems</i>	
	Bridge - State Hwy	1
	Bridge (Local) - Category A	2
	Bridge (Local) - Category B	2
	Bridge (Local) - Category C	3
	<i>Transportation Lifeline Systems Total</i>	8
	Essential Services Facilities Total	55
Moderate Total		55

Source: Plumas County GIS, USGS

Overall Community Impact

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the Planning Area during specific times. Based on the risk assessment, it is evident that landslides will continue to have potentially large economic impacts to certain areas of the County. However, many of the landslides in the Planning Area 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;
- 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

Future Development

Although new growth and development corridors could 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's February 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. The Plumas County Planning Department provided a table containing the assessor parcel numbers (APNs) for the 1,075 parcels representing the different future development projects or areas. Using the GIS parcel spatial file and the APNs, the future development projects were mapped.

For the landslide analysis of future development areas, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point and linked to the Assessor's data. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts and acreage within each landslide incidence and susceptibility area. The County was separated into three areas. Figure 4-137 shows the landslide incidence and susceptibility area and future development areas in the central portion of the County. Figure 4-138 shows the landslide incidence and susceptibility area and future development areas in the central portion of the County. Figure 4-139 shows the landslide incidence and susceptibility area and future development areas in the south portion of the County. Parcels and acreages in the landslide incidence and susceptibility areas are summarized in Table 4-71.

Figure 4-137 Plumas County North – Future Development Areas in Landslide Incidence and Susceptibility Areas



Figure 4-138 Plumas County Central – Future Development Areas in Landslide Incidence and Susceptibility Areas

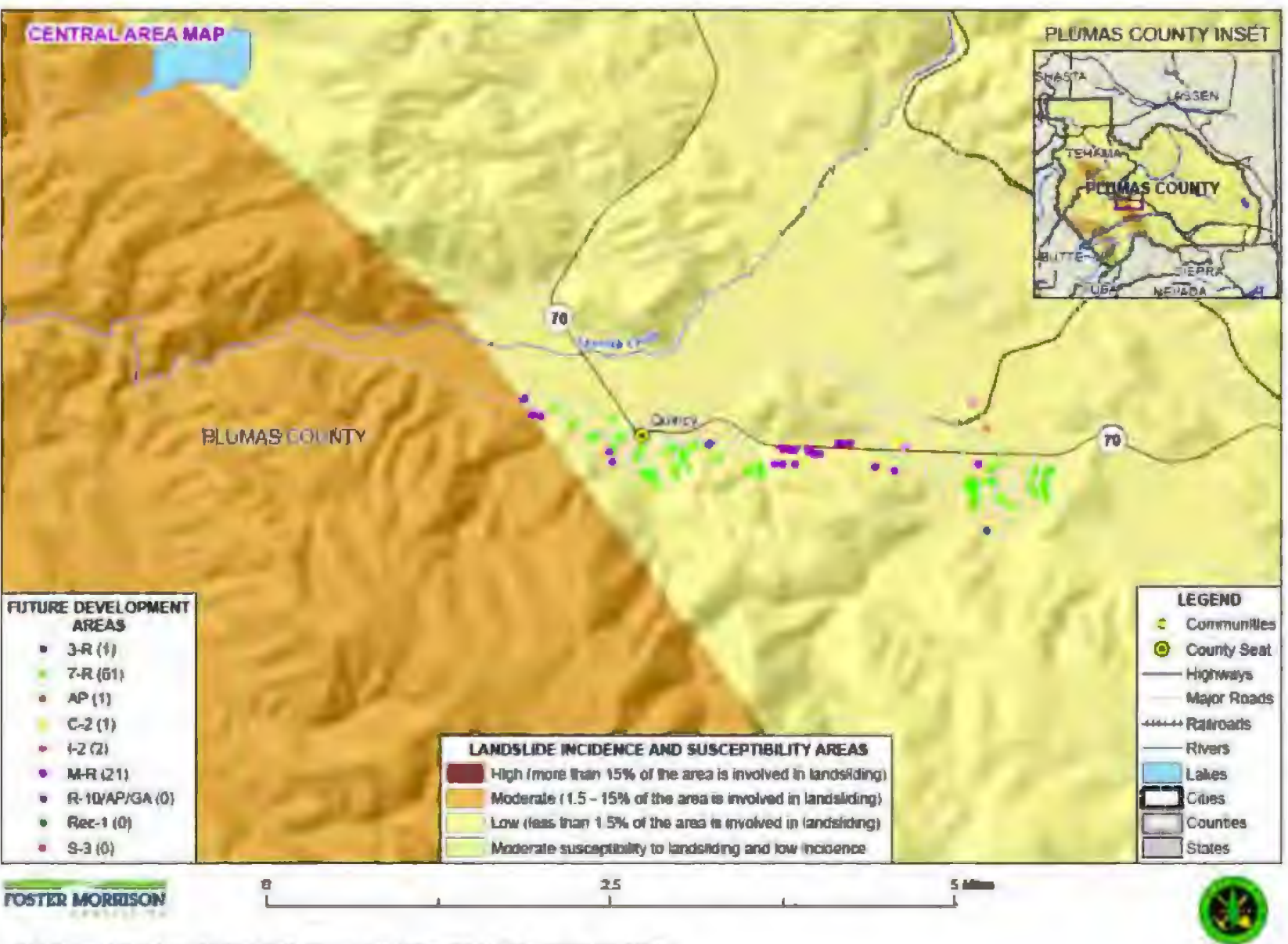


Figure 4-139 Plumas County South – Future Development Areas in Landslide Incidence and Susceptibility Areas

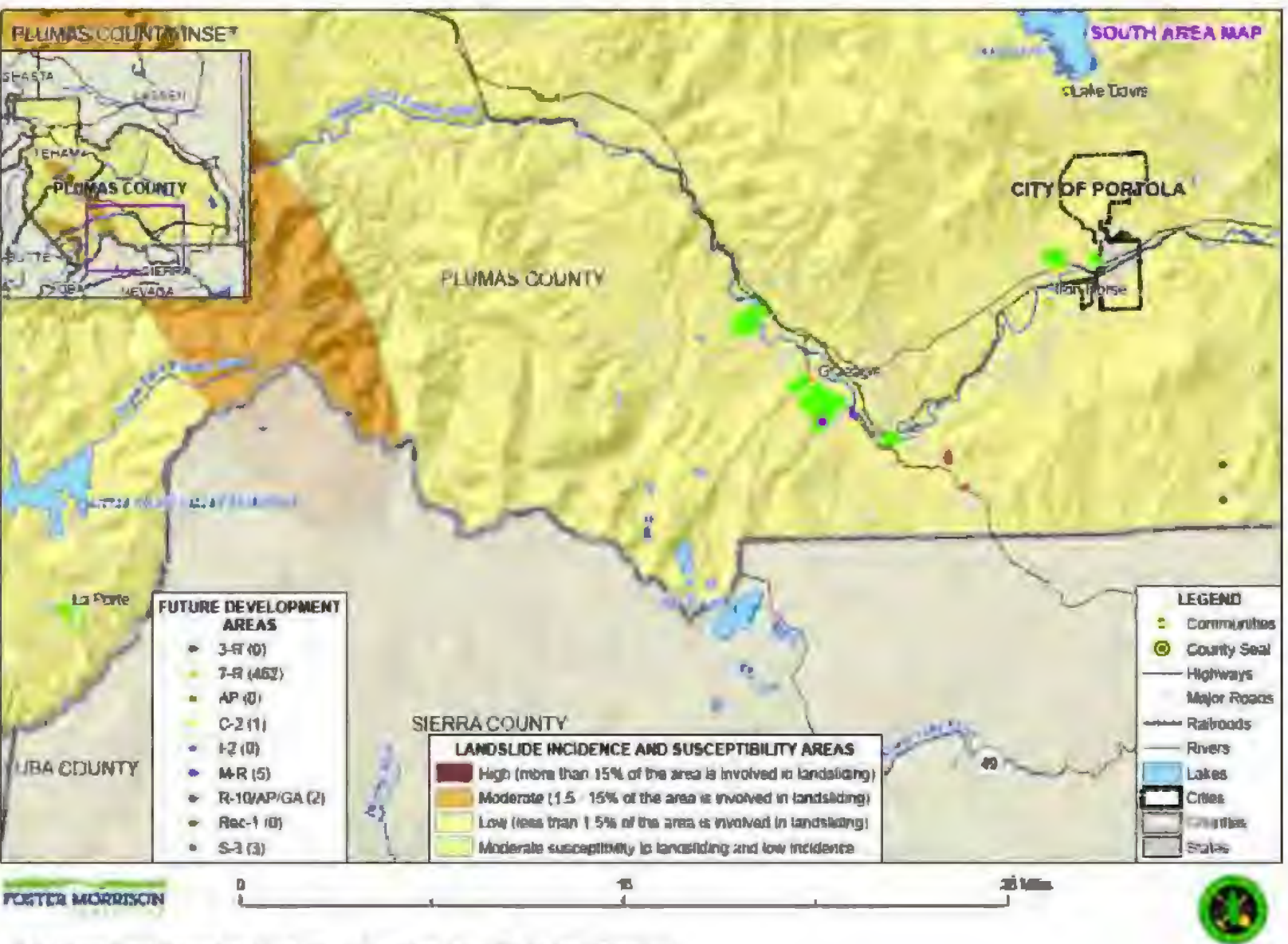


Table 4-82 Plumas County – Future Development Parcel and Acre Counts in Summary Landslide Susceptibility and Incidence Areas

Landslide Potential/Future Development	Total Parcel Count	Improved Parcel Count	Total Acres
Low			
3-R	1	0	9.010
7-R	1021	391	504.007
AP	1	0	4.010
C-2	2	0	6.730
I-2	2	1	15.930
M-R	41	8	114.572
R-10/AP/GA	2	1	1,108.880
Rec-1	2	1	13.840
S-3	3	1	56.270
Grand Total	1,075	403	1,833.249

Source: Plumas County GIS, USGS

4.3.14. Levee Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

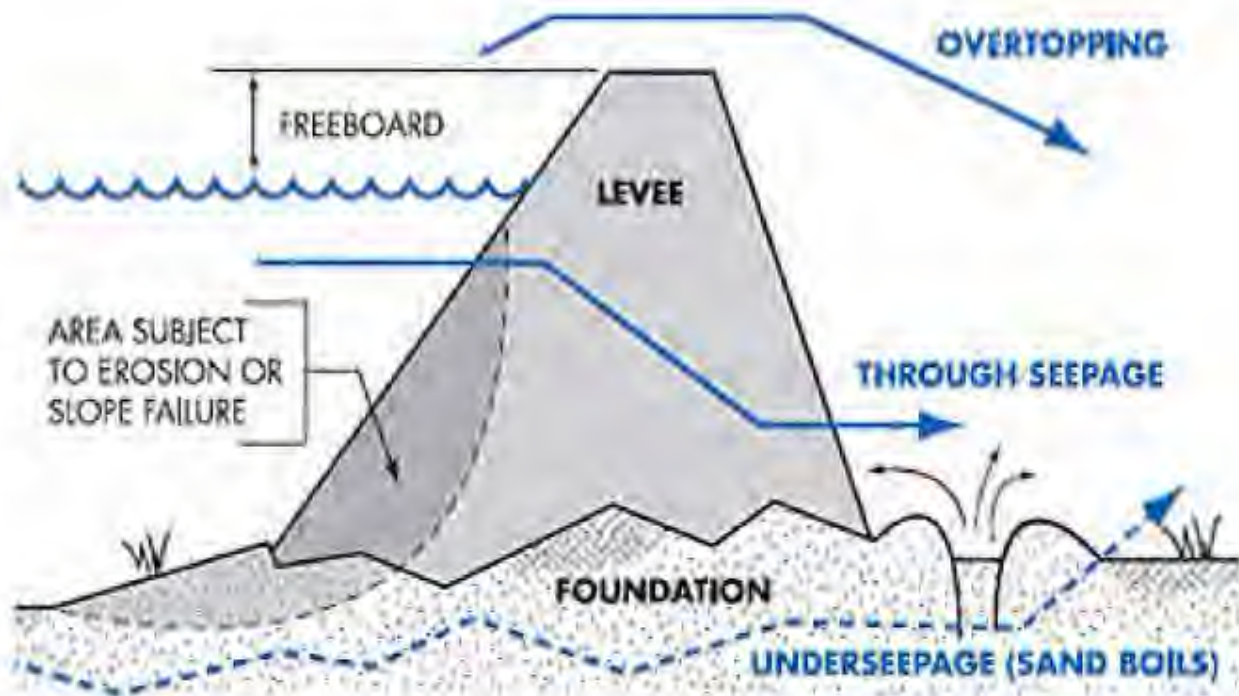
A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower steam channel, levees can also increase the speed of the water. Levees can be 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.

Under-seepage refers to water flowing under the levee through the levee foundation materials, often emanating from the bottom of the landside slope and ground surface and extending landward from the landside toe of the levee. Through-seepage refers to water flowing through the levee prism directly, often emanating from the landside slope of the levee. Both conditions can lead to failure by several mechanisms,

including excessive water pressures causing foundation heave and slope instabilities, slow progressing internal erosion, and piping leading to levee slumping. Rodents can burrow into and compromise the levee system. Erosion can also lead to levee failure. Figure 4-140 depicts the causes of levee failure.

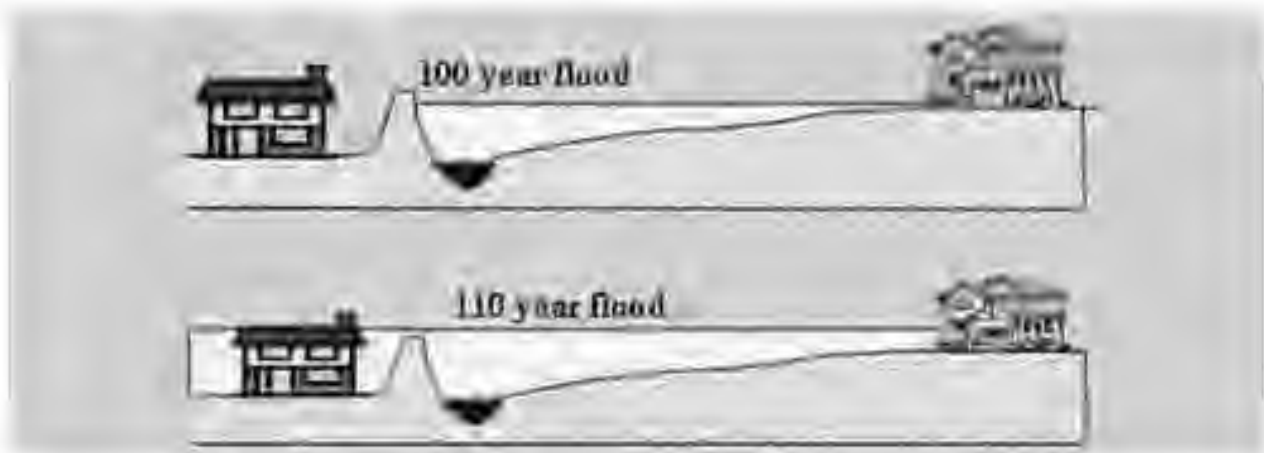
Figure 4-140 Potential Causes of Levee Failure



Source: USACE

Overtopping failure occurs when the flood water level rises above the crest of a levee. As shown in Figure 4-141, overtopping of levees can cause greater damage than a traditional flood due to the often lower topography behind the levee.

Figure 4-141 Flooding from Levee Overtopping



Source: *Levees in History: The Levee Challenge*. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.

Location and Extent

A search of the National Levee Database identified 3 leveed areas in Plumas County. None of these 3 levees are certified as providing protection from the 1% annual chance or other flood. These levees include:

- Plumas County Levee 1 (near Taylorsville)
- Plumas County Levee 2 (near Greenville)
- North Fork Feather River at Chester (near Chester) – East and West levees

A map of the County is shown on Figure 4-142.

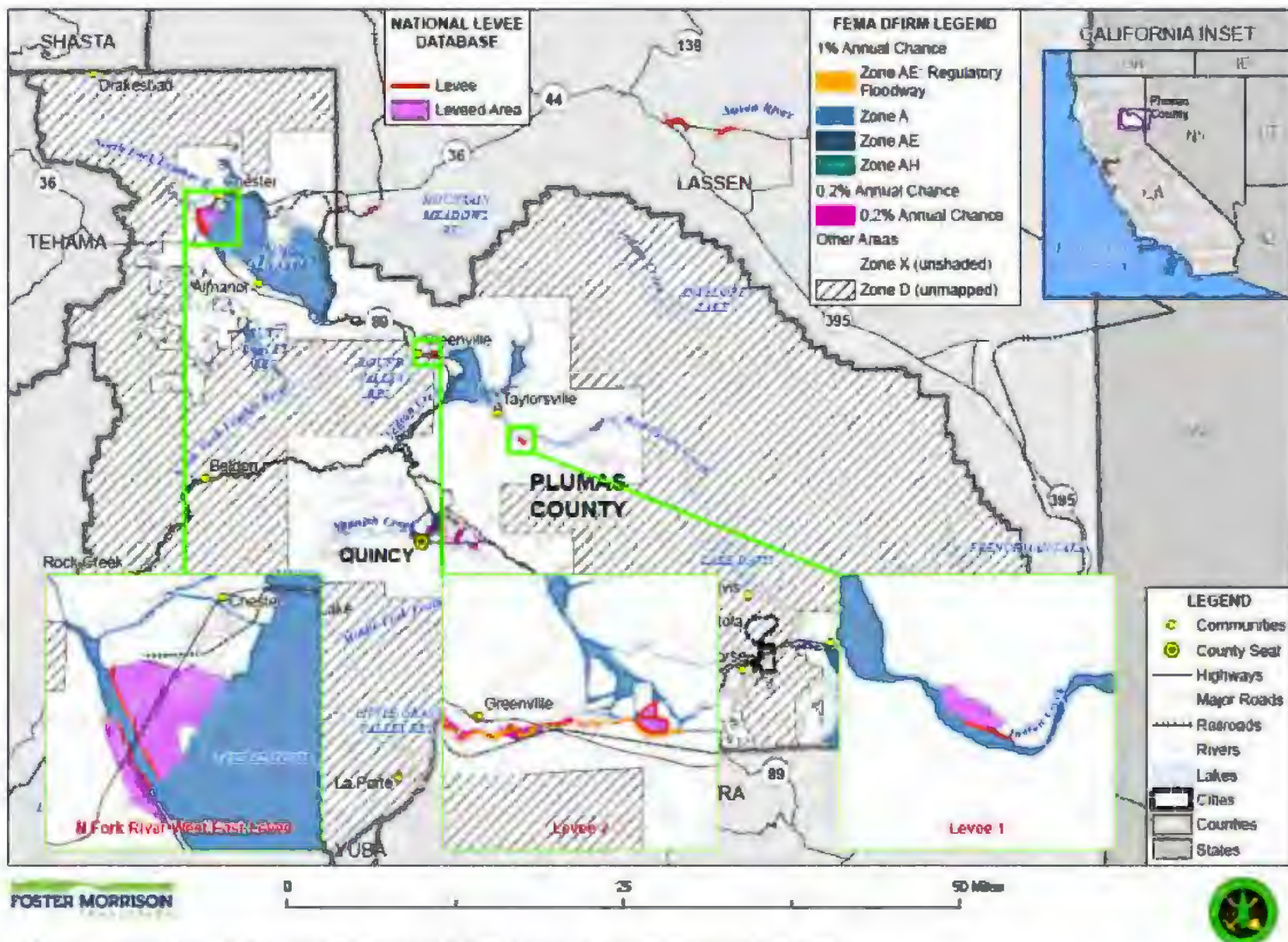


Figure 4-142 Plumas County – Levees and Locations

Data Source: National Levee Database (Website Version 2.31.0, API Version 2.31.0, Dataset last updated Apr 10, 2020).
FEMA DFIRM 3/2/2005 Plumas County GIS, CalAtlas. Map Date: 03/01/2020

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

There have been no disaster declarations related to levee failure in Plumas County, as shown on Table 4-5.

NCDC Events

There have been no NCDC levee failure events in Plumas County.

Hazard Mitigation Planning Committee Events

The HMPC noted the following levee events:

- During the Easter storm of **1952**, there was an avalanche that blocked a creek, causing it to back up and overtop Levee #2. Specific damages could not be recalled.
- In both **1986** and **1997** Levee #1 were overtopped and eroded. Both times it was fixed under a Natural Resource Conservation Service flood repair program. The levee protects ranch land, and some structures that are located below the river bed level in elevation. These structures are at risk from levee failure.

Likelihood of Future Occurrence

Unlikely – It is unlikely that levees in the County will fail. It is important to remember that no levee provides protection from events for which it was not designed: they are not fail-safe.

Climate Change and Levee Failure

In general, increased flood frequency in California is a predicted consequence of climate change. Mechanisms whereby climate change leads to an elevated flood risk include more extreme precipitation events and shifts in the seasonal timing of river flows. This threat may be particularly significant because recent estimates indicate the additional force exerted upon the levees is equivalent to the square of the water level rise. These extremes are most likely to occur during storm events, leading to more severe damage from waves and floods. Though this is tempered by the fact that there are so few levees in the County that would be affected. So, while climate change can increase flood frequency, in Plumas, it is unlikely to increase the potential for levee failure.

Vulnerability Assessment

Vulnerability—Medium

Levee failure flooding can occur as the result of partial or complete collapse of an impoundment, and often results from prolonged rainfall and flooding. The primary danger associated with dam or levee failure is the high velocity flooding of those properties downstream of the breach. Impacts from this include property damage, critical facility damage, and life safety issues. A levee failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to levee 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.

Vulnerability Analysis

The DFIRM shows no X Protected by Levee areas for the County. As such, no GIS analysis was performed on Plumas County Parcel and Assessor's Data. However, the National Levee Database has performed a basic analysis for each levee in the County. Information by levee follows. It is important to note, that although the National Levee Database identifies areas that the levee is protecting; these levee protected areas are not areas certified as providing protection against the 1% annual chance or other flood. It only represents those areas that the levee was designed to protect, but as they are not certified, they do not remove anyone within the protected area from the floodplain as represented in FEMA DFIRMs.

Plumas County Levee 1

Plumas County Levee 1 is located near Taylorsville. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 0.37 miles long. Protected areas were not quantified by the National Levee Database. Ownership and maintenance agencies of this levee were not included in the National Levee Database. The HMPC noted that landowners maintain the levee. Protected areas can be seen on Figure 4-143.

Figure 4-143 Plumas County Levee 1 Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 7
- Structures at Risk 3
- Property Value \$1,230,000

Plumas County Levee 2

Plumas County Levee 2 is located near Greenville. This levee is not accredited by FEMA as providing 1% annual chance flood protection. The levee is 0.79 miles long. Protected areas were not quantified by the National Levee Database. Ownership and maintenance agencies of this levee were not included in the National Levee Database. The HMPC noted that landowners maintain the levee. Protected areas can be seen on Figure 4-144.

Figure 4-144 Plumas County Levee 2 Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 0
- Structures at Risk 0
- Property Value \$0

North Fork Feather River at Chester – West Levee

The North Fork River at Chester – West Levee is an earthen levee located along the west bank of the Chester Flood Control Ditch. The Chester Flood Control Ditch is a man-made, rock-lined channel that funnels excess water from North Fork Feather River to Lake Almanor, about 1.5 miles southwest of Chester,

California. Water flows into the ditch after it is redirected by an upstream diversion dam. North Fork Feather River at Chester – West lowers the risk of flooding from the ditch. This levee is not accredited by FEMA as providing 1% annual chance flood protection.

The levee was constructed as part of the Feather River Project in 1976 to reduce the risk of flooding for Chester. According to the National Levee Database, this levee is locally maintained by the Plumas County Public Works. The Central Valley Flood Protection Board is its sponsor, and the California Department of Water Resources is charged with inspecting and helping maintain the levee. This levee is approximately 1.33 miles long, starting on Chester Ski Road, about half a mile north of Highway 36, and ending at Lake Almanor, east of Highway 89. The levee protects approximately 0.42 mi². Protected areas can be seen on Figure 4-145.

Figure 4-145 North Fork Feather River at Chester – West Levee Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 40
- Structures at Risk 8
- Property Value \$560,000

According to the National Levee Database, this levee is considered low risk based on the likelihood of the levee failing and the consequences to the people and property if it were to fail. Water has never risen up the side of this levee during a past flood event. Therefore, there is some uncertainty about how the levee will perform during a large storm. If water were to rise over the top of the levee, portions of the levee might erode, or be washed away. Large trees in the levee may allow water to seep through the levee and weaken the soils. If the levee were to fail, the land west of the levee could be flooded with up to 2 feet of water, including portions of Highway 36. There are currently no specific emergency warning systems in place for the area. However, there should be significant warning time before a flood and the population behind the levee is low. The levee has a high capacity for water and is expected to perform well overall. Evacuation routes are expected to be easily accessible for most of the people living behind the levee. The danger of a levee failure is also limited because there are no people living in the immediate vicinity of the levee.

North Fork Feather River at Chester East Levee

The North Fork River at Chester – East Levee is an earthen levee located along the east bank of the Chester Flood Control Ditch located roughly 1.5 miles southwest of Chester, California. The Chester Flood Control Ditch is a man-made, rock-lined channel that funnels excess water from North Fork Feather River to Lake Almanor. Water flows into the ditch after it is redirected by an upstream diversion dam. North Fork Feather River at Chester – East lowers the risk of flooding from the ditch for the people living in Chester. This levee is not accredited by FEMA as providing 1% annual chance flood protection.

The levee was constructed as part of the Feather River Project in 1976. According to the National Levee Database, this levee is locally maintained by the Plumas County Public Works. The Central Valley Flood Protection Board is its sponsor, and the California Department of Water Resources is charged with inspecting and helping maintain the levee. The levee is approximately 1.89 miles long, and runs north to south, starting about 1 mile north of Highway 36 where it crosses the ditch, to Lake Almanor. The levee protects approximately 1.89 mi². Protected areas can be seen on Figure 4-146.

Figure 4-146 North Fork Feather River at Chester – East Levee Protected Areas



Source: National Levee Database

An assessment was performed on January 1, 2017 of this levee. That risk analysis showed the following:

- People at Risk 613
- Structures at Risk 344
- Property Value \$75,900,000

This levee is considered low risk based on the likelihood of the levee failing and the consequences to the people and property if it were to fail. There has not yet been a rainstorm that caused water to rise that the very bottom of the levee. If water were to rise over the top of the levee, portions of the levee could be washed away. There is also a large open pit quarry that is very close to the base of the levee. During a heavy rainstorm, the water could seep through the area of the quarry and weaken the levee. However, if the levee were to break in this location, the water would fill the quarry first before flooding the area behind the levee. This would allow more time for people living in the leveed area to evacuate. Quarry operations would not

be occurring during such a storm. Flood water would be less than 2 feet deep. There are currently no specific emergency warning systems in place for the area. Warning times may be longer than expected. However, the levee has a high capacity for water and is generally expected to perform well, even in the event of a failure, though there is some uncertainty because it has never been tested by a flood. Evacuation routes are expected to be clear for most of the people living behind the levee. The danger of a levee failure is also limited since there are no people living in the immediate area of the levee.

Impacts

Levee failure flooding and associated impacts would vary depending on which structure fails and the nature and extent of the failure and associated flooding. This flooding can present a threat to life and property, including buildings, their contents, and their use. Large flood events can affect lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, agricultural industry, and the local and regional economies.

Future Development

With limited levees in the unincorporated County, future development will likely not be affected by this hazard. Should levees be built, future development built in the levee areas would be subject to the building standards in the Plumas County Floodplain Ordinance.

4.3.15. Pandemic

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

According to the World Health Organization (WHO), a disease epidemic occurs when there are more cases of that disease than normal. A pandemic is a worldwide epidemic of a disease. A pandemic may occur when a new virus appears against which the human population has no immunity. It is important to realize that this LHMP Update does not examine pandemic contingency plans, but instead focuses on examining the risk of a normal hazard occurrence.

A pandemic occurs when a new virus emerges for which people have little or no immunity, and for which there is no vaccine. This disease spreads easily person-to-person, causes serious illness, and can sweep across the country and around the world in a very short time. The U.S. Centers for Disease Control and Prevention has been working closely with other countries and the World Health Organization to strengthen systems to detect outbreaks of that might cause a pandemic and to assist with pandemic planning and preparation. An especially severe pandemic could lead to high levels of illness, death, social disruption, and economic loss.

Location and Extent

During a pandemic, the whole of the County is at risk, as pandemic is a regional, national, or international event. The speed of onset of pandemic is usually short, while the duration is variable, but can last for more than a year as shown in the 1918/1919 Spanish Flu. There is no scientific scale to measure the magnitude of pandemic. Pandemics are usually measured in numbers affected by the pandemic, and by number who die from complications from the pandemic.

Past Occurrences

Disaster Declaration History

There has been one state and federal disaster declaration due to pandemic, as shown in Table 4-83.

Table 4-83 Plumas County – State and Federal Pandemic Disaster Declarations 1950-2020

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Pandemic	1	2020	1	2020

Source: Cal OES, FEMA

NCDC Events

The NCDC does not track pandemic.

WHO Events

The 20th century saw three outbreaks of pandemic flu.

- The **1918-1919 Influenza Pandemic (H1N1)**, (aka the Spanish Flu), is the catastrophe against which all modern pandemics are measured. It is estimated that approximately 20 to 40 percent of the worldwide population became ill and that over 50 million people died. Approximately 675,000 deaths from the flu occurred in the U.S. alone.
- The **February 1957-1958 Influenza Pandemic (H2N2)** (aka the Asian Flu) was first identified in the Far East. Immunity to this strain was rare in people less than 65 years of age, and a pandemic was predicted. In preparation, vaccine production began in late May 1957, and health officials increased surveillance for flu outbreaks. Unlike the virus that caused the 1918 pandemic, the 1957 pandemic virus was quickly identified, due to advances in scientific technology. Vaccine was available in limited supply by August 1957. The virus came to the U.S. quietly, with a series of small outbreaks over the summer of 1957. When U.S. children went back to school in the fall, they spread the disease in classrooms and brought it home to their families. Infection rates were highest among school children, young adults, and pregnant women in October 1957. Most influenza-and pneumonia-related deaths occurred between September 1957 and March 1958. The elderly had the highest rates of death. By December 1957, the worst seemed to be over. However, during January and February 1958, there was another wave of illness among the elderly. This is an example of the potential “second wave” of infections that can develop during a pandemic. The disease infects one group of people first, infections

appear to decrease and then infections increase in a different part of the population. Although the Asian flu pandemic was not as devastating as the 1918-1919 flu, about 69,800 people in the U.S. died.

- The **1968 Influenza Pandemic (H3N2)** was first detected in Hong Kong (aka the Hong Kong Flu). The first cases in the U.S. were detected as early as September of that year, but illness did not become widespread in the U.S. until December. Deaths from this virus peaked in December 1968 and January 1969. Those over the age of 65 were most likely to die. The same virus returned in 1970 and 1972. The number of deaths between September 1968 and March 1969 for this pandemic was 33,800, making it the mildest pandemic in the 20th century.

To date, the 21st century has seen two acknowledged pandemics.

- **2009 Swine Flu (H1N1)**— 2009 H1N1 (sometimes called “swine flu”) was a new influenza virus causing illness in people. This virus was originally referred to as “swine flu” because laboratory testing showed that many of the genes in this new virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study showed that this virus was very different from what normally circulates in North American pigs. It had two genes from flu viruses that normally circulate in pigs in Europe and Asia and bird (avian) genes and human genes. Scientists call this a “quadruple reassortant” virus. This virus spread from person-to-person worldwide, probably in much the same way that regular seasonal influenza viruses spread. On June 11, 2009, the World Health Organization (WHO) signaled that a pandemic of 2009 H1N1 flu was underway. It was first detected in the United States in early 2009 and spread to the world later that year. About 70 percent of people who were hospitalized with this 2009 H1N1 virus had one or more medical conditions previously recognized as placing people at “high risk” of serious seasonal flu-related complications. This included pregnancy, diabetes, heart disease, asthma, and kidney disease. Young children were also at high risk of serious complications from 2009 H1N1, just as they are from seasonal flu. And while people 65 and older were the least likely to be infected with 2009 H1N1 flu, if they got sick, they were also at “high risk” of developing serious complications from their illness. Some studies estimated that 11 to 21 percent of the global population at the time—or around 700 million to 1.4 billion people (of a total 6.8 billion)—contracted the illness. This was more than the number of people infected by the Spanish flu pandemic, but only resulted in about 150,000 to 575,000 fatalities for the 2009 pandemic. A follow-up study done in September 2010 showed that the risk of serious illness resulting from the 2009 H1N1 flu was no higher than that of the yearly seasonal flu. For comparison, the WHO estimates that 250,000 to 500,000 people die of seasonal flu annually.
- **2019/2020 COVID 19** – During the creation of this LHMP Update, the world was under various forms of lockdown due to COVID-19 (known also as coronavirus). Coronaviruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19. COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don’t develop any symptoms and don’t feel unwell. Most people (about 80%) recover from the disease without needing special treatment. Around 1 out of every 6 people who gets COVID-19 becomes seriously ill and develops difficulty breathing. Older people, and those

with underlying medical problems like high blood pressure, heart problems or diabetes, are more likely to develop serious illness. People with fever, cough and difficulty breathing should seek medical attention.

HMPC Events

As of early August 2020, Plumas County had 33 total positive cases of coronavirus. Only one was active at that time. The County PUSD currently has 4 committees conducting plans specific to our schools reopening this fall due to COVID-19

Likelihood of Future Occurrence

Likely – The calculation for future occurrence of pandemic must first be considered in light of circumstances. The diseases are naturally occurring in the populations that reside in the County. In addition, this Plan is not examining the pandemic potential of these diseases, but instead examines when these diseases manifest in severe injury or fatalities among humans. Given these assumptions and the five outbreaks since 1900, the likelihood of future occurrence is considered likely.

Climate Change and Pandemic

According to the WHO, there are three categories of research into the linkages between climatic conditions and infectious disease transmission. The first examines evidence from the recent past of associations between climate variability and infectious disease occurrence. The second looks at early indicators of already-emerging infectious disease impacts of long-term climate change. The third uses the above evidence to create predictive models to estimate the future burden of infectious disease under projected climate change scenarios.

Historical Evidence

There is much evidence of associations between climatic conditions and infectious diseases. Malaria is of great public health concern, and seems likely to be the vector-borne disease most sensitive to long-term climate change. Malaria varies seasonally in highly endemic areas. The link between malaria and extreme climatic events has long been studied in India, for example. Early last century, the river-irrigated Punjab region experienced periodic malaria epidemics. Excessive monsoon rainfall and high humidity was identified early on as a major influence, enhancing mosquito breeding and survival. Recent analyses have shown that the malaria epidemic risk increases around five-fold in the year after an El Niño event.

Early impacts of climate change

These include several infectious diseases, health impacts of temperature extremes and impacts of extreme climatic and weather events.

Predictive Modeling

The main types of models used to forecast future climatic influences on infectious diseases include statistical, process-based, and landscape-based models. These three types of model address somewhat different questions.

Statistical models require, first, the derivation of a statistical (empirical) relationship between the current geographic distribution of the disease and the current location-specific climatic conditions. This describes the climatic influence on the actual distribution of the disease, given prevailing levels of human intervention (disease control, environmental management, etc.). By then applying this statistical equation to future climate scenarios, the actual distribution of the disease in future is estimated, assuming unchanged levels of human intervention within any particular climatic zone. These models have been applied to climate change impacts on malaria, dengue fever and, within the USA, encephalitis. For malaria some models have shown net increases in malaria over the coming halfcentury, and others little change.

Process-based (mathematical) models use equations that express the scientifically documented relationship between climatic variables and biological parameters – e.g., vector breeding, survival, and biting rates, and parasite incubation rates. In their simplest form, such models express, via a set of equations, how a given configuration of climate variables would affect vector and parasite biology and, therefore, disease transmission. Such models address the question: “If climatic conditions alone change, how would this change the potential transmission of the disease?” Using more complex “horizontal integration”, the conditioning effects of human interventions and social contexts can also be incorporated.

This modelling method has been used particularly for malaria and dengue fever (4). The malaria modelling shows that small temperature increases can greatly affect transmission potential. Globally, temperature increases of 2-3°C would increase the number of people who, in climatic terms, are at risk of malaria by around 3- 5%, i.e. several hundred million. Further, the seasonal duration of malaria would increase in many currently endemic areas.

Since climate also acts by influencing habitats, landscape-based modeling is also useful. This entails combining the climate-based models described above with the rapidly-developing use of spatial analytical methods, to study the effects of both climatic and other environmental factors (e.g. different vegetation types – often measured, in the model development stage, by ground-based or remote sensors). This type of modelling has been applied to estimate how future climate-induced changes in ground cover and surface water in Africa would affect mosquitoes and tsetse flies and, hence, malaria and African sleeping sickness.

Conclusion

Changes in infectious disease transmission patterns are a likely major consequence of climate change. We need to learn more about the underlying complex causal relationships, and apply this information to the prediction of future impacts, using more complete, better validated, integrated, models.

Vulnerability Assessment

Vulnerability—High

Pandemic has and will continue to have impacts on human health in the region. A pandemic occurs when a new virus emerges for which there is little or no immunity in the human population; the virus causes serious illness and spreads easily from person-to-person worldwide. There are several strategies that public health officials can use to combat pandemic flu. Constant surveillance regarding current pandemic, use of infection control techniques, and administration of vaccines once they become available. Citizens can help prevent spread of pandemic flu by staying home, or “self-quarantining,” if they suspect they are infected. Pandemic does not affect the buildings, critical facilities, and infrastructure in the County. Pandemic can have varying levels of impact to the citizens of the County, depending on the nature of the pandemic.

Impacts

Impacts could range from school and business closings to the interruption of basic services such as public transportation, health care, and the delivery of food and essential medicines. Hospitalizations and deaths can occur, especially to the elderly or those with pre-existing underlying conditions. As seen with Covid-19, multiple businesses were forced to close temporarily (some permanently) an unemployment rose significantly. Supply chains for food can be interrupted. Prisons may need to release prisoners to comply with social distance standards.

Future Development

Future development is not expected to be significantly impacted by this hazard, though population growth in the County could increase exposure to pandemic flu, and increase the ability of each disease to be transmitted among the population of the County. If the median age of County residents continues to increase, vulnerability to pandemic diseases may increase, due to the fact that these diseases are often more deadly to senior citizens.

4.3.16. Tree Mortality

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard. Much of this section was provided by the University of California Cooperative Extension Forest and Natural Resources Program for Plumas and Sierra Counties.

Hazard/Problem Description

One of the many vulnerabilities of drought in Plumas County is the increased risk of widespread tree mortality events that pose hazards to people, homes, and community infrastructure, create a regional economic burden to mitigate, and contribute to future fuel loads in forests surrounding communities. During extended drought, tree mortality is driven by a build-up in endemic bark beetle populations and

exacerbated by latent populations of a suite of native insects and disease. Non-native forest pests (insects and/or pathogens) can also contribute to tree mortality events.

The most common driver of tree mortality are forest pests in the bark beetle category. Bark beetles mine the inner bark (the phloem-cambial region) on twigs, branches, or trunks of trees and shrubs. Bark beetles frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. Bark beetles can contribute to the decline and eventual death of trees; however only a few aggressive beetle species are known to be the sole cause of tree mortality. The three most common bark beetles that actively contribute to mortality in Plumas County include the fir engraver (*Scoyltus ventralis*), the western pine beetle (*Dendroctonus brevicomis*) and the mountain pine beetle (*Dendroctonus ponderosae*); though documented damage has also occurred from less prevalent or aggressive species such as the Jeffrey pine beetle (*Dendroctonus jeffreyii*), the Douglas-fir beetle (*Dendroctonus pseudotsugae*), Douglas-fir engraver beetle, (*Scolytus unispinosus*), the Red Turpentine beetle (*Dendroctonus valens*) or the Ips species. Bark beetle mortality and the scope and scale of mortality is closely linked with two common factors: high stand densities of trees and extended drought (Fettig et al. 2012) – both of which are common occurrences in the forests of Plumas County.

Commonly tree mortality incidences have been within endemic background levels and highly localized and dispersed in nature; however, in the past two decades, larger more widespread tree mortality events have occurred in various parts of California creating land management challenges that have notable socio-economic impacts to mountain communities. Forests with high densities of trees are particularly vulnerable during extended drought where endemic bark beetle populations can explode to epidemic proportions in a short amount of time, as recently experienced during the 2012-2016 tree mortality event in the central and southern Sierra Nevada counties (see Figure 4-147).

Figure 4-147 Examples of widespread tree mortality induced by drought in the southern Sierra Nevada. Wildland urban intermix forested community in Fresno county in a) May 2015 and b) February 2016.



Source: CAL FIRE

In addition to bark beetles, many tree mortality factors include a complex of pathogens and insects. For example, various types of fungal root diseases and trunk rots can create water stress on trees that contribute to susceptibility to bark beetle mortality. Annosus root disease (*Heterobasidion occidentale*) is a common root disease that is found throughout the county. Outbreaks of forest defoliator insects have also occurred

throughout the county. Over the last decade both the sawfly (*Neodiprion*) and the Douglas-fir Tussock Moth (DFTM) (*Orgyia pseudotsugae*) have occurred in white fir forests of Plumas County. While defoliation events are not huge drivers of mortality, these incidents have contributed to localized areas of concern. Notably two defoliation events of sawfly and DFTM in the La Porte and Bucks Lake communities contributed to localized mortality patches. These defoliation events make true fir forest stands more vulnerable to fir engraver bark beetle mortality (see Figure 4-148).

Figure 4-148 Tree mortality as the result of pathogen and insect complexes.



Source: University of California

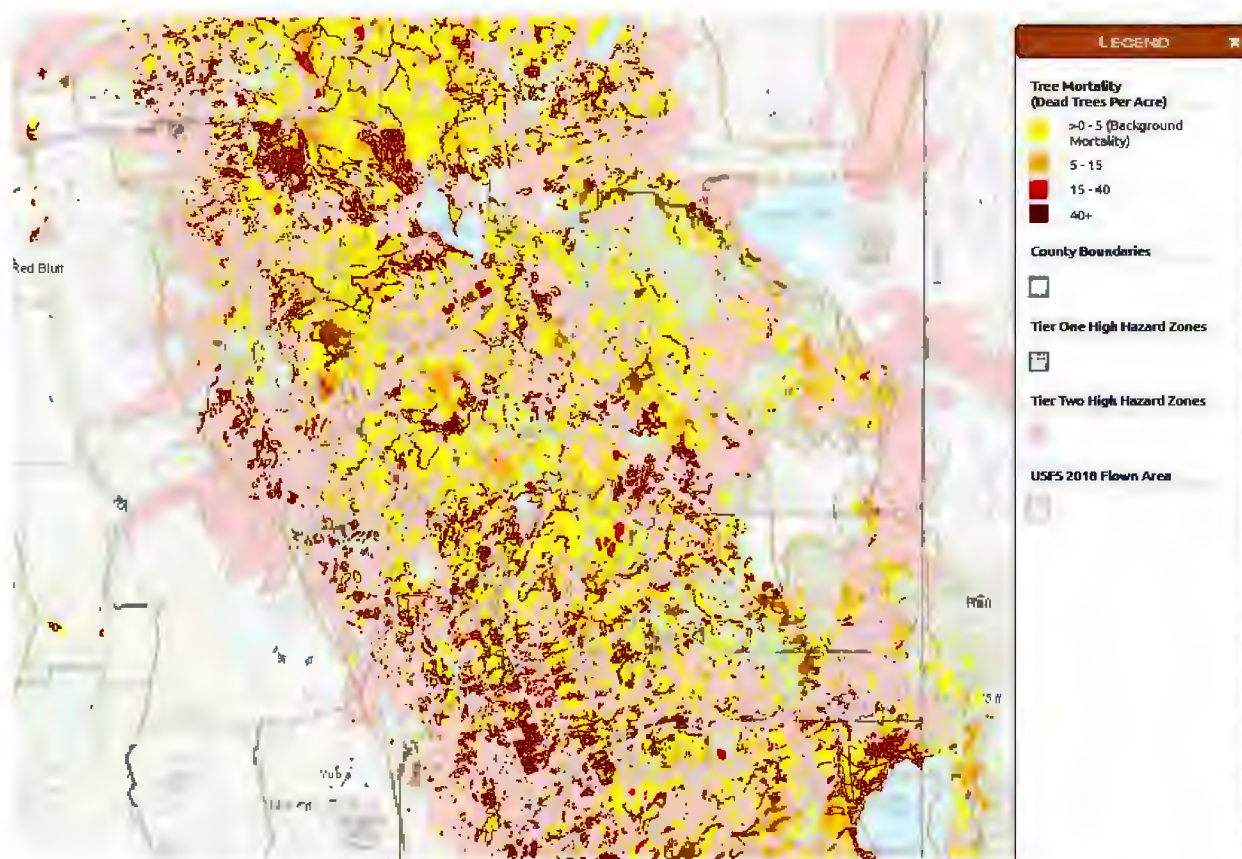
Sierra Nevada mixed conifer forests evolved with and are adapted to periodic drought; however high stand densities – in combination with periodic drought and pest/pathogen complexes – make trees particularly susceptible to larger scale mortality events. Widespread mortality events contribute to hazardous fuel accumulations which, in turn, contribute to elevated wildfire hazard (Stephens et al 2018). Elevated tree mortality within striking distance of homes, roads, and community infrastructure also contribute to operational complexities and economic burden on rural forested counties.

Location and Extent

Onset of tree mortality events can be relatively fast as seen in Figure 4-126; however conditions – such as high stand densities – that lead to tree mortality accumulate slowly over time. Many areas in Plumas County have seen increases in tree mortality. The County has mapped these areas, and that map is shown in Figure 4-149. Shown are results of 2012-2018 aerial tree-mortality surveys. Using a color legend, the map shows a scale of:

- Deep burgundy depicting areas with more than 40 dead trees per acre
- Red depicting 15 - 40 dead trees per acre
- Orange depicting 5 -15 dead trees per acre
- Yellow depicting 5 or less dead trees per acre

Figure 4-149 Plumas County – Tree Mortality Areas



Source: CAL FIRE, map retrieved 1/17/2020

In the past decade, mortality has increased in the northern portion of Plumas County as well as the Lakes Basin area. During the past statewide tree mortality event, much of Plumas county was designated as Tier 2 High mortality hazard on the watershed scale along with numerous Tier 1 High hazard “hot spots”.

Past Occurrences

Disaster Declaration History

On October 30, 2015, Governor Brown proclaimed a State of Emergency and included provisions to expedite the removal and disposal of dead and dying hazardous trees. As a result, costs related to identification, removal, and disposal of dead and dying trees caused from drought conditions may be eligible for California Disaster Assistance Act (CDAA) reimbursement.

Plumas County created a Tree Mortality task force which was a loosely organized coalition of parties from local, state, and federal agencies and non-governmental organizations such as the Plumas County Fire Safe Council. Much of the task force was focused on identification and monitoring of areas of tree mortality concern.

NCDC Events

The NCDC does not track tree mortality events in Plumas County.

Hazard Mitigation Planning Committee Events

Widespread tree mortality events have occurred in Plumas County primarily due to unnaturally high tree densities and drought episodes that facilitate a build-up of endemic bark beetle populations. Tree mortality events have also occurred from defoliation insects, plant diseases and from introduction of non-native forest pests. The HMPC noted that there have been a number of tree mortality events in Plumas County. Notable events include:

- Douglas-fir tussock moth outbreak in the 1980's
- Late 1980's/Early 1990's mortality of white fir across the Tahoe and Plumas National Forests
- 2012-2018 Drought Related Tree Mortality Event in both pine and fir
- 2014-2016 Sawfly and Douglas-fir tussock moth outbreak

The HMPC noted other events that occurred outside of Plumas County. Past tree mortality events in the northern Sierra Nevada have been well documented in scientific literature (Macomber and Woodcock 1994; Ferrell et al 1994; Guarin and Taylor 2005; Preisler et al 2017). Over the past two decades tree mortality events in California forests have impacted numerous forested communities with widespread and large scale economic and social impacts. Examples include:

- Bark beetle outbreak in Southern California: San Bernadino and Lake Arrowhead 2003-2006
- Bark Beetle outbreak in the central and southern Sierra Nevada 2010-2018
- Sudden Oak Death in the Northern California Coast Range 2001-ongoing
- Golden Spotted Oak Borer mortality of Black Oak in Southern California

Likelihood of Future Occurrence

Likely – There have been four (multi-year) tree mortality events in the County since 1980. Given the past events, the lingering drought conditions in California, and the heavily wooded nature of much of the County, tree mortality is considered likely in the future.

Climate Change and Tree Mortality

Tree mortality events are inevitable, particularly considering the climate change predictions for Plumas County. Trends suggest that the northern Sierra Nevada may become generally warmer and wetter, with longer periods of prolonged summer drought (Merriam et al. 2013)

While warmer and wetter weather patterns may increase forest growth, 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. 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 (Tepley et al 2017; Fellows and Goulden 2008) 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 (Van Mantgem et al 2009) 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.

Battles et al. (2008) evaluated the impacts of climate change on the mixed-conifer region in California and provide insight to forest health concerns and management implications for forest managers. This study and others (Allen et al 2015) found that changes in climate could “exacerbate forest health concerns” by increasing weakened tree susceptibility to mortality as a result of fire, disease epidemics and insect outbreaks and potentially enabling forest insects and disease to expand ranges or increase potential for widespread damage (Battles et al 2008; Allen et al 2015). These predictions were realized the following decade in the central and southern Sierra Nevada wherein vast stretches of ponderosa pine forest were decimated in a drought driven epidemic. Other research (Stephens et al 2018) suggest that landscape level tree mortality may drive extreme fire behavior and high severity of future fire events in these forests – emphasizing that tree mortality events have 2nd and 3rd order consequences for Plumas county communities.

The implications of climate change suggest useful strategies for communities and land managers can employ include: 1) creating resistant forest structures, 2) creating resilient forest landscapes, and 3) consider re-aligning vegetation communities to be more adapted to climate change. (Millar et al 2007 & Stephens et al 2010)

Forest management strategies that increase species diversity, promote heterogeneity, and create lower density stands would be effective in providing “structures that are more resilient to catastrophic events like fire and (insect) epidemics” (Battles et al 2008). Prescribed fire, and its potential repeated use may help reduce stand densities which promote increased resilience to climate change driven drought conditions (Van Mantgem 2009).

Vulnerability Assessment

Vulnerability—Medium

Dead trees are a hazard to the general public and forest visitors, but the risk of injury, death, property damage or infrastructure damages varies depending how the hazard interacts with potential targets. Dead trees within the wildland urban intermix or wildland urban interface or urban areas therefore pose a greater risk to due to their proximity to residents, businesses, and road, power, and communication infrastructure.

Dead trees may fall or deteriorate in their entirety or in part – either mechanism has the potential for injury, death, or inflicting severe damage to targets. As the time since tree mortality increases, so does the deterioration of wood and the potential for tree failure. During the 2012-2018 drought, the state of California Tree Mortality Task force designated multiple Tier 1 and Tier 2 High Hazard Zones where tree mortality posed an elevated risk to human health, properties, and resource values. A number of Plumas County areas were designated during this event and the majority of Plumas County watersheds were designated as Tier 2 high hazard zones because of the significant levels of tree mortality. These areas were shown on Figure 4-149.

Plumas County is unique in that many residential and business areas of the community are in the wildland urban interface/intermix with the forest. Trees in these interface/intermix areas are particularly vulnerable to insect and/or drought driven mortality because of the additional stressors that urban environments impose on trees (ie. Soil compaction, altered hydrology, physical damage, heat islands etc.). This exacerbates the occurrence of tree mortality within the populated settings of the County.

Impacts

Tree mortality affects industrial and non-industrial timber land owners by reducing inventory and degrading timber quality and yield from forest properties. As seen in the central and southern Sierras during the 2012-2018 tree mortality event, the glut of dead timber creates an oversupply beyond what sawmills can handle and process, thereby reducing or eliminating the value of dead trees for salvage. In these cases, tree mortality can create economic hardship on forest landowners of all sizes as they try to mitigate safety hazards posed by standing dead and deteriorating trees and development of future fuel accumulations – which leads to increase fire risk.

During tree mortality events, the cost of removing dead trees far exceeds the salvage value of the tree. This can create an undue burden on forest landowners of all sizes, particularly for residential areas where there are many complexities in removing trees such as power infrastructure, homes, water lines, and other assets that need to be protected.

Future Development

Development standards in California take wildfire into account; however, there are no standards developed for reducing the risk of tree mortality. Areas of Very High Fire Hazard Severity have increased scrutiny regarding development standards and siting. An increase in tree mortality may increase the fire risk and be a factor in development in areas of high tree mortality and wildfire risk as an increase in dead and dry fuels may increase the wildfire risk in the future. Future development could consider mitigating tree hazards within infrastructure (i.e. power and road corridors) to mitigate potential for dead tree hazards in the future.

4.3.17. Volcano

Hazard Profile

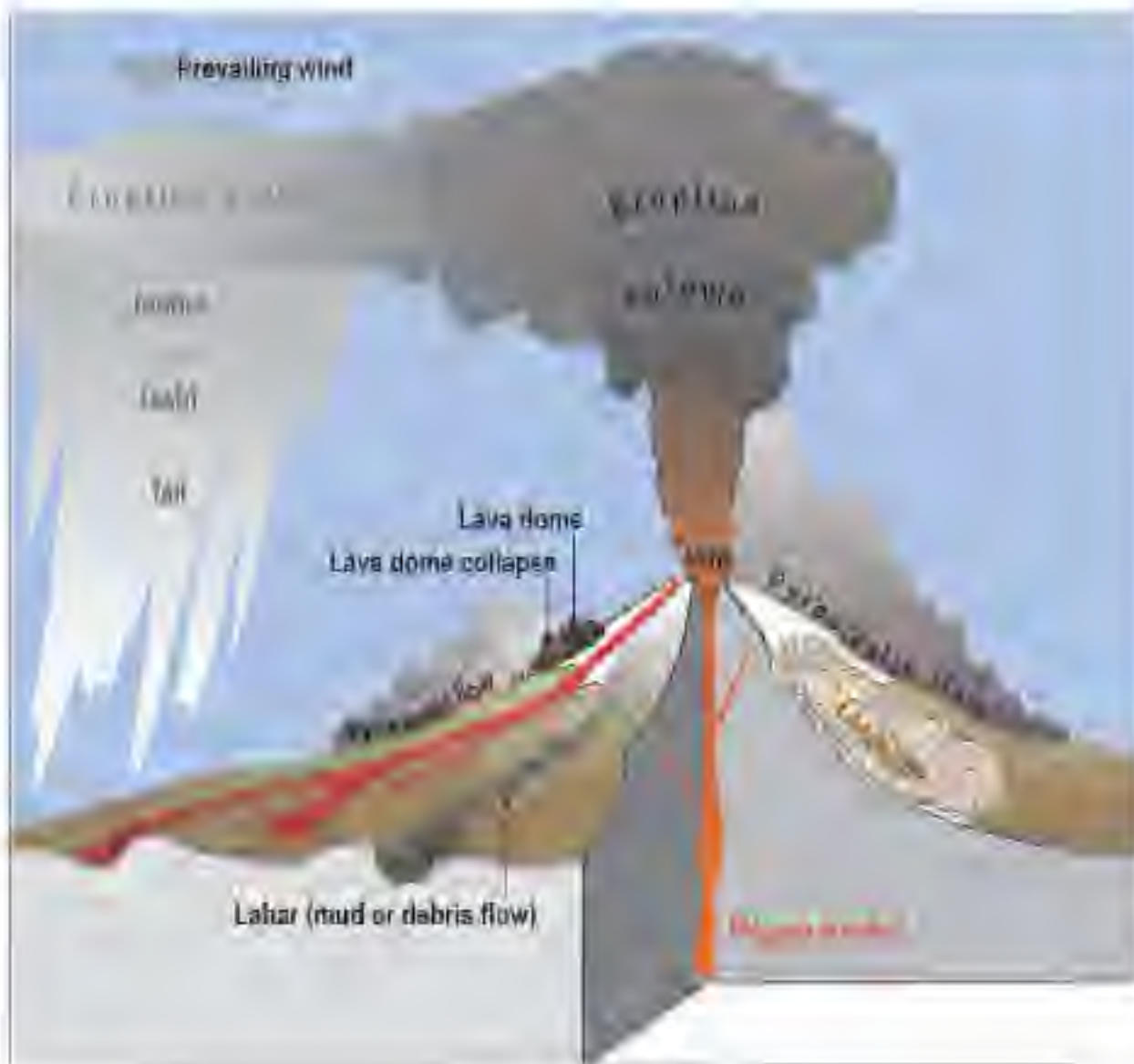
This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect this hazard.

Hazard/Problem Description

The 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.

As shown in Figure 4-150, 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 4-150 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 4-151. 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 4-151 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 is shown in Table 4-84.

Table 4-84 Volcano Threat near Plumas County

Volcano	Lassen Volcanic Center
Threat	Very High Threat
	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 thinks the vulnerability to this hazard is low.

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 4-152 shows volcanoes in or near California and their location relative to the Plumas County.

Figure 4-152 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 not been created for the Lassen Volcanics Area. However, 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.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations related to volcano, as shown on Table 4-4.

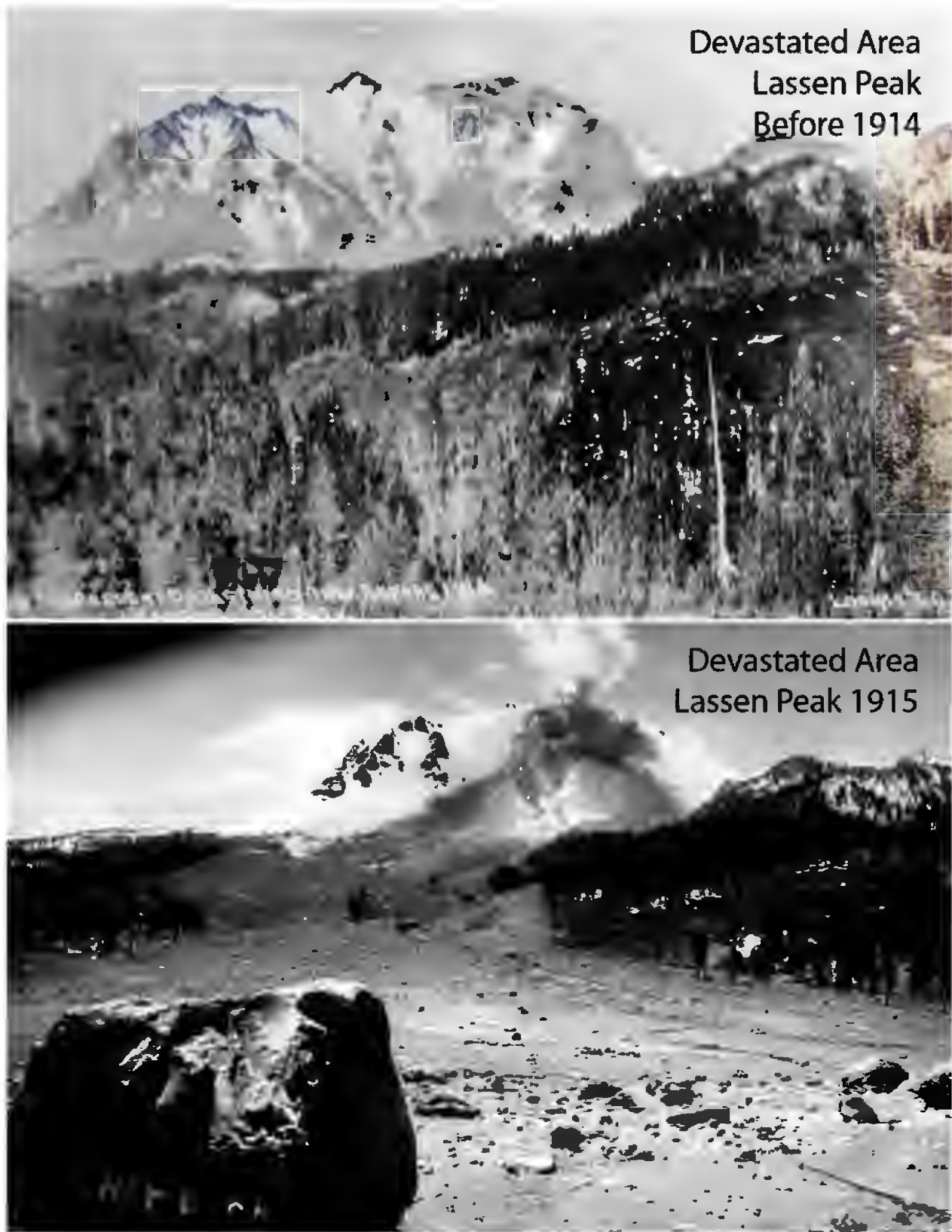
NCDC Events

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 mi². 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 4-153, while Figure 4-154 shows the extent of damages due to the eruption.

Figure 4-153 1915 Lassen Volcano Eruption



Source: USGS

Figure 4-154 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 Occurrences

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 geologic 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

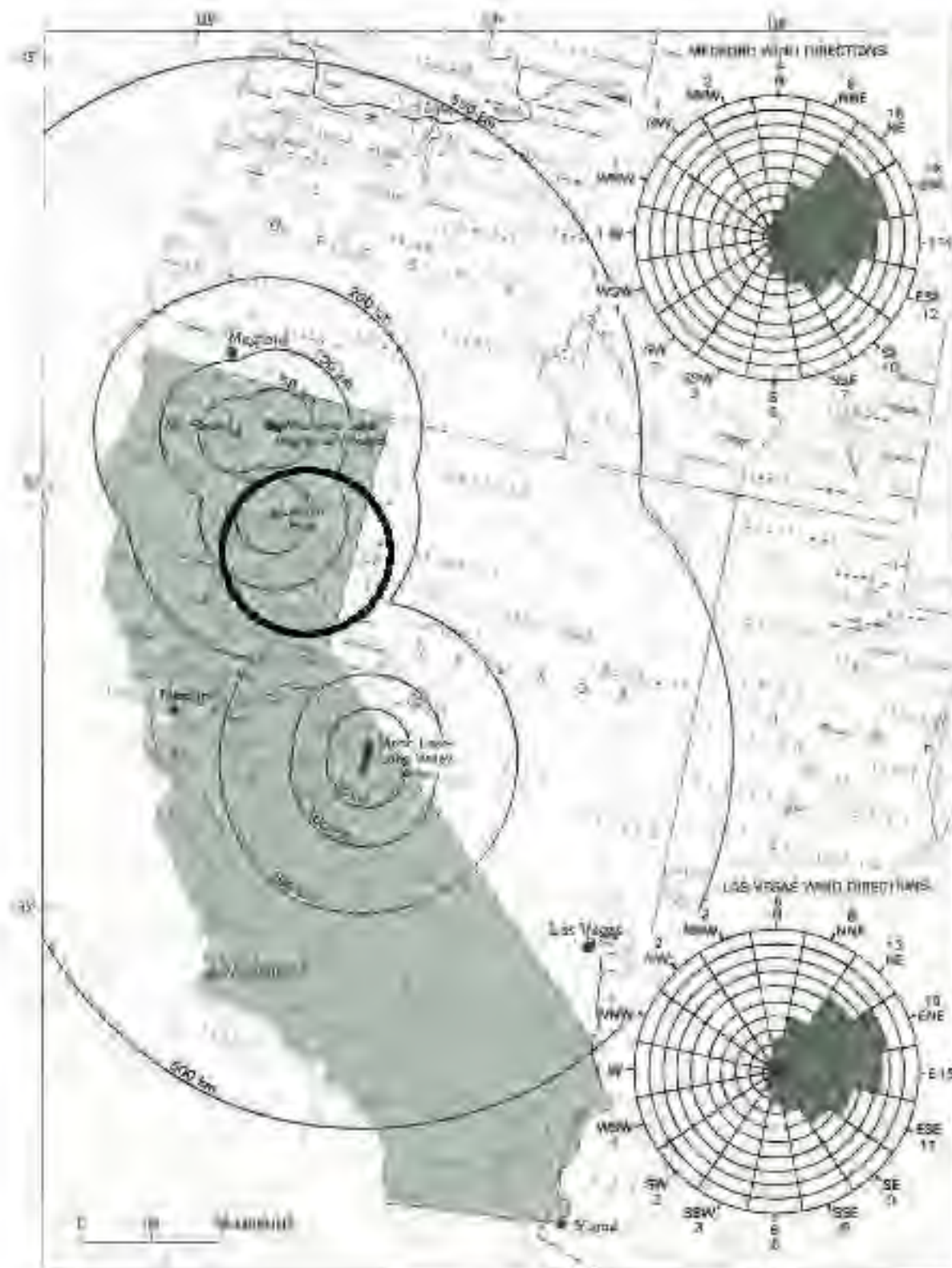
Climate change is unlikely to influence volcanic eruptions.

Vulnerability Assessment

Vulnerability—Low

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. 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 4-155.

Figure 4-155 Potential Ashfall Areas for California Volcanoes



Source: USGS Bulletin 1847

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.

Impacts

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.

Future Development

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.

4.3.18. Wildfire

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect Plumas County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect 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. Generally, 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.

Location and Extent

Wildfire risk in Plumas County varies by location. According to the 2014 LHMP, 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, and also its accessibility to the population increases its risk for human-triggered fires. It is more relevant to identify areas of lower fire hazard, which are the larger valleys such as Indian, American, and Sierra, 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.

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 WUI 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 as well as the area around the communities that pose a fire threat.

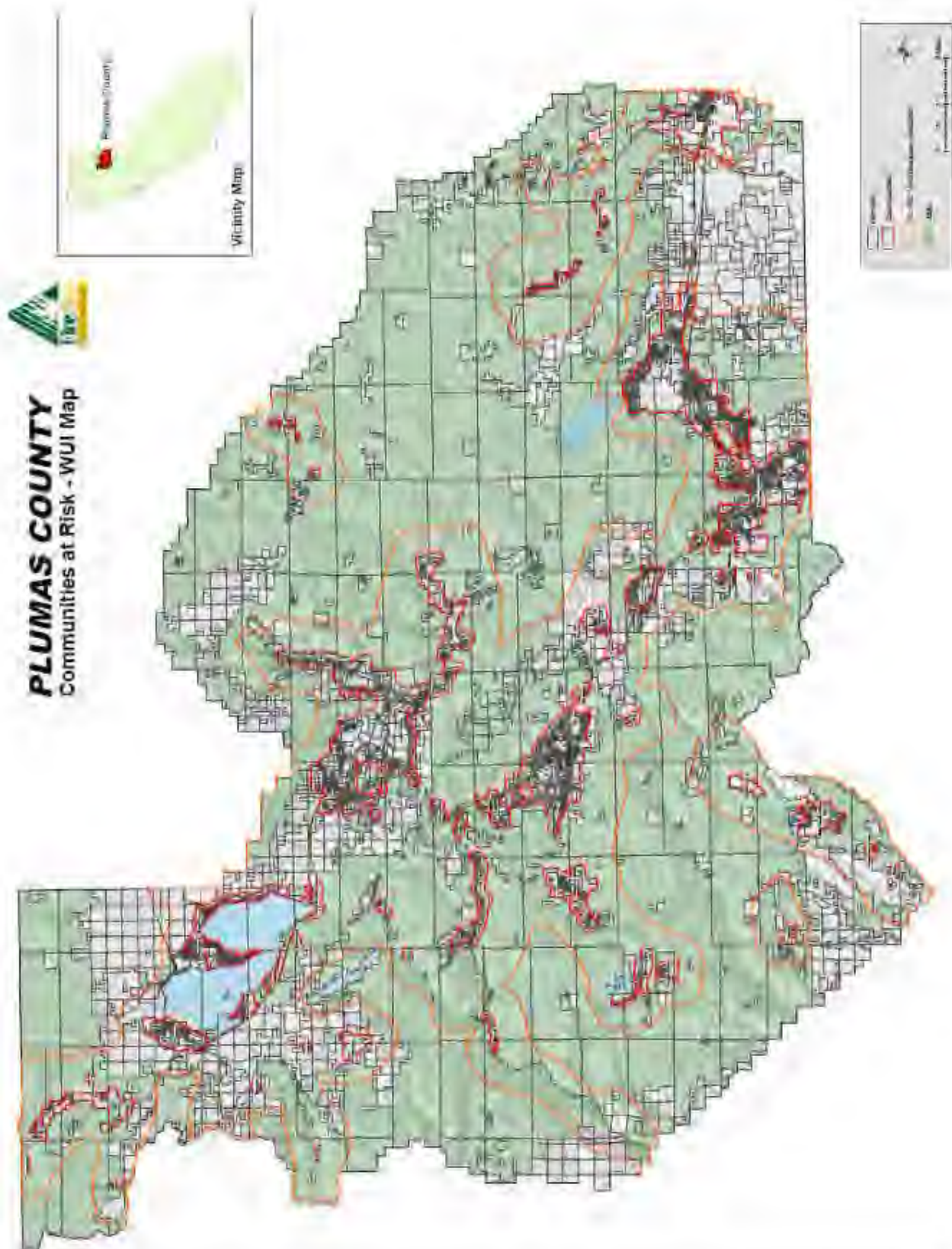
There are two types of WUI environments. The first is the true urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low density communities where homes are intermixed in wildland 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 and urban development 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 pattern of increased damages is directly related to increased urban spread into historical forested areas that have wildfire as part of the natural ecosystem. Many WUI fire areas have long histories of wildland fires that burned only vegetation in the past. However, with new development, a wildland fire following a historical pattern will now burn developed areas. WUI fires may also include fires that occur in remote

areas that have critical infrastructure easements through them, including electrical transmission towers, railroads, water reservoirs, communications relay sites or other infrastructure assets. The WUI for Plumas County from the 2019 Plumas County Community Wildfire Protection Plan (CWPP) is shown on Figure 4-156.

Figure 4-156 WUI Boundaries in Plumas County



Source: 2019 Plumas County Community Wildfire Protection Plan

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 sustain wildfires and allow for predictions of a given area's potential 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 the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater a 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 compliment 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. 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.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned and the intensity of the burn. CAL FIRE measures fuels in the areas as part of their Fire Hazard Severity maps. Extents are measured in the following Fire Hazard Severity Zones (FHSZ) categories (discussed in more detail below):

- Very High
- High

- Moderate
- Non-Wildland/Non-Urban
- Urban/Unzoned

Geographical extents of these FHSZs in the County can be found on Table 4-85.

Table 4-85 Plumas County – Geographical Extents of Fire Hazard Severity Zones

Fire Hazard Severity Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	1,506,183	86.23%	39,220	51.41%	1,466,963	87.82%
High	111,978	6.41%	10,619	13.92%	101,359	6.07%
Moderate	71,238	4.08%	12,788	16.76%	58,450	3.50%
Non-Wildland/non-Urban	53,695	3.07%	11,368	14.90%	42,326	2.53%
Urban Unzoned	106	0.01%	55	0.07%	51	0.00%
Total	1,743,200	99.80%	74,050	97.07%	1,669,150	99.92%

Source: CAL FIRE

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.

Post-Wildfire Landslides and Debris Flows

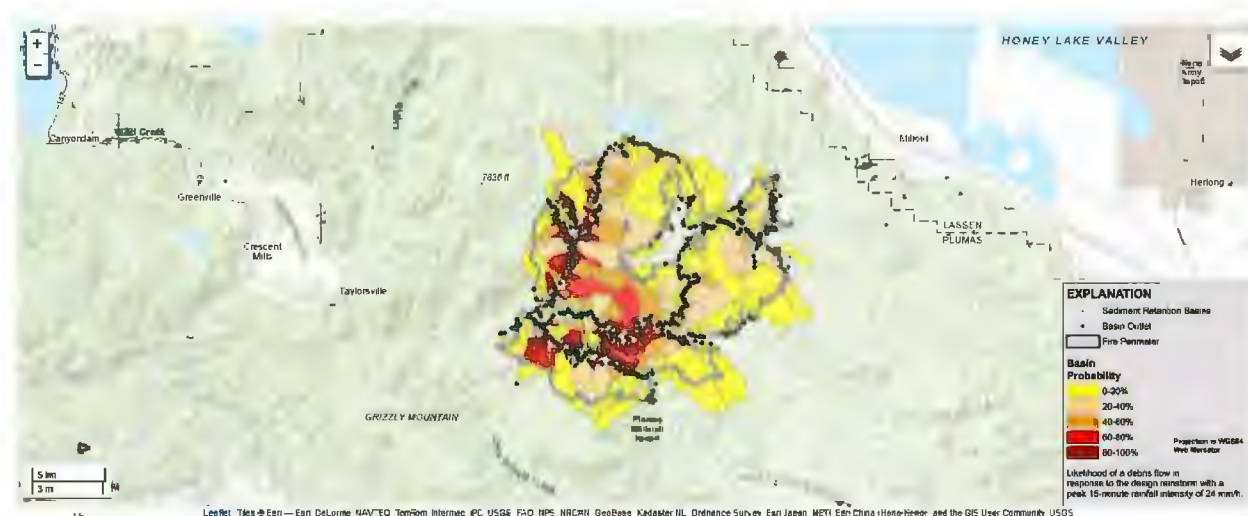
Post-wildfire landslides and debris flows are a concern in Plumas County. Fires that burn in sloped areas remove vegetation that holds hillsides together during rainstorms. Once that vegetation is removed, the hillside may be compromised, resulting in landslides and debris flows. Mapping of these areas has begun to occur.

2019 Walker Fire Landslide and Debris Flow Mapping

Post-fire debris flow hazard assessments for the Walker Fire 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.

Figure 4-157 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 4-157 Walker Fire Landslide and Debris Flow Probabilities



Source: USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=261)

2017 Minerva 5 Wildfire

Post-fire debris flow hazard assessments for the Minerva 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.

Figure 4-158 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 4-158 Minerva 5 Fire Landslide and Debris Flow Probabilities



Source: USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=105)

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up three state and four federal events. This is shown in Table 4-86. The 2008 BTU Lightning Complex Fire caused the federal disaster in 2008 (along with other California wildfires that summer). The Bucks Fire caused a federal and state disaster declaration in 1999. The Plumas National Forest Fire #531 (known as the Clarks Fire) cause a state declaration in 1987 (along with other California wildfires that summer). An unnamed fire occurred in 1960 which caused a state declaration (along with other California wildfires that summer).

Table 4-86 Plumas County – State and Federal Disaster Declaration from Wildfire 1950-2020

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1960, 1987, 1999	4	1999, 2008, 2020 (twice)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. Events in Plumas County in the database is shown in Table 4-87.

Table 4-87 NCDC Wildfire Events in Plumas County 1993 to 9/30/2019*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Dense Smoke	1	0	0	0	0	\$0	\$0

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Wildfire	9	0	0	0	0	\$22,775,000	\$0
Total	10	0	0	0	0	\$22,775,000	\$0

Source: NCDC

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

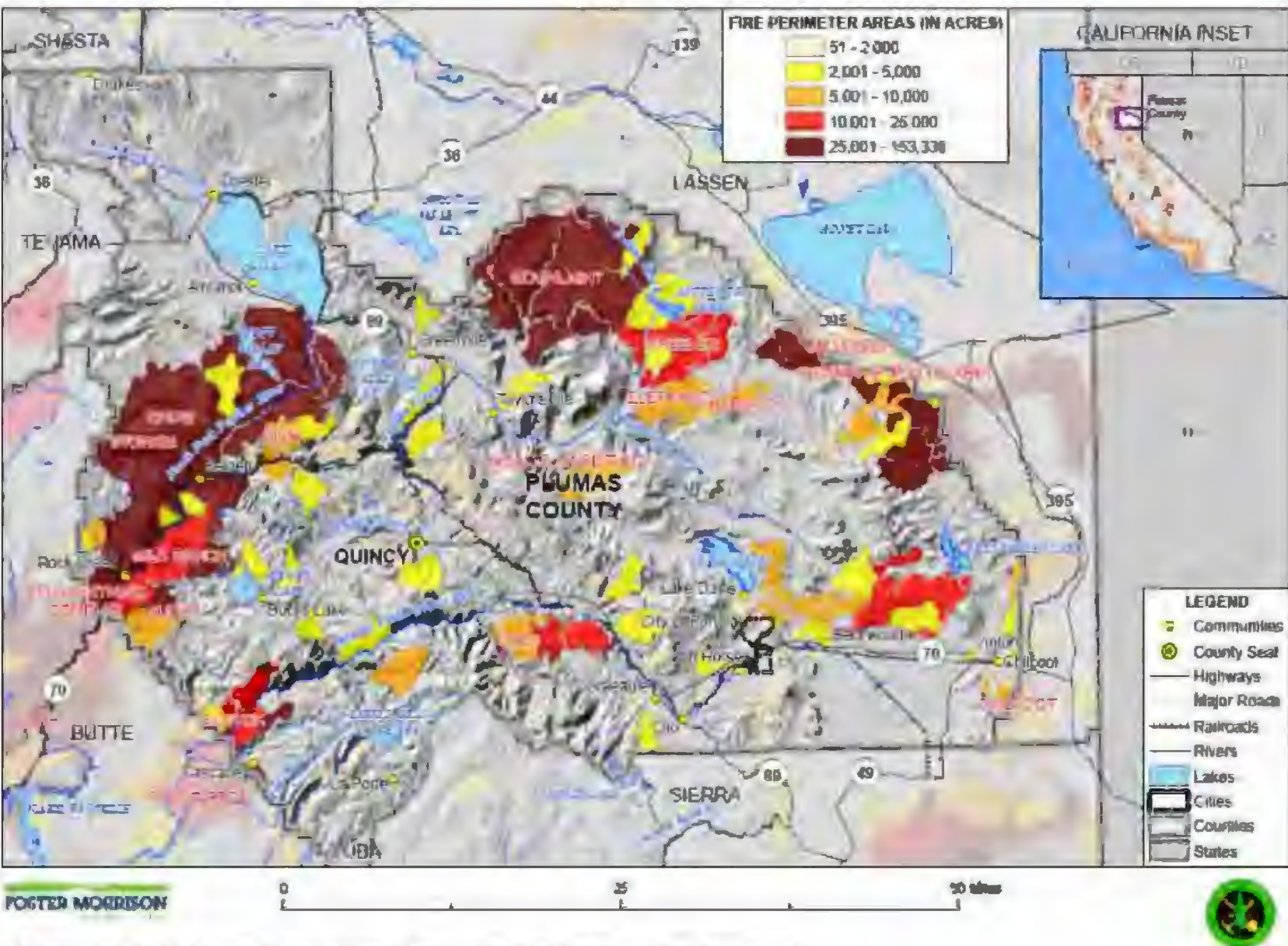
CAL FIRE Events

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 since 1950 were extracted and are listed in Table 4-88. Each of them was tracked by CAL FIRE. Figure 4-159 shows largest 15 fires in the CAL FIRE database for the County from 1950 to 2018, colored by the size of the acreage burned. All wildfires in the CAL FIRE database that intersect the County can be found in Appendix G.

Figure 4-159 Plumas County – Wildfire History CAL FIRE 1910 to 2018



Data Source: CAL FIRE Fire History (firep18_1 | 5/7/2019, Plumas County GIS, Cal Atlas Map Date: 03/01/2020)

Table 4-88 Plumas County – Largest 15 Wildfires by Acres Burned 1950-2018

Wildfire Name	Date	Cause Description	GIS Acres
(blank)	–	Unknown/Unidentified	163,031
CHIPS	7/28/2012	Campfire	76,346
MOONLIGHT	9/3/2007	Equipment Use	64,512
STORRIE	8/17/2000	Railroad	55,729
(blank)	–	Miscellaneous	38,396
BUCKS	8/23/1999	Lightning	27,888
WHEELER	7/5/2007	Lightning	22,330
PLUMAS NF #531 (CLARK)	8/30/1987	Miscellaneous	19,391
BTU LIGHTNING COMPLEX	7/2/2008	Lightning	16,476
MILK RANCH	9/11/1951	Miscellaneous	14,505
(blank)	(blank)	Lightning	12,926
SCOTCH	6/21/2008	Lightning	9,799
ELEPHANT	9/17/1981	Lightning	6,852
INGALLS (ASSIST #12)	9/17/1981	Unknown/Unidentified	6,697
RICH	7/29/2008	Railroad	6,111

Source: CAL FIRE

Hazard Mitigation Planning Committee

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 the City of 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 Sheriff 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 4-160.

Figure 4-160 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.

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. As of September 20, the 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. There is a worry that the post-wildfire burn scar will pose landslide, debris flow, and flooding issues.

Figure 4-161 North Complex Fire Burn Area

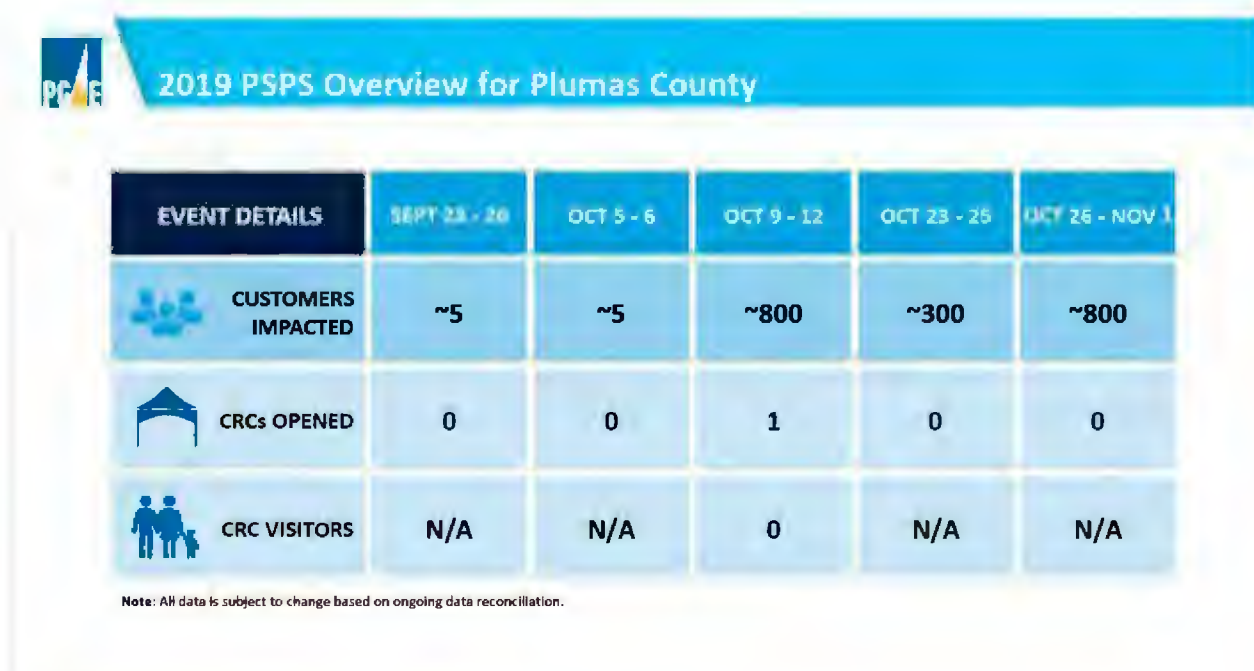


Source: Cal Fire Inciweb. Retrieved 9/28/2020

Public Safety Power Shutoff Events

The County noted that there have been events in the past where wildfires have not occurred, but wildfire conditions were high. During these time of high winds, high temps, and high wildfire risk, a PSPS occurred in the County. These events from 2019 are discussed below:

Figure 4-162 Plumas County – 2019 PSPS Events



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The HMPC noted that PG&E has approached Feather River College about using its campus as a location during PSPS outages. The College has not committed.

Likelihood of Future Occurrence

Highly Likely — Traditionally, from May to October of each year (though becoming more of a year around threat in recent years), Plumas County faces a serious wildland fire threat. 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, sizable portions of Plumas County continue to be at risk from wildfire. However, many of the fires occur in more remote areas of the County with limited structures and people at risk.

Climate Change and Wildfire

Climate change and its effects on wildfire come from two sources:

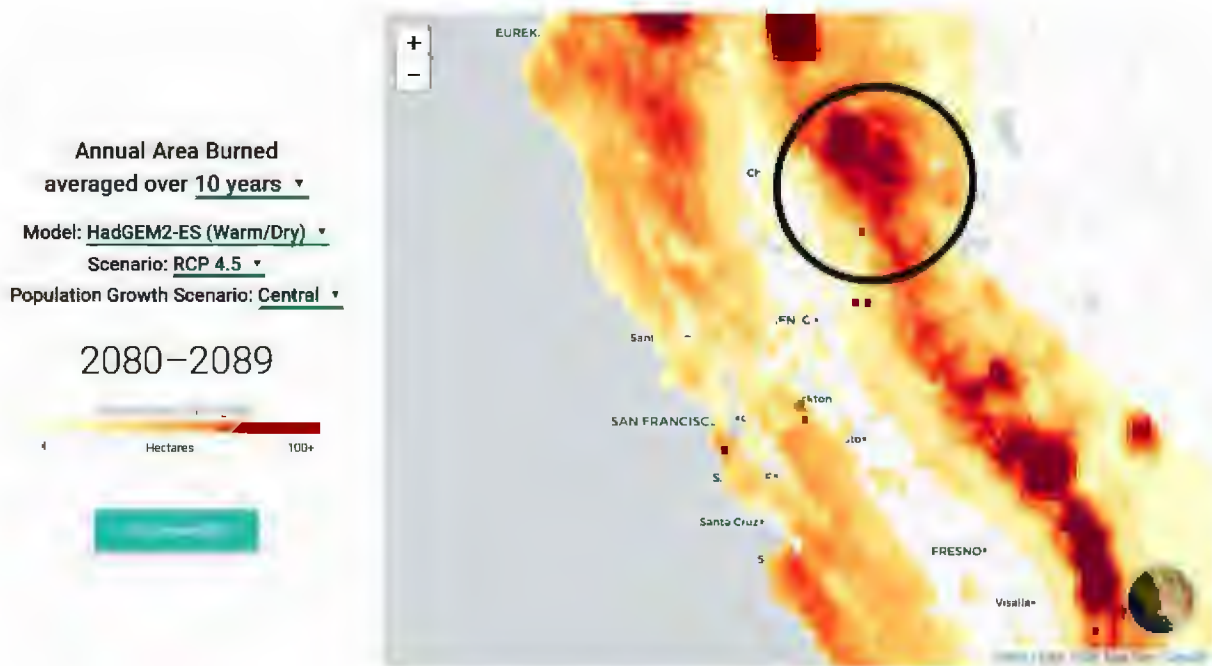
- Cal-Adapt
- 2019 Plumas County CWPP

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 2080-2089, as compared to recent (2010) conditions. This is shown in Figure 4-163. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase slightly (and much less than other California counties) in the near term and subside during mid-to late-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 Plumas County, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Figure 4-163 Plumas County – Projected Increase in Wildfire Burn Areas



Source: Cal-Adapt

Cal-Adapt has also sought to model annual averages of area burned in the State. Four models have been selected by California’s Climate Action Team Research Working Group as priority models for research contributing to California’s Fourth Climate Change Assessment. Projected future climate from these four models can be described as producing:

- A warm/dry simulation (HadGEM2-ES) – shown by the red line on the below charts
- A cooler/wetter simulation (CNRM-CM5) – shown by the blue line on the below charts
- An average simulation (CanESM2) – shown by the green line on the below charts
- The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5) – shown by the purple line on the below charts

Future modeled annual averages of area burned from Cal-Adapt for the Plumas County Planning (using the quad that contains the City of Quincy) are shown in Figure 4-164. It shows the following:

- The upper chart shows modeled annual averages of area burned for the selected area on map under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.
- The lower chart shows modeled annual averages of area burned for the selected area on map under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

Figure 4-164 Plumas County – Future Acreage Burned: High and Low Emission Scenarios

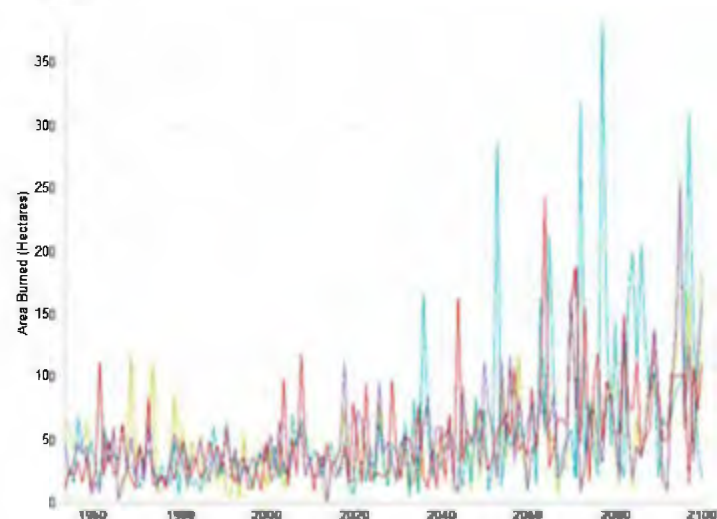
Annual Average of Area Burned

Grid Cell (39.90625, -120.96875)

Emissions continue to rise strongly through 2050 and plateau around 2100 (RCP 8.5). Central Population Growth Projections.

Modeled Data (2006–2099)

CanESM2
CNRM-CM5
HadGEM2-ES
InROC5



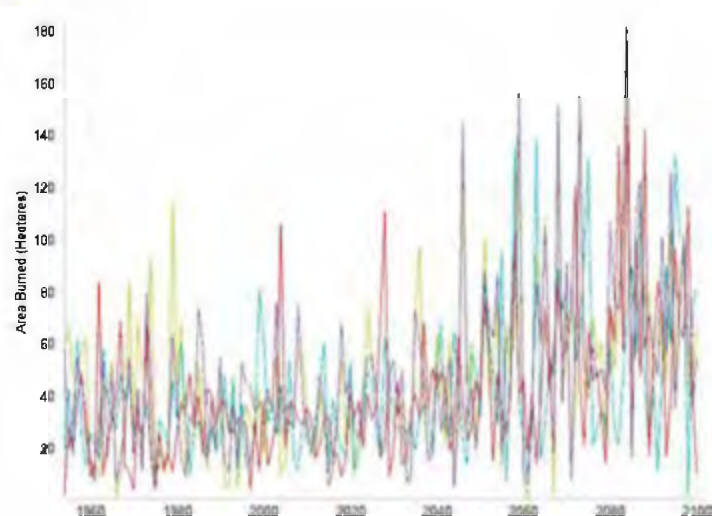
Annual Average of Area Burned

Grid Cell (39.90625, -120.96875)

Emissions peak around 2040, then decline (RCP 4.5). Central Population Growth Projections.

Modeled Data (2006–2099)

CanESM2
CNRM-CM5
HadGEM2-ES
InROC5



Source: Cal-Adapt – Annual Average of Acres Burned

RCP 4.5

Emissions peak
around 2040, then
decline

RCP 8.5

Emissions continue to
rise strongly through
2050 and plateau
around 2100

POPULATION SCENARIO

Central

QUICK STATS

Annual Mean Hectares for 1961–1990

32.9

Annual Mean Hectares for 2070–2099

87.3

Change Location

RCP 4.5

Emissions peak
around 2040, then
decline

RCP 8.5

Emissions continue to
rise strongly through
2050 and plateau
around 2100

POPULATION SCENARIO

Central

QUICK STATS

Annual Mean Hectares for 1961–1990

32.1

Annual Mean Hectares for 2070–2099

67.5

Change Location

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—High

Risk and vulnerability to the Plumas County Planning Area from wildfire is of concern, with some areas of the County being at greater risk than others as described further in this section. High fuel loads in portions of the County, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the County, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

The 2035 General Plan Public Health and Safety Element noted that suppression of natural fires has allowed the forest understory to become dense, creating the potential for larger and more intense wildland fires. Wind, steepness of terrain, and naturally volatile or hot-burning vegetation contributes to wildland fire hazard potential.

Impacts

Wildfires can result in loss of life, injuries, damage to structures, and can cause short-term and long-term disruption to the County. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure. The HMPC noted that there have had several times when wildfire took out all the communications towers, including 911 systems.

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. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. 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. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities. As a result of PSPS incident, many residents have purchased generators. These generators are becoming a fire hazard. In 2019, a generator started a house fire in Pioneer.

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 HMPC 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, telecommunications and high voltage transmission lines are also at risk to wildfire.

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.

In addition, there are natural resources at risk when wildland-urban interface fires occur. One is the watershed and ecosystem losses that occur from wildland fires. This includes impacts to water supplies and water quality as well as air quality. Another is the aesthetic value of the area. Major fires that result in visible damage detract from that value. Other assets at risk include wildland recreation areas, wildlife and habitat areas, and rangeland resources. The loss to these natural resources can be significant.

Wildfire (Smoke) and Air Quality

During many summer months in past years, Plumas County residents have had to breathe wildfire smoke, from fires both within and outside of the County. 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 PM_{2.5} 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.

Cal-Adapt is an online tool put together by the California Energy Commission that downscales global climate models to the California level with projections for sea-level rise, drought, temperature increase, heat, and wildfire, from 2020 out to 2085. Figure 4-163 showed the 2085 wildfire projection for Plumas County. Air quality in these areas of the County could be greatly reduced due to wildfire if the scenario projected is accurate.

Insurance in WUI Areas

The HMPC 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.

The HMPC noted additionally that insurance premium increases and policy cancellations not only increase the cost of living (a particular challenge for those in DAC and SDAC communities) it also affects the real estate industry and, in turn, the tax base. This can have implications for schools and infrastructure in the County.

Wildfire Analysis

The Plumas County Planning Area has mapped CAL FIRE fire hazard severity zones (FHSZs) based on fire responsibility areas as further described below. GIS was used to determine the possible impacts of wildfire within the County and how the wildfire risk varies across the Planning Area. The wildfire analysis includes an analysis of affected parcels and values by Fire Responsibility areas and by CAL FIRE's FHSZs.

Fire Responsibility Area Analysis

There are numerous wildland fire protection agencies that have responsibility within the County, including the USFS, the BLM, the BIA, and CAL FIRE. 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 state and federal agencies for fire suppression and protection. Fire Responsibility areas are generally categorized by Federal Responsibility Areas (FRA), State Responsibility Areas (SRA) and Local Responsibility Areas (LRA).

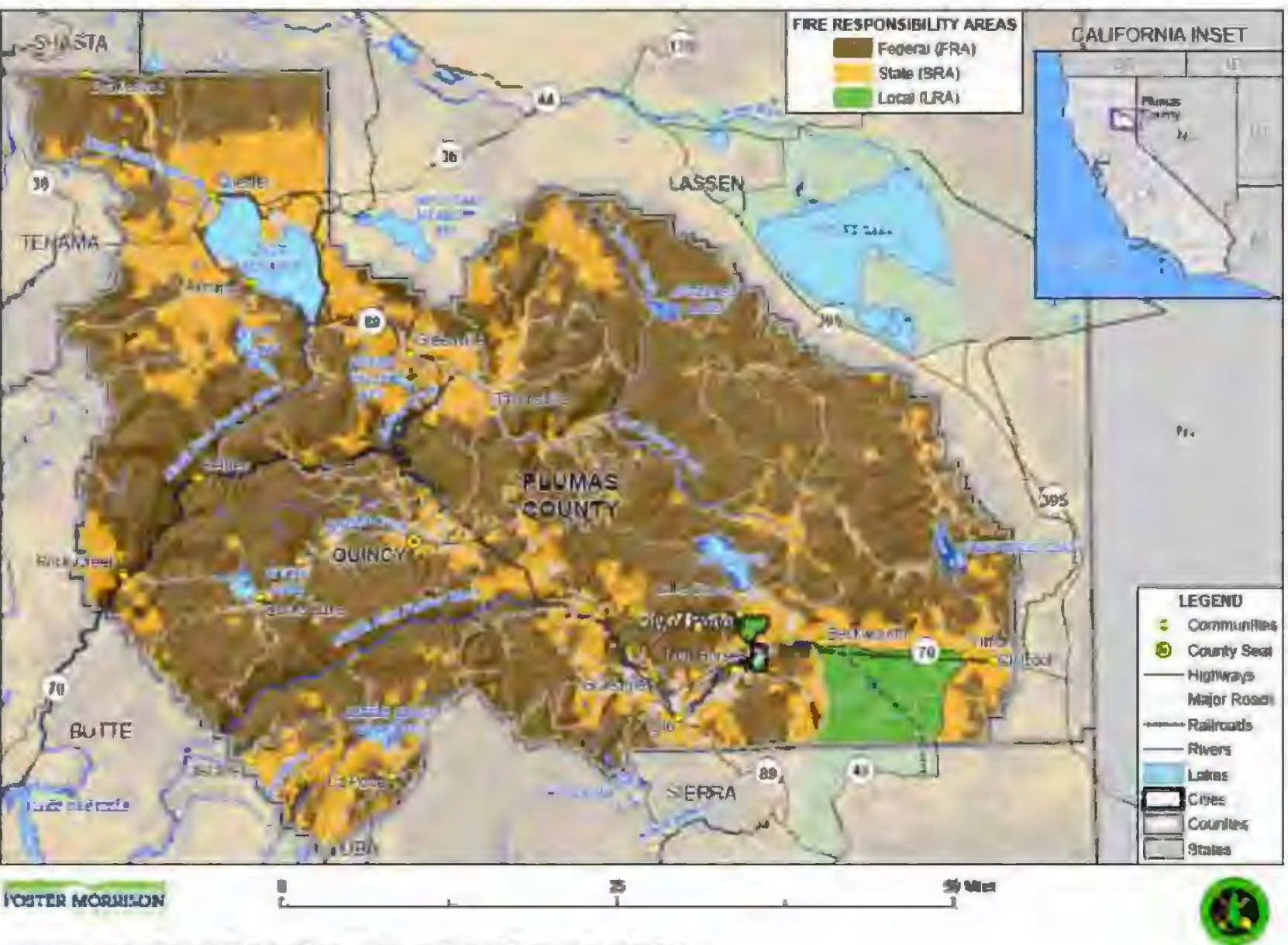
The CAL FIRE data, detailing Fire Responsibility Areas within the County Planning Area, was utilized to determine the locations, numbers, types, and values of land and structures falling within each Fire Responsibility Area. The following sections provide details on the methodology and results for this analysis.

Methodology

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 State Responsibility Area layer was used in this analysis to show Plumas County's parcel counts and values by FRA, SRA, and LRA.

The fire responsibility area layer was overlaid with the parcel data. Since it is possible for any given parcel to intersect with multiple fire responsibility areas, for purposes of this analysis, the parcel centroid was used to determine which fire responsibility area to assign to each parcel. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessor's database and the FIS parcel layer. Based on this approach, the fire responsibility areas for the Plumas County Planning Area were determined and further broken out by property use and included information on both land and improved values. Locations of each responsibility area are shown in Figure 4-165.

Figure 4-165 Plumas County Planning Area – Fire Responsibility Areas by FRA, SRA, LRA



Fire Responsibility Areas and Values at Risk Results

Most of the physical area of Plumas County falls in the FRA and SRA. The FRA contains 851 parcels, of which 3 are improved. The SRA contains 11,492 improved parcels, with over \$4.3 billion in total value. The LRA has 2,241 improved parcels with \$762 million in total value. 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. The County parcel inventory and associated values by fire responsibility area are provided in Table 4-89 for the entire Plumas County Planning Area, as described in the Values at Risk in Section 4.2. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the fire hazard severity zones due primarily to Proposition 13 and to a lesser extent properties falling under the Williamson Act.

Table 4-89 Plumas County Planning Area – Count and Value of Parcels by Local, State, and Federal Responsibility Areas by Property Use

Fire Responsibility Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
FRA	851	3	\$82,693	\$71,521	\$0	\$50,344	\$204,558
SRA	20,753	11,492	\$1,171,362,962	\$2,070,122,430	\$11,047,284	\$1,117,730,814	\$4,370,263,490
LRA	2,802	2,241	\$114,697,139	\$362,897,827	\$7,587,111	\$276,779,944	\$761,962,021
Grand Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: CAL FIRE, Plumas County 12/31/2018 Parcel/Assessor's Data

Fire Hazard Severity Zone Analysis

As part of the Fire and Resource Assessment Program (FRAP), CAL FIRE was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as FHSZs, then define the application of various mitigation strategies to reduce risk associated with wildland fires.

Fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The fire hazard model developed by CAL FIRE considers the wildland fuels. Fuel is that part of the natural vegetation that burns during the wildfire. The model also considers topography, especially the steepness of the slopes. Fires burn faster as they burn up-slope. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. Finally, the model considers the production of burning fire brands (embers) how far they move, and how receptive the landing site is to new fires.

In 2007, CAL FIRE updated its FHSZ maps for the State of California to provide updated map zones, based on new data, science, and technology that will create more accurate zone designations such that mitigation

strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources. The program is still ongoing with fire hazard severity zone maps being updated based on designated responsibility areas: FRA, SRA, and LRA.

The CAL FIRE data, detailing FHSZs within the Plumas County Planning Area, was utilized to determine the locations, numbers, types, and values of land and structures falling within each FHSZ. The following sections provide details on the methodology and results for this analysis.

Methodology

CAL FIRE mapped the SRA FHSZs, or areas of significant fire hazard, based on fuels, terrain, weather, and other relevant factors. Zones are designated with Very High, High, Moderate, Non-Wildland/Non-Urban and Urban Unzoned hazard classes. The goal of this mapping effort is to create more accurate fire hazard zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The FHSZs will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources.

The “Draft” LRA FHSZ (c6fhszl06_1) dated September 2007 layer and the Adopted SRA FHSZ (fhszs06_3_6) dated November 2007 were used to get a complete coverage of Fire Hazards.

Analysis was performed using the FHSZ datasets, and using GIS, the parcel layer was overlaid on the Draft and Adopted FHSZ layers. For the purposes of this analysis, if the parcel centroid intersects the zone’s area, it will be assumed that the entire parcel is in that area. This analysis illustrates the FHSZs specific to the Planning Area and the unincorporated County.

Fire Hazard Severity Zones Analysis Results: Values at Risk

The FHSZs in Plumas County are shown in Figure 4-166. Analysis results for Plumas County are summarized in Table 4-90 and broken out by property use in Table 4-91. These tables summarize total parcel counts, improved parcel counts, and their improved and land values, other values, and the estimated contents replacement values based on the CRV factors detailed in Table 4-6.

Figure 4-166 Plumas County Planning Area – Fire Hazard Severity Zones

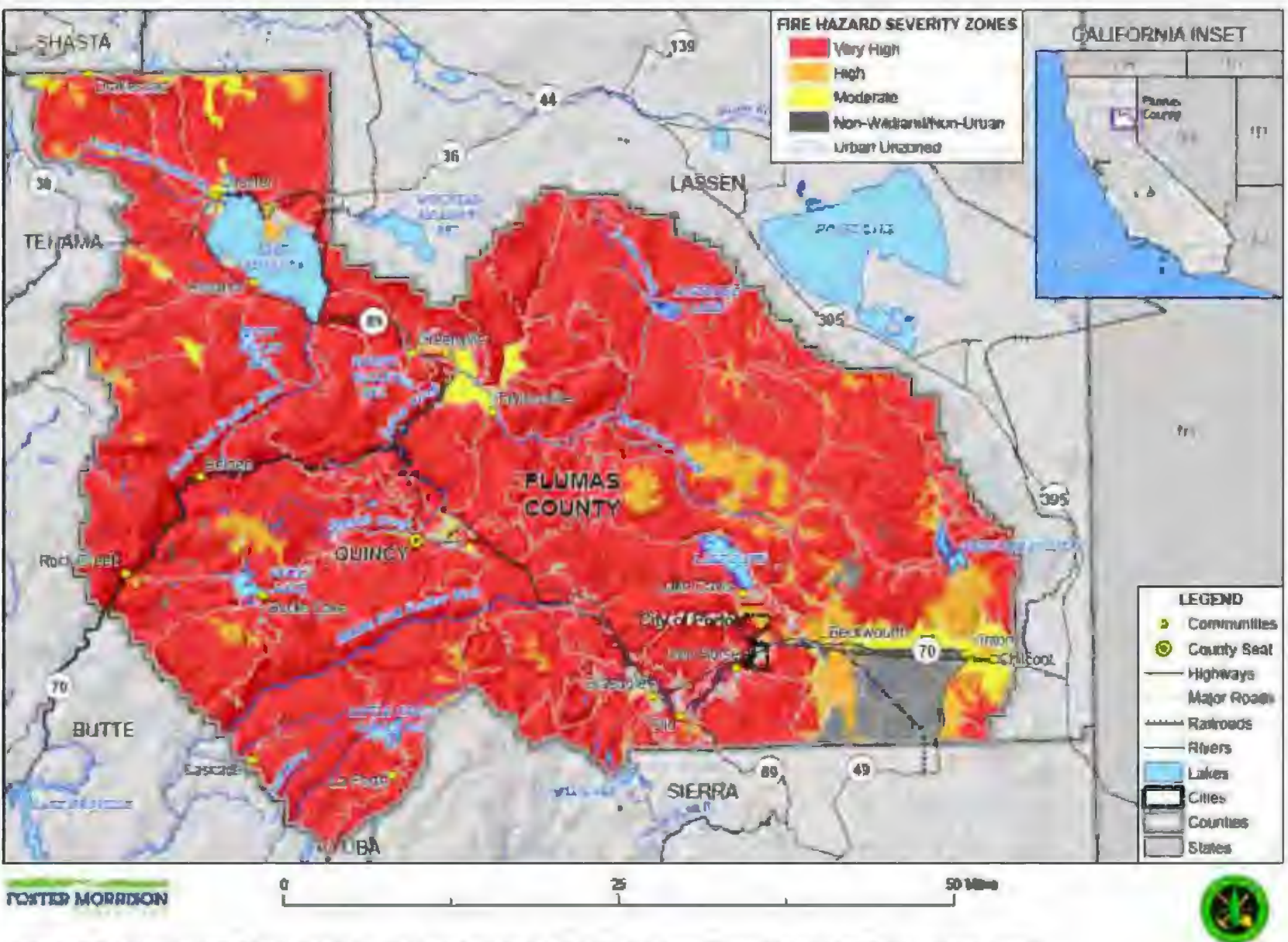


Table 4-90 Plumas County Planning Area – Count and Value of Parcels in Fire Hazard Severity Zones

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Personal Property Value	Estimated Contents Value	Total Value
Very High	15,077	7,919	\$625,137,169	\$1,199,929,774	\$5,144,346	\$648,472,350	\$2,478,683,639
High	7,405	4,552	\$536,265,058	\$986,940,105	\$5,389,174	\$547,521,263	\$2,076,115,600
Moderate	1,595	1,073	\$107,749,579	\$195,097,153	\$6,584,813	\$135,902,803	\$445,334,348
Non-Wildland/Non-Urban	163	63	\$11,861,793	\$8,059,341	\$1,173,270	\$7,591,665	\$28,686,069
Urban Unzoned	166	129	\$5,129,195	\$43,065,405	\$342,792	\$55,073,021	\$103,610,413
Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: CAL FIRE, Plumas County February 2020 Parcel/Assessor's Data

Table 4-91 Plumas County Planning Area – Count and Value of Parcels in Fire Hazard Severity Zones by Property Use

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	1,629	167	\$63,634,788	\$9,922,123	\$214,838	\$9,922,123	\$83,693,872
Commercial	380	247	\$26,245,635	\$60,124,482	\$1,116,488	\$60,124,482	\$147,611,087
Federal Lands	206	0	\$0	\$0	\$0	\$0	\$0
Government	460	0	\$143,742	\$0	\$0	\$0	\$143,742
Industrial	49	28	\$2,915,409	\$3,075,066	\$0	\$4,612,599	\$10,603,074
Institutional	43	25	\$845,530	\$8,581,918	\$70,710	\$8,581,918	\$18,080,076
Miscellaneous	92	0	\$8,119	\$0	\$0	\$0	\$8,119
Recreational	435	41	\$8,711,556	\$12,236,271	\$1,370,705	\$12,236,271	\$34,554,803
Residential	11,133	7,411	\$522,632,390	\$1,105,989,914	\$2,371,605	\$552,994,957	\$2,183,988,866
ROW/Utilities	650	0	\$0	\$0	\$0	\$0	\$0
Very High Total	15,077	7,919	\$625,137,169	\$1,199,929,774	\$5,144,346	\$648,472,350	\$2,478,683,639
High							
Agricultural	116	22	\$14,709,786	\$5,381,274	\$30,562	\$5,381,274	\$25,502,896
Commercial	360	259	\$31,785,031	\$74,735,975	\$3,510,251	\$74,735,975	\$184,767,232
Federal Lands	6		\$0	\$0	\$0	\$0	\$0
Government	86		\$0	\$0	\$0	\$0	\$0
Industrial	35	22	\$2,329,289	\$3,308,741	\$3,120	\$4,963,112	\$10,604,262
Institutional	27	14	\$896,583	\$3,357,032	\$0	\$3,357,032	\$7,610,647

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
Miscellaneous	12		\$0	\$0	\$0	\$0	\$0
Recreational	76	55	\$5,269,263	\$18,010,657	\$59,240	\$18,010,657	\$41,349,817
Residential	6,378	4,180	\$481,275,106	\$882,146,426	\$1,786,001	\$441,073,213	\$1,806,280,746
ROW/Utilities	309	0	\$0	\$0	\$0	\$0	\$0
High Total	7,405	4,552	\$536,265,058	\$986,940,105	\$5,389,174	\$547,521,263	\$2,076,115,600
Moderate							
Agricultural	171	58	\$19,432,016	\$5,208,224	\$922,149	\$5,208,224	\$30,770,613
Commercial	110	91	\$9,643,026	\$61,986,773	\$5,095,089	\$61,986,773	\$138,711,661
Federal Lands	1	0	\$0	\$0	\$0	\$0	\$0
Government	38	0	\$0	\$0	\$0	\$0	\$0
Industrial	45	23	\$2,866,861	\$4,527,585	\$18,164	\$6,791,378	\$14,203,988
Institutional	13	4	\$99,442	\$458,286	\$5,445	\$458,286	\$1,021,459
Miscellaneous	11	0	\$0	\$0	\$0	\$0	\$0
Recreational	5	0	\$0	\$0	\$0	\$0	\$0
Residential	1,114	897	\$75,708,234	\$122,916,285	\$543,966	\$61,458,143	\$260,626,628
ROW/Utilities	87	0	\$0	\$0	\$0	\$0	\$0
Moderate Total	1,595	1,073	\$107,749,579	\$195,097,153	\$6,584,813	\$135,902,803	\$445,334,348
Non-Wildland/Non-Urban							
Agricultural	69	31	\$8,164,038	\$3,355,287	\$1,126,390	\$3,355,287	\$16,001,002
Commercial	4	3	\$267,336	\$1,021,107	\$46,880	\$1,021,107	\$2,356,430
Federal Lands	1	0	\$0	\$0	\$0	\$0	\$0
Government	5	0	\$0	\$0	\$0	\$0	\$0
Industrial	14	9	\$1,129,647	\$1,373,797	\$0	\$2,060,696	\$4,564,140
Institutional	0	0	\$0	\$0	\$0	\$0	\$0
Miscellaneous	14	0	\$0	\$0	\$0	\$0	\$0
Recreational	5	0	\$0	\$0	\$0	\$0	\$0
Residential	40	20	\$2,300,772	\$2,309,150	\$0	\$1,154,575	\$5,764,497
ROW/Utilities	11	0	\$0	\$0	\$0	\$0	\$0
Non-Wildland/Non-Urban Total	163	63	\$11,861,793	\$8,059,341	\$1,173,270	\$7,591,665	\$28,686,069
Urban Unzoned							
Agricultural	0	0	\$0	\$0	\$0	\$0	\$0
Commercial	13	9	\$724,420	\$1,022,616	\$0	\$1,022,616	\$2,769,652
Federal Lands	0	0	\$0	\$0	\$0	\$0	\$0
Government	1	0	\$0	\$0	\$0	\$0	\$0

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	4	2	\$458,430	\$32,816,957	\$293,260	\$49,225,436	\$82,794,083
Institutional	4	2	\$42,845	\$300,896	\$3,750	\$300,896	\$648,387
Miscellaneous	0	0	\$0	\$0	\$0	\$0	\$0
Recreational	1	1	\$135,089	\$123,211	\$0	\$123,211	\$381,511
Residential	140	115	\$3,768,411	\$8,801,725	\$45,782	\$4,400,863	\$17,016,781
ROW/Utilities	3	0	\$0	\$0	\$0	\$0	\$0
Urban Unzoned Total	166	129	\$5,129,195	\$43,065,405	\$342,792	\$55,073,021	\$103,610,413
Unincorporated Plumas County Total	24,406	13,736	\$1,286,142,794	\$2,433,091,778	\$18,634,395	\$1,394,561,101	\$5,132,430,068

Source: CAL FIRE, Plumas County February 2020 Parcel/Assessor's Data

Population at Risk

A separate analysis was performed to determine population that reside in FHSZs. Using GIS, the CAL FIRE FHSZ datasets were overlayed on the improved residential parcel data. Those parcel centroids that intersect each FHSZ were counted and multiplied by the Census Bureau average household size; results were tabulated by FHSZ (see Table 4-92). According to this analysis, there is a population of 2,081 in the Moderate FHSZ, 9,698 in the High FHSZ, and 17,193 in the Very High FHSZ in the County.

Table 4-92 Plumas County Planning Area – Residential Populations at Risk in Moderate or Higher Fire Hazard Severity Zones

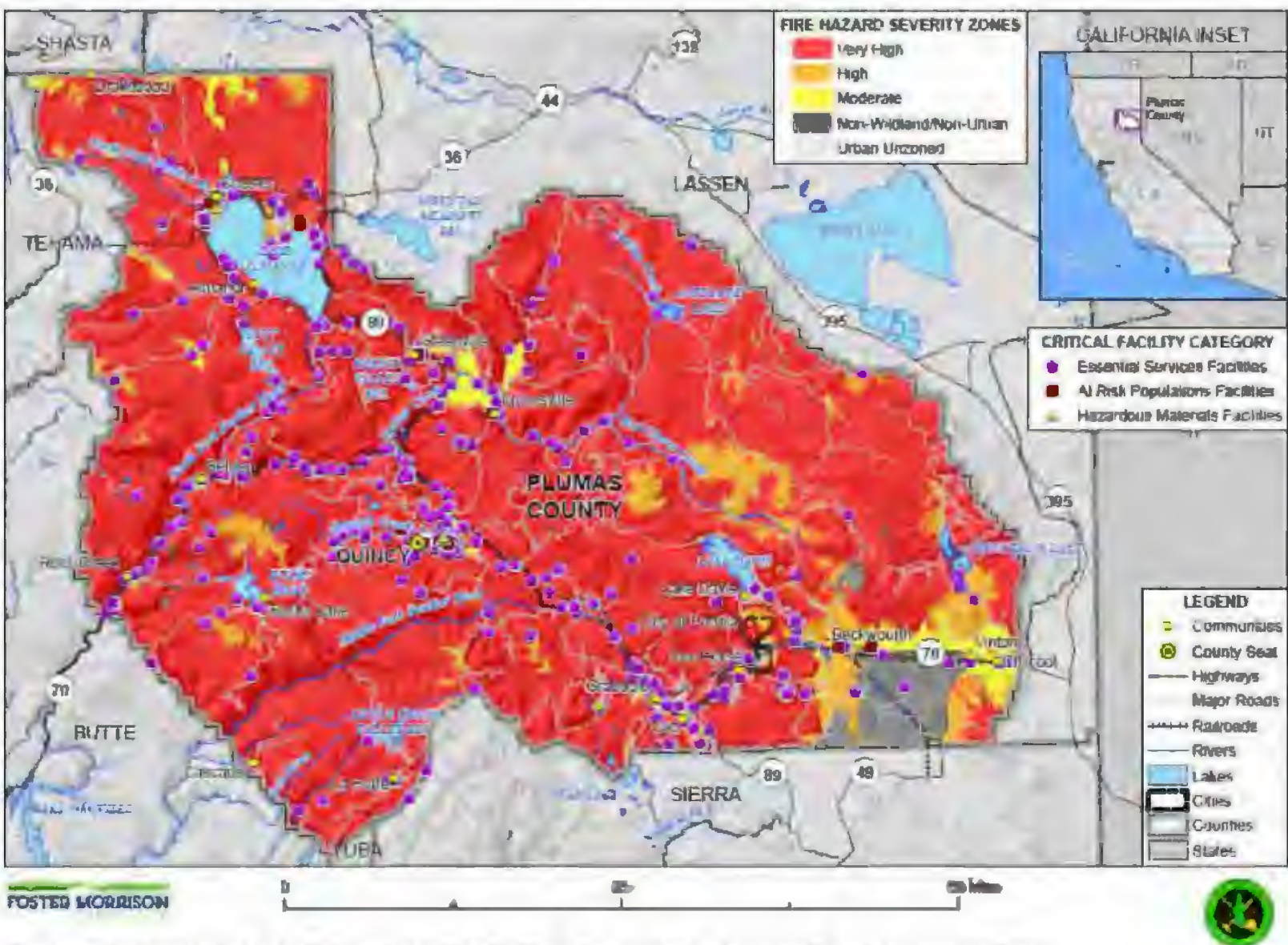
Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Unincorporated Plumas County	7,411	17,193	4,180	9,698	897	2,081
Total	7,411	17,193	4,180	9,698	897	2,081

Source: CAL FIRE, US Census Bureau Average Household Sizes: unincorporated Plumas County (2.32)

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Plumas County to determine critical facilities in the Fire Hazard Severity Zones. Using GIS, the CAL FIRE, Fire Hazard Severity Zones were overlayed on the critical facility GIS layer. Figure 4-167 shows critical facilities, as well as the Fire Hazard Severity Zones. Table 4-93 details critical facilities by facility type and count for the Planning Area. Details of critical facility definition, type, name and address by flood zone are listed in Appendix F.

Figure 4-167 Plumas County– Critical Facilities in FHSZs



Data Source: CAL FIRE | Adopted SRA 11/2007 - This206_3_32 | Draft 9/2007 - (33This206_1), Plumas County GIS | Cal-Alice Map Date: 03/01/2020

Table 4-93 Plumas County– Critical Facilities in FHSZs

Fire Hazard Severity Zones	Critical Facility Category	Facility Count
Very High	Essential Services Facilities	566
	At Risk Populations Facilities	19
	Hazardous Materials Facilities	2
	Total	587
High	Essential Services Facilities	148
	At Risk Populations Facilities	11
	Hazardous Materials Facilities	1
	Total	160
Moderate	Essential Services Facilities	44
	At Risk Populations Facilities	4
	Hazardous Materials Facilities	1
	Total	49
Non-Wildland/Non-Urban	Essential Services Facilities	10
	Total	10
Urban Unzoned	Essential Services Facilities	5
	At Risk Populations Facilities	4
	Total	9
Grand Total		815

Source: Plumas County GIS, CAL FIRE

Overall Community Impact

The overall impact to the community from a severe wildfire includes:

- Injury and loss of life;
- Air quality and health impacts;
- Commercial and residential structural and property damage;
- Decreased water quality in area watersheds;
- Increase in post-fire hazards such as flooding, sedimentation, and debris flows/mudslides;
- Damage to natural resource habitats and other resources, such as crops, timber and rangelands;
- Loss of water, power, roads, phones, and transportation, which could impact, strand, and/or impair mobility for emergency responders and/or area residents;
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures;
- Negative impact on commercial and residential property values;
- Loss of churches, which could severely impact the social fabric of the community;
- Loss of schools, which could severely impact the entire school system and disrupt families and teachers, as temporary facilities and relocations would likely be needed; and
- Impact on the overall mental health of the community.

Future Development

Population growth and development in Plumas County has recently slowed; however, additional growth and development within the WUI and other high fire hazard areas of the County would place additional values at risk to wildfire. California building codes are in effect to reduce this risk, including WUI standards.

GIS Analysis

Plumas County's February 2020 Parcel/Assessor's data and data from the County planning department were used as the basis for the unincorporated County's inventory of parcels and acres of future development areas. The Plumas County Planning Department provided a table containing the assessor parcel numbers (APNs) for the 1,075 parcels representing the different future development projects or areas. Using the GIS parcel spatial file and the APNs, the future development projects were mapped.

For the wildfire analysis of future development areas, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point and linked to the Assessor's data. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts and acreage within each FHSZ. The County was separated into three areas. Figure 4-168 shows the FHSZs and future development areas in the central portion of the County. Figure 4-169 shows the FHSZs and future development areas in the central portion of the County. Figure 4-170 shows the FHSZs and future development areas in the south portion of the County. Parcels and acreages in the FHSZs are summarized in Table 4-94, and detailed in Table 4-95.

Figure 4-168 Plumas County North – Future Development in FHSZs

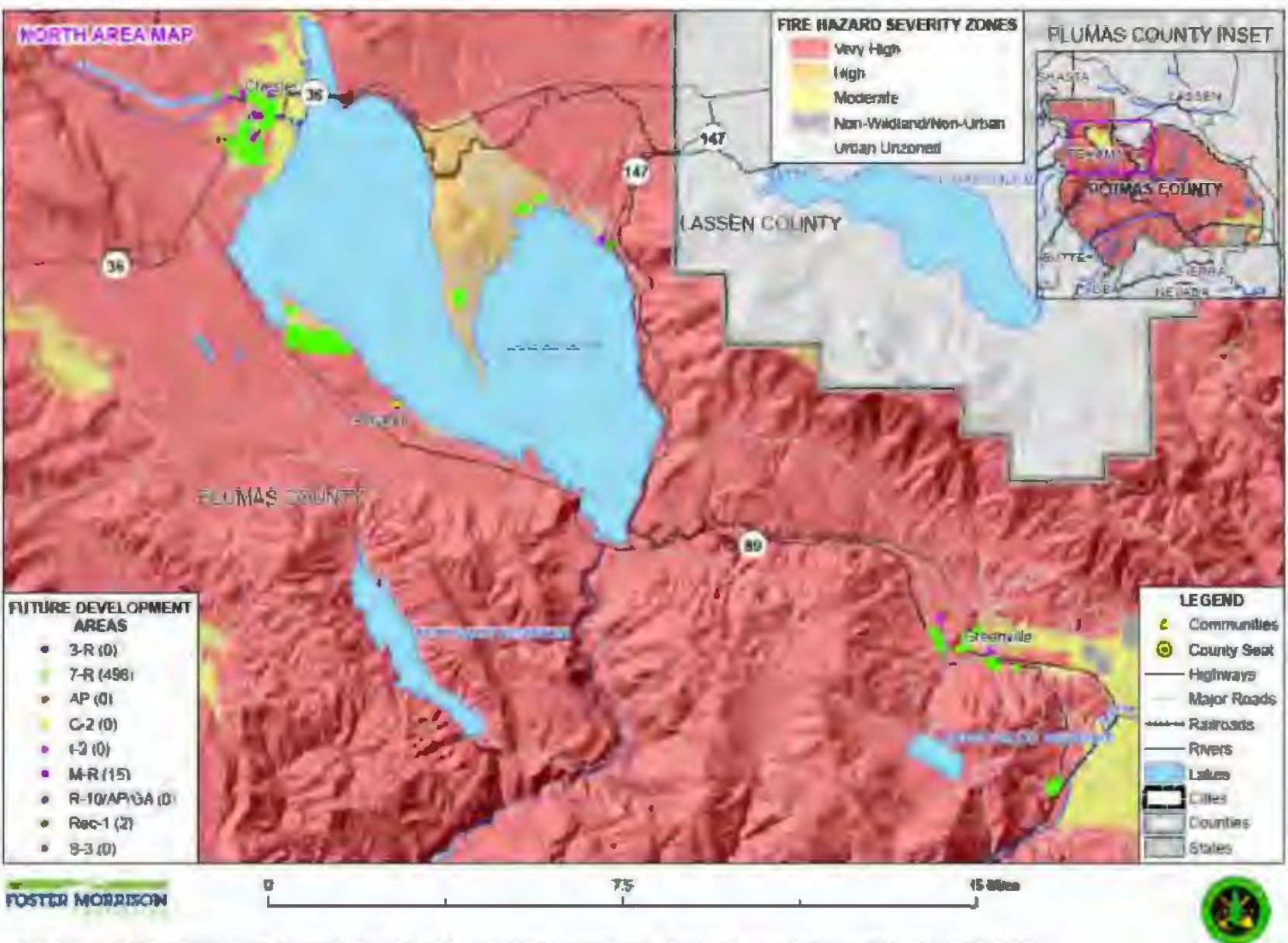


Figure 4-169 Plumas County Central – Future Development in FHSZs

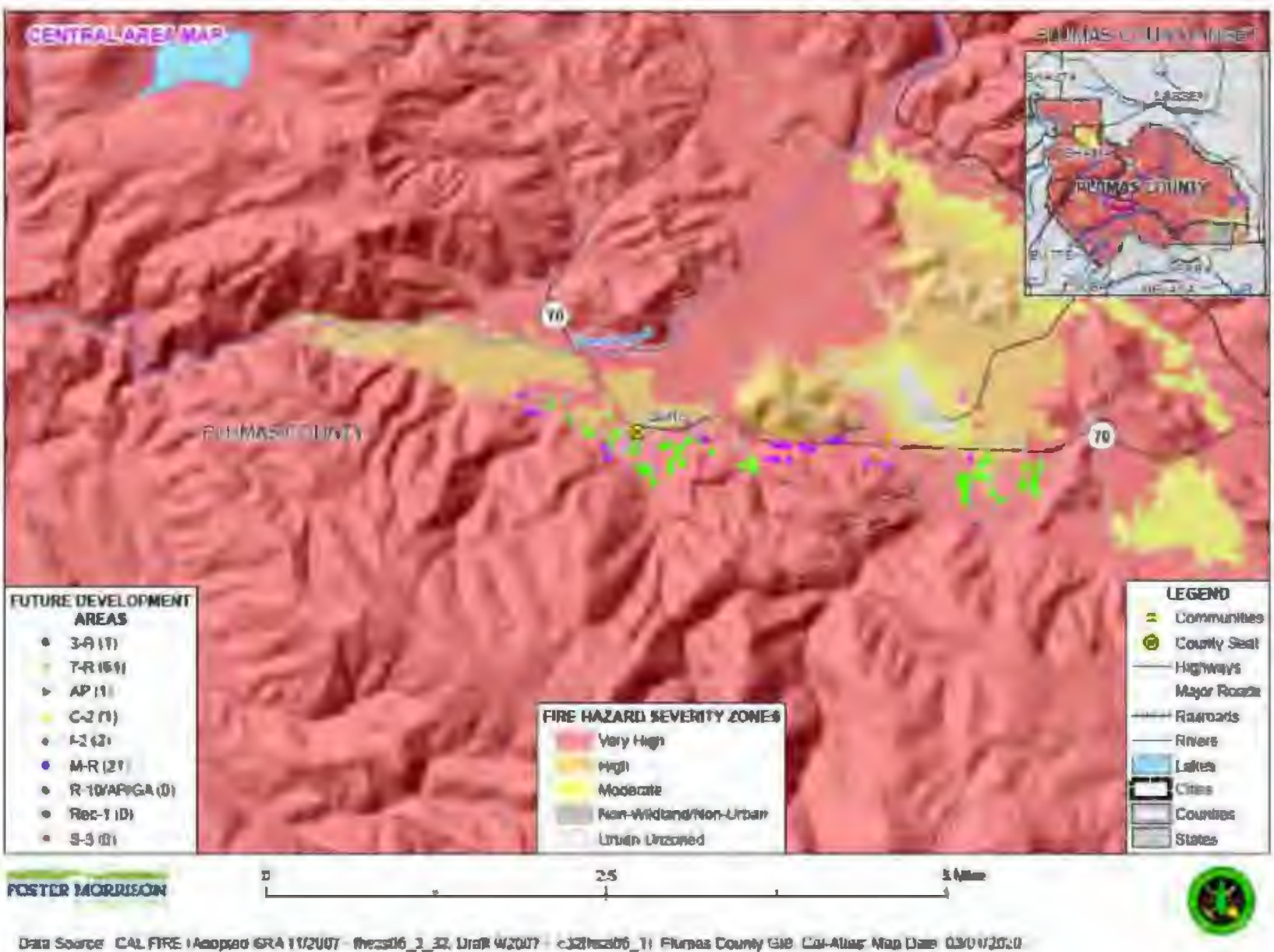


Figure 4-170 Plumas County South – Future Development in FHSZs

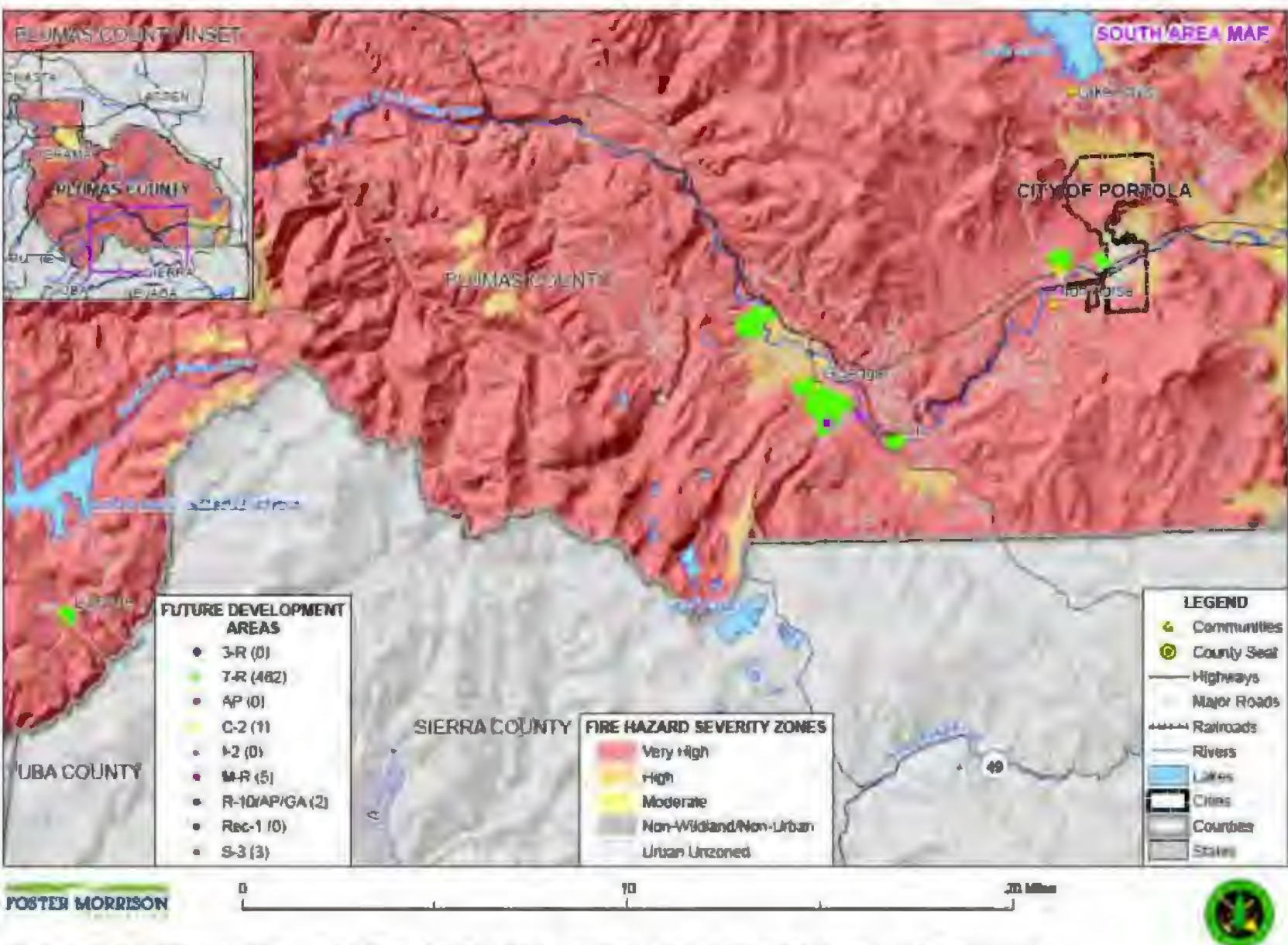


Table 4-94 Plumas County – Future Development Parcel and Acre Counts in FHSZs

Fire Hazard Severity Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
Very High			
3-R	1	0	9.010
7-R	516	196	238.836
C-2	2	0	6.730
I-2	1	0	0.980
M-R	29	6	103.952
R-10/AP/GA	2	1	1,108.880
Rec-1	2	1	13.840
S-3	3	1	56.270
Very High Total	556	205	1,538.498
High			
7-R	389	149	231.144
AP	1		4.010
I-2	1	1	14.950
M-R	4	2	7.380
High Total	395	152	257.484
Moderate			
7-R	100	42	30.373
M-R	8	0	3.240
Moderate Total	108	42	33.613
Urban Unzoned			
7-R	16	4	3.654
Urban Unzoned Total	16	4	3.654
Grand Total			
	1,075	403	1,833.249

Source: Plumas County GIS, CAL FIRE

Table 4-95 Plumas County – Future Development Parcel and Acre Counts in FHSZs and Areas

Map Area/Fire Hazard Severity Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
North Area			
Very High			
7-R	80	25	67.222
M-R	4	1	3.980

Map Area/Fire Hazard Severity Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
Rec-1	2	1	13.840
Very High Total	86	27	85.042
High			
7-R	336	129	209.780
M-R	3	2	6.390
High Total	339	131	216.170
Moderate			
7-R	66	32	18.403
M-R	8		3.240
Moderate Total	74	32	21.643
Urban Unzoned			
7-R	16	4	3.654
Urban Unzoned Total	16	4	3.654
North Area Total	515	194	326.509
Central Area			
Very High			
3-R	1		9.010
7-R	54	18	27.324
C-2	1		2.870
I-2	1		0.980
M-R	20	4	32.330
Very High Total	77	22	72.514
High			
7-R	7	4	2.639
AP	1		4.010
I-2	1	1	14.950
M-R	1		0.990
High Total	10	5	22.589
Central Area Total	87	27	95.103
South Area			
Very High			
7-R	382	153	144.290
C-2	1		3.860
M-R	5	1	67.642
R-10	2	1	1,108.880
S-3	3	1	56.270

Map Area/Fire Hazard Severity Zone/ Future Development Area	Total Parcel Count	Improved Parcel Count	Total Acres
Very High Total	393	156	1,380.942
High			
7-R	46	16	18.725
High Total	46	16	18.725
Moderate			
7-R	34	10	11.970
Moderate Total	34	10	11.970
South Area Total	473	182	1,411.637
Grand Total	1,075	403	1,833.249

Source: Plumas County GIS, CAL FIRE

4.3.19. Natural Hazards Summary

Table 4-96 summarizes the results of the hazard identification, hazard profile, and vulnerability assessment for the Plumas County Planning Area based on hazards data and input from the HMPC. For each hazard profiled in Section 4.3, this table includes the likelihood of future occurrence and whether the hazard is considered a priority hazard for mitigation actions (as discussed in Chapter 5 of this Plan Update) in the Plumas County Planning Area.

As detailed in the hazard identification section, 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 on the 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, crop, and economic damage. The ability of a community 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 by the HMPC to prioritize those hazards of greatest significance to the Plumas County Planning Area, enabling the County to focus resources where they are most needed.

Table 4-96 Hazard Identification/Profile Summary and Determination of Priority Hazards

Hazard	Likelihood of Future Occurrence	Priority Hazard
Avalanche	Highly Likely	N
Climate Change	Likely	Y
Dam Failure	Unlikely	Y
Drought & Water shortage	Likely	Y
Earthquake	Occasional	Y
Floods: 1%/0.2% annual chance	Occasional/ Unlikely	Y
Floods: Localized Stormwater	Highly Likely	Y

Hazard	Likelihood of Future Occurrence	Priority Hazard
Landslide, Mudslide, and Debris Flow	Likely	Y
Levee Failure	Unlikely	Y
Pandemic	Likely	Y
Severe Weather: Extreme Heat	Highly Likely	Y
Severe Weather: Heavy Rains and Storms	Highly Likely	Y
Severe Weather: High Winds and Tornadoes	Highly Likely/ Unlikely	Y
Severe Weather: Winter Storms and Freeze	Highly Likely	Y
Tree Mortality	Likely	Y
Volcano	Unlikely	N
Wildfire	Highly Likely	Y

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 mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this LHMP Update.

A two-step approach was used to conduct this assessment for the County. 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 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.

Similar to the HMPC's effort to describe hazards, risks, and vulnerability of the County, this mitigation capability assessment describes the County's existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. 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 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; mitigation education, outreach, and partnerships are discussed in Section 4.4.4, and other mitigation efforts are discussed in Section 4.4.5.

4.4.1. Plumas County's Regulatory Mitigation Capabilities

Table 4-97 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Plumas County. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 4-97 Plumas County Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
General Plan	Yes 2013	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.
Capital Improvements Plan	Y	Draft is still being edited but the RTP contains most of what is in the CIP
Economic Development Plan	No, but	See General Plan Economics Element for economic development goals, policies, and implementation measures
Local Emergency Operations Plan	Yes	See link to County website: https://www.plumascounty.us/1941/Emergency-Operations-Plan
Continuity of Operations Plan	Y	See EOP “Basic Plan” “Continuity of Government” plan starting on page 23
Transportation Plan	Y	Plumas County Transportation Commission https://www.plumascounty.us/1900/Regional-Transportation-Plan
Stormwater Management Plan/Program	N	No master plan as far storm water goes, very few actual storm water systems, mostly surface run-off
Engineering Studies for Streams	?	We typically will have hydraulics studies for projects on streams – my question is, what is your definition of an “engineering” study, it can mean lots of things which means I would be sending you lots of documents that may not be what they want.
Community Wildfire Protection Plan	Y	See link: https://www.plumasfiresafe.org/wildfire-planning-documents.html

Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	N	--
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Yes (2019 CA Building Code and Title 24)
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	See Table 4-98
Fire department ISO rating:	Y	See attached "Plumas County Fire Protection Agencies (Oct 2019), see "ISO rating"
Site plan review requirements	Y	Yes (Plumas County Code, Title 9 Planning and Zoning)
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
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
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.

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
Flood insurance rate maps	Y, but	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.
Elevation Certificates	Y	On an as needed basis, per parcel/structure – puts a burden on property owners in Zone "A" to conduct an engineered analysis (e.g., flood study) to provide property-specific BFE information and inform areas within and beyond the "Zone A" boundary as shown on the FEMA FIRM
Acquisition of land for open space and public recreation uses	N	--
Erosion or sediment control program	N	Plumas County does not have a grading or drainage ordinance. Grading permits follow the California Building Code Appendix J for issuance, which does not necessarily address 2035 General Plan policies. Public Works Department is currently preparing a draft Grading and Drainage Plan ordinance. Public Works estimates the draft coming to Planning Commission in 2020.
Other		

How can these capabilities be expanded and improved to reduce risk?

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 4-98.

Table 4-98 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 Dist
5/5X	Eastern Plumas Rural Fire District
4/8b	Graeagle Fire Protection District
5	Greenhorn Creek CSD
4/4Y	Hamilton Branch Fire Protection Dist
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.

Goal PHS 6.1	To protect local communities from injury and damage resulting from natural catastrophes and man-made hazardous conditions.
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.
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.

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 6.3.4	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.

Goal PHS 6.4	To minimize the loss of life, injury or damage to property as a result of floods in Plumas County.
Policy 6.4.2	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 6.7	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.

Goal PHS 6.7	To provide effective emergency response to natural or human-made hazards and disasters.
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.
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.
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.
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.

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 9.5.3	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.
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.

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 9.7.3	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.
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 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 (2020)

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 (2016)

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 are 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.

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.

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.

Note: The 30' clearing is being expanded to 100' by the County.

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 2007 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.

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.

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 consistent 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.

Subdivisions (Title 9, Chapter 2)

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.

Development Standards (Title 9, Chapter 3)

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.

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.

4.4.2. **Plumas County's Administrative/Technical Mitigation Capabilities**

Table 4-99 identifies the County personnel responsible for activities related to mitigation and loss prevention in the County.

Table 4-99 Plumas County Administrative/Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
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.

Disaster Council	Y	Disaster Council – objective is to meet quarterly. Met on July 21, 2020 where main topics of discussion were: --Mass Care and Shelter Annex to EOP --PG&E PSPS – develop an Annex. How will Plumas County respond to PSPS including notifications to our Access and Functional Needs Population with Base Line Medical information provided by PG&E Feedback – OES should be the lead, likely underutilized; could have more involvement and defined leadership to be better utilized – mission could be expanded. Title 4 (Public Safety); Sec. 4-1.03. - Disaster Council. (a)So that informed decisions can be made and the public protected, the Board of Supervisors creates a group named the Plumas County Disaster Council and charges it with the responsibility of developing and recommending for adoption by the Board of Supervisors an emergency operations plan, mutual aid plans and rules and regulations as necessary. (b)The membership is flexible as new members can be added as the need for the knowledge and services of additional personnel becomes apparent. The Disaster Council should be made up of representatives from the County's functional areas, such as: fire and rescue operations, evacuation and transportation, public health services, care and shelter operations, radiological protection operations, coroner services, law enforcement and traffic control, restoration of services, communications, managing emergency operations and emergency medical services. (c)Some functional areas may be represented by more than one person. (d)The Chairman of the Board of Supervisors will be the Chairman of the Disaster Council, Vice-Chairman will be the Director of the Plumas County Office of Emergency Services. (e)Unlike other County committees and councils, this one does not have specific individuals as members, specific terms of service nor specific meeting times. (f)Either the Chairman or the Vice-Chairman can call a meeting. The Disaster Council will meet at least bi-annually.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Coming	PW has applied for a multi-year maintenance permit from Cal F&W for 168 bridges, large culverts, and drainage ways so that we may expedite maintenance tasks such debris removal, brushing, basic bridge and culvert maintenance, etc. It's a large stack of maps and paper.
Mutual aid agreements	Y	--Mutual Aid Radio Systems --Plumas County Fire Chiefs Association Local Fire Service Mutual Aid & Rescue Plan (updated 2016)
Other		
Staff	Y/N FT/PT	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

Floodplain Administrator	Y	Staffing is adequate and trained. Coordination is being worked on to increase effectiveness.
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.
Community Planner	Y	Planning Director has experience with hazard mitigation.
Civil Engineer	Y	Staff is trained on regulation enforcement with a hazard focus. Coordination is effective.
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://plumascountry.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://plumascountry.us/2295/FEMA-Flood-Insurance-Rate-Maps-Informati
Other		
Technical	Y/N	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (Reverse 911, outdoor warning signals)	Y	--IPAWS – integrated public alert system --Code Red https://www.plumascountry.us/2163/CodeRed-Emergency-Alert-System --EAS, emergency alert system --NOAA, national weather service alert system --Outdoor warning sirens (in process Peninsula Fire Department)
Hazard data and information	Y	OES
Grant writing	Y	OES, Planning, and Public Works (may be others)

Hazus analysis	N
Other	
How can these capabilities be expanded and improved to reduce risk?	
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 4-100 identifies financial tools or resources that the County could potentially use to help fund mitigation activities.

Table 4-100 Plumas County Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (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	
Authority to levy taxes for specific purposes	Y	Funding has not been used for mitigation in the past.
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	--
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	Funding has not been used for mitigation in the past.
Incur debt through private activities	N	
Community Development Block Grant	Y	For housing (not hazard mitigation) in the past via Plumas County Community Development Commission (housing authority)
Other federal funding programs	Y	--Homeland Security Grant --EMPG – Emergency Management Performance Grant --Title III Funding-Federal funding to County of Plumas
State funding programs	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
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 4-101 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 4-101 Plumas County Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Firewise Communities / Fire Safe Council
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	--Local Fire Departments --Plumas Fire Safe Council --Individual Firewise certified communities - Public Health
Natural disaster or safety related school programs	Y	--local Fire Departments - Plumas Unified School District Safety Officer
StormReady certification	N	
Firewise Communities certification	Y	As of 3/30/2020 – there are 21 certified communities, with 4 others in process
Public-private partnership initiatives addressing disaster-related issues	N	
Other	Y	Cooperation with electric companies like PG&E on PSPS and other events.
How can these capabilities be expanded and improved to reduce risk?		
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.		

Firewise in Plumas County

Plumas County has multiple Firewise communities. The following graphic shows investments made in Plumas County to Firewise efforts:

Firewise Investments

2019 Firewise Communities reported:

- ✓ \$2.3 million invested
- ✓ 57,000 + hours of fuel reduction

**Lifetime Investment
\$5.3 million**



FIREWISE USA™
RESIDENTS REDUCING WILDFIRE RISKS

Source: Plumas County

Community Wildfire Safety Program

PG&E has partnered with the County to prepare for PSPS events. Goals of the program are to make PSPS events smaller in size, duration, and with more information communicated to residents. High Fire Threat maps were created, additional weather stations were installed, high definition cameras were added, and the system has been hardened and vegetation management has been performed.

4.4.5. Other Mitigation Efforts

The County has pursued other mitigation efforts not already captured in the capability assessment above. These include:

- 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 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 Safe 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.



Chapter 5 Mitigation Strategy

Requirement §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 Plumas County Local Hazard Mitigation Plan (LHMP) Update. It describes how the County 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 Hazard Mitigation Planning Committee (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 portion of the 2014 LHMP was conducted by the HMPC. Some of the initial goals and objectives from the 2014 Plumas County LHMP were refined and reaffirmed, some goals were deleted, and others were added. The end result was a new set of goals, reorganized to reflect the completion of or progress towards the 2014 actions, the updated risk assessment and the new priorities of this 2020 LHMP Update. To support the new LHMP goals, the mitigation actions from 2014 were reviewed and assessed for their value in reducing risk and vulnerability to the Plumas County Planning Area from identified hazards and 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 LHMP Update and Section 5.4 details the new mitigation action plan.

Taking all of the above into consideration, the 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 HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the action plan recommendations of this Plan.
- Use existing rules, regulations, policies, and procedures already in existence.
- 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 NFIP

Given 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. Detailed below is a description of Plumas County's flood management program to ensure continued compliance with the NFIP. Also to be considered are the numerous flood mitigation actions contained in this LHMP Update 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 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) 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, but may evaluate the overall value of joining CRS in the future during the implementation phase of this LHMP Update.

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. As well, the County's floodplain management activities apply to existing and new development areas, implementing flood protection measures for structures and maintaining drainage systems to help reduce the potential of flooding within the County.

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 are discussed on Table 5-1.

Table 5-1 Unincorporated Plumas County NFIP Status

NFIP Topic		Comments
Insurance Summary		
How many NFIP policies are in the community?	140 policies	
What is the total premium and coverage?	\$178,103 in annual premiums \$32,883,100 in coverage	
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 claims \$1,099,373.04 in paid claims 9 substantial damage claims	
How many structures are exposed to flood risk within the community?	557 in 1% annual chance floodplain 88 in 0.2% annual chance floodplain	

NFIP Topic		Comments
Number of Repetitive and Severe Repetitive Loss Properties	4 RL structures 0 SRL structures	
Describe any areas of flood risk with limited NFIP policy coverage	No areas with limited NFIP policy coverage.	
Staff Resources		
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No	
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review is done	
What are the barriers to running an effective NFIP program in the community, if any?	None	
Compliance History		
Is the community in good standing with the NFIP?	Y	
Are there any outstanding compliance issues (i.e., current violations)?	No	
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	
Regulation		
When did the community enter the NFIP?	9/24/1984	
Are the FIRMs digital or paper?	Digital	
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet	

NFIP Topic	Comments
Provide an explanation of the permitting process.	An application for a development permit for any man-made change to real estate in an area of special flood hazard shall include the following information: The proposed elevation in relation to mean sea level of the lowest floor of all structures; or, if in zone AO, elevation of highest adjacent grade and proposed elevation of lowest floor; (b) The proposed elevation in relation to mean sea level to which any nonresidential structure would be floodproofed if required by Section 8-17.301(c)(2); (c) All appropriate certifications listed in Article 3 of this chapter and Section 9-3.309 of Article 3 of Title 9 of this Code; (d) A description of the extent to which any watercourse will be altered or relocated as a result of the proposed man-made changes to real estate; (e) A proposed method and means, subject to the approval of the Building Official, to verify the location of the man-made change to real estate; (f) And an application for a development permit for any man made change to real estate in a 100-year flood hazard area shall include an engineered analysis based on a uniform procedure prescribed by the County Engineer that has been completed, submitted to the County Engineer, reviewed and approved by the County Engineer, and copies thereof provided to the County Engineer, the Planning Director and the Building Official. 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. In an A zone, residential construction, new or substantial improvement, shall have the lowest floor, including basement, elevated at least one foot above the base flood elevation. In an AO zone, residential construction, new or substantial improvement, shall have the lowest floor, including basement, elevated above the highest adjacent grade to a height exceeding the depth number specified in feet on the Flood Insurance Rate Map by at least one foot, or elevated at least three (3') feet above the highest adjacent grade if no depth number is specified. On completion of the structure, the elevation of the lowest floor shall be certified by a registered professional engineer or surveyor, and shall be verified by the Building Official, to be properly elevated. The certification and verification shall be provided to the Building Official and the County Engineer.
Community Rating System (CRS)	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A
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/Plumas County

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 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 all 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. As detailed in Section 4.4, the Capability Assessment for the County, 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 the County.

These EOP's, 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 will 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 three main types of HMA grants: (1) Hazard Mitigation Grant Program (HMGP), (2) Building Resilient Infrastructure and Communities (BRIC), replacing the former Pre-Disaster Mitigation (PDM) Program, and (3) Flood Mitigation Assistance (FMA) Program. 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

Requirement §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 HMPC has 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.

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
- A 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 2014 LHMP 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 two 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. 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 2020 LHMP Update.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, 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 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

5.3 Identification and Analysis of Mitigation Actions

Requirement §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 the County 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 in the County is unlikely, the vulnerability of the county is low, or capabilities are already in place to mitigate negative impacts. Further, the resulting mitigation strategy presented in this Chapter focuses on those mitigation actions that the County has the authority, resources, and capacity to consider for implementation over the next 5-years covered by this LHMP Update.

Once it was determined which hazards warranted the development of specific mitigation actions, the 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 future and existing buildings 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 2014 LHMP and new actions identified during this planning process were reviewed and prioritized via an LHMP mitigation action voting website for inclusion in this 2020 LHMP Update. The Plumas County mitigation action voting website established at <https://fostermorrison.aweeba.com/> included the list of actions brainstormed during the mitigation strategy meetings and provided a mechanism for everyone to vote on their priority actions for further development as detailed further below. This comprehensive review of mitigation measures was performed using the criteria (alternatives and selection criteria) in Appendix C.

With these criteria in mind, HMPC members were each provided with nine weighted votes, indicating High (worth 5 points), Medium (worth 3 points), and Low (worth 1 point) priorities. The team was asked to use the votes 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 greater detail 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 LHMP Update.

Recognizing the limitations in prioritizing actions from multiple departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue actions that contributed 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

Requirement §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, infrastructure, and natural and cultural resources 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 5-2 identifies all mitigation actions to this LHMP Update. For each mitigation action item included in Table 5-2, a detailed mitigation implementation strategy has been developed.

The mitigation action plan contains both new action items developed for this LHMP Update as well as old actions that were yet to be completed from the 2014 Plan. Table 5-2 indicates whether the action is new or from the 2014 LHMP and Chapter 2 contains the details for each 2014 mitigation action item indicating whether a given action item has been completed, deleted, or deferred.

As described throughout this LHMP Update, Plumas County 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 County to consider for implementation over the next 5-years covered by this 2020 Update. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-2. 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 the County, individuals, and departments based in part on department direction, staffing, and available 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 Plumas County has numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as stormwater and drainage plans, fire plans, and capital improvement budgets and reports. These actions are considered to be part of this Plan, 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 Plan.

Further, it should be clarified that the actions included in this mitigation strategy are subject to review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The County is not obligated by this document to implement any or all of these projects. Rather, this mitigation strategy represents the desires of the community 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.

Table 5-2 Plumas County Planning Area Mitigation Actions

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Multi-Hazard Actions					
Action 1. Integrate Local Hazard Mitigation Plan into Public Health & Safety Element of General Plan	New action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	New action	X	X	X	Public Information
Action 3. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access	New action	X	X	X	Structural Projects Emergency Services
Action 4. Companion Animal/Livestock/Horse/Equipment Trailer	New action	X	X		Emergency Services
Action 5. Plumas County General Plan Public Health & Safety Element update to incorporate Senate Bill (SB) 379 requirements	New action	X	X		Prevention
Action 6. Continue Telephone Emergency Notification System (TENS) Capability Enhancements Countywide	New action	X	X		Emergency Services
Action 7. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.	New action	X	X		Emergency Services
Action 8. Evaluate Coverage and Expansion for Broadband Services. Advance Grants and Projects Accordingly	New action	X	X		Emergency Services
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.	New action	X	X		Property Protection Structural Projects Emergency Services
Action 10. Identify Critical Facilities Requiring Backup Generators	New action	X	X		Property Protection Structural Projects Emergency Services

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 11. Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter	New action	X	X		Emergency Services
Action 12. Explore establishing a Community Emergency Response Team (CERT)	New action	X	X		Emergency Services
Action 13. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access	2014 action	X	X		Property Protection Emergency Services
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	New action	X	X		Property Protection Public Information Emergency Services
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.	New Action	X	X		Prevention Emergency Services
Climate Change, Drought and Water Shortage Actions					
Action 16. Develop a Climate Action Plan	New action	X	X	X	Prevention
Action 17. Water Shortage Preparedness and Contingency Planning Pilot Project	New action	X	X		Prevention
Action 18. Water Supply Infrastructure Improvements	New action	X	X		Property Protection Structural Projects
Dam Failure, Flood, Localized Flood, Levee Failure, Landslide, Mudslide, and Debris Flow, and Severe Weather Actions					
Action 19. Countywide Stormwater Drainage and Grading Ordinance	New action	X	X	X	Prevention
Action 20. Develop a Countywide Drainage Master Plan	New action	X	X	X	Prevention
Action 21. FEMA Mapping Update	New action	X	X	X	Prevention
Action 22. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles (Gates, Crown Repair, Vegetation Maintenance, etc.)	New action	X	X	X	Structural Projects Property Protection Emergency Services Natural Resource Protection

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 23. Ongoing Implementation of Stream Clearing and Maintenance Programs	New action	X	X	X	Property Protection Natural Resource Protection
Action 24. Plumas Eureka CSD stream bank flood mitigation	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 25. Evaluate and Implement Projects to Reduce Flooding in Plumas Eureka CSD	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 26. Plumas Eureka CSD Sewer Plant Flood Mitigation	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 27. Evaluate Options for Obtaining 100-year Level of Certification for the Diversion Dam (East and West Chester Levees)	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
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	New action	X	X	X	Prevention
Action 29. Identify and Implement Bank Stabilization Projects	2014 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 30. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad	New action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 31. Evaluate and Implement Wolf Creek Channel Stabilization Projects through Greenville and Indian Valley Areas	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
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	New action	X	X		Property Protection Structural Projects

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 33. Seismic Risk Evaluations to Prioritize and Implement Seismic Retrofits	New action	X	X		Property Protection Structural Projects
Pandemic Actions					
Action 34. Update and Refine Pandemic Plan	New action	X	X		Prevention
Wildfire, Drought and Water Shortage, and Tree Mortality Actions					
Action 35. Plumas County Agriculture, Forestry, and Natural Resources Resilience	New action	X	X		Prevention Natural Resource Protection
Action 36. Invasive Species Control and Eradication	New action	X	X		Prevention Natural Resource Protection
Action 37. Continue and Promote Defensible space (PRC 4291) Projects Including Assistance Efforts for Senior and Disabled Residents	New action	X	X		Property Protection
Action 38. Establish Additional Firewise USA Sites (communities) and Promote Existing Ones	New action	X	X		Prevention Public Information Property Protection
Action 39. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects	New action	X	X		Prevention
Action 40. Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.	New action	X	X		Prevention Property Protection Structural Projects
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	New action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
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)	New action	X	X		Prevention
Action 43. Local Adoption of State Responsibility Area Fire Safe Regulations	New action	X	X		Prevention

Action Title	New Action/ 2014 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	Mitigation Type
Action 44. Improve Funding and Response Capabilities of Local Fire Protection Districts and Expand Districts in Areas not Covered	New action	X	X		Prevention Property Protection Natural Resource Protection
Action 45. Review and Update, as Needed, Plumas County Code to Address Defensible Space and Vegetation Management	New Action	X	X		Prevention Property Protection Natural Resource Protection

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Public Health & Safety Element of General Plan

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

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). In 2006, the state adopted AB 2140 which added provisions specifying what is to be included in a Local Hazard Mitigation Plan (LHMP) and requiring a linkage between a local jurisdiction's LHMP and the Safety Element of their General Plan. AB 2140 requires a jurisdiction to adopt the LHMP into the Safety Element of the General Plan in order to be fully eligible for disaster relief funding under the California Disaster Assistance Act. AB 2140 can be met by either including the LHMP language specific to AB 2140 as part of the Safety Element or to incorporate the LHMP by reference into the Safety Element of the General Plan.

Project Description: Specifically, AB 2140 requires that Plumas County adopts this 2020 LHMP Update as part of the Public Health & Safety Element of its General Plan. Adoption of the LHMP into the Public Health & 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: Public Health & Safety Element of General Plan

Responsible Office/Partners: Plumas County Planning Department and County Board of Supervisors

Cost Estimate: County Board of Supervisors/Planning Commission/Planning Department staff time

Potential Funding: County Budgets

Timeline: 2021 – 2022; as soon as possible after FEMA approval of the 2020 LHMP Update

Project Priority (H, M, L): High

Action 2. Enhance Public Education, Awareness, and Outreach of Natural Hazards and Public Understanding of Hazard Mitigation and Disaster Preparedness

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

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 help mitigate the impacts from natural hazards and how to be better prepared and more self-reliant for the next natural disaster event.

Project Description: A comprehensive multi-hazard education and 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 4, as well as other goals of this LHMP Update, and will consider:

- Collaboration with other County agencies and groups to ensure consistent messaging and a comprehensive approach to natural hazard education;
- 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;
- Holding seasonal public education and training events to targeted populations and areas in the County;
- 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 include natural hazard mitigation and to reach the broader region.

Responsible Office/Partners: Plumas County OES and other County departments; other public outreach agencies such as the Plumas County Fire Safe Council and others

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and how to be more self-reliant and better prepared. Effective public outreach programs are aimed at protecting lives and reduce damages from natural hazards. An effective public education program can be highly effective and relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Project Priority (H, M, L): High

Action 3. Continue Bridge Replacement Program using Federal Funding Source for Evacuation and Emergency Services Access

Hazards Addressed: Wildfire, Floods: Localized Stormwater

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: 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); Plumas County Public Works

Cost Estimate: \$1,500,000 to \$2,500,000 per bridge

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: Frequency of bridge replacement is dependent on Plumas County cash flow.

Project Priority (H, M, L): High

Action 4. Companion Animal/Livestock/Horse/Equipment Trailer

Hazards Addressed: Wildfire, Flood, Evacuation related hazards

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Plumas County does not currently own a trailer that can be used for the transport of companion animals, livestock, horses or the emergency equipment required to care for them.

Many people will refuse to evacuate if they cannot move their companion animals, livestock, or horses 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.

Project Description: To purchase a multi-species appropriate bumper pull livestock trailer.

Other Alternatives: 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

Cost Estimate: \$17,000.00

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: Urgent

Project Priority (H, M, L): High

Action 5. 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

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

Cost Estimate: \$180,000

Benefits (Losses Avoided): People and property

Potential Funding: Grant to be identified

Timeline: 2021 – 2022

Project Priority (H, M, L): Medium

Action 6. Continue Telephone Emergency Notification System (TENS) Capability Enhancements Countywide

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Plumas County has two TENS systems- CodeRED (Everbridge coming soon to replace CodeRED) and IPAWS. Improve capability of contacting the public with emergency alerts.

Project Description: Increase public education for sign up and emergency notification methods. Publications, advertising, media outreach.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County CWPP, Plumas County Emergency Operations Plan

Responsible Office/Partners: Plumas County OES, CALFIRE, Plumas County Fire Districts, Plumas Fire Safe Council

Cost Estimate: \$5,000

Benefits (Losses Avoided): Public education; faster notification of emergency to community; community enhances knowledge of being prepared

Potential Funding: EMPG, State 911 funding

Timeline: Ongoing

Project Priority (H, M, L): Medium

Action 7. Evacuation Planning, Mapping, and Exercising, to Include Considerations for Shelters, Refuge Areas, Safety Zones, Evacuation Signage, etc.

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: In the Wildland Urban Interface. Communities, industrial landowners, along with local, state, and federal agencies should work collaboratively to identify and pursue funding to improve access for evacuations. Access communities for evacuations in and out of the community in the wildland urban interface (WUI) - A number of existing “at risk” communities in Plumas County presently only have “one way” in and out of their community.

Evacuation planning - many of the County’s communities have evacuation plans. Efforts by the County should continue to work towards providing plans to those communities without one. Based upon final evacuation planning efforts, provide alternatives to constructing and or re-purposing existing routes to mitigate wildfire risk to communities. Some communities only have one way in and out in the case of an evacuation. Road surfaces for some main evacuation routes are rocky and will limit the speed residents and visitors could evacuate. Some roads are narrow with no turnouts and in need of annual fuel reduction and mowing of roadsides for fire safety. In case temporary refuge sites need to be used during evacuations as a last resort, not all sites have annual fuel reduction completed. Some designated shelters have no cooling systems to filter smoke for at risk populations.

Project Description: Coordinate with Partners to identify alternate evacuation roads for communities with only one road out of community. Improve existing road surfaces in need of improvement for commonly used primary and secondary routes out of communities. Evacuation roads should have fuel reduction and roadside mowing completed on a regular schedule. Evacuation Interagency Functional Exercises for Plumas County. Evacuation route signing for highest risk communities. Emergency preparedness publications and maps for residents, businesses and visitors. Address Senate Bill 99 (2019, Nielsen) (GC 65302) that requires, upon the next revision of the housing element on or after January 1, 2020, to review and update the safety element to include information identifying residential developments in hazard areas that do not have at least 2 emergency evacuation routes.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County CWPP, Plumas County Emergency Operations Plans, PG&E Public Safety Power Shutoff plan, Plumas County Hazardous Materials Plan, Hydroelectric Public Safety Plan, Plumas County General Plan

Responsible Office/Partners: County Agencies (Sheriff, OES, Planning, GIS, Road Departments) CALFIRE, Plumas County Fire Districts, Plumas County Community Service Districts (CSD), Plumas Fire Safe Council, Caltrans, USFS

Cost Estimate: Unknown at this time

Benefits (Losses Avoided): Improve emergency preparedness of roads and personal preparation. Improve speed of evacuations out of communities. Improve public safety.

Potential Funding: EMPG, FEMA grants

Timeline: 1-5 years and ongoing

Project Priority (H, M, L): High

Action 8. Evaluate Coverage and Expansion for Broadband Services. Advance Grants and Projects Accordingly

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Plumas County is a rural county with rugged, canyon and mountainous landscapes making communications challenging and expensive.

Technology and communications infrastructure is outdated with poor to mediocre performances and reliability throughout a majority of the geographic boundaries of the County. ‘Modern’ communications exist mostly in downtown corridors.

Project Description: Projects vary widely, from County outdated and under-maintained emergency communications infrastructure to business and residential communications infrastructure.

This has been a Board priority for some time, but executed slowly with recessions and lack of key staff in place to see funding and projects through.

Improved contracts and updated fees can help the County maintain and improve its communications infrastructure.

The County has enjoyed a beneficial relationship with Plumas-Sierra Rural Electric Cooperative (Plumas-Sierra) to bring the communications infrastructure and services the County does have to date. Currently, the County is collaborating with Plumas-Sierra to evaluate and expand communications services with CARES Act grants.

Other Alternatives: Continue to support and collaborate with Plumas-Sierra Rural Electric Cooperative for communications coverage, expansion, maintenance and improvements

Existing Planning Mechanism(s) through which Action Will Be Implemented: Regular collaboration of board representatives and staff from each party, letters of support for grants, potentially create a committee for communications or fold into an existing committee

Responsible Office/Partners: County Administrator

Cost Estimate: Varies by project

Benefits (Losses Avoided): Improved communications among communities enable quick responses by first responders, citizens, businesses and all County stakeholders and agencies to minimize loss of infrastructure and life.

Potential Funding: General Fund, tax and/or increases, grants, combination thereof

Timeline: Current and ongoing with rapid development in technology

Project Priority (H, M, L): Medium

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.

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Loss of communications put the public and emergency responders at risk. Landline numbers are decreasing in Plumas County. 50% of the population in Plumas County uses cell phones as their only phone. Loss of cell towers and areas of no cell coverage will reduce the ability to reach the public in the case of a “Code RED” Telephone Emergency Notification System.

Project Description: Improve fencing. Ensure all sites have backup generators for power. Complete hazardous fuel reduction including yearly maintenance for all sites. Enhance backhaul systems to include wired, fiber optic and wireless components. This project will mobilize portable cell tower “hot spots” when needed.

Other Alternatives: None Identified

Existing Planning Mechanism(s) through which Action Will Be Implemented: Tactical Interoperable Communications (for land mobile radios for public safety)

Responsible Office/Partners: Operational Area Public Safety Agency and Wireless carriers

Cost Estimate: Minimum of \$500,000

Benefits (Losses Avoided): Minimize risks and vulnerability of cell tower and repeater sites.

Potential Funding: DHS, FEMA/CALOES Grants

Timeline: Ongoing

Project Priority (H, M, L): High

Action 10. Identify Critical Facilities Requiring Backup Generators

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During hazard events or times of PSPS, it is imperative for critical facilities to be functional.

Project Description: Critical facilities without existing generator power back up will be reviewed and prioritized for the installation of generators.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Public Health and Safety Element of General Plan

Responsible Office/Partners: Plumas County Facility Services

Cost Estimate: To be determined on a facility by facility basis.

Benefits (Losses Avoided): Reduced risk of critical facility failure.

Potential Funding: FEMA and Cal OES grants; other state grants, PG&E

Timeline: As funding is available.

Project Priority (H, M, L): Medium

Action 11. Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During times where hazards occur, access to food may be limited. The Camp Fire in Paradise (nearby Butte County) which took 85 lives, left survivors with little to no access to emergency food supplies due to the absence of an Emergency Food Access plan.

Project Description: The Food Council had identified the need for such a plan as well as support and assistance in formulating such a plan. This project will seek to have food access in the event of a natural hazard.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: EOP Annex B

Responsible Office/Partners: Plumas County OES

Cost Estimate: Putting the Plan together will have costs mostly in staff time and local budgets.

Benefits (Losses Avoided): This will reduce risk to citizens who may be evacuated during times of hazard events.

Potential Funding: Existing budgets.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 12. Explore Establishing a Community Emergency Response Team (CERT)

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: During hazard events in the County, especially during wildfires, there is a need to have volunteers know what to do before, during, and after the hazards the County and their communities may face.

Project Description: The Community Emergency Response Team (CERT) program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a consistent, nationwide approach to volunteer training and organization that professional responders can rely on during disaster situations, allowing them to focus on more complex tasks.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: There is no existing planning mechanism under which the CERT teams would fall. May be integrated into EOP activities

Responsible Office/Partners: Plumas County OES

Cost Estimate: Unknown, but due to the nature of the CERT program (being a volunteer organization), costs are not expected to be large.

Benefits (Losses Avoided): Increased readiness and volunteer preparation for hazard events.

Potential Funding: Cal OES and FEMA grants.

Timeline: Within 5 years.

Project Priority (H, M, L): Medium

Action 13. Ingress/Egress Road Projects to Widen and Improve Roads for Evacuation and Emergency Services Access

Hazards Addressed: Wildfires, and all other hazards requiring evacuation and emergency access

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: There are many County, Private and Forest Service Roads within Plumas 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: EOP and related efforts

Responsible Office/Partners: Plumas County Public Works/Engineering Department

Cost Estimate: To be determined on a project-specific basis

Benefits (Losses Avoided): Efficient evacuation of residents while allowing emergency services access.

Potential Funding: CalFire Grants

Timeline: When funding becomes available

Project Priority (H, M, L): High

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

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, Severe Weather: High Winds and Tornadoes, Severe Weather: Winter Storms and Freeze, Tree Mortality, and Wildfire)

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: 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.” This was an issue during the search, rescue, and evacuations due to the North Complex Fire in August of 2020. Many properties didn’t have address signage that was visible. Plumas County Code Title 9, Chapter 8. Street Address System has been adopted as implementation of the SRA Fire Safe Regulations (PRC 4290).

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. Structural Fire Protection Districts are also primary sources for code compliant addressing signs within the boundaries of their districts

Other Alternatives: Private companies can also produce reflective street and address signs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Any road or address signage shall be reviewed by Plumas County Planning prior to manufacturing for compliance with existing

road names and property addresses on file in the County's Geographic Information System and 911 Emergency Response system.

Responsible Office/Partners: Plumas County Public Works/Engineering Department; Districts located within Plumas County which provide structural fire protection services.

Cost Estimate: At cost of sign to produce

Benefits (Losses Avoided): Proper reflective signage and street signs help first responders efficiently respond.

Potential Funding: Project funding unknown at this time, possible FEMA and State grants, staff time

Timeline: Ongoing, as needed

Project Priority (H, M, L): High

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.

Hazards Addressed: Wildfire, Landslide, Mudslide, and Debris Flow

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: 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, for example, during Plumas County Coordinating Council meetings.

Responsible Office/Partners: Plumas County Public Works Department and Plumas and Lassen National Forests

Cost Estimate: \$100,000 to \$500,000

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: Ongoing to add additional alternate routes.

Project Priority (H, M, L): High

Climate Change, Drought and Water Shortage Actions

Action 16. Develop a Climate Action Plan

Hazards Addressed: Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

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

Cost Estimate: Staff time

Benefits (Losses Avoided): Reduced risk to people and property from climate change.

Potential Funding: Staff time

Timeline: 2022 – 2024

Project Priority (H, M, L): Medium

Action 17. Water Shortage Preparedness and Contingency Planning Pilot Project

Hazards Addressed: Climate Change, Drought & Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Sierra Institute is a grantee of the California Department of Water Resources (DWR) Disadvantaged Community Involvement (DACI) grant program, having been awarded funding for the planning and implementation of community assessments and technical assistance provision in the Mountain Counties Funding Area. Sierra Institute, through Proposition 1 funds provided by DWR, is supporting technical assistance efforts by Plumas County for the purposes of assessment, capacity building, and technical assistance to small drinking water systems.

Project Description: The goal of this technical assistance grant project is to develop water shortage preparedness, needs assessment, and contingency planning strategies for the most vulnerable water systems and disadvantaged and Tribal communities in the Upper Feather River (UFR) Integrated Regional Water Management (IRWM) Region. The preparedness and planning efforts will assess water infrastructure related needs including aging infrastructure, drought vulnerabilities, identifying service area boundaries, chemical contaminants, and other problems. A GIS layer will be developed for responding small water systems depicting service area boundaries, well locations, and other notable system infrastructure. Project information, a fact sheet, and findings will be provided to project partners, stakeholders, and others. Meetings with water system partners will be conducted to coordinate planning efforts.

Other Alternatives: N/A

Existing Planning Mechanism(s) through which Action Will Be Implemented: Integrated Regional Water Management (IRWM) Plan

Responsible Office/Partners: Plumas County Planning Department, GIS Department, and Environmental Health Department; Hinman & Associates; and Sierra Institute

Cost Estimate: \$45,000

Benefits (Losses Avoided): Creating contingency planning for the smallest and most vulnerable systems is critical and this project aims to accomplish a Plumas County system-wide level assessment with outcomes to support local planning and preparedness for other UFR region small water systems. Municipal water providers in the UFR region will be able to utilize the water shortage preparedness and contingency planning Plumas County pilot efforts to develop water shortage contingency plans for their own agencies and identify projects to address drought vulnerabilities with the intent of using the information to leverage state and federal funding as it becomes available to address the needs.

Potential Funding: Department of Water Resources (DWR) Proposition 1 Disadvantaged Community Involvement (DACI) grant program

Timeline: 2020 – 2021

Project Priority (H, M, L): High

Action 18. Water Supply Infrastructure Improvements

Hazards Addressed: Climate Change, Drought & Water Shortage

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: The Upper Feather River (UFR) Integrated Regional Water Management (IRWM) Regional Water Management Group (RWMG) nominated candidates for a DWR IRWM implementation grant focusing on domestic and emergency water storage to address climate change driven changes in supply, availability, and needs. As precipitation and recharge patterns vary with climate change, it is critical that water service providers plan to maximize storage options and identify and develop alternative water sources in response to changing conditions.

Project Description:

1. Project Administration.
2. Sierraville Public Utilities District (SPUD) Alternative Water Source and Development is the development of a pump house/booster pump/onsite power generation.
3. Indian Valley Community Services District (IVCSD) Community/Emergency Water Storage Tank project consists of a new water storage tank to provide additional storage for domestic and emergency purposes to meet peak needs and to allow flexibility for maintenance needs.

Other Alternatives: None identified

Existing Planning Mechanism(s) through which Action Will Be Implemented: Integrated Regional Water Management (IRWM) Plan – the candidate projects fall under the IRWM strategies for regional self-reliance, water supply, and water quality.

Responsible Office/Partners: Plumas County Planning Department, Hinman & Associates, Sierraville Public Utilities District, and Indian Valley Community Services District

Cost Estimate: \$1,002,536

Benefits (Losses Avoided): Provides alternative water sources to create a more reliable source of domestic and emergency water supply, particularly in response to extended periods of drought and in response to the increasing threat of catastrophic wildfire.

Potential Funding: Proposition 1 Round 1 Integrated Regional Water Management (IRWM) Implementation Grant award funded (July 21, 2020 award letter).

Timeline: 2020 – 2023

Project Priority (H, M, L): High

Dam Failure, Flood, Localized Flood, Levee Failure, Landslide, Mudslide, and Debris Flows, and Severe Weather Actions

Action 19. Countywide Stormwater Drainage and Grading Ordinance

Hazards Addressed: Floods: Localized Stormwater

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: Plumas County is in need of a Countywide Stormwater Drainage and Grading Ordinance.

Project Description: Develop Countywide Stormwater Drainage and Grading Ordinance to standardize development related to stormwater and grading issues.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: This would create a planning mechanism.

Responsible Office/Partners: Plumas County Public Works Department

Cost Estimate: Estimated \$10,000

Benefits (Losses Avoided): With standardized procedure for stormwater drainage and grading, Countywide drainage will be improved.

Potential Funding: Current funding in place

Timeline: Within 1 year

Project Priority (H, M, L): High

Action 20. Develop a Countywide Drainage Master Plan

Hazards Addressed: Dam Failure, Flood: 1% and 0.2% Annual Chance, Floods: Localized Stormwater, Levee Failure, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: 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: No action

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: Plumas County Public Works/Engineering Department

Cost Estimate: \$200,000

Benefits (Losses Avoided): Increase efficiency of the Countywide drainage to prevent or minimize flooding during a record storm water event.

Potential Funding: FEMA and other Grant Funding

Timeline: Within the next five years

Project Priority (H, M, L): High

Action 21. 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

Issue/Background: 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: Floodplain Ordinance

Responsible Office/Partners: Plumas County Public Works/Engineering Department

Cost Estimate: Unknown

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: FEMA and CA DWR Grants

Timeline: Within 5 years

Project Priority (H, M, L): High

***Action 22. Evaluate Options to Repair and Maintain Levee Crown for Emergency Access Vehicles
(Gates, Crown Repair, Vegetation Maintenance, etc.)***

Hazards Addressed: Levee Failure, Floods: 1%/0.2% annual chance

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: 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 levees 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: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Flood Control and Water Conservation District

Cost Estimate: Unknown scope and budget Countywide

Benefits (Losses Avoided): Maintain levees 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: When funding is available

Project Priority (H, M, L): High

Action 23. Ongoing Implementation of Stream Clearing and Maintenance Programs

Hazards Addressed: Floods: Localized Stormwater

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: 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: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: A draft document titled Lake and Streambed Alteration Agreement for County-Wide Routine Maintenance Program for Plumas County. This document, when approved will streamline the process of obtaining permits for routine maintenance of storm drainage facilities and water crossings.

Responsible Office/Partners: Plumas County Public Works/Engineering Department

Cost Estimate: \$500 per mile to manage stream vegetation management based on CalFire Antelope Conservation Camp personnel doing the work.

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: FEMA and State Grants, County budgets. Actual funding source to be determined

Timeline: When funding becomes available for privately owned streams

Project Priority (H, M, L): High

Action 24. Plumas Eureka CSD stream bank flood mitigation

Hazards Addressed: Erosion caused by high velocity flood waters

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: Developed private property within the Plumas Eureka CSD has been damaged by high velocity flood water. Property owners have built walls and other barriers to try to protect property. Other properties are unprotected. The effectiveness of the walls and barriers is yet to be tested.

Project Description: A study to determine if there is an effective approach to reducing erosion at vulnerable properties or determine if property owners will accept a buy out to remove structures from the properties.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Flood Control and Water Conservation District, Plumas Eureka CSD

Cost Estimate: \$25,000

Benefits (Losses Avoided): Property protection, life safety

Potential Funding: FEMA and State grants

Timeline: When funding is available

Project Priority (H, M, L): High

Action 25. Evaluate and Implement Projects to Reduce Flooding in Plumas Eureka CSD

Hazards Addressed: Flood

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: Portions of the community within the Plumas Eureka Community Services District have experienced flood damage during 100 year flood events along the Middle Fork of the Feather River. The flooding is from the river and not tributaries.

Project Description: The project would include determining the repetitive flood history of houses in the 100 year flood zone. Using the results of the study determine if the homeowners would be willing to elevate their homes or accept a buyout. If there is interest in elevation or buyout, request grant funds from appropriate FEMA grant programs.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Flood Control and Water Conservation District, Homeowners, Plumas Eureka CSD.

Cost Estimate: To be determined on a project basis.

Benefits (Losses Avoided): Property protection, life safetyP

Potential Funding: FEMA Flood Mitigation Assistance Grants (FMA) or Hazard Mitigation Grants (HMGP)

Timeline: Within 5 years

Project Priority (H, M, L): Medium

Action 26. Plumas Eureka CSD Sewer Plant Flood Mitigation

Hazards Addressed: Flood

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: A number of manholes that are components of the Plumas Eureka Community Services District wastewater collection system are within the 100 year floodplain. Flood waters flow into the system and overwhelms the treatment plants. In the 2017 flood event, flooding resulted in damage to pumps and forced the treatment plant to be shut down. Homes in the area were without sewer service for several days.

Project Description: The project would include installing sealed manhole covers in the flood area and improving the capability of the treatment plants to accommodate infiltration of flood waters.

Other Alternatives: Flood walls or levees to protect the area.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Public Works Department, Plumas County Flood Control and Water Conservation District, Plumas Eureka CSD

Cost Estimate: \$50,000

Benefits (Losses Avoided): Property protection, \$50,000 over 30 years

Potential Funding: HMGP or other grant programs, Capital budget

Timeline: Within the next two years

Project Priority (H, M, L): High

Action 27. 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, 4, 5, 6, 7

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

Cost Estimate: Staff time

Benefits (Losses Avoided): People and property protection

Potential Funding: Staff time

Timeline: 2021

Project Priority (H, M, L): Medium

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

Hazards Addressed: Flood

Goals Addressed: 1, 2, 4, 5, 6, 7

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

Cost Estimate: Staff time

Benefits (Losses Avoided): People and property protection

Potential Funding: Staff time

Timeline: 2021

Project Priority (H, M, L): Medium

Action 29. Identify and Implement Bank Stabilization Projects

Hazards Addressed: Severe Weather: Heavy Rains and Storms, Landslide, Mudslide, and Debris Flow

Goals Addressed: 1, 2, 3, 4, 5, 6, 7

Issue/Background: 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: No action

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

Cost Estimate: \$3,400,000

Benefits (Losses Avoided): Prevent damage to bridge abutments during high water events.

Potential Funding: IRWM Grant Funding

Timeline: Dependent on funding

Project Priority (H, M, L): High

Action 30. Identify and Implement Projects to Address Areas of Landslides Affecting Roadway and Railroad

Hazards Addressed: Floods: Localized Stormwater, Severe Weather: Heavy Rains and Storms, Landslide, Mudslide, and Debris Flow

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: 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 Public Works/Engineering Department

Cost Estimate: \$50,000 to \$300,000 per landslide repair depending on severity

Benefits (Losses Avoided): Increase efficiency of the Countywide drainage to prevent or minimize flooding during a record storm water event.

Potential Funding: Potentially FEMA and other Grant Funding

Timeline: Within the next five years

Project Priority (H, M, L): High

Action 31. 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, 4, 5, 6, 7

Issue/Background: 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: No action

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

Cost Estimate: To be determined

Benefits (Losses Avoided): Protection of Wolf Creek Channel protects the surrounding areas from flooding during high water flows.

Potential Funding: FEMA and other Grants

Timeline: Dependent on Funding

Project Priority (H, M, L): High

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

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: The Plumas Eureka CSD “Preliminary Engineering Report for the 2015 Water System Improvements” recommended the replacement of the of two water storage tanks due to seismic concerns and existing steel construction.

Project Description: The two tanks would be removed and replaced with two new 300,000-gallon welded steel tank.

Other Alternatives: None known at this time

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Plumas County Building Department, Plumas Eureka CSD

Cost Estimate: \$1,000,000

Benefits (Losses Avoided): \$1,100,000 – the estimate includes the replacement of the tank, the repair of the road leading up to the tank, and unknown damages downstream in the Plumas Eureka community

Potential Funding: HMGP or other appropriate grant programs, SRF loan, or Bond

Timeline: Within the next ten years

Project Priority (H, M, L): High

Action 33. Seismic Risk Evaluations to Prioritize and Implement Seismic Retrofits

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: Most unreinforced masonry (URM) buildings possess features that can threaten lives during earthquakes. These include unbraced parapets, walls and roofs that are not well attached to each other, and walls that are poorly constructed. When earthquakes occur, inadequate connections in these buildings can allow masonry to fall. Floors and roofs may collapse leaving occupants and passers-by in harm’s way. These risks to life can be significantly reduced with seismic retrofits.

County Building does not have an inventory of URM buildings in the unincorporated area of Plumas.

Project Description: URM's are the primary structures most at risk for seismic events. Conduct an URM inventory of critical facilities and public buildings based on visual field surveys, investigations, and a review of property records to evaluate the risks and potential for the need to conduct seismic retrofits. Note, County to make the assumption that any buildings built before the establishment of the Building Department in 1960, if masonry, is presumed to be of URM construction.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Zoning Code

Responsible Office/Partners: Plumas County Building Department

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduction in damage and loss of property and possibly life should earthquake occur.

Potential Funding: Hazard Mitigation Grant from FEMA and the Cal OES.

Timeline: 5 years

Project Priority (H, M, L): Low

Pandemic Actions

Action 34. Update and Refine Pandemic Plan

Hazards Addressed: Pandemic

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: Due to the experience with 2020 COVID-19 Pandemic, Plumas County Public Health realized the need to update the existing Pandemic Plan.

Project Description: PCOES will incorporate the Pandemic Plan into the County EOP when finalized and approved by PC Disaster Council.

Other Alternatives: Keep existing Pandemic Plan as is.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing Pandemic Plan

Responsible Office/Partners: Plumas County OES, Public Health Department

Cost Estimate: Staff Time

Benefits (Losses Avoided): Reduced risk to County when a pandemic occurs.

Potential Funding: Existing budgets

Timeline: 0-3 years

Project Priority (H, M, L): High

Wildfire, Drought and Water Shortage, and Tree Mortality Actions

Action 35. Plumas County Agriculture, Forestry, and Natural Resources Resilience

Hazards Addressed: Climate Change, Drought, Tree Mortality

Goals Addressed: 1, 2, 4, 5, 6, 7

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 landowners 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 mortality 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 Department
- Feather River Resource Conservation District
- Feather River Watershed Group
- Feather River Integrated Regional Watershed Management (IRWM) plan

Cost Estimate: To Be determined. 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.

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: 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 36. Invasive Species Control and Eradication

Hazards Addressed: Invasive Species, Wildfire, Drought, Climate Change

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: Aggressive noxious weeds crowd out native vegetation and alter the natural environment and habitat for wildlife species, as well as impacting agricultural efficiency, recreational land values, and increased fire danger.

Project Description: Noxious weed control and eradication on non-federal lands. This will involve mechanical removal, hand removal, chemical (e.g., herbicides), and prescribed fire treatments.

Other Alternatives: Targeted grazing may also be used as a method of control.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas-Sierra Department of Agriculture noxious weed program heads Eradicate Exotic and Detrimental Species (WEEDS) Management Group that plans and coordinates management of noxious weeds.

Responsible Office/Partners: Plumas-Sierra Department of Agriculture, UC Cooperative Extension, and Feather River Resource Conservation District

Cost Estimate: Approximately \$40,000 annually for Department of Agriculture noxious weed management program including 2 employees at \$24.29 per hour at approximately 1,284 hours per year, and \$40,000 annually for projects complimenting the Departments efforts.

Benefits (Losses Avoided): Control of noxious weed species enhance native vegetation and its associated wildlife. Eradication and/or control of these species will help to reduce the number of seeds and/or plant parts that can invade other sensitive resources and habitats, especially forest and riparian habitats. The replacement of native vegetation with noxious weeds increases the risk of severe impacts from drought and wildfire, while also reducing agricultural efficiency and resiliency or value of the landscape as a whole. By managing or eradicating noxious weeds, these impacts can be mitigated.

Potential Funding: RAC grants, CALTRANS grants, CDFA funding, SNC grants, WCB grants

Timeline: Ongoing

Project Priority (H, M, L): High

Action 37. Continue and Promote Defensible space (PRC 4291) Projects Including Assistance Efforts for Senior and Disabled Residents

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: 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 28.4%, far outpacing the State's estimated 14.3%. According to the California Census, 15.4% of people under the age of 65 have a disability (as compared with the State's 6.9%). 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 fourteen 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. Every residence treated through the program has 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:

1) 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.

or 2) not providing an incentive 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

Responsible Office/Partners: Plumas County Fire Safe Council (implementation and outreach); CAL FIRE (enforcement and outreach); USDA Forest Service (funding and outreach); Plumas County Office of Emergency Services (outreach)

Cost Estimate: Senior/Disabled Defensible Space Assistance program: \$120,000/year; Outreach: \$10,000-\$100,000/year

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. In conjunction these factors have the ability to significantly reduce the amount of greenhouse gasses released from wildfires.

Potential Funding: Various grant sources: Cal Fire, FEMA, other federal and state grants

Timeline: ongoing

Project Priority (H, M, L): High

Action 38. Establish Additional Firewise USA Sites (communities) and Promote Existing Ones

Hazards Addressed: Wildfire, Tree Mortality

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: The National Fire Protection Association's (NFPA) Firewise USA Program encourages local solutions for safety by involving homeowners in taking individual responsibility for preparing their homes from the risk of wildfire. Firewise is a key component of Fire Adapted Communities- a collaborative approach that connects all those who play a role in wildfire education, planning and action with comprehensive resources to help reduce risk. The program is co-sponsored by the USDA Forest Service, the US Department of the Interior, and the National Association of State Foresters. To save lives and property from wildfire NFPA's Firewise USA program teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.

Project Description: Continue to support funding for the Plumas County Office of Emergency Services' Fire Prevention Specialist position which supports the formation of new Firewise sites by providing information to interested citizens, facilitating community meetings, and coordinating participation from the Plumas County Fire Safe Council, local fire departments, Plumas and Lassen National Forest fire programs, CAL FIRE, and residents.

Ongoing support of Firewise communities is provided through forum at the Plumas County Fire Safe Council meetings and an annual Plumas Firewise meeting. Information about the program and existing sites is maintained on the Fire Safe Council website. Community boundaries are updated and provided to the public by Plumas County GIS.

Other Alternatives: Firewise communities are self-organizing and can continue to operate without coordination. However, assistance from OES with the certification process is responsible for the escalating number of communities attaining national recognition.

Additionally, resource sharing between communities has proven highly valuable. Coordinated information from various agencies provides residents with the information needed to make meaningful steps towards wildfire mitigation and preparedness as Firewise communities.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County CWPP

Responsible Office/Partners:

- Plumas County Fire Safe Council
- CAL FIRE
- Plumas County Office of Emergency Services
- Plumas County GIS Department

Cost Estimate: To be determined

Benefits (Losses Avoided): Since the first Firewise community received certification in Plumas County in 2010, Firewise communities have reported a total investment of \$5.3 million in fuel reduction and wildfire preparedness activities.

Firewise program benefits from the NFPA website:

Get a framework for action

Meeting the criteria for becoming a Firewise USA® site helps communities get organized and find direction for their wildfire safety efforts. Like the first rungs on a ladder, the criteria help get a community started toward annual, systematic action to reduce their risks from brush, grass and forest fires.

Learn about wildfire

As people go through the process, they learn about wildfire risks in the community and the simple things they can do to reduce them. They connect with experts – local fire fighters, state forestry professionals, and national researchers – to continue to learn about fire and find resources to accomplish fire-safe actions.

Get a peace of mind

People who work with experts to learn about wildfire and take action start to see results quickly. Knowing that they are using the best information available and actually taking steps to reduce the risk of damage from fire helps people start to feel safer in their environment and in their homes. Having a plan for what to do in the event of a fire helps people become calmer and more prepared to act quickly.

Community-building

As neighbors get together to do work, often meeting one another for the first time, they build a stronger bond with each other. Activity can help rally people to a common cause for the good of the neighborhood. This strengthening of community ties can benefit residents in many ways, and is especially helpful during an emergency.

Build citizen pride

While the work can be fun, it isn't always easy. Neighbors work very hard in communities to remove brush and debris, clean up common areas, and dispose of green waste. They are rightly proud when they achieve national recognition for their efforts.

Get publicity

The program provides communities with metal signs, a plaque and other materials that can be presented publicly to honor their status as a Firewise USA® recognition site. These recognition ceremonies are great ways to shine the spotlight on community efforts. News media find this to be a great story to cover, and the national program features community stories regularly on the website and in its publications. All this publicity results not only in satisfaction for the residents involved, but also provides one more way to reach large numbers of people with information about wildfire safety.

Access to funding and assistance

Preference is sometimes given to Firewise USA® sites over other candidates when allocations of grant money are made for wildfire safety or fuel mitigation. The reason is that there are invariably more requests than available funds when grants are available through state or federal agencies. If requests are equally worthy, some officials tend to have more confidence in communities that have demonstrated the foresight of becoming a recognized Firewise USA® site.

Insurance discount for USAA members in certain states

The Department of Insurance in California have approved filings by USAA to give homeowners insurance discounts to USAA members living in communities recognized by the Firewise USA® program.

Potential Funding: Various grant sources: Cal Fire, FEMA, other federal and state grants

Timeline: ongoing

Project Priority (H, M, L): Medium

Action 39. Continue to Evaluate and Track Available Funding Sources for Wildfire Mitigation Projects

Hazards Addressed: Wildfire, Tree Mortality

Goals Addressed: 1, 2, 4, 5, 6, 7

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

Cost Estimate: \$1,300 annually

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

Timeline: ongoing

Project Priority (H, M, L): High

Action 40. *Develop a Program to Promote and/or Incentivize Home Hardening Retrofitting including: Roofs, Vents, Siding, Windows, etc.*

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6, 7

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 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, CAL FIRE, Office of State Fire Marshall

Cost Estimate: Phase 1: Outreach, Education, and Technical Assistance with Home Ignition Zone assessment consultations: \$50,000-\$75,000

Phase 2: Home retrofitting programs: Could range from \$1-5 million

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 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

Hazards Addressed: Climate Change/ Drought/ Tree Mortality/ Wildfire

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: 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.

Battles et al. (2008) evaluated the impacts of climate change on the mixed-conifer region in California and provide insight to forest health concerns and management implications for forest managers. This study and others found that changes in climate could “exacerbate forest health concerns” by increasing weakened tree susceptibility to mortality as a result of fire, disease epidemics and insect outbreaks and potentially enabling forest insects and disease to expand ranges or increase potential for widespread damage. These predictions were realized the following decade in the central and southern Sierra Nevada wherein vast stretches of ponderosa pine forest were decimated in a drought driven epidemic. Other research suggest that landscape level tree mortality may drive extreme fire behavior and high severity of future fire events in these forests. (Stephens et al 2018).

In the State of California, the wildfires that have burned the most acres, caused the most destruction, and ended with the greatest loss of life have been in the last decade, with most of these dubious records set in the last five years. The past five seasons have substantiated the increase in fire behavior that was predicted by climate and fire scientists. Not only have these fires burned more of everything, but firefighters have agreed that wildfire behavior has become more erratic and uncontrollable.

The stakeholders and partners identified in this proposal have a longstanding history of experience promoting and maintaining fuel reduction and forest restoration efforts. The programs these partners offer compliment a growing firewise situational awareness in Plumas county. Organizational collaboration is necessary to strategically coordinate and design efforts on a fire-adapted community scale.

Project Description: Identify: The Plumas County Fire Safe Council including the USDA Forest Service, CAL FIRE, UC Cooperative Extension, and the Feather River Resource Conservation District annually evaluate projects for inclusion in the CWPP. As part of this mitigation action the Fire Safe Council and collaborators will continue to refine the process by which projects are prioritized. Emerging resources include collaborative mapping initiatives that compile data from multiple agencies, organizations, and landowners. Identification of priority projects will also involve evaluation of grant opportunities and aligning funding objectives with project outcomes. This includes continuing county wide efforts for monitoring tree mortality and delivering outreach and education on prevention and coordinating mitigation strategies and efforts.

Implement: Administer and oversee fuel reduction projects across public and private lands that increase the pace and scale by which all implantation entities are undertaking forest health projects. Implementation includes addressing CEQA/NEPA requirements. Project treatments include hand-thinning, chipping, pile burning, broadcast burning, mastication, and removal of timber and biomass.

Other Alternatives: Currently various responsible entities work collaboratively and independently to identify and implement forest health projects.

Alternatives to this mitigation range from:

- 1) No treatment
- 2) Not integrating forest health with fuel reduction projects
- 3) Identifying projects without a framework for prioritization
- 4) Maintaining or reducing the annual number of acres treated or planned

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County CWPP, Plumas National Forest 1988 LRMP and 2004 Sierra Nevada Framework Plan Amendment, CALFIRE Vegetation Treatment Program (VTP) and Calif. Forest improvement Program (CFIP)

Responsible Office/Partners:

- USDA Forest Service: Plumas National Forest and Lassen National Forest
- CAL FIRE
- Plumas County Fire Safe Council
- UC Cooperative Extension
- Feather River Resource Conservation District

Cost Estimate: Identify: \$30,000 annually; Implement: \$400-500 million annually

Benefits (Losses Avoided): Benefits of this project deliverables includes reduction in fuel accumulation and fire severity in Plumas County which enhances community fire protection strategies as well as promoting forest health and natural resource conservation. Plumas County is home to nearly 19,000 residents living in the Wildland Urban Interface, which poses a wildfire risk to their health and lives.

The economic impact that results from catastrophic wildfires is nearly irreversible: homes in the County are estimated at a total value of \$3.7 trillion and the agricultural product value is approximately \$40 million annually (of which nearly half is generated from forest products). Successful and continued implementation may result in innumerable economic benefits in losses avoided in terms of mitigating structure losses to wildfire, but also enhanced ecosystem services.

Potential Funding:

- CAL FIRE CCI Forest Health grant funding
- CAL FIRE CCI Fire Prevention grant funding
- USFS Wyden Authority funding (Stevens)
- Sierra Nevada Conservancy grant funding
- Forest product revenue

Timeline: ongoing

Project Priority (H, M, L): High

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)

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6, 7

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

Cost Estimate: \$67,200

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: 2021 – 2022

Project Priority (H, M, L): Medium

Action 43. Local Adoption of State Responsibility Area Fire Safe Regulations

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: New regulations effective January 1, 2020

Project Description: Review and amend, as needed, Plumas County Code Title 8 (Building Regulations) and Title 9 (Planning and Zoning) sections which implement the State Responsibility Area Fire Safe Regulations

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Code Title 8 (Building Regulations) and Title 9 (Planning and Zoning); Plumas County 2035 General Plan; PHS 6.3 and Implementation Measure 7

Responsible Office/Partners: Plumas County Planning Department

Cost Estimate: Staff time

Benefits (Losses Avoided): People and property protection

Potential Funding: Staff time

Timeline: 2021 – 2022

Project Priority (H, M, L): Medium

Action 44. Improve Funding and Response Capabilities of Local Fire Protection Districts and Expand Districts in Areas not Covered

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6, 7

Issue/Background: Local fire departments are the first in responders to most in units to most incidents in populated areas in the county. Each of these districts is funded by a small share of property taxes, supplemented in some cases by voter-approved special assessments. Limited funding strains the districts' ability to support staffing, state-required updates to firefighter safety gear, station and apparatus maintenance and improvements. Recruiting and retention of volunteers, who make up the majority of the emergency response force, has become increasingly difficult.

Project Description: Assist districts in identifying funding opportunities to supplement tax revenues for improved response capabilities. Assist districts in developing volunteer recruitment and retention strategies to improve response team numbers and stability.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Plumas County Fire Chiefs Association Strategic Plan.

Responsible Office/Partners: PCOES, PC Chiefs Association

Cost Estimate: To be determined as project specifics are identified

Benefits (Losses Avoided): Firefighter safety and increased response capability

Potential Funding: CSFA, AFG

Timeline: Ongoing

Project Priority (H, M, L): High

Action 45. Review and Update, as Needed, Plumas County Code to Address Defensible Space and Vegetation Management

Hazards Addressed: Wildfire, Tree Mortality

Goals Addressed: 6

Issue/Background: Plumas County Code, Title 4 (Public Safety), Chapter 2 (Fire Prevention), Article 1 (Firebreaks) requires persons owning, renting or operating cabins, tents, stores, residences, hotels, or other structures to maintain a firebreak or clearing free from inflammable material for thirty (30') feet from such structures during the period from April 1 to October 31. A review of the Plumas County Code is needed to adhere to PRC 4291 including addressing the January 1, 2005 State law requirement for defensible space clearance around homes and structures that was extended from thirty (30') feet to one-hundred (100') feet. Further, a review for best practices of Plumas County Code, Title 8 (Building Regulations), Chapter 16 (Abatement of Hazardous Weeds and Rubbish) is warranted that enforces CA Health and Safety Code Sections 14930-14931 under Division 12 (Fires and Fire Protection) for removal of “dirt, rubbish, weeds, or other rank growth” by the owners, lessees, or occupants of buildings, grounds, or lots in the County.

Project Description: Review and update, as needed, Plumas County Code sections including, but not limited to Title 9 (Planning and Zoning), Chapter 9, SRA Fire Safe Regulations (see also Action 43); Title 4 (Public Safety), Chapter 2, Fire Prevention; and Title 8 (Building Regulations), Chapter 16 Abatement of Hazardous Weeds and Rubbish to address state law requirements for defensible space and other vegetation management best practices.

Other Alternatives: None

Existing Planning Mechanisms through which Action will be Implemented: Plumas County Code

Responsible Office/Partners: Plumas County Planning Department, County Board of Supervisors, and CAL FIRE and Fire Safe Council

Cost Estimate: County Board of Supervisors/Planning Commission/Planning Department staff time

Benefits (avoided Losses): Incorporation of updated code amendments will help the County to address recent legislative state requirements.

Potential Funding: Cal OES / FEMA grant opportunities; County General Fund

Timeline: 2023

Project Priority: Medium



Chapter 6 Plan Adoption

Requirement §201.6(c)(5) and §201.7(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 Plan is to secure buy-in from Plumas County, raise awareness of the plan and the risks and vulnerabilities of natural hazards in the Planning Area, and to formalize the Plan's implementation. The adoption of this Plan Update completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of the Disaster Mitigation Act (DMA) of 2000. For Plumas County, this adoption also establishes compliance with AB 2140 requiring adoption by reference or incorporation into the Public Health & Safety Element of the General Plan. An adoption resolution was created for Plumas County. The Plumas County Board of Supervisors, or the governing board for the County, has adopted this 2020 Local Hazard Mitigation Plan by passing a resolution. A copy of the proposed resolution and the executed copies are included in Appendix D: Adoption Resolution.



Chapter 7 Plan Implementation and Maintenance

Requirement §201.6(c)(4) and §201.7(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 LHMP Update is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. 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 this LHMP Update. This chapter also discusses incorporating the 2020 LHMP Update into existing planning mechanisms and how to address continued public involvement.

Chapter 3 Planning Process includes information on the implementation and maintenance process since the 2014 Plumas County LHMP was adopted. This section includes information on the implementation and maintenance process for this 2020 LHMP Update.

7.1 Implementation

Once adopted, this LHMP Update faces the truest test of its worth: implementation. While this Plan contains many worthwhile actions, the County will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned to the actions during the planning process 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 general plans, stormwater plans, Fire Plans, Emergency Operations Plans (EOP), evacuation plans, and other hazard and emergency management planning efforts for Plumas County. The County already implements policies and programs to reduce losses to life and property from hazards. This LHMP Update 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.

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 and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Plumas County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This could include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the County will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal programs and earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The County's elected officials and department staff are charged with implementation of various activities in this LHMP Update. During the annual review as described later in this section, an assessment of progress on each of the goals and actions in the LHMP should be determined and noted. At that time, recommendations should be made to modify timeframes for completion of activities, funding resources, and responsible entities. On an annual basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from the LHMP entirely and activities addressing problems unforeseen during Plan development may be added.

7.1.1. Role of Hazard Mitigation Planning Committee (HMPC) in Implementation and Maintenance

With adoption of this 2020 LHMP Update, the County will be responsible for the LHMP Update implementation and maintenance. The HMPC identified in Appendix A (or similar committee), led by Plumas County OES, County Administrator, and the Planning Department, will reconvene each year to ensure mitigation strategies are being implemented and to record the implementation status of each mitigation action. As such, Plumas County will continue its relationship with the HMPC, and:

- 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 LHMP's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this Plan;
- Report on Plan progress and recommended changes to the County Board of Supervisors (BOS); and
- Inform and solicit input from the public.

The primary duty of the County is to see this LHMP Update successfully carried out and to report to the Plumas County BOS 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 on the County website (and others as appropriate).

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 recognized.

7.2.1. Maintenance Schedule

The Plumas County OES Emergency Services Coordinator, County Administrator, and Planning Department Director, as the HMPC leads, are responsible for initiating LHMP reviews and consulting with the other stakeholders. In order to monitor progress and update the mitigation strategies identified in the action plan, at a minimum, Plumas County will revisit this Plan annually and following a hazard event. The HMPC will meet annually to review progress on LHMP implementation and will provide annual evaluation reports. The HMPC 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 LHMP Update anticipated to be fully approved and adopted in early 2021, the next LHMP Update for the Plumas County Planning Area will occur in 2026.

7.2.2. Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in this 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
- 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 the 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 as well during the monitoring and update of this Plan to determine feasibility of future implementation. Updating of the Plan will be by written changes and submissions, as the HMPC deems appropriate and necessary, and as approved by the County Board of Supervisors. In keeping with the five-year update process, the HMPC will convene public meetings to solicit public input on the Plan and its routine maintenance and the final product will be adopted by the governing boards or councils of all participating jurisdictions, as appropriate.

Annual Review Process

For the LHMP Update review process, the Plumas County OES, County Administrator, and Planning Department will be responsible for coordinating, scheduling, and facilitating reviews and maintenance of this Plan. The LHMP Update is intended to be a living document. Review of the LHMP Update will normally occur on an annual basis each year and will be conducted by the HMPC as follows:

- Plumas County will place an advertisement in the local newspaper advising the public of the date, time, and place for each annual review of the Plan and will be responsible for leading the meeting to review the Plan.
- Notices will be emailed 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 the Plumas County Planning Commission 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 Plan will be available for public comment at select Plumas County locations.
- After the review meeting, minutes of the meeting and an annual report will be prepared by the HMPC and provided to the public and other interested stakeholders. The report will also be presented to the County BOS and a request will be made that the Board take action to recognize and adopt any changes resulting from the review.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating this 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.
- 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 (EOC) and whether the event resulted in a presidential 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 descriptions.
- Documented damages due to the event.
- 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 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 Hazard Mitigation Plan. 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.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective is incorporation of the hazard mitigation plan recommendations and their underlying principles into other County 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 LHMP Update, 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 County already implements policies and programs to reduce losses to life and property from hazards. This LHMP Update 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:

- County general plan
- County Emergency Operations Plans and other emergency management efforts
- County ordinances
- Flood/stormwater management/master plans
- Fire Plans/Community Wildfire Protection plans
- Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessments in the jurisdictional annexes
- Other plans, regulations, and practices with a mitigation focus

HMPC members involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this LHMP Update 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 LHMP into existing planning mechanisms include:

1. As recommended by Assembly Bill 2140, the County should adopt (by reference or incorporation) this LHMP into the Public Health & Safety Element of the General Plan. Evidence of such adoption shall be provided to Cal OES and FEMA.

2. Integration of flood actions identified in this mitigation strategy with the actions and implementation priorities established in existing and new Watershed and Stormwater Drainage Plans.
3. Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing Fire Plans, including local CWPPs.
4. Integration of many of the infrastructure, roads, and facility improvement projects with the County Capital Improvement Program.
5. Using the risk assessment information to update the hazard analysis and other data, such as Critical Facility locations, in local Emergency Operations Plans and other emergency management planning documents.

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 Update.

7.2.4. Continued Public Involvement

Continued public involvement is imperative to the overall success of this Plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the Plan implementation and seek additional public comment. The LHMP maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, newspaper articles, and through public hearings.

Public Involvement Process for Annual Reviews

The public will be noticed by placing an advertisement in local newspapers and on County's OES webpage 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 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 be responsible for coordinating the activities necessary to involve the greater public. The HMPC will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the Plan update process. As part of this effort, public meetings will be held and public comments will be solicited on the next LHMP Update process.



Appendix A Planning Process

A.1 Lists of HMPC Invites/Stakeholders

A.1.1. LHMP Invite List

Name	Agency/Organization	Title	Email
Agencies and Stakeholders			
Shane Bergmann	Almanor Recreation and Park District	Vice President	arpd01@frontier.com
Carlos Espana	Almanor Recreation and Park District	Trails Coordinator	cespana1304@gmail.com
Jim Doohan	American Valley CSD	General Manager	jim@americanvalleycsd.com
Bob Nelson	ARES - auxiliary communications	Emergency Coordinator - KA6NSN - Amateur Radio	papillon@inreach.com
Bret Russell	Beckwourth Fire Protection District	Chief	chief russell@beckwourthfire.com
Jeff Iverson	Bucks Lake Fire Protection District	Chief	buckslakefd@aol.com
Kate Beth Kalinosky	Burlington Northern Santa Fe		kate.kalinosky@bnsf.com
David Stewart	CA Public Utilities Commission	Division of Rail Safety	ATM@cpuc.ca.gov
Naveed Paydar	CA Public Utilities Commission	Local Government Liaison	Naveed.Paydar@cpuc.ca.gov
Shane Vargas	CAL FIRE	Pre-Fire Planning and Engineering	shane.vargas@fire.ca.gov
Scott Packwood	CAL FIRE LMU	Unit Chief	scott.packwood@fire.ca.gov
Pamela Joe	Cal OES	Tribal Advisor	pamela.joe@caloes.gov
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A.2 Website for Hazard Mitigation Plan



A.3 Kickoff Meeting

A.3.1. Kickoff Meeting Invite to Stakeholders

From: Ferguson, Tracey <TraceyFerguson@countyofplumas.com>

Sent: Thursday, January 9, 2020 5:04 PM

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Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>
Subject: Plumas County 2020 LHMP Update - You're Invited - Planning Committee Kick Off Meeting

Hello!

Plumas County is kicking off efforts to update the County's 2014 Local Hazard Mitigation Plan (LHMP). The purpose of the LHMP process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in the County. The Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments have a FEMA-approved LHMP in place in order to be eligible for certain pre- and post-disaster mitigation funding to protect communities from future disaster-related losses.

You are receiving this notice because we would like to invite you to take part in this plan update as a member of the Hazard Mitigation Planning Committee (HMPC).

County and agency participation and coordination is a requirement of an approved LHMP, as is the inclusion of any hazard data, information, and mitigation projects your department or agency may want to see included in this Update. Thus, your input will be critical to the success of this project.

Participation includes:

- ✓ Attending and participating in the HMPC meetings (5 anticipated over the next 7 months)
- ✓ Providing available data/information requested of the HMPC
- ✓ Reviewing and providing comments on the plan drafts

The Plumas County Planning Department and Office of Emergency Services are partnering to take the lead on coordinating this project for the County. A project Kickoff Meeting will be held at the following location and time:

January 29, 2020

1:30pm-4:30 pm

Quincy Library, Meeting Room

445 Jackson St, Quincy, CA 95971

The Kickoff Meeting will explain the LHMP update process and how you can be involved. A public meeting will also be held the evening of January 29, 2020. Details on the public meeting will be forthcoming.

Please RSVP to the County's consultant, Jeanine Foster at jeanine.foster@fostrermorrison.com and plan on attending or delegating your department or agency attendance to this important LHMP Kickoff Meeting.

Tracey Ferguson, AICP
Planning Director



Plumas County Planning & Building Services
Planning Department
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Quincy, CA 95971
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A.3.2. Kickoff Meeting Agenda

**Plumas County
Local Hazard Mitigation Plan (LHMP) Update
HMPC (Kickoff) Meeting #1
January 29, 2020**

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC)
4. Planning for Public Input
5. Coordinating with other Agencies
6. Hazard Identification
7. Schedule
8. Data Needs
9. Questions and Answers

SIGN-IN SHEET

Plumas County LOCAL HAZARD MITIGATION PLANNING PROJECT

HMPC Kickoff Meeting #1
January 29, 2020 (1:30 PM)



Name/Title	Email Address	Phone	Department/Organization Affiliation
KELLY RILEY CAL DES MITIGATION PLANNING	Kelly.Riley@Caloes.ca.gov	416.500.2544	CAL OES
SEANE ALLEN President Secretary	hereward@earthlink.net	(707) 293-1199	Plumas County Special District #1 Fire District #1
Ken Rd. Donnell	kold@frontier.net	530-566-2561	Citizen
RHONDA WILLIAMS Board of Directors EASTERN PLUMAS FIRE	rregada@protonmail.com	(530) 616-1365	Eastern Plumas Rural Fire District
Larry Williams People Planning Comm.	calmopper@gmail.com	(530) 394-7044	Planning Commission
Chuck Erickson Shasta Firewise Comm.	chuck@shastafirewise.com	530-896-1888	Shasta County Firewise Comm.
Jeanie Longshore Code Enforcement	jean@longshore.com	(530) 895-2002	Plumas County Building Department
Chuck White Building Dept	chuckwhite@plumas.ca.gov	530-893-6206	Plumas County Building Dept
Felix CANEY Plumas Unified Sch. Dist.	F.CANEY@PUCOE.org	530-287-6545	Plumas Unified Sch. Dist.

SIGN-IN SHEET

Plumas County
LOCAL HAZARD MITIGATION PLANNING PROJECT



HMPC Kickoff Meeting #1
January 29, 2020 (1:30 PM)

Name/Title	Email Address	Phone	Department/Organization Affiliation
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James Beatty COO	jbeatty@plumasc.org	530 242 3717	Plumas District Legislator
Ken Trautna FRC	ktrautna@plu.edu	293 0202	FRC
Gailly McGowan	gmcgowan@plu.edu	258 6441	Fire Safe Council
Patricia Green	pgreen@plu.edu	927 5299	FL ECD
JEFF ENGER	enger.dist.5@gmail.com	218 3665	SUPERVISOR
Rob Thorman	robthorman@countyofplumas.com	232 6193	ICPW
Ryan Tompkins	rtompkins@ucanr.edu	530 258 9402	Univ. Calif. Cooperative Extension - Plumas
TRINA CUNNINGHAM	trina.cunningham@plu.edu	530 521 8141	TRIMBLE FOREST FIRE

SIGN-IN SHEET

Plumas County
LOCAL HAZARD MITIGATION PLANNING PROJECT



HMPC Kickoff Meeting #1
January 29, 2020 (1:30 PM)

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Bob Frank EPRFD	RP.Frank1@nsn.com	530 228 2229	Portola
Terry Baubien Fire Chief	terrybaubien@plumas.ca.gov	530 394 6000	Indian Village Fire
Joe DeGroot Deputy Director of Public Works	JoeDeGroot@plumas.ca.gov	530 282 6000	Plumas County Public Works
John Reynolds Chair	JOHN.REYNOLDS@plumas.ca.gov	512 604 3577	Fire Safe Council
Vol. Firefighter M.H. Rodriguez	plumas@sigglobal.net	203 3225	AM. Red Cross
Levi Warr Water Resource Engineer	Levi.Warr@water.ca.gov	916 574 1734	Delta
John Reynolds Chair	johnreynolds@plumas.ca.gov	530 1955	Plumas Forest Service
John Reynolds Chair	John.Reynolds@plumas.ca.gov	530 1955	Plumas Forest Service

SIGN-IN SHEET

Plumas County
LOCAL HAZARD MITIGATION PLANNING PROJECT



HMPC Kickoff Meeting #1
January 29, 2020 (1:30 PM)

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CHIEF OF PLANNING LOCAL HAZARD MITIGATION PLANNING DIRECTOR	CHIEF OF PLANNING LOCAL HAZARD MITIGATION PLANNING DIRECTOR	283 6446	CH / Plan
Lori Simpson	lorisimpson@countyofplumas.com	530 368-6110	
Ray Baker	rbaker@plce.k12.ca.us	530 283-6545	PUSD
TRACY FERGUSON PLANNING DIRECTOR	tracy.ferguson@countyofplumas.com	530-283-6214	COUNTY PLANNING / LHM PLANNING PROJECT
CRISTINA WINGFIELD	cristina.wingfield@pcso.net	530 257-1672	PCSO
HEATHER HOWELL	heather.howell@plce.k12.ca.us	916 202 2635	Howell Learning

HMPC Kickoff Meeting #1
January 29, 2020 (1:30 PM)

[illegible]

A.4 Risk Assessment Meeting

A.4.1. Email Invite to Risk Assessment Meetings

From: Ferguson, Tracey <TraceyFerguson@countyofplumas.com>

Sent: Friday, March 27, 2020 10:31 AM

To: cespana1304@gmail.com; arpd01@frontier.com; jim@americanvalleycsd.com; papillon@inreach.com; chief russell@beckwourthfire.com; buckslakefd@aol.com; kate.kalinosky@bnsf.com; ATM@cpuc.ca.gov; Naveed.Paydar@cpuc.ca.gov; jerilyn.anderson@calema.ca.gov; shane.vargas@fire.ca.gov; scott.packwood@fire.ca.gov; Don.Gordon@fire.ca.gov; Denise.Shemenski@caloes.ca.gov; Lindsey.Stanley@CalOES.ca.gov; Robert.Goyeneche@CalOES.ca.gov; rod.daugherty@caloes.ca.gov; Alex.Knigge@CalOES.ca.gov; Monica.Williams@CalOES.ca.gov; eegide@chp.ca.gov; steve.pain@dot.ca.gov; marcelino.gonzalez@dot.ca.gov; kathy.grah@dot.ca.gov; brett.gomes@wildlife.ca.gov; recdept@psln.com; shmp@conservation.ca.gov; klichti@chesterfire.org; brianlayne.cpubd@frontier.com; joe.waterman.jw@gmail.com; frmotzkus@digitalpath.net; smilingirisheyes1@yahoo.com; jerry.hurley@sbcglobal.net; kevin@globalexchange.org; kdowns@manhard.com; l.knox@ci.portola.ca.us; t.roberts@ci.portola.ca.us; jenniferlacy33@gmail.com; ajuska@collinsco.com; bwest@collinsco.com; i319155@thegrid.net; rafrank1@msn.com; lbrown@sierracounty.ca.gov; dgustafson@blm.com; Kelly.soule@water.ca.gov; Robert.curry@water.ca.gov; Curtis.Anderson@water.ca.gov; Bill.Ehorn@water.ca.gov; Alan.VanMatre@water.ca.gov; rafrank1@msn.com; info@ephc.org; mimithegolfgal@gmail.com; btracy@frc.edu; KTrutna@frc.edu; NBoyd@frc.edu; bgraevs@frrcd.org; xing.liu@fema.dhs.gov; Swofford, Terrell <terrellswofford@sbcglobal.net>; Reservations@goldlakeridge.com; kathy.kogge@gmail.com; goldmntncsd@sbcglobal.net; chbowman@prodigy.net; arksonshine12@yahoo.com; edwardw9200@gmail.com; harvey@playgraeagle.com; johnworfalt@gmail.com; kblevy777@yahoo.com; tyson_GCVFD@hotmail.com; cjbishop1962@gmail.com; roycarter@greenhorncsd.org; cecilia51@sbcglobal.net; dmanning@greenvillerancheria.com; brendenfinch66@gmail.com; john@reynolds-family.us; hambranchfire@yahoo.com; bjamill@frontiernet.net; chrisgallagher@frontier.com; ivchief@frontier.com; info.ivrpd@gmail.com; blake.jung@am.jll.com; joannfites@gmail.com; laportefire@yahoo.com; rjmacar@frontiernet.net; kimcain@surewest.net; deb.bumpus@usda.gov; russell.nickerson@usda.gov; jstclair01@fs.fed.us; jrust@fs.fed.us; nbunch@fs.fed.us; cromberg588@gmail.com; akwadawg@me.com; akwadawg@icloud.com; awilson@greenvillerancheria.com; michelle.fulton@sbcglobal.net; pmrow@jps.net; wgrandall@gmail.com; ron1942mv@gmail.com; gvalpreda@gmail.com; michelle.mead@noaa.gov; trinacunningham.maidu@gmail.com; dave@pacificsunset.com; julie@myairdistrict.com; melissak@myairdistrict.com; sallymtemp53@gmail.com; jharris@pacificforest.org; penfire@frontiernet.net; psp6@pge.com; taletha@plumascharterschool.org; nicholas_dawson@firenet.gov; frankunitedsv@yahoo.com; Gibson, Tim <TimGibson@countyofplumas.com>; PCAC <pcac@countyofplumas.com>; Leonhardt, Chuck <CLeonhardt@countyofplumas.com>; Allen, Roberta <RobertaAllen@countyofplumas.com>; Hobson, Tony <thobson@pcbh.services>; Engel.dist.5@gmail.com; Goss, Kevin <kevin.goss4district2@gmail.com>; Simpson, Lori <lorisimpson.plumas@gmail.com>; Thrall, Sharon <sherrie.thrall@gmail.com>; White, Charles <CharlesWhite@countyofplumas.com>; Langston, Jennifer <JenniferLangston@countyofplumas.com>; rdiefendorf@plumascdc.org; Settlemire, Craig <CSettlemire@countyofplumas.com>; Caiazzo, Neal <NealCaiazzo@countyofplumas.com>; Hayden, Karen <KarenHayden@countyofplumas.com>; Hasse, Evan <EvanHasse@countyofplumas.com>; Sipe, Jerry <JerrySipe@countyofplumas.com>; Perez, Jim <JimPerez@countyofplumas.com>; Correia, Kevin <KevinCorreia@countyofplumas.com>; Steffanic, John <JohnSteffanic@countyofplumas.com>; plumasfiresafe@plumascorporation.org; matt@plumascorporation.org; mike@plumascorporation.org; Osborn, Becky <BeckyOsborn@countyofplumas.com>; Selvage, Nancy

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flanigan@leavitt.com; annandlaura10@gmail.com; Jason Moghaddas <jmoghaddas@sig-gis.com>
Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>

Subject: SAVE THE DATE - 4/15/2020 - LHMP HMPC Meeting #2

Hello Plumas County Local Hazard Mitigation Planning Team –

You are invited to attend the 2nd Hazard Mitigation Planning Committee (HMPC) Meeting for the development of the County's 2020 LHMP.

SAVE THE DATE:

"Risk Assessment"

Wednesday, April 15, 2020

9:00 am to 12:00 pm

Online format TBD – more information to follow

Earlier this year, Plumas initiated its hazard mitigation planning effort, with support of Foster Morrison Consulting. Many of you attended the planning team kickoff meeting in late January. Over the past 8 weeks, the Foster Morrison team and County staff have been working to collect data to develop Chapter 4 of the LHMP, or the Risk Assessment Chapter. During this 2nd HMPC meeting, the team will be reviewing the risk assessment data developed to-date and looking for your feedback in refining and adding to the working draft Risk Assessment Chapter.

In light of the ongoing COVID-19 public health concerns, this meeting will be conducted remotely. We are currently evaluating the best virtual platform and will get back to everyone with the call in/remote login details.

Please RSVP to me and plan on participating (or delegating your participation). The County appreciates your ongoing participation and input—it is critical to the success of the LHMP project update.

Thanks everyone!

Tracey Ferguson, AICP

Planning Director



Plumas County Planning & Building Services

Planning Department

555 Main Street

Quincy, CA 95971

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F: (530) 283-6134

traceyferguson@countyofplumas.com

www.plumascounty.us

A.4.2. Risk Assessment Meeting Agenda

**Plumas County
Local Hazard Mitigation Plan (LHMP) Update
HMPC Meeting #2 – Risk Assessment Part 1
April 15, 2020**

1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment
4. Review of Data Needs
5. Next Steps

A.4.3. Risk Assessment Meeting Sign in Sheets

Attendance was kept for the risk assessment meeting. The meeting was held virtually using Zoom, so the sign in sheet below reflects the attendance of the meeting.

Name	Agency
Carlos Espana	Almanor Recreation and Park District
Shane Vargas	CAL FIRE
Erik Egide	California Highway Patrol Quincy
Marci Gonzalez	Caltrans
Lauren Knox	City of Portola City Manager's Office
Sami Nall	DWR
Remy Gill	DWR
Kevin Trutna	Feather River College
Kathy Kogge	Gold Mountain
Cary Curtis	Gold Mountain CSD
Chuck Bowman	Graeagle
Chris Gallagher	Indian Valley CSD
Tony Balbiani	Indian Valley Fire Protection District
Jim Gibson	La Porte Fire Protection District
Russell Nickerson	Lassen National Forest
Mike Flanigan	Leavitt Group
Steve Peters	Long Valley Fire Protection District
Trina Cunningham	Native American Tribes
Melissa Klundby	Northern Sierra Air Quality Management District
Marty Walters	PCIRC
Andrew Courtright	Peninsula Fire Protection District
Jim Wilcox	Plumas Corporation
Jerry Sipe	Plumas County Environmental Health
Sue McCourt	Plumas County OES
Hannah Hepner	Plumas County Fire Safe Council
John Olofson	Plumas County Planning Commission
Tracey Ferguson	Plumas County Planning Department
Joe Blackwell	Plumas County Public Works - LHMP Lead
Rob Thorman	Plumas County Public Works - alternate
John Rowden	Plumas Eureka Community Services District
Ray Bakker	Plumas Unified School District
Emily Compton	Plumas-Sierra Rural Electric Cooperative
Michael Rodriguez	Red Cross

Name	Agency
Ryan Tompkins	UC Cooperative Extension
Tracy Schohr	UC Cooperative Extension
Jason Moghaddas	Spatial Informatics Group
Michael Battles	DOT
Chris Morrison	Foster Morrison
Tim Gibson	Plumas-Sierra Department of Agriculture
Willo Vieira	Plumas-Sierra Department of Agriculture
Sherrie Thrall	Plumas County Board of Supervisor
Andrea Irving	Smith Creek Ranch Firewise
Zoe Stancer	Safety Officer Plumas District Hospital

A.5 Mitigation Strategy Meetings

A.5.1. Email Invites to Mitigation Strategy Meetings

From: Ferguson, Tracey <TraceyFerguson@countyofplumas.com>

Sent: Friday, March 27, 2020 10:31 AM

To: cespana1304@gmail.com; arpd01@frontier.com; jim@americanvalleycsd.com; papillon@inreach.com; chiefrussell@beckwourthfire.com; buckslakefd@aol.com; kate.kalinosky@bnsf.com; ATM@cpuc.ca.gov; Naveed.Paydar@cpuc.ca.gov; jerilyn.anderson@calema.ca.gov; shane.vargas@fire.ca.gov; scott.packwood@fire.ca.gov; Don.Gordon@fire.ca.gov; Denise.Shemenski@caloes.ca.gov; Lindsey.Stanley@CalOES.ca.gov; Robert.Goyeneche@CalOES.ca.gov; rod.daugherty@caloes.ca.gov; Alex.Knigge@CalOES.ca.gov; Monica.Williams@CalOES.ca.gov; eegide@chp.ca.gov; steve.pain@dot.ca.gov; marcelino.gonzalez@dot.ca.gov; kathy.grah@dot.ca.gov; brett.gomes@wildlife.ca.gov; recdept@psln.com; shmp@conservation.ca.gov; klichti@chesterfire.org; brianlayne.cpud@frontier.com; joe.waterman.jw@gmail.com; frmotzkus@digitalpath.net; smilingirisheyes1@yahoo.com; jerry.hurley@sbcglobal.net; kevin@globalexchange.org; kdowns@manhard.com; l.knox@ci.portola.ca.us; t.roberts@ci.portola.ca.us; jenniferlacy33@gmail.com; ajuska@collinsco.com; bwest@collinsco.com; i319155@thegrid.net; rafrank1@msn.com; lbrown@sierracounty.ca.gov; dgustafson@blm.com; Kelly.soule@water.ca.gov; Robert.curry@water.ca.gov; Curtis.Anderson@water.ca.gov; Bill.Ehorn@water.ca.gov; Alan.VanMatre@water.ca.gov; rafrank1@msn.com; info@ephc.org; mimithegolfgal@gmail.com; btracy@frc.edu; KTrutna@frc.edu; NBoyd@frc.edu; bgraevs@frrcd.org; xing.liu@fema.dhs.gov; Swofford, Terrell <terrellswofford@sbcglobal.net>; Reservations@goldlakerlodge.com; kathy.kogge@gmail.com; goldmtncsd@sbcglobal.net; chbowman@prodigy.net; arksonshine12@yahoo.com; edwardw9200@gmail.com; harvey@playgraeagle.com; johnworfgalt@gmail.com; kblevy777@yahoo.com; tyson_GCVFD@hotmail.com; cjbishop1962@gmail.com; roycarter@greenhorncsd.org; cecilia51@sbcglobal.net; dmanning@greenvillerancheria.com; brendenfinch66@gmail.com; john@reynolds-family.us; hambranchfire@yahoo.com; bjhammill@frontiernet.net; chrisgallagher@frontier.com; ivchief@frontier.com; info.ivrpd@gmail.com; blake.jung@am.jll.com; joannfites@gmail.com; laportefire@yahoo.com; rjmacar@frontiernet.net; kimcain@surewest.net; deb.bumpus@usda.gov; russell.nickerson@usda.gov; jstclair01@fs.fed.us; jrust@fs.fed.us; nbunch@fs.fed.us; cromberg588@gmail.com; akwadawg@me.com; akwadawg@icloud.com; awilson@greenvillerancheria.com; michelle.fulton@sbcglobal.net; pmrow@jps.net; wgrandall@gmail.com; ron1942mv@gmail.com; gvalpreda@gmail.com; michelle.mead@noaa.gov; trinacunningham.maidu@gmail.com; dave@pacificsunset.com; julie@myairdistrict.com; melissak@myairdistrict.com; sallymtemp53@gmail.com; jharris@pacificforest.org; penfire@frontiernet.net; psp6@pge.com; taletha@plumascharterschool.org;

nicholas_dawson@firenet.gov; frankunitedsv@yahoo.com; Gibson, Tim
 <TimGibson@countyofplumas.com>; PCAC <pcac@countyofplumas.com>; Leonhardt, Chuck
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 Tony <thobson@pcbh.services>; Engel.dist.5@gmail.com; Goss, Kevin
 <kevin.goss4district2@gmail.com>; Simpson, Lori <lorisimpson.plumas@gmail.com>; Thrall, Sharon
 <sherrie.thrall@gmail.com>; White, Charles <CharlesWhite@countyofplumas.com>; Langston, Jennifer
 <JenniferLangston@countyofplumas.com>; rdiefendorf@plumascdc.org; Settle mire, Craig
 <CSettle mire@countyofplumas.com>; Caiazzo, Neal <NealCaiazzo@countyofplumas.com>; Hayden,
 Karen <KarenHayden@countyofplumas.com>; Hasse, Evan <EvanHasse@countyofplumas.com>; Sipe,
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 plumasfiresafe@plumascorporation.org; matt@plumascorporation.org; mike@plumascorporation.org;
 Osborn, Becky <BeckyOsborn@countyofplumas.com>; Selvage, Nancy
 <NancySelvage@countyofplumas.com>; Preston, Dave <DavePreston@countyofplumas.com>; Fuchs,
 Lindsay <LindsayFuchs@countyofplumas.com>; Lawson, Scott <pcmuseum@psln.com>;
 suemccourt1@gmail.com; plancom3 <plancom3@countyofplumas.com>; plancom5
 <plancom5@countyofplumas.com>; plancom4 <plancom4@countyofplumas.com>; plancom2
 <plancom2@countyofplumas.com>; Herrin, Becky <BeckyHerrin@countyofplumas.com>; Evans, Tim
 <TimEvans@countyofplumas.com>; Ferguson, Tracey <TraceyFerguson@countyofplumas.com>;
 Metcalf, Erin <ErinMetcalf@countyofplumas.com>; Woodruff, Andrew
 <AndrewWoodruff@countyofplumas.com>; Revene, Zach <ZachRevene@countyofplumas.com>;
 Venable, Tina <TinaVenable@countyofplumas.com>; Venable, Tina
 <TinaVenable@countyofplumas.com>; Hammond, Andrew <AndrewHammond@countyofplumas.com>;
 Perreault, Bob <BobPerreault@countyofplumas.com>; Blinn, Jerry <JerryBlinn@countyofplumas.com>;
 Graham, Jim <JimGraham@countyofplumas.com>; Blackwell, Joe
 <JoeBlackwell@countyofplumas.com>; Mannle, John <JohnMannle@countyofplumas.com>; Crews,
 Mark <MarkCrews@countyofplumas.com>; Thorman, Rob <RobThorman@countyofplumas.com>;
 Snyder, Mari <MariSnyder@countyofplumas.com>; Hydrick, Gabriel
 <GabrielHydrick@countyofplumas.com>; beckygrant@pcso.net; cwingfield@pcso.net; Towery, Roni
 <RoniTowery@countyofplumas.com>; Johns, Todd <ToddJohns@countyofplumas.com>;
 iJames@pcso.net; hereward@thegrid.net; billwickman@sbcglobal.net; steve.pecsd@gmail.com;
 john.rowden@digitalpath.net; johnsea21@yahoo.com; kmerriam@fs.fed.us; joel.bronk@usda.gov;
 micki.smith@usda.gov; david.brillenz@usda.gov; matthew.jedra@usda.gov;
 christopher.carlton@usda.gov; zbeail@fs.fed.us; mike.wintch@usda.gov; aaron.grove@usda.gov;
 rbakker@pcoe.k12.ca.us; fcarey@pcoe.k12.ca.us; Loripini@gmail.com; pmccutcheon@pcoe.k12.ca.us;
 bmarshall@psrec.coop; ecompton@psrec.coop; dsrudolph@sbcglobal.net; eprfpd@att.net;
 westalmanorfd@citlink.net; Beatley, Lori <LoriBeatley@countyofplumas.com>;
 david.schmid@plumasbank.com; david.windle@calsierratitle.com; fenwayboston@sbcglobal.net;
 robbie.quincyfire@sbcglobal.net; doug95971@gmail.com; johnparksiii@gmail.com;
 crandall.ken@gmail.com; scfd7900@gmail.com; krodgers@sierrainstitute.us; JKusel@sierrainstitute.us;
 sdebonis@spi-ind.com; jstarr@spi-ind.com; 9500sierravalleyfire@gmail.com;
 sierravalleygmd@sbcglobal.net; sierravalleyrcd@gmail.com; svv8213@gmail.com;
 andrea.m.irving@gmail.com; rmckillop@sopherwheeler.com; pviolet@sopherwheeler.com;
 quentin.youngblood@usda.gov; msyost@frontiernet.net; jlundquistgis@gmail.com;
 retompkins@ucanr.edu; De Lasaux, Mike <mjdelaux@ucdavis.edu>; tkschohr@ucanr.edu;
 FCASTILLO@up.com; ufr.contact@gmail.com; Matthew.J.Roberts@usace.army.mil;
 dan.martynn@ca.usda.gov; kschmidt@usgs.gov; westalmanorfd@citlink.net;
 joleen@clineandassociates.net; plumasm@sbcglobal.net; dbeatty@pdh.org; Victoria.LaMar-

Haas@CalOES.ca.gov; BC7102@outlook.com; chuckdaytonportola@gmail.com;
cary.curtis77@gmail.com; matthacsche@yahoo.com; Vieira, Willo <WilloVieira@countyofplumas.com>;
kelly.riley@caloes.ca.gov; renegaderoper@att.net; levi.warr@water.ca.gov;
brenna@brennahowell.com; jim@plumascorporation.org; marty.m.walters@gmail.com; mike-
flanigan@leavitt.com; annandlaura10@gmail.com; Jason Moghaddas <jmoghaddas@sig-gis.com>
Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>

Subject: SAVE THE DATE - 4/15/2020 - LHMP HMPC Meeting #2

Hello Plumas County Local Hazard Mitigation Planning Team –

You are invited to attend the 2nd Hazard Mitigation Planning Committee (HMPC) Meeting for the development of the County's 2020 LHMP.

SAVE THE DATE:

"Risk Assessment"

Wednesday, April 15, 2020

9:00 am to 12:00 pm

Online format TBD – more information to follow

Earlier this year, Plumas initiated its hazard mitigation planning effort, with support of Foster Morrison Consulting. Many of you attended the planning team kickoff meeting in late January. Over the past 8 weeks, the Foster Morrison team and County staff have been working to collect data to develop Chapter 4 of the LHMP, or the Risk Assessment Chapter. During this 2nd HMPC meeting, the team will be reviewing the risk assessment data developed to-date and looking for your feedback in refining and adding to the working draft Risk Assessment Chapter.

In light of the ongoing COVID-19 public health concerns, this meeting will be conducted remotely. We are currently evaluating the best virtual platform and will get back to everyone with the call in/remote login details.

Please RSVP to me and plan on participating (or delegating your participation). The County appreciates your ongoing participation and input—it is critical to the success of the LHMP project update.

Thanks everyone!

Tracey Ferguson, AICP
Planning Director



Plumas County Planning & Building Services
Planning Department
555 Main Street
Quincy, CA 95971
P: (530) 283-6214
F: (530) 283-6134

A.5.2. Mitigation Strategy Meeting Agenda

Plumas County Local Hazard Mitigation Plan (LHMP) Update Mitigation Strategy Meetings May 19 and 20, 2019

HMPC Meeting #3:

1. Introductions
2. Status of the DMA Planning Process
3. Risk Assessment Update
4. Develop Updated Plan Goals and Objectives
5. Identify and Review Mitigation Alternatives/Projects

HMPC Meeting #4:

1. Introductions
2. Identify and discuss Mitigation Alternatives/Projects
3. Review Mitigation Selection Criteria
4. Prioritize Mitigation Projects
5. Review of Schedule/Next Steps

A.5.3. Mitigation Strategy Meeting Sign in Sheets

Attendance was kept for the mitigation strategy meetings. The meetings were held virtually using Zoom, so the sign in sheets below reflects the attendance of the meeting.

May 19 Meeting Sign-in

Name	Agency
Chris Morrison	Foster Morrison
Chuck Bowman	Graeagle Firewise Community
Frank Carey	Plumas Unified Schools
Hannah Hepner	Plumas County Fire Safe Council
Jeanine Foster	Foster Morrison Consulting
Jerry Sipe	Plumas County Environmental Health
Jim Wilcox	Plumas Corporation
Joe Blackwell	Plumas County Public Works - LHMP Lead
John Rowden	Plumas Eureka Community Services District
Lauren Knox	City of Portola City Manager's Office
Lori Beatley	Public Health – Emergency Preparedness
Marty Walters	PCIRC
Melissa Klundby	Northern Sierra Air Quality Management District
Michael Rodriguez	Red Cross
Ray Bakker	Plumas Unified School District
Remy Gill	DWR
Rob Thorman	Plumas County Public Works - alternate
Ryan Tompkins	UC Cooperative Extension
Sami Nall	DWR
Sue McCourt	Plumas County OES
Tracey Ferguson	Plumas County Planning Department
Willo Vieira	Plumas-Sierra Department of Agriculture
Zoe Stancer	Safety Officer Plumas District Hospital

May 20 Meeting Sign-in

Name	Agency
Brenna Howell	Howell Consulting
Chris Morrison	Foster Morrison
Chuck Bowman	Graeagle Firewise Community
Emily Compton	Sierra Rural Electric Cooperative
Erik Egide	California Highway Patrol
Hannah Hepner	Plumas County Fire Safe Council
Jeanine Foster	Foster Morrison Consulting
Joe Blackwell	Plumas County Public Works - LHMP Lead
John Rowden	Plumas Eureka Community Services District
Lauren Knox	City of Portola City Manager's Office
Marty Walters	PCIRC
Ray Bakker	Plumas Unified School District
Remy Gill	DWR
Rob Thorman	Plumas County Public Works - alternate
Ryan Tompkins	UC Cooperative Extension
Sue McCourt	Plumas County OES
Tracey Ferguson	Plumas County Planning Department
Tracy Schor	UC Cooperative Extension
Willo Vieira	Plumas-Sierra Department of Agriculture

A.6 Internal County Meeting

From: Jeanine Foster <jeanine.foster@fostermorrison.com>

Sent: Monday, June 1, 2020 2:12 PM

To: TimGibson@countyofplumas.com; WilloVieira@countyofplumas.com;
CLeonhardt@countyofplumas.com; Engel.dist.5@gmail.com; lorisimpson.plumas@gmail.com;
CharlesWhite@countyofplumas.com; JenniferLangston@countyofplumas.com;
JerrySipe@countyofplumas.com; KevinCorreia@countyofplumas.com; pcmuseum@psln.com;
Loripini@gmail.com; suemccourt1@gmail.com; plancom4@countyofplumas.com;
plancom5@countyofplumas.com; ErinMetcalfe@countyofplumas.com;
AndrewWoodruff@countyofplumas.com; JoeBlackwell@countyofplumas.com;
RobThorman@countyofplumas.com; GabrielHydrick@countyofplumas.com; cwingfield@pcso.net;
ToddJohns@countyofplumas.com; LoriBeatley@countyofplumas.com;
LindsayFuchs@countyofplumas.com; BobPerreault@countyofplumas.com;
JohnMannle@countyofplumas.com; JohnSteffanic@countyofplumas.com;
DavePreston@countyofplumas.com; NealCaiazzo@countyofplumas.com; thobson@pcbh.services;
KathyWilliams@countyofplumas.com; traceyferguson@countyofplumas.com

Cc: Chris Morrison; Jeanine Foster

Subject: Jeanine Foster's Zoom Meeting

When: Monday, June 1, 2020 2:00 PM-3:00 PM (UTC-07:00) Mountain Time (US & Canada).

Where: <https://us02web.zoom.us/j/81309971522?pwd=Rmtib2liK2c1SGczSys3bHZtSHNadz09>

Hi Everyone,

This upcoming meeting is a follow on to the last mitigation strategy meetings held on May 19th and 20th. This County focused meeting will discuss the mitigation actions and projects identified at the last meeting and the results of the prioritization (voting) process. The next steps for developing mitigation action worksheets for inclusion in the LHMP Update will also be addressed.

Thanks to everyone for your continued support to this project!

Jeanine Foster is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting

<https://us02web.zoom.us/j/81309971522?pwd=Rmtib2liK2c1SGczSys3bHZtSHNadz09>

Meeting ID: 813 0997 1522

Password: 353679

A.6.1. Internal Meeting Agenda

AGENDA
Plumas County
Local Hazard Mitigation Plan (LHMP) Update
Mitigation Strategy – Internal County Meeting
June 4, 2020

1. Introductions
2. Present Draft Goals and Objectives
3. Discuss Mitigation Alternatives/Actions/Projects
4. Identify County Mitigation Action Champions
5. Next Steps

A.6.2. Internal Meeting Sign In Sheet

Attendance was kept for the internal meeting. The meeting was held virtually using Zoom, so the sign in sheet below reflects the attendance of the meeting.

Name	Agency
Jerry Sipe	Plumas County Environmental Health
Sue McCourt	Plumas County OES
Chuck White	Plumas County Building Department
Jennifer Langston	Plumas County Code Enforcement
Tracey Ferguson	Plumas County Planning Department
Lori Simpson	Plumas County Board of Supervisors
Rob Thorman	Plumas County Public Works - alternate
Lindsay Fuchs	Plumas County Librarian
Lori	Plumas County Public Health
Carson Wingfield	Plumas County Sheriff's Office/OES
Tim Gibson	Plumas County Agricultural Department
Willo Viera	Plumas County Agricultural Department
John Steffanic	Plumas County Fairgrounds
Gabriel Hydrick	Plumas County Administrator/Risk Management
Kevin Corriera	Plumas County Facility Services
Jeff Engle	Plumas County Board of Supervisors
Chris Morrison	Foster Morrison
Jeanine Foster	Foster Morrison

A.7 Final Team Meeting

A.7.1. Final Team Meeting Invite

From: Ferguson, Tracey

Sent: Wednesday, October 14, 2020 9:02 AM

To: arpd01@frontier.com; cespana1304@gmail.com; jim@americanvalleycsd.com; papillon@inreach.com; chiefussell@beckwourthfire.com; buckslakefd@aol.com; kate.kalinsky@bnsf.com; ATM@cpuc.ca.gov; Naveed.Paydar@cpuc.ca.gov; shane.vargas@fire.ca.gov; scott.packwood@fire.ca.gov; pamela.joe@caloes.gov; Victoria.LaMar-Haas@CalOES.ca.gov; kelly.riley@caloes.ca.gov; Lindsey.Stanley@CalOES.ca.gov; Robert.Goyeneche@CalOES.ca.gov; rod.daugherty@caloes.ca.gov; Alex.Knigge@CalOES.ca.gov; Monica.Williams@CalOES.ca.gov; eegide@chp.ca.gov; marcelino.gonzalez@dot.ca.gov; kathy.grah@dot.ca.gov; brett.gomes@wildlife.ca.gov; recdept@psln.com; shmp@conservation.ca.gov; klichti@chesterfire.org; brianlayne.cpub@frontier.com; frmotzkus@digitalpath.net; joe.waterman.jw@gmail.com; kdowns@manhard.com; l.knox@ci.portola.ca.us; t.roberts@ci.portola.ca.us; jenniferlacy33@gmail.com; ajuska@collinsco.com; j319155@thegrid.net; rafrank1@msn.com; kdd@frontiernet.net; lbrown@sierracounty.ca.gov; Alan.VanMatre@water.ca.gov; levi.warr@water.ca.gov; Sami.Nall@water.ca.gov; Remy.Gill@water.ca.gov; Bill.Ehorn@water.ca.gov; Kelly.soule@water.ca.gov; Robert.curry@water.ca.gov; mimithegolfgal@gmail.com; renegaderoper@att.net; rafrank1@msn.com; btracy@frc.edu; KTrutna@frc.edu; NBoyd@frc.edu; bgraevs@frrcd.org; xing.liu@fema.dhs.gov; Swofford, Terrell <terrellswofford@sbcglobal.net>; Reservations@goldlakelodge.com; kathy.kogge@gmail.com; wtseney@yahoo.com; cary.curtis77@gmail.com; goldmtncsd@sbcglobal.net; chbowman@prodigy.net; arksonshine12@yahoo.com; edwardw9200@gmail.com; harvey@playgraeagle.com; johnworfgalt@gmail.com; kblevy777@yahoo.com; Tyson@GreenhornCSD.com; cecilia51@sbcglobal.net; cjbishop1962@gmail.com; dmanning@greenvillerancheria.com; brendenfinch66@gmail.com; john@reynolds-family.us; hambranchfire@yahoo.com; bjhammill@frontiernet.net; brenna@brennahowell.com; chrishgallagher@frontier.com; ivchief@frontier.com; info.ivrpd@gmail.com; joannfites@gmail.com; laportefire@yahoo.com; rjmacar@frontiernet.net; kimcain@surewest.net; deb.bumpus@usda.gov; jrust@fs.fed.us; nbunch@fs.fed.us; russell.nickerson@usda.gov; mike-flanigan@leavitt.com; cromberg588@gmail.com; akwadawg@me.com; awilson@greenvillerancheria.com; michelle.fulton@sbcglobal.net; pmrow@jps.net; wgrandall@gmail.com; ron1942mv@gmail.com; gvalpreda@gmail.com; michelle.mead@noaa.gov; trinacunningham.maidu@gmail.com; julie@myairdistrict.com; melissak@myairdistrict.com; sallymtemp53@gmail.com; jharris@pacificforest.org; pcircboard.martywalters@gmail.com; penfire@frontiernet.net; BC7102@outlook.com; psp6@pge.com; taleta@plumascharterschool.org; nicholas_dawson@firenet.gov; jim@plumascorporation.org; frankunitedsv@yahoo.com; PCAC <pcac@countyofplumas.com>; Leonhardt, Chuck <CLEonhardt@countyofplumas.com>; Allen, Roberta <RobertaAllen@countyofplumas.com>; Hobson, Tony <thobson@pcbh.services>; Engel.dist.5@gmail.com; Goss, Kevin <kevin.goss4district2@gmail.com>; Simpson, Lori <lorisimpson.plumas@gmail.com>; Thrall, Sharon <sherrie.thrall@gmail.com>; White, Charles <CharlesWhite@countyofplumas.com>; Langston, Jennifer <JenniferLangston@countyofplumas.com>; rdiefendorf@plumascdc.org; Settle mire, Craig <CSettle mire@countyofplumas.com>; Hayden, Karen <KarenHayden@countyofplumas.com>; Caiazzo, Neal <NealCaiazzo@countyofplumas.com>; Hasse, Evan <EvanHasse@countyofplumas.com>; Sipe, Jerry <JerrySipe@countyofplumas.com>; Correia, Kevin <KevinCorreia@countyofplumas.com>; Steffanic, John <JohnSteffanic@countyofplumas.com>; matt@plumascorporation.org; mike@plumascorporation.org; plumasfiresafe@plumascorporation.org; Osborn, Becky <BeckyOsborn@countyofplumas.com>; Selvage, Nancy <NancySelvage@countyofplumas.com>; Preston, Dave <DavePreston@countyofplumas.com>; Fuchs, Lindsay <LindsayFuchs@countyofplumas.com>; Lawson, Scott <pcmuseum@psln.com>; Loripini@gmail.com; suemccourt1@gmail.com; plancom2 <plancom2@countyofplumas.com>;

plancom5 <plancom5@countyofplumas.com>; plancom5 <plancom5@countyofplumas.com>; Herrin, Becky <BeckyHerrin@countyofplumas.com>; Evans, Tim <TimEvans@countyofplumas.com>; Metcalf, Erin <ErinMetcalf@countyofplumas.com>; Woodruff, Andrew <AndrewWoodruff@countyofplumas.com>; Venable, Tina <TinaVenable@countyofplumas.com>; Perreault, Bob <BobPerreault@countyofplumas.com>; Graham, Jim <JimGraham@countyofplumas.com>; Thorman, Rob <RobThorman@countyofplumas.com>; Blackwell, Joe <JoeBlackwell@countyofplumas.com>; Snyder, Mari <MariSnyder@countyofplumas.com>; Hydrick, Gabriel <GabrielHydrick@countyofplumas.com>; beckygrant@pcso.net; cwingfield@pcso.net; ijames@pcso.net; Towery, Roni <RoniTowery@countyofplumas.com>; Johns, Todd <ToddJohns@countyofplumas.com>; hereward@thegrid.net; billwickman@sbcglobal.net; dbeatty@pdh.org; zstancer@pdh.org; steve.pecsd@gmail.com; john.rowden@digitalpath.net; johnsea21@yahoo.com; aaron.grove@usda.gov; Christopher.Carlton@usda.gov; david.brillenz@usda.gov; joel.bronk@usda.gov; kmerriam@fs.fed.us; matthew.jedra@usda.gov; micki.smith@usda.gov; mike.wintch@usda.gov; zbeail@fs.fed.us; rbakker@pcoe.k12.ca.us; fcarey@pcoe.k12.ca.us; pmccutcheon@pcoe.k12.ca.us; Gibson, Tim <TimGibson@countyofplumas.com>; Vieira, Willo <WilloVieira@countyofplumas.com>; bmarshall@psrec.coop; ecompton@psrec.coop; eprfpd@att.net; westalmanorfd@citlink.net; Beatley, Lori <LoriBeatley@countyofplumas.com>; david.schmid@plumasbank.com; david.windle@calsierratitle.com; fenwayboston@sbcglobal.net; rcassou@qfd.ca.gov; plumasm@sbcglobal.net; johnparksiii@gmail.com; crandall.ken@gmail.com; scfd7900@gmail.com; JKusel@sierrainstitute.us; krodgers@sierrainstitute.us; jstarr@spi-ind.com; sdebonis@spi-ind.com; 9500sierravalleyfire@gmail.com; sierravalleygmd@sbcglobal.net; sierravalleyrcd@gmail.com; svv8213@gmail.com; andrea.m.irving@gmail.com; pviolett@sopherwheeler.com; jmoghaddas@sig-gis.com; richard.stockton.g1ee@statefarm.com; quentin.youngblood@usda.gov; msyost@frontiernet.net; retompkins@ucanr.edu; tkchohr@ucanr.edu; FCASTILLO@up.com; ufr.contact@gmail.com; Matthew.J.Roberts@usace.army.mil; dan.martynn@ca.usda.gov; kschmidt@usgs.gov; westalmanorfd@citlink.net; joleen@clineandassociates.net; jerry.hurley@sbcglobal.net; kevin@globalexchange.org; chuckdaytonportola@gmail.com; annandlaura10@gmail.com; mike-flanigan@leavitt.com; matthacsche@yahoo.com; kevin@globalexchange.org; 'tribalaffairs@caloes.ca.gov' <tribalaffairs@caloes.ca.gov>

Subject: HMPC & Public Meetings - Zoom Info - Plumas 2020 LHMP Update - Public Review Draft

Hello Plumas County Hazard Mitigation Planning Committee (HMPC) members and interested parties,

The LHMP Public Review Draft is now available on the Plumas County Office of Emergency Services (OES) website for public review and comment at:

<https://www.plumascounty.us/2218/Documents>

Comments are due by Friday, October 23, 2020

Want to review a hard copy? Go to the Plumas County Public Library branches in Quincy (445 Jackson Street), Greenville (204 Ann Street), Chester (210 First Avenue), and Portola (34 Third Avenue) or at the Planning & Building Services counter (555 Main Street, Quincy).

Please submit Comments to:

Mailing address: 555 Main Street, Quincy, CA 95971 ATTN: Tracey Ferguson, Planning Director

Email address: TraceyFerguson@countyofplumas.com

Public Meeting. A public meeting on the LHMP Public Review Draft will be held **Tuesday, October 20, 2020 from 6-7:30 pm** virtually via Zoom where the public is welcome to join, ask questions, and provide comments. Join Zoom Meeting at this link:

<https://us02web.zoom.us/j/84753178672?pwd=R1p2ZUtRNi9zM1RmVkhqKy81SDczUT09>

Phone Number: 1-669-900-6833

Meeting ID: 847 5317 8672

Passcode: 897553

Final HMPC Meeting. Hazard Mitigation Planning Committee Meeting #5 is scheduled for **Wednesday, October 21, 2020 from 9:00-11:30am**. Join Zoom Meeting at this link:

<https://us02web.zoom.us/j/84283075091?pwd=UkowaXhLK283SlRpYTRiY1F3QmZCdz09>

Phone Number: 1-669-900-6833

Meeting ID: 842 8307 5091

Passcode: 791334

If you have any questions, please contact me at TraceyFerguson@countyofplumas.com or 530-283-6214 or Jeanine Foster at Jeanine.foster@fostermorrison.com or 303-717-7171.

Thank you for your continued engagement in the process!

Tracey Ferguson, AICP
Planning Director



Plumas County Planning & Building Services

Planning Department

555 Main Street

Quincy, CA 95971

P: (530) 283-6214

F: (530) 283-6134

traceyferguson@countyofplumas.com

www.plumascounty.us

A.7.2. Final Meeting Invite on Plumas County Website



A.7.3. Final Team Meeting Agenda

AGENDA Plumas County Local Hazard Mitigation Plan (LHMP) Update Final Meeting October 21, 2020

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Summary of Changes in Plumas County Planning Area Vulnerabilities/ Mitigation Priorities
5. Public Input: Data/Projects
6. Final Steps

A.7.4. Final Team Meeting Sign in Sheet

Attendance was kept for the final meeting. The meeting was held virtually using Zoom, so the sign in sheet below reflects the attendance of the meeting.

Name	Agency/Title
Tracey Ferguson	Plumas County Planning Department
Sue McCourt	Plumas County OES
Rob Thorman	Plumas County Public Works
Remy Gill	CA Department of Water Resources
Carson Wingfield	Plumas County OES
Willo Vieira	Plumas County Agricultural Department
Chris Morrison	Foster Morrison Consulting
Jeanine Foster	Foster Morrison Consulting

A.8 Public Involvement

A.8.1. Early Public Meeting Advertisement in Plumas County News (ran 1/15 and 1/22/2020)



Get Involved!

**LOCAL HAZARD MITIGATION
PLAN UPDATE: MEETING #1**

Help Plumas County be Hazard-Ready

Plumas County is updating its 2014 Local Hazard Mitigation Plan (LHMP). Floods, drought, wildfires, and severe weather are just a few of the hazards of concern to the County. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for the County's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with a FEMA-approved LHMP are eligible to apply for both pre- and post-disaster mitigation grant funding.

The people most aware of potential hazards are the people that live and work in the affected communities. In addition to plan participation by Plumas County departments and local, state and federal agencies, the County is seeking members of the public to participate in the LHMP Update process.

Public Informational Meeting #1

January 29, 2020 • 5:30 - 7pm

**Quincy Library Meeting Room
445 Jackson St., Quincy**

For more information contact:
Tracey Ferguson, AICP,
Plumas County Planning Director, at 530-283-6214
or TraceyFerguson@countyofplumas.com
To review the 2014 Hazard Mitigation Plan
document, please go to [https://www.plumas
county.us/2214/Mult-Hazard-Mitigation-Plan](https://www.plumascounty.us/2214/Mult-Hazard-Mitigation-Plan)



A.8.2. Early Public Meeting Newspaper Article in Plumas County News
on 1/29/2020

Help the county prepare for hazards

Plumas County is updating its 2014 Local Hazard Mitigation Plan (LHMP) and is seeking public comment. Floods, drought, wildfires and severe weather are just a few of the hazards of concern in the county.

While natural hazards such as these cannot be prevented, an LHMP forms the foundation of the county's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with FEMA-approved LHMPs are eligible to apply for both pre- and post-disaster mitigation grant funding.

The people most aware of potential hazards are the people who live and work in the affected communities. In addition to plan participation by Plumas County departments and local, state and federal agencies, the county is seeking members of the public to participate in the LHMP update process.

The initial Plumas County LHMP public information meeting will be held Wednesday, Jan. 29, 5:30 to 7 p.m., at the Quincy Library, 445 Jackson St., in Quincy.

For more information, contact Plumas County Planning Director Tracey Ferguson, ACIP, at 283-6214 or TraceyFerguson@countyofplumas.com.

To review the 2014 Hazard Mitigation Plan document, visit www.plumascounty.us/2214/Mult-Hazard-Mitigation-Plan.

A.8.3. Early Public Meeting: Kickoff Meeting – Public Agenda

**Plumas County
Local Hazard Mitigation Plan (LHMP)
Public Meeting #1
January 29, 2020**

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. Hazard Identification and Profiles
4. Opportunities for Public Participation and Input
5. Schedule
6. Questions and Answers

A.8.4.

Early Public Meeting: Kickoff Meeting – Public Sign in Sheets



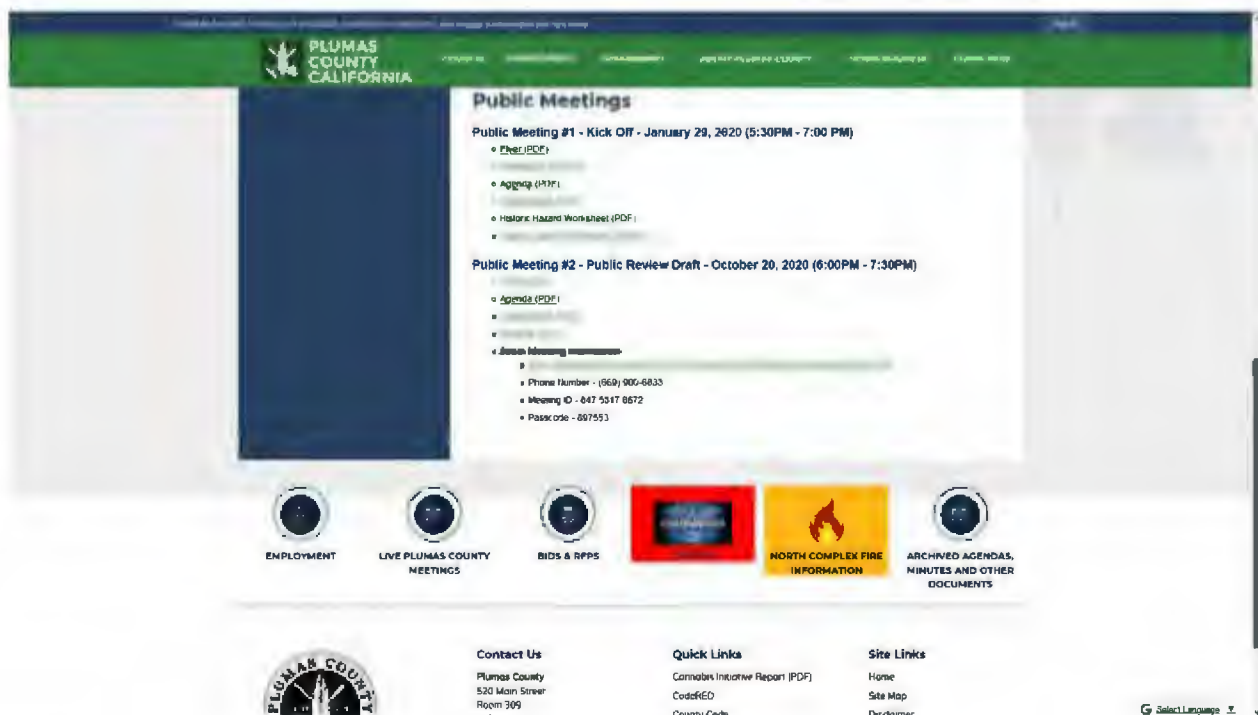
SIGN-IN SHEET

Plumas County LOCAL HAZARD MITIGATION PLANNING PROJECT

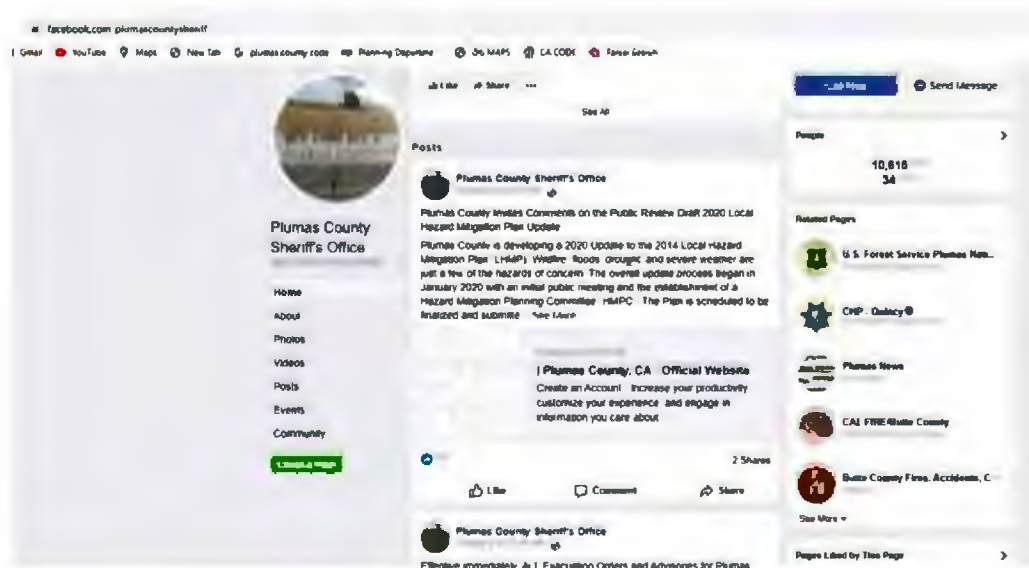
Public Meeting #1
January 29, 2020 (5:30 PM)

Name/Title	Email Address	Phone	Citizen/Affiliation
CARY CURTIS	cary.curtis77@gmail.com	530-832-9745	Gold Mountain CA
	jpe.jerry@gmail.com	530-249-5106	citizen
Warren Grandall - Arch	wgrandall@gmail.com	530-283-0470	Meadow Valley Fire
Tracey Ferguson	traceyfergusme@countyofplumas.com	530-243-6214	Planning Department LHMP Project Mgr
Matt Truesche	MattTruesche@yahoo.com	530 575 7572	Citizen LAFCO Public
Willie Vieira	willevieira@countyofplumas.com	(530) 283-6126	Ag Dept/ Citizen

A.8.5. Final Public Meeting: Review of Plan – Public Meeting Invite on Plumas County Website



A.8.6. Final Public Meeting: Invite on Plumas County Sheriff's Office Facebook Page



A.8.7. Final Public Meeting – Flyer posted on Community Billboards



Plumas County Invites Comments on the Public Review Draft 2020 Local Hazard Mitigation Plan (LHMP) Update

Plumas County is developing a 2020 Update to the 2014 Local Hazard Mitigation Plan (LHMP). Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from natural hazards. Wildfire, floods, drought, and severe weather are just a few of the hazards of concern. While natural hazards such as these cannot be prevented, the LHMP forms the foundation for the County's long-term strategy to reduce disaster losses. The overall update process began in January 2020 with an initial public meeting and the establishment of a Hazard Mitigation Planning Committee (HMPC) comprised of representatives from the County, special districts, other agencies and organizations, key local, regional, and state stakeholders, and the public. The Plan is scheduled to be finalized and submitted to the California Office of Emergency Services (Cal OES) and the Federal Emergency Management Agency (FEMA) in October 2020.

Opportunity for Public Input!

2020 LHMP Public Review Draft Released October 7, 2020

The LHMP Public Review Draft is now available on the Plumas County Office of Emergency Services (OES) website for public review and comment at: <https://www.plumascounty.us/2218/Documents>.

All public comments are due by Friday, October 23, 2020

To review a hard copy of the LHMP Public Review Draft, go to the Plumas County Public Library branches in Quincy (445 Jackson Street), Greenville (204 Ann Street), Chester (210 First Avenue), and Portola (34 Third Avenue) or visit the Planning & Building Services counter at 555 Main Street, Quincy.

Board of Supervisors Meeting October 13, 2020

The LHMP Public Review Draft is on the Board agenda for Tuesday October 13, 2020 at 10:00 am in the Board of Supervisors Room 308, Courthouse, Quincy. Meetings are live streamed at <http://plumas.cocastreamingmedia.com/web/Home.aspx>. Members of the public can also submit comments on agenda items using the email address: public@countyofplumas.com.

Planning Commission Meeting October 15, 2020

The LHMP Public Review Draft is on the Commission agenda for Thursday October 15, 2020 at 10:00 am in the Board of Supervisors Room 308, Courthouse, Quincy. Meetings are live streamed at <http://plumas.cocastreamingmedia.com/web/Home.aspx>. Members of the public can also submit comments on agenda items using the email address: publicplanningcommission@countyofplumas.com.

Public Meeting October 20, 2020

A public meeting on the LHMP Public Review Draft will be held Tuesday, October 20, 2020 from 6-7:30 pm virtually via Zoom. The public is welcome to join, ask questions, and provide comments. Additional information on the public meeting, including the Zoom meeting call in information, will be available on the County's OES website at: <https://plumascounty.us/2236/Planning-Committee-and-Public-Meetings>.

LHMP Public Review Draft comments can be submitted to the Plumas County Planning Department:

Physical location/	Planning & Building Services, Planning Department
Mailing address:	555 Main Street, Quincy, CA 95971 ATTN: Tracey Ferguson, Planning Director
Email address:	TraceyFerguson@countyofplumas.com

If you have any questions, please contact Director Ferguson at TraceyFerguson@countyofplumas.com or 530-283-6214. Thank you for your engagement in the process!

A.8.8. Final Public Meeting – Article on Plumas News Site



Plumas County is putting together a plan to deal with the myriad disasters that could impact the area. Calamities such as wildfire, flood, avalanche, drought, dam failure, earthquake, severe weather and climate change are all being addressed, and the plan must be submitted to the state's Office of Emergency Services and FEMA on the federal level.

The public has until Friday, Oct. 23, to comment on the draft plan, which must be submitted by the end of the month. The document is called the Plumas County Local Hazard Mitigation Plan. Back in December of 2019, the county received a planning grant from Cal OES/FEMA and worked with Foster Morrison Consulting to develop the plan, which can be viewed at <https://www.plumascounty.us/2218/Documents>.

The public will have three opportunities to hear the plan discussed:

Planning Director Tracey Ferguson will discuss the plan with the Board of Supervisors on Oct. 13. Meetings are live-streamed at <http://plumascoca.sulleinemedia.com/web/home.aspx>. Members of the public can also submit comments on agenda items using the email address: public@countyofplumas.com.

The Planning Commission will also discuss the topic during its Oct. 15 meeting, which begins at 10 a.m. in the Board of Supervisors room. That event is also live-streamed at <http://plumascoca.sulleinemedia.com/web/home.aspx>. The public can also submit comments on agenda items using the email address: publicplanningcommission@countyofplumas.com.

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Finally, a public meeting on the document will be held Tuesday, Oct. 20, from 6-7:30 p.m. virtually via Zoom. The public is welcome to join, ask questions, and provide comments. Additional information on the public meeting, including the Zoom meeting call in information, will be available on the County's OES website at: <https://plumascounty.us/2236/Planning-Committee-and-Public-Meetings>.

Comments can be submitted to the Plumas County Planning Department by Oct. 23. They may be hand delivered, mailed or emailed.

Physical location/ Mailing address: Planning & Building Services, Planning Department 555 Main Street, Quincy, CA 95971 ATTY. Tracey Ferguson

Email address: TraceyFerguson@countyofplumas.com

If you have any questions, please contact Director Ferguson at TraceyFerguson@countyofplumas.com or 530-283-6214.

More News

Indian Valley Academy students host candidate forum

October 18, 2020

<https://www.plumasnews.com/public-attend-to-comment-on-countys-hazard-mitigation-plan-think-wild-fires-floods-and-more/>

3/3

A.8.9. Final Public Meeting – Library Outreach

Portola Library



Greenville Library



Chester Library



Quincy Library



A.8.10. Public Comments

Commenter/Date	Comment	How Incorporated
Marty Walters – 2/2/2020	I'd like to be added to your notification list relating to this plan update. I live in a pre-FIRM flood zone in Quincy and have been experiencing more extremes in flooding behavior in the past 10 years, with the winter of 2016-2017 resulting in floodwaters in my house for the first time since it was constructed in 1960. My home at 93 Lindan Ave is adjacent to the collection point for a number of ditches that drain most of the urban area of Quincy, and extreme storm events combined with beaver activity, siltation of the ditches, and lack of efficient drainage in American Valley is causing a lot of backed up water from the bike path and American Valley to flow into my property during big rain events. I have a lot of photos and videos of various events in the last five years or so if you're interested.	Marty was invited to participate in meetings. She helped inform many sections of the Plan Update. Mitigation Action 19 (Countywide Stormwater Drainage and Grading Ordinance) and Action 20 (Develop a Countywide Drainage Master Plan) should also help to address identified concerns. In addition, Plumas County Public Works noted some complicating factors in addressing the drainage issues specific to the areas in and around the Walters' property. Specifically, much of the work, including stream clearing and maintenance, required access to

Commenter/Date	Comment	How Incorporated
	I've tried to work with the county public works for years to address some of these issues with no luck, and the message I've received is that it's up to me as the homeowner to deal with this on my own. I'm saving up to do some grading and put in landscaping that can act as flood walls during major flood events to keep water from entering my property from the bike path. I'm hoping that the county's planning and building codes will allow me to construct flood protection to keep water out of my home since it appears the county is not willing to mitigate the flooding in areas that it controls. In addition, I think the county needs to address drainage capacity before approving any more infill development or new building construction in Quincy. The drainage ditches are completely inadequate, and Cal Trans' maintenance of the ditches near Highway 70 just moves the problem downstream.	private property; the County ran in to issues when they were unable to successfully negotiate right of entry agreements with all necessary property owners.
Michael Rodriguez – 3/7/2020	As the volunteer disaster leader in Plumas County for the American Red Cross, I wanted to share a few thoughts. I did attend the last kickoff meeting and was impressed with the number of people that attended. I also enjoyed the process as you described for updating the HMP. Since the local ARC volunteers are activated by the County EOC, we are a small group and yet we have opened evacuation centers. One concern I have as shelter manager is the idea of feeding a large number of clients. The deployments I have served at always had local churches or other food service groups to feed everyone. I wonder what has been planned for this eventuality. Recently, I spoke with the president of Feather River College and we shared information about a shelter and feeding need. I asked him to contact the EOC director. The county emergency plan has Social Services as the lead for Mass Care until ARC can take over. I would be happy to talk with you about this topic. I feel it is important for everyone to understand the focus and limits of ARC for our community.	Mitigation Action 11 (Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter) was included in the Plan Update to address this issue.
Ken Donnell – 6/15/2020	My concerns relate to having a well educated public in advance of any emergency, and a government contact person(s) with advance planning for how to address public involvement in responding to an emergency event. These concerns include: - good education and training for local non-government citizens to be aware of the Plumas/FEMA Hazards plan, - designation of a local government agency contact person to lead this education effort and be lead the	Mitigation Action 12 (Explore establishing a Community Emergency Response Team (CERT)) was included in the Plan Update to address this issue. Mitigation Action 2 (Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness) addresses the public education and preparedness

Commenter/Date	Comment	How Incorporated
	lead public contact person in the event of an emergency (not a spokesperson for the media, but more of a public action coordinator) - an action plan for how this public contact person will function in an emergency event - a rough action plan for how non-governmental persons can respond to help in an emergency under the direction of the contact person - sufficient funding to make this all happen Does this message suffice for your needs at this moment? If no, what do I need to do to make my comments official, and are these comments needed by this coming June 18?	piece.
Paul Mrowczynski – 8/18/2020	I have lived in Plumas County for 37 years and am involved in Fire Preparation (Meadow Valley Firewise co coordinator) as well as Food Security (Plumas Sierra Counties Community Food Council). In briefly reviewing the 586 page Plumas County Local Hazard Mitigation Plan Update HMPC Review Draft August 2020, I searched for evidence of development of an Emergency Food Access Plan. Wildfires were identified as the leading concern of the 17 disaster events reviewed. At our Food Council meeting two weeks ago, a representative from the Butte County Community Action Agency spoke of the need for emergency planning for food access in response to wildfire. The Camp Fire in Paradise (Butte county) which took 85 lives, left survivors with little to no access to emergency food supplies due to the absence of an Emergency Food Access plan. The Food Council had identified the need for such a plan as well as support and assistance in formulating such a plan. I appreciate the quality of work demonstrated in the Local Hazard Mitigation Plan. I reached out via telephone to Jeanine Foster and discussed the possibility of including a mitigation strategy for Emergency Food Access in the plan. In talking with Dana Krinsky I learned that the process for realizing such a plan needs to involve a countywide Disaster Committee and the Office of Emergency Services. before presenting to the Plumas County Board of Supervisors. With fires in Loyalton (over 30,000 acres 8/15 to 8/18) and smaller fires in Oroville (8/17) and outside Quincy (Claremont 200 acres 8/17), we must get a draft developed ASAP. I am writing this email to request that the Mitigation Plan include a section that would identify the value of developing the Emergency Food Access Plan in response to a catastrophic Wildfire. This would give more support in efforts to develop the plan for Food Access. Our next step is to identify a process of developing the plan and an agency to review it on a	Mitigation Action 11 (Prepare Emergency Food Access Plan as a Complement to the Plumas County EOP Annex B: Mass Care & Shelter) was included in the Plan Update to address this issue.

Commenter/Date	Comment	How Incorporated
	regular basis for changes and improvements. Thanks for all your work at making Plumas a safer place to live.	
Carlos Espana – 8/23/2020	On behalf of Almanor Recreation and Park District and based on my areas of expertise, I think the document is unbelievably comprehensive and I note no obvious deficiencies based on my scan of the latest draft of the document. I hope that at least 1% of what needs to be done according to the document can be done within the next 50 years.	Comment noted.
Remy Gill – 8/24/2020	I have finished reviewing the sections of the LHMP that are water related and I am very impressed. The document is very informative and well written in my opinion. I only had one minor comment and that was in some sections DWR is referred to as Cal DWR and some sections just DWR. CA DWR will be good.	The acronym for “California Department of Water Resources” was corrected to “CA DWR” in the Plan Update.
Dale Knutsen – 10/12/2020	After reviewing the ref (a) document, I’d like to offer a few comments. My vantage point is that of a 34 year residential property owner in the Lake Almanor basin, and a 20 year participant in regional fire prevention and fire safety matters. With that in mind, let me start by saying that the draft plan clearly addresses the many potential community hazards that could impact the county. The breadth and depth of coverage seems quite complete. With regard to the section on wildfire, I would like to recommend several County actions that I believe would improve public safety. First, I believe that there should be a strong and persistent effort to lobby the USFS to change its current forest harvest policies to not only allow but encourage greatly increased conifer harvesting. We should strive to thin our forests and return them to the historic stocking level that existed before the 20th century. Doing so will have the following beneficial effects: -Reduced fuel loading and reduced fire hazard -Reduced water requirements for trees (more for streams & reservoirs) -Reduced stress on remaining trees (less susceptible to beetles and disease) -Increased revenue to the USFS. Second, I believe that the county should adopt a brush and weed abatement ordinance, applicable to all private lands, that requires property owners to reduce the fire threat of these fuels along roads, property boundaries and near structures. The area within 100 feet of structures is especially critical.	With respect to forest management issues on USFS lands, the County utilizes the Plumas County Coordinating Council to interface with the USFS and other agencies. These issues are important to overall wildfire prevention in the County, and will continue to be discussed via these communication channels. Plumas County Code, Title 4 (Public Safety), Chapter 2 (Fire Prevention), Article 1 (Firebreaks) requires persons owning, renting or operating cabins, tents, stores, residences, hotels, or other structures to maintain a firebreak or clearing free from inflammable material for thirty (30’) feet from such structures during the period from April 1 to October 31. Mitigation Action 45 was included to review and revise, as necessary, the Plumas County Code to adhere to PRC 4291 including addressing the January 1, 2005 State law requirement for defensible space clearance around homes and structures that was extended from thirty (30’) feet to one-hundred (100’) feet. Further, Plumas County Code, Title 8 (Building Regulations), Chapter 16 (Abatement of Hazardous Weeds and Rubbish) enforces CA Health and

Commenter/Date	Comment	How Incorporated
	Finally, I believe that the county should carefully review the existing agreement between CAL FIRE and the USFS regarding assigned fire protection responsibilities in Plumas County, and seek to expand CAL FIRE coverage of developed areas and critical infrastructure. As an example of what I am referring to, I am attaching a map indicating the current fire protection assignments in the Lake Almanor basin. In this case, CAL FIRE has responsibility for the private lands in the uncolored zone, but the USFS has responsibility for private parcels and facilities in the yellow zone. Given that CAL FIRE trains for fire suppression actions involving structures and infrastructure facilities, whereas USFS normally does not, the public would be better served if CAL FIRE were the lead agency for responses on private lands.	Safety Code Sections 14930-14931 under Division 12 (Fires and Fire Protection) for removal of “dirt, rubbish, weeds, or other rank growth” by the owners, lessees, or occupants of buildings, grounds, or lots in the County. This will also be reviewed under Mitigation Action 45. The County acknowledges the complexities regarding assigned fire protection responsibilities in Plumas. As detailed above, the County through its Coordinating Council and other avenues such as the Plumas County Fire Safe Council will continue to discuss the most effective roles for oversight and implementation of fire prevention and suppression activities in the various Federal, State, and Local fire Responsibility Areas.

A.9 Meeting Handouts

A.9.1. Kickoff Meeting Handouts

Plumas County Hazard Identification and Profiles – 2019/2020

Disaster Declarations and National Weather Service Research

Plumas County – Disaster Declarations 1950-2019

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2017	California Severe Winter Storms, Flooding, Mudslides	Flood	Storms	DR-4308	–	4/1/2017
2017	California Severe Winter Storms, Flooding, Mudslides	Flood	Storms	DR-4301	–	2/14/2017
2014	California Drought	Drought	Drought	GP 2014-13	1/17/2014	–
2008	Wildfires	Fire	Fire	EM-3287	–	6/28/2008
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	–	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	–	9/13/2005
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–
1999	California Wildfires	Fire	Fire	EM-3140	8/26/1999	9/1/1999
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97-1/31/97	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	DR-1046	Proclaimed	3/12/1995
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95-3/14/95	1/13/1995
1993	California Severe Storm, Winter Storm, Mud & Landslides, Flooding	Flood	Storms	DR-979	–	2/3/1993
1992	1992 Late Winter Storms	Flood	Storms	DR-979	1/7/93 - 2/19/93	1/15/1993

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1987	1987 Wildland Fires	Fire	Fire	GP	9/10/1987, 9/3/1987	–
1986	1986 Storms	Flood	Storms	DR-758	2/18-86-3/12/86	2/18/1986
1980	April Storms	Flood	Storms	–	4/1/1980	–
1977	1977 Drought	Drought	Drought	EM-3023	1/20/1977	–
1970	1970 Northern California Flooding	Flood	Flood	DR 283	1/27/1970 - 3/2/1970	2/16/1970
1969	California Severe Storms, Flooding	Flood	Storms	DR-253	1/23/69, 1/25/69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	1/26/1969
1964	1964 Late Winter Storms	Flood	Storms	DR-183	12/22/64, 12/23/64, 12/28/64, 1/5/65, & 1/14/65	12/24/1964
1963	1963 Floods and Rains	Flood	Storms	DR-145	2/7/63, 2/26/63, 2/29/63, & 4/22/63	2/25/63
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	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	OCD 50-01	11/21/1950	–

Source: FEMA, Cal OES

Plumas County Disaster Declaration Summary Table 1950-2019

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1977, 2014	0	–
Economic	1	2001	0	–
Fire	3	1960, 1987, 1999	2	1999, 2008

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	16	1950, 1955, 1958 (twice), 1963 (twice), 1964, 1969, 1970, 1980, 1986, 1992, 1995 (twice), 1996, 1997	15	1955, 1958, 1963, 1964, 1969, 1970, 1986, 1992, 1993, 1995 (twice), 1997, 2006, 2017 (twice)
Hurricane	0	—	1	2005
Totals	22	—	18	—

Source: FEMA, Cal OES

Disasters since 2014 Plan

- 2014 Drought (state)
- 2017 Flood (two federal)

*NCDC Severe Weather Events for Plumas County 1950-5/31/2019**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	1	0	0	0	0	\$0	\$0
Cold/Wind Chill	3	0	0	0	0	\$0	\$0
Debris Flows	5	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
Flash Flood	3	0	0	0	0	\$0	\$0
Flood	10	0	0	1	0	\$3,140,000	\$0
Freezing Fog	1	0	0	0	0	\$0	\$0
Hail	19	0	0	0	0	\$100	\$5,000
Heavy Rain	47	0	0	0	0	\$1,000	\$0
Heavy Snow	280	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	2	0	0	0	0	\$25,100	\$0
Thunderstorm Wind	2	0	0	0	0	\$675,000	\$0
Wildfire	9	0	0	0	0	\$22,775,000	\$0
Winter Storm	117	0	0	0	0	\$150,000	\$0
Winter Weather	31	0	0	0	0	\$0	\$0
Total	632	1	0	2	0	\$29,284,700	\$0

Source: NCDC

*Note: Losses reflect totals for all impacted areas

**Due to the regional nature of reporting certain hazard events, these hazards are included in the NCDC database for Plumas County

Hazards Comparisons Summary

Plumas County Hazard Identification 2019

2014 Plumas County Plan	General Plan Safety Element	2018 State of California Plan Applicable Hazards	Proposed Plumas County 2019 Hazards
Avalanche (part of geologic hazards)	—	Avalanche	Avalanche
Climate Change	—	Climate Change & Related Hazards	Climate Change
Dam Failure	Flood and Dam Inundation Hazards	Dam Failure	Dam Failure
Drought		Droughts and Water Shortage	Drought and Water Shortage
Earthquake (part of geologic hazards)	Geologic and Seismic Hazards	Earthquake	Earthquake (including liquefaction)
Floods: 100/500 year	Flood and Dam Inundation Hazards	Flood	Flood: 1%/0.2% annual chance
—	—	Flood	Flood: Localized/Stormwater
Landslides (part of geologic hazards)	Geologic and Seismic Hazards	Landslide	Landslide, Mudslide, and Debris Flows
—	—	Levee Failure	Levee Failure
Severe Weather (consolidated hazard)	—	Extreme Heat	Severe Weather: Extreme Heat
Severe Weather (consolidated hazard)	—	Severe Weather and Storms	Severe Weather: Heavy Rains and Storms
Severe Weather (consolidated hazard)	—	Severe Weather and Storms	Severe Weather: High Winds and Tornadoes
Severe Weather (consolidated hazard)	—	Severe Weather and Storms	Severe Weather: Winter Storm and Freeze
Volcanoes (part of geologic hazards)	—	Volcano	Volcano
Wildfire	Wildland Fire Hazards	Wildfire	Wildfire

Plumas County LHMP Update: 2019 Hazards

- 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
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather:
- High Winds and Tornadoes
- Severe Weather:
- Winter Storms and Freeze
- Volcano
- Wildfire

Plumas County 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, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop 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	
Prepared by:	Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 5628 West Long Place Littleton, CO 80123 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Phone:	
Email:	
Date:	

Plumas County
2019 Local Hazard Mitigation Plan Update
County and Participating Jurisdiction: Vulnerability & Capability
Worksheets

Risk and Vulnerability Questions

Localized/Stormwater Flooding

1. Please describe the localized/stormwater flood issue specific to your jurisdiction in paragraph form. In addition, please complete a table similar to the below example detailing types and location of localized/stormwater flooding problems. If available, also attach a map of problem areas.

Text Description:

Table 1 Localized Flooding Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees

Earthquake Vulnerability

1. Number of unreinforced masonry buildings. If available, please provide an inventory of URM buildings specific to your jurisdiction. Include any tables and/or maps. Is this a layer available in GIS?

Special Populations

1. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.

Development Trends

1. Describe development trends and expected growth areas and how they relate to hazard areas and vulnerability concerns/issues. Please provide zoning maps and maps and tables detailing areas targeted for future development within your jurisdiction.

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. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

The following planning and land management tools are typically used by local jurisdictions to implement hazard mitigation activities. Please indicate which of the following your jurisdiction has in place. If your jurisdiction does not have this capability or authority, please indicate in the comments column if a higher level of government has the authority.

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
General Plan		
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan		
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program		
Engineering Studies for Streams		
Community Wildfire Protection Plan		
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code		
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire department ISO rating:		
Site plan review requirements		
Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		

Natural hazard specific ordinance (stormwater, steep slope, wildfire)
Flood insurance rate maps
Elevation Certificates
Acquisition of land for open space and public recreation uses
Erosion or sediment control program
Other
How can these capabilities be expanded and improved to reduce risk?

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, please indicate so in the comments column.

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission		
Mitigation Planning Committee		
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)		
Mutual aid agreements		
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official		
Floodplain Administrator		
Emergency Manager		
Community Planner		
Civil Engineer		
GIS Coordinator		
Other		
Technical	Y/N	Describe capability Has capability been used to assess/mitigate risk in the past?

Warning systems/services (Reverse 911, outdoor warning signals)
Hazard data and information
Grant writing
Hazus analysis
Other
How can these capabilities be expanded and improved to reduce risk?

Fiscal

Identify whether your jurisdiction has access to or is eligible to use the following financial resources for hazard mitigation

Funding Resource	Access/ Eligibility (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		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs		
State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)		
Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		

National Flood Insurance Program (NFIP) Worksheet

Use this worksheet to collect information on your community's participation in and continued compliance with the NFIP, as well as identify areas for improvement that could be potential mitigation actions.

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	FM to complete
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?	FM to complete
How many structures are exposed to flood risk within the community?	FM to complete
Describe any areas of flood risk with limited NFIP policy coverage	
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	
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?	
Compliance History	
Is the community in good standing with the NFIP?	
Are there any outstanding compliance issues (i.e., current violations)?	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	
Is a CAV or CAC scheduled or needed?	
Regulation	
When did the community enter the NFIP?	FM to complete
Are the FIRMs digital or paper?	FM to complete
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	
Provide an explanation of the permitting process.	
Community Rating System	
Does the community participate in CRS?	
What is the community's CRS Class Ranking?	
What categories and activities provide CRS points and how can the class be improved?	
Does the plan include CRS planning requirements?	

Prepared by:	Date	Email	Phone

HISTORIC HAZARD EVENTS WORKSHEET

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop 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 5628 West Long Place Littleton, CO 80123 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

A.9.2. Risk Assessment Meeting Handouts

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Avalanche	Limited	Highly Likely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water shortage	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Significant	Occasional/ Unlikely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Levee Failure	Limited	Unlikely	Limited	Medium	Medium
Pandemic	Extensive	Likely	Critical	High	Low
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
Severe Weather: Winter Storms/Freeze	Extensive	Highly Likely	Negligible	Medium	Medium
Tree Mortality	Significant	Likely	Limited	Medium	High
Volcano	Extensive	Unlikely	Catastrophic	Low	Low
Wildfire	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					

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

Avalanche

- 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.
- There have been no disaster declarations or NCEM 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? CAN THE COUNTY PROVIDE INFORMATION ON PAST OCCURRENCES OR SPECIFIC AREAS/CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Low
- Non-Priority Hazard

Climate Change

- The 2018 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 both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- OTHERS? CAN THE COUNTY PROVIDE INFORMATION ON EVIDENCE OF PAST OCCURRENCES OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal OES, National Performance of Dam's data, and DSOD, there are 22 dams in Plumas County. Of these 22 dams; 2 were rated as extremely high, 14 rated as High Hazard, 4 as Significant Hazard, and 2 as Low Hazard.
- There is 1 (High Hazard) dam of concern to Plumas in Lassen County – Indian Ole
- The most significant dams of concern include the Extremely High and High Hazard where loss of life is possible.
- According to multiple sources, there have been no past dam failure events or issues of concern.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High
- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Plumas County Planning Area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack at 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels were the highest they've been in 22 years. But then back down again in early 2018, only to be back up again in late 2018/2019. 2019/2020 is continuing to see a fair amount of rain.
- 2 state (1977, 2014) disaster declarations and 1 federal declaration (1977) for Plumas County since 1950. There have been 2 NCDC drought events in Plumas County, all related to events in the 2014 to 2016 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.
- WHAT CAN YOU ADD ON WATER SUPPLY SOURCES AND RELIABILITY?
- HMPC – 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?
- 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 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 41, 5.0 or greater earthquakes have occurred within 90 miles of Quincy.
- 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.
- OTHERS? FELT OCCURRENCES? PAST DAMAGES?
- HAVE ANY STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES? DO COMMUNITIES HAVE A URM OR OTHER INVENTORY?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: High
- Priority Hazard

Flood Hazards

100/500 year

- 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.
- 16 state and 15 federal declarations from 1950-present were for heavy rains and flooding. 13 NCDC Flood Events.
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- NEED SUMMARY OF IMPACTS FROM THE (2) 2017 FLOOD EVENTS (THAT RESULTED IN DISASTER DECLARATIONS) AND OTHERS SINCE THE 2014 PLAN.
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- CAN THE HMPC PROVIDE DETAILS ON PROBLEM AREAS? PAST OCCURRENCES?
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- Likelihood of Future Occurrence: Highly 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, mud slides and avalanches.
- There have been no disaster declarations associated with landslides in Plumas County. The NCDC contains no records of landslides in the County.
- Landslide mapping indicate that a couple portions of the southwestern County are at moderate risk for landslides. The rest of the County is at low risk.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES? 6 EVENTS NOTED FROM 2006-2013.
- CAN THE COUNTY PROVIDE INFORMATION ON PAST LANDSLIDE EVENTS SINCE 2013?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard?

Levee Failure

- A search of the National Levee Database identified 3 leveed areas in Plumas County. None of these 3 levees are certified as providing protection from the 1% annual chance or other 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

- DOES ANYONE HAVE ADDITIONAL INFORMATION ON THESE LEVEES?
- No disaster declarations associated with levee failures; the NCDC does not identify any levee failure events.
- ANY PAST LEVEE FAILURE EVENTS/ISSUES/CONCERNS TO NOTE?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Priority Hazard

Pandemic

- The 20th Century had 3 Pandemics (WHO): 1918-1919 Influenza Pandemic (H1N1), 1957-1958 Influenza Pandemic (H2N2), and the 1968 Influenza Pandemic (H3N2). The 21st Century had 2 Pandemics (WHO): 2009 Swine Flu (H1N1) and 2020 Covid-19.
- One 2020 federal declaration for Covid-19; the NCDC does not track pandemics.
- CAN WE GET A SUMMARY OF COVID-19 IN PLUMAS COUNTY (STATISTICS/ IMPACTS/ RESPONSE)? WHAT ABOUT THE 2009 SWINE FLU?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Tree Mortality

- On October 30, 2015, California proclaimed a State of Emergency and included provisions to expedite the removal and disposal of dead and dying hazardous trees. As a result, costs related to identification, removal, and disposal of dead and dying trees caused from drought conditions may be eligible for California Disaster Assistance Act (CDAA) reimbursement.
- There have been four (multi-year) tree mortality events in the County since 1980.
- WHAT ARE THE PRIMARY ISSUES/CONCERNS/IMPACTS? DOES THE COUNTY HAVE STATS ON THE ACRES OF TREE MORTALITY? WHAT IS THE COUNTY DOING TO MITIGATE?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Severe weather

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 extreme heat events (NCDC) since 1993; No state or federal disaster declarations
- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS/MAJOR CONCERNS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard?

Heavy rains and storms (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
- The NCDC data recorded 19 hail, 47 rain, and 1 lightning event for Plumas County since 1950, for a total of 67 NCDC events.
- There have been 16 federal and 15 state declarations since 1950 for flooding, including heavy rains and storms.
- CAN THE HMPC PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS IN THE COUNTY SINCE 2014. PA SHEETS? EOC ACTIVATIONS? OTHER?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes – non reported
- The NCDC data recorded 92 high wind events; no events for tornadoes since 1955.
- Biggest issues are associated with wind fueling fires and also triggering PSPS events.
- CAN THE HMPC PROVIDE INFORMATION ON PAST HIGH WINDS AND TORNADO EVENTS AND DAMAGES? WHAT ARE THE PRIMARY CONCERNS TO THE COUNTY?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Winter Storms and Freeze

- 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 County has no state or federal disaster declarations for extreme cold and freeze. NCDC identified 3 extreme cold or freeze events as well as 431 winter weather, snow and snow storms.
- PLEASE PROVIDE DETAILS ON EXTREME COLD, FREEZE, AND WINTER STORM (SNOW) EVENTS IN THE COUNTY. WHAT ARE THE MOST SIGNIFICANT ISSUES/CONCERNS?
- 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 closest potential threat to Plumas County.
- Lassen Peak experienced a significant eruption in 1915.
- DOES THE COUNTY HAVE RECORDS OF PAST ISSUES/ DAMAGES TO PLUMAS, IF ANY?
- No federal or state disaster declaration. No NCDC events for volcanoes.
- WHAT ARE THE COUNTY'S CONCERNS FROM LASSEN PEAK/OTHERS?

- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Non-Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Plumas County Planning Area.
- Any ignition has the potential to become an out of control wildfire. Wildfire is one of the most significant hazard the County faces.
- 2 state and 3 federal disaster declarations for Wildfire since 1950: 1960 -unnamed fire; 1987 -Clarks Fire; 1999 –Bucks Fire; 2008 BTU Lightning Complex Fire.
- Other large fires to note: 2019 Walker Fire (54,612); 2018 Camp Fire (153,336); 2012 Chips Fire (76,350); 2007 Moonlight Fire (64,960); 2007 Wheeler Fire (22,332); 2000 Storrie Fire (56,076); 1951 Milk Ranch Fire (21,979); OTHERS?
- 10 NCDC wildfire events since 1993; 1 of these for smoke.
- CAN THE COUNTY IDENTIFY THE MOST SIGNIFICANT HISTORIC WILDFIRES AND PAST DAMAGES/ IMPACTS/ ISSUES?
- DOES THE COUNTY HAVE INFORMATION ON 2019 PSPS EVENTS AFFECTING PLUMAS? ANY?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Data Needs

Review of Key Items to date:

- Hazard-specific data
 - ✓ Historic Hazard Worksheets or list of past hazard occurrences and impact to County
- Risk Assessment Worksheets (Need for all)
- 2014 Mitigation Action Status Update (Need for all)
- Fill in information on past occurrences/impacts/problem areas for all hazards to address above questions for each hazard

Other Data Items:

General:

- Historic Hazard Data and Key areas affected in the County (items identified in today's meeting)
- EOC Activations
- Public Assistance (PA) Summaries
- After Action Reports -
- Critical Facilities - Updated definition and GIS layer of facilities
- Future Development Areas for County

A.9.3. Mitigation Strategy Meeting Handouts

Handouts specific to the Mitigation Strategy Meeting can be found in Appendix C.

A.9.4. Final Meeting Handouts

Handouts specific to the Final Meeting can be found in Section 2.2 of the Base Plan Update. That section provides a summary by hazard of significant changes in current conditions, Planning Area vulnerability, and any resulting modifications to the community's mitigation program priorities since the 2014 LHMP:

A.9.5. Early Public Meeting Handouts

Plumas County LHMP Update: 2020 Hazards

- 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
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather:
- High Winds and Tornadoes
- Severe Weather:
- Winter Storms and Freeze
- Volcano
- Wildfire

Plumas County 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, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop 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 5628 West Long Place Littleton, CO 80123 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

A.9.6. Final Public Meeting Handouts

PLUMAS COUNTY 2020 LHMP UPDATE FINAL PUBLIC MEETING October 20, 2020

Hazards List

- Avalanche
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: (100/500 year)
- Flood: Localized/Stormwater
- Landslide Mudslide, and Debris Flow
- Levee Failure
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning)
- Severe Weather: High Winds and Tornadoes
- Severe Weather: Winter Storms and Freeze
- Tree Mortality
- Volcano
- Wildfire

Mitigation Strategy: 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

Note: The Mitigation Action Table (Table 5-4) from Chapter 5 was given to the public as well.



Appendix B References

2014 Plumas County LHMP

2017 Climate Change and Health Profile Report – Plumas County

2017 US Census Bureau American Community Survey

2018 State of California Hazard Mitigation Plan

2019 City of Portola Local Hazard Mitigation Plan (Draft)

2019-2024 Plumas County Housing Element

2019-2024 Plumas County Housing Element Background Report

ArkStorm at Tahoe - Stakeholder Perspectives on Vulnerabilities and Preparedness for an Extreme Storm Event in the Greater Lake Tahoe, Reno and Carson City Region. 2014.

Bureau of Land Management

CA DWR Best Available Maps

CAL FIRE GIS datasets

Cal OES

Cal-Adapt

Cal-Adapt – Annual Average of Acres Burned

Cal-Adapt – Extended Drought Scenarios

Cal-Adapt – Number of Extreme Heat Days by Year

Cal-Adapt – Precipitation: Decadal Averages Map

CalAtlas

California Adaptation Planning Guide

California Climate Adaptation Strategy (CAS) – 2014

California Department of Finance

California Department of Fish and Wildlife

California Department of Parks and Recreation Office of Historic Preservation

California Department of Water Resources

California Department of Water Resources (CA DWR) Division of Safety of Dams

California Department of Water Resources Best Available Maps

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California Department of Water Resources Proposition 84 Integrated Regional Water Management

California Division of Mines and Geology

California Employment Development Department

California Geological Survey

California Natural Diversity Database

California Office of Emergency Services – Dam Inundation Data

California Office of Emergency Services (Cal OES)

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National Drought Mitigation Center

National Drought Mitigation Center – Drought Impact Reporter

National Institute of Building Science Multi-Hazard Mitigation Council 2017 Interim Report

National Integrated Drought Information System

National Levee Database

National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) Storm Events Database

National Park Service

National Weather Service

Natural Resource and Conservation Service

NOAA Storm Prediction Center

Pacific Gas and Electric Company

Personal interviews with planning team members and staff from the County

Plumas County 2014 Local Hazard Mitigation Plan

Plumas County 2019 Community Wildfire Protection Plan

Plumas County 2019-2024 Housing Element

Plumas County 2035 General Plan Conservation Element

Plumas County 2035 General Plan Conservation Open Space Element

Plumas County 2035 General Plan Land Use Element

Plumas County 2035 General Plan Public Health & Safety Element

Plumas County 2035 General Plan Water Resources Element

Plumas County Agriculture Commissioner

Plumas County Assessor's Office

Plumas County Building Department

Plumas County Digital Flood Insurance Rate Map March 2, 2005

Plumas County Economic Development Department

Plumas County Flood Insurance Study March 2, 2005

Plumas County GIS

Plumas County GIS Department

Plumas County Novel Coronavirus website

Plumas County Planning Department

Plumas County Road Department

Plumas County's February 2020 Assessor Data

Plumas Eureka Community Services District

Proceedings of the National Academy of Sciences

Public Health Alliance of Southern California

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Science Magazine

Sierra Avalanche Center

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Appendix C Mitigation Strategy

Plumas County Local Hazard Mitigation Plan Update HMPC Meetings #4 & 5 - Mitigation Strategy May 19 & 20, 2020

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AGENDA

Plumas County Local Hazard Mitigation Plan (LHMP) Update HMPC Meetings #3 & #4 - Mitigation Strategy May 19 & 20, 2020

HMPC Meeting #3:

- Introductions
- Status of the DMA Planning Process
- Risk Assessment Status
- Develop Plan Goals and Objectives
- Introduction to Day 2: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

- Introductions
- Review Mitigation Selection Criteria
- Identify and discuss Mitigation Alternatives/Actions/Projects
- Prioritize Mitigation Projects
- Review of Schedule/Data Needs

**Mitigation Strategy Meetings
May 19 & 20, 2020
Day 1**

Plumas County Hazard Identification & Profiles

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Avalanche	Limited	Highly Likely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	–
Dam Failure	Extensive	Unlikely	Critical	High	Medium
Drought & Water shortage	Extensive	Likely	Limited	Medium	High
Earthquake	Extensive	Occasional	Critical	Medium	Low
Floods: 1%/0.2% annual chance	Significant	Occasional/ Unlikely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Highly Likely	Negligible	Medium	Medium
Landslide, Mudslide, and Debris Flow	Significant	Likely	Negligible	Medium	Medium
Levee Failure	Limited	Unlikely	Limited	Medium	Medium
Pandemic	Extensive	Likely	Critical	Medium	Low
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/Tornadoes	Extensive	Highly Likely/ Unlikely	Limited	Medium	Low
Severe Weather: Winter Storms/Freeze	Extensive	Highly Likely	Negligible	Medium	Medium
Tree Mortality	Significant	Likely	Limited	Medium	High
Volcano	Extensive	Unlikely	Catastrophic	Low	Low
Wildfire	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					

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 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

Avalanche

- 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.
- There have been no disaster declarations or NCEM 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.
- North and East faces of Grizzly ridge in Genesee: Easter Storm of 1952, blocked Genesee Road.
- OTHERS? CAN THE COUNTY PROVIDE INFORMATION ON PAST OCCURRENCES OR SPECIFIC AREAS/CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: Low
- Non-Priority Hazard

Climate Change

- The 2018 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 both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- OTHERS? CAN THE COUNTY PROVIDE INFORMATION ON EVIDENCE OF PAST OCCURRENCES OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal OES, National Performance of Dam's data, and DSOD, there are 22 dams in Plumas County. Of these 22 dams; 2 were rated as extremely high (Bucks Storage/Lake Almanor), 14 rated as High Hazard, 4 as Significant Hazard, and 2 as Low Hazard.
- There is 1 (High Hazard) dam of concern to Plumas outside of Lassen County – Indian Ole
- The most significant dams of concern include the Extremely High and High Hazard where loss of life is possible.
- Only past occurrence: in 2017 storms, the Bidwell Dam loss some bedrock on the spillway - \$10K to repair.
- OTHERS?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High

- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Plumas County Planning Area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack at 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels were the highest they've been in 22 years. But then back down again in early 2018, only to be back up again in late 2018/2019. 2019/2020 is continuing to see a fair amount of rain.
- 2 state (1977, 2014) disaster declarations and 1 federal declaration (1977) for Plumas County since 1950. There have been 2 NCDC drought events in Plumas County, both related to events in the 2014 to 2016 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.
- Surface water is more predominant through CSDs in more developed areas; groundwater (wells) more predominant in rural areas.
- During times of drought certain areas have had wells go dry. Also wells are extremely vulnerable to long term loss of electricity; this can be a big issue for ranchers and water for livestock.
- HMPC – 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?
- 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 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 41, 5.0 or greater earthquakes have occurred within 90 miles of Quincy.
- 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.
- In late 2019, an earthquake storm occurred in Indian Creek/Genesee/Taylorsville areas. Ranged from 2.5 to 3.0
- Hona Lake area and Sierra Valley – areas of concern? OTHERS?
- OTHERS? FELT OCCURRENCES? PAST DAMAGES?

- HAVE ANY STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Likely – minor earthquake
- Vulnerability: High
- Priority Hazard

Flood Hazards

100/500 year

- 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.
- 16 state and 15 federal declarations from 1950-present were for heavy rains and flooding. 13 NCDC Flood Events.
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- NEED SUMMARY OF COUNTY PA DAMAGES FROM THE (2) 2017 FLOOD EVENTS (THAT RESULTED IN DISASTER DECLARATIONS) AND OTHER EVENTS SINCE THE 2014 PLAN, WHAT ABOUT 2019?.
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- CAN THE HMPC PROVIDE DETAILS ON SIGNIFICANT PAST OCCURRENCES?
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- Likelihood of Future Occurrence: Highly 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, mud slides and avalanches.
- There have been no disaster declarations associated with landslides in Plumas County. The NCDC contains no records of landslides in the County.
- Landslide mapping indicate that a couple portions of the southwestern County are at moderate risk for landslides. The rest of the County is at low risk.
- 6 events noted from 2006-2013. 2017 storms and floods caused landsliding on Hwy 89 in the Greenville/Indian Valley area. There are several problem areas here that have blocked access to Indian Valley.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES?

- CAN THE COUNTY PROVIDE INFORMATION ON OTHER PAST LANDSLIDE EVENTS SINCE 2013 AND CURRENT PROBLEM AREAS?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Levee Failure

- A search of the National Levee Database identified 3 leveed areas in Plumas County. None of these 3 levees are certified as providing protection from the 1% annual chance or other flood. These levees include: 1) Plumas County Levee 1 (near Taylorsville), owned by 4-5 landowners that also own the levee?; 2) Plumas County Levee 2 (near Greenville); and 3) North Fork Feather River at Chester (near Chester) – East and West levees (aka Diversion Dam), maintained by County Public Works.
- DOES ANYONE HAVE ADDITIONAL INFORMATION ON THESE LEVEES?
- No disaster declarations associated with levee failures; the NCDC does not identify any levee failure events.
- Vegetation Management is a constant issue on levees.
- Levee #1 failed in both 1986 and 1997; fixed under the NRCS repair program.
- Levee #? Is made out of riverbed materials. Overtime, more material piles up and causes overtopping
- Levees #1 and the Diversion Dam all have people and property at risk (NLD). Levee #2 does not.
- OTHER ISSUES?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Priority Hazard

Pandemic

- The 20th Century had 3 Pandemics (WHO): 1918-1919 Influenza Pandemic (H1N1), 1957-1958 Influenza Pandemic (H2N2), and the 1968 Influenza Pandemic (H3N2). The 21st Century had 2 Pandemics (WHO): 2009 Swine Flu (H1N1) and 2020 Covid-19.
- One 2020 federal declaration for Covid-19; the NCDC does not track pandemics.
- WE WILL GET A SUMMARY OF CURRENT COUNTY COVID STATS AS WE GET FURTHER ALONG.
- WAS THE COUNTY AFFECTED BY THE 2009 SWINE FLU?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Tree Mortality

- On October 30, 2015, California proclaimed a State of Emergency and included provisions to expedite the removal and disposal of dead and dying hazardous trees. As a result, costs related to identification, removal, and disposal of dead and dying trees caused from drought conditions may be eligible for California Disaster Assistance Act (CDAA) reimbursement.
- There have been four (multi-year) tree mortality events in the County since 1980.
- Lots of dead trees falling over on private property.

- BESIDES THE INCREASED WILDFIRE RISK DUE TO TREE MORTALITY, ANY PAST EVENTS RESULTING IN DAMAGE TO COUNTY FACILITIES, OTHERS?
- WHAT ARE THE PRIMARY ISSUES/CONCERNS/IMPACTS? DOES THE COUNTY HAVE STATS ON THE ACRES OF TREE MORTALITY? WHAT IS BEING DONE TO MITIGATE?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Severe weather

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 extreme heat events (NCDC) since 1993; No state or federal disaster declarations
- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS/MAJOR CONCERNS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy rains and storms (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
- The NCDC data recorded 19 hail, 47 rain, and 1 lightning event for Plumas County since 1950, for a total of 67 NCDC events.
- There have been 16 federal and 15 state declarations since 1950 for flooding, including heavy rains and storms.
- CAN THE HMPC PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS IN THE COUNTY SINCE 2014. 2017, 2019, PA SHEETS? OTHER?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes – non reported
- The NCDC data recorded 92 high wind events; no events for tornadoes since 1955.
- Biggest issues are associated with wind fueling fires and also triggering PSPS events.
- Significant microburst event in July 2003. Also Lake Almanor area has been affected in the past.
- CAN THE HMPC PROVIDE INFORMATION ON OTHER PAST HIGH WINDS AND TORNADO EVENTS AND DAMAGES?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Winter Storms and Freeze

- 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 County has no state or federal disaster declarations for extreme cold and freeze. NCDC identified 3 extreme cold or freeze events as well as 431 winter weather, snow and snow storms.
- PLEASE PROVIDE DETAILS/DAMAGES ON EXTREME COLD, FREEZE, AND WINTER STORM (SNOW) EVENTS IN THE COUNTY. WHAT ARE THE MOST SIGNIFICANT ISSUES/CONCERNS?
- 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 COUNTY'S CONCERNS FROM LASSEN PEAK/OTHERS?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Non-Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Plumas County Planning Area.
- Any ignition has the potential to become an out of control wildfire. Wildfire is one of the most significant hazards the County faces.
- 2 state and 3 federal disaster declarations for Wildfire since 1950: 1960 -unnamed fire; 1987 -Clarks Fire (19,391); 1999 –Bucks Fire (27,888); 2008 BTU Lightning Complex Fire (16,476).
- Other large fires to note: 2019 Walker Fire (54,612); 2018 Camp Fire (306); 2012 Chips Fire (76,346); 2007 Moonlight Fire (64,512); 2007 Wheeler Fire (22,330); 2000 Storrie Fire (55,729); 1951 Milk Ranch Fire (14,505); OTHERS?
- 10 NCDC wildfire events since 1993; 1 of these for smoke.
- In 2019, Plumas experienced 5 PSPS events from September – November 2019. 2 of these affected less than 5 customers.
- CAN THE COUNTY IDENTIFY PAST DAMAGES/ IMPACTS/ ISSUES FROM THE WALKER AND CAMP FIRES, BOTH EOC ACTIVATIONS SINCE THE LAST PLAN.
- ANY NOTABLE COUNTY DATA FROM CLARKS, BUCKS, AND BTU LIGHTNING COMPLEX FIRES?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Plumas County Priority Hazards

- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Flood: 1%/0.2% annual chance
- Flood: Localized/Stormwater
- Landslide, Mudslide & Debris Flows
- Levee Failure
- Pandemic
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds and Tornadoes
- Severe Weather: Winter Storms and Freeze
- Tree Mortality
- Wildfire

Non-Priority Hazards:

- Avalanche
- 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:

- Mitigation Goals
- Mitigation Actions
- Action (Implementation) Plan

Mitigation Goals

Up to now, the HMPC has been involved in collecting and providing data for the Plumas County Local Hazard Mitigation Plan Update. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of the Plumas County Planning Area to identified hazards and includes an assessment of the area's current capabilities for countering these threats through existing policies, regulations, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals will lead us to incorporating these improvements into the Mitigation Strategy portion of the LHMP. Our planning goals should provide direction for what loss reduction activities can be undertaken to make the planning area more disaster resistant.

Mitigation Goals are general guidelines that represent the community'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.

Goals statements will 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.

Finally, before we formulate our goals, we should discuss other planning area goals from other regional/county/city programs and priorities. This keeps us from "reinventing the wheel," as well as being consistent with Multi-Objective Management --- or "MOM" --- where communities strive for efficiency by combining projects/needs that are similar in nature or location. Utilizing "MOM" effectively can result in

identifying multiple sources of funding that can be “packaged” and broadening the supporting constituency base by including “outcomes” desired by various stakeholder groups.

Types/Sources of other area mitigation plans and programs include:

- General Plans
- Stormwater Program and Plans
- Flood/Watershed Management Plans and Studies
- Drought Plans, Integrated Regional Water Management Plan
- Community Wildfire Protection Plans
- Strategic Fire Plans
- Dam Emergency Action Plans
- Emergency Operations Plans
- Climate Adaptation Plans
- Other?

Sample Goals from other Plans

Goals from the 2018 California State Hazard Mitigation Plan

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.

Goals from the City of Portola 2019 LHMP

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

Goals from the Plumas County General Plan Public Health and Safety Element, 2013

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.

Goal PHS 6.1	To protect local communities from injury and damage resulting from natural catastrophes and man-made hazardous conditions.
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.
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.

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 6.3.2	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 6.7	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).

Goal PHS 6.7	To provide effective emergency response to natural or human-made hazards and disasters.
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.

Plumas County Fire Safe Council Community Wildfire Protection Plan (CWPP), 2019

Purpose: 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.

2016 Upper Feather River IRWM Plan

- Protect and improve water quality and water supply reliability.
- Protect and improve the health of the environment.
- Protect and improve the economy of the Region and provide water and wastewater treatment services to all citizens.
- Establish and maintain effective communication among water and resource stakeholders in the Region.
- Protect and enhance the economic viability of the working landscapes of the Region.

Plumas County 2013 LHMP Update (This is what we are updating)

ALL HAZARD GOAL: Maximize the use of mitigation actions to prevent losses from natural hazards identified in the 2014 HMP.

- ALL HAZARD OBJECTIVE 1: Increase the County's capability to provide mitigation opportunities and assistance to Plumas County communities.
- ALL HAZARD OBJECTIVE 2: Continuously improve hazard assessments.
- ALL HAZARD OBJECTIVE 3: Protect Natural and Cultural Resources through hazard mitigation.
- ALL HAZARD OBJECTIVE 3: Support mitigation planning in all County Operations.

GOAL 1: Minimize the losses of life and property due to Wildfire in Plumas County

- OBJECTIVE 1.1: Enhance community awareness of effective mitigation measures and wildfire impacts through education.
- OBJECTIVE 1.2: Enhance the county's capability to notify and prepare the community during wildfire season.
- OBJECTIVE 1.3: Continue reducing fuel hazards conditions within the wildland-urban interface
- OBJECTIVE 1.4: Continue implementation actions of the community wildfire protection plan (CWPP), and continue to seek establishment of fire wise communities.
- OBJECTIVE 1.5: Enhance the county wildfire hazard code enforcement capabilities within wildland-urban interface.
- OBJECTIVE 1.6: Continue land use planning efforts to ensure increased fire safety in new developments.

GOAL 2: Minimize the losses of life and property due to Severe Weather in Plumas County

- OBJECTIVE 2.1: Increase community capabilities to mitigate the impact of winter weather hazards.
- OBJECTIVE 2.2: Increase community capabilities to mitigate summer weather hazards.
- OBJECTIVE 2.3: Implement actions to enhance reliability of power supply during and after

GOAL 3: Minimize the losses of life and property due to Flooding in Plumas County

- OBJECTIVE 3.1: Mitigate flooding of structures and infrastructure.
- OBJECTIVE 3.2: Increase public awareness of flood mitigation.
- OBJECTIVE 3.3: Improve the effectiveness of flood insurance programs.

GOAL 4: Minimize the losses of life and property due to Geologic Hazards in Plumas County

- OBJECTIVE 4.1: Provide for earthquake resistance in new construction.
- OBJECTIVE 4.2: Mitigate potential damage to life and property from landslides and rock falls.
- OBJECTIVE 4.3: Educate the public in earthquake mitigation and readiness.

GOAL 5: Minimize the effects of Drought and Climate Change in Plumas County

- OBJECTIVE 5.1: Educate the citizens of Plumas County on methods to reduce the effects of Drought and Climate Change
- OBJECTIVE 5.2: Protect water resources within Plumas County watersheds from drought conditions.

GOAL 6: Minimize the losses of life and property due to Dam Failure in Plumas County

- OBJECTIVE 6.1: Reduce the Risk of Dam Failure
- OBJECTIVE 6.2: Increase capability for continuity of government.
- OBJECTIVE 6.3: Enhance warning capabilities.

Miscellaneous 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 County Capabilities to all Hazards
- Any Hazard-specific goals (wildfire, flood?)

Goals Development

The purpose of goal's development is to reach a consensus on Plan goals. Everyone should provide 2 goals that they would like to see for the 2020 Plumas County LHMP Update. Provided above are example goals for this LHMP. You may reword these or develop your own.

Each person should provide either via chat (on this zoom call) or email, 2 goals they would like to see included for this Plan Update.

When collated, we will combine and rework them into 3-5 goals for this LHMP Update and send them out to the HMPC for further review and refinement.

**Mitigation Strategy Meetings
May 19 & 20, 2020
Day 2**

Mitigation Strategy: Actions

Mitigation Actions are specific projects and activities that help achieve the goals and accomplish risk reduction in the community.

Categories of Mitigation Measures

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
 - ✓ 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 naturally 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:

- Avoidance: setting construction projects back from the stream.
- Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
- 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 Measures from 2014 Plumas County LHMP (This is what we are Updating)

- Assist Citizens and Business to participate in hazard mitigation activities
- Construct alternate community escape routes for high-risk communities
- Evaluate Indian Valley for flooding issues in a localized setting
- Implement bank stabilization projects based upon criteria developed during HMP Risk Assessment for Landslide
- Continue and enhance drought-monitoring programs through the County Agricultural Commissioner's Office

Mitigation Strategy: Action 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 mitigation actions and projects will be further collated by hazard and will be presented back to the HMPC for prioritization. This will be done the week of May 25th via an email link.

Each person will have 9 votes total to vote for their preferred mitigation actions/projects:

- 3 high priority votes (5 points each)
- 3 medium priority votes (3 points each)
- 3 low priority votes (1 point each)

You may use as many of your votes on any one action or project --- or you may spread them out over many projects. The votes will indicate the consensus of the team.

Use your list of mitigation selection criteria to help you make your determinations.

After the votes are tabulated, we will send out an email detailing mitigation action prioritization results.

Mitigation Action Worksheet

Jurisdiction:	
Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background:	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Cost Estimate:	
Benefits (Losses Avoided):	
Potential Funding:	
Timeline:	
Project Priority:	

Worksheet completed by:	
Name and Title:	
Phone:	

Plumas County 2020 LHMP Update

Mitigation Strategy Meetings – Action Prioritization

35 Voting Members

Actions sorted by Vote Totals

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Public awareness, education, outreach, and preparedness program enhancements for all hazards – whole community, consistent messaging, utilizing a variety of mechanisms (multi-media, educate and clarify various emergency systems, messaging and training; promote self-reliance)	Public Outreach/ Multi-hazard	77
Harden and increase cell service coverage: Identify key locations and add additional cell/repeater towers, generator backup, etc. and incorporate use of FirstNet	Emergency Services/ Multi-hazard	59
Evacuation planning and exercising, to include considerations for shelters, refuge areas, safety zones, evacuation signage, etc.	Emergency Services/ Multi-hazard	54
Continue fuel reduction projects	Wildfire	43
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	Emergency Services/ Multi-hazard	41
Continue wildfire fuel break projects at the County level	Wildfire	39
Continue fuels reduction/vegetation management along roadways by USFS, CalTrans, County, and others	Wildfire	38
Improve funding and response capabilities of local Fire Protection Districts; expand Districts in areas not covered	Wildfire	37
Evaluate coverage and expansion for broadband services	Emergency Services/ Multi-hazard	35
Ingress/egress road projects to widen and improve roads for evacuation and emergency services access	Emergency Services/ Multi-hazard	30
Implement prescribed burns and forests thinning to promote forest health	Drought/ Tree Mortality/ Wildfire	28
Continue fuel reduction efforts along ingress and egress areas	Wildfire	27
Incorporate LHMP Update by reference through council adoption into the public health and safety element of the General Plan	Multi-hazard	26
Develop and maintain a position for County Fire Marshall	Wildfire	25
Develop a Countywide Drainage Master Plan	Flood	24
Identify and implement projects to enhance forest health	Climate Change/ Drought/ Tree Mortality/ Wildfire	22
Water supply infrastructure improvements	Drought & Water Shortage	19

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Conduct a seismic risk evaluation of critical facilities and public buildings; prioritize and implement seismic retrofits.	Earthquake	19
Continue defensible space assistance efforts for seniors, disabled and low-income citizens – PRC 4291	Wildfire	18
Home hardening and retrofitting: roofs, eave vents, fire resistant siding, tempered glass windows, etc. (AB 38)	Wildfire	18
Identify critical facilities and infrastructure requiring backup generators (Fairgrounds, Beckwourth CSA sewer plant, PECSD sewer plant, homeless day shelters, others?)	Emergency Services/ Multi-hazard	17
Identify and implement priority wildfire risk reduction projects from the Plumas County CWPP	Drought/ Tree Mortality/ Wildfire	16
Update and refine Pandemic Plan	Pandemic	16
Continue and promote defensible space projects (SB 190)	Wildfire	14
Continue bridge replacement program using federal funding source for evacuation and emergency services access	Emergency Services/ Multi-hazard	14
Identify at risk communities to establish a second point of access	Emergency Services/ Multi-hazard	14
Continue Reverse 911 capability enhancements countywide	Emergency Services/ Multi-hazard	13
Evaluate options for undergrounding utilities and infrastructure for both new development and for existing developments in Very High Fire Hazard Severity Zones (AB 38)	Wildfire	12
Continued work with UC Davis to look at crop varieties to reduce dependence on water	Drought	11
Evaluate and augment community water sources and infrastructure for fire suppression	Drought/ Tree Mortality/ Wildfire	11
Promote additional Firewise USA sites	Wildfire	10
Continue ongoing maintenance of levees	Flood/Levee Failure	10
Identification and implementation of projects to enhance soil health	Climate Change/ Drought/ Tree Mortality/ Wildfire	9
Detection, prevention, and mitigation of tree mortality throughout the County	Drought/ Wildfire	9
Create a working group to evaluate and track available funding sources for wildfire projects	Wildfire	8
Evaluate options for obtaining 100-year level of certification for the Diversion Dam (East and West Chester Levees)	Flood/Levee Failure	7
Flood Ordinance Review and Update	Flood	7
PRC 4290 – Promote compliant street/address reflective signage for public and private roads and structures	Emergency Services/ Multi-hazard	7
Development/refinement of telecommunication/ broadband ordinance	Emergency Services/ Multi-hazard	7

Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
Evaluate options to repair and maintain levee crown for emergency access vehicles (gates, crown repair, etc.)	Flood/Levee Failure	6
Identification of and outreach to critical facilities in dam inundation areas	Dam Failure	6
Continue education and training of land managers	Drought/ Tree Mortality/ Wildfire	5
Develop a Drainage Master Plan for Chester	Flood	5
Evaluate and implement projects to reduce flooding in Plumas Eureka CSD	Flood	5
Conduct a drainage study for Spanish Creek	Flood	5
FEMA Mapping Update	Flood	5
Stream channel vegetation management/cleanout projects	Flood	5
Develop a Drainage Master Plan for Quincy/East Quincy	Flood	3
Evaluate options for reducing flood risk in Indian Valley, with a focus on repetitive loss structures	Flood	3
Ongoing implementation of stream clearing and maintenance programs	Flood	3
Plumas Eureka CSD stream bank flood mitigation	Flood	3
Develop a Climate Action Plan	Climate Change	3
Update General Plan Health & Safety Element to include climate change	Climate Change	3
Develop rebate program to incentivize the installation of snow protectors on propane regulators	Severe Weather: Freeze and Winter Storm	2
Identify and implement projects to address areas of landslides affecting roadways and railroad	Landslide/ Mudslide/ Debris Flow	2
Conduct a URM inventory of public buildings	Earthquake	2
Plumas Eureka CSD Sewer Plant Flood Mitigation	Flood	2
Develop Countywide drought mitigation strategies	Drought & Water Shortage	1
Identify and implement bank stabilization projects (see IRWMP)	Flood	1
Continue vegetation maintenance on levees	Flood/Levee Failure	1
Continue to provide homeless day shelters; evaluate for cooling capabilities and expansion for cooling centers	Severe Weather: Extreme Heat	1
Implement program to increase sprinkler efficiency	Drought	1
Evaluate and implement Wolf Creek channel stabilization projects through Greenville and Indian Valley areas	Flood	0
Review and Update of Wildfire Code to include vegetation management, ignition resistant construction, etc.	Wildfire	0
Evaluate use of reclaimed water for golf courses and other uses	Drought	0



Appendix D Adoption Resolution

RESOLUTION NO. 2021- 4596

A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF PLUMAS

ADOPTING THE PLUMAS COUNTY LOCAL HAZARD MITIGATION PLAN 2020 UPDATE

WHEREAS, Plumas County recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

WHEREAS, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple Federal Emergency Management Agency ("FEMA") pre- and post-disaster mitigation grant programs; and

WHEREAS, Plumas County fully participated in the FEMA-prescribed mitigation planning process to prepare the Plumas County Local Hazard Mitigation Plan; and

WHEREAS, the California Office of Emergency Services ("Cal OES") and FEMA Region IX officials have reviewed the Plumas County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body; and

WHEREAS, Plumas County desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Plumas County Local Hazard Mitigation Plan; and

WHEREAS, adoption by the governing body for Plumas County demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the Plumas County Local Hazard Mitigation Plan 2020 Update; and

WHEREAS, adoption of this plan by the governing body legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

PLUMAS COUNTY BOARD OF SUPERVISORS RESOLUTION
ADOPTING PLUMAS COUNTY LOCAL HAZARD MITIGATION PLAN 2020 UPDATE

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors of Plumas County adopts the Plumas County Local Hazard Mitigation Plan 2020 Update as an official plan; and

BE IT RESOLVED, that the Plumas County Board of Supervisors adopts the Plumas County Local Hazard Mitigation Plan 2020 Update by reference into the General Plan Public Health & Safety Element in accordance with the requirements of Assembly Bill 2140 ("AB 2140"), and

BE IT FURTHER RESOLVED, Plumas County will submit this adoption resolution to the CAL OES and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act and to establish conformance with the requirements of AB 2140.

ADOPTED JUNE 15, 2021, by the Board of Supervisors of the County of Plumas
by the following vote:

AYES: Supervisors Thraill, Cereceda, Goss, Huganir, and Knud

NOES: None

ABSENT: None

ABSTAIN: None


Jeff Engel
Chair, Board of Supervisors

ATTEST:

Heidi Putnam
Clerk of said Board of Supervisors


Heather Baker
Plumas County Clerk



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					
<i>Ambystoma macrodactylum sigillatum</i>	southern long-toed salamander	None	None	SSC	–
<i>Rana boylei</i>	foothill yellow-legged frog	None	Candidate Threatened	SSC	–
<i>Rana cascadae</i>	Cascades frog	None	Candidate Endangered	SSC	–
<i>Rana draytonii</i>	California red-legged frog	Threatened	None	SSC	–
<i>Rana muscosa</i>	southern mountain yellow-legged frog	Endangered	Endangered	WL	–
<i>Rana sierrae</i>	Sierra Nevada yellow-legged frog	Endangered	Threatened	WL	–
Animals – Birds					
<i>Accipiter gentilis</i>	northern goshawk	None	None	SSC	–
<i>Accipiter striatus</i>	sharp-shinned hawk	None	None	WL	–
<i>Aquila chrysaetos</i>	golden eagle	None	None	FP ; WL	–
<i>Buteo swainsoni</i>	Swainson's hawk	None	Threatened	–	–
<i>Haliaeetus leucocephalus</i>	bald eagle	Delisted	Endangered	FP	–
<i>Ardea alba</i>	great egret	None	None	–	–
<i>Ardea herodias</i>	great blue heron	None	None	–	–
<i>Charadrius montanus</i>	mountain plover	None	None	SSC	–
<i>Falco mexicanus</i>	prairie falcon	None	None	WL	–
<i>Antigone canadensis tabida</i>	greater sandhill crane	None	Threatened	FP	–
<i>Riparia riparia</i>	bank swallow	None	Threatened	–	–
<i>Lanius ludovicianus</i>	loggerhead shrike	None	None	SSC	–
<i>Larus californicus</i>	California gull	None	None	WL	–
<i>Pandion haliaetus</i>	osprey	None	None	WL	–
<i>Setophaga petechia</i>	yellow warbler	None	None	SSC	–
<i>Spizella breweri</i>	Brewer's sparrow	None	None	–	–
<i>Phalacrocorax auritus</i>	double-crested cormorant	None	None	WL	–
<i>Melanerpes lewis</i>	Lewis' woodpecker	None	None	–	–
<i>Picoides arcticus</i>	black-backed woodpecker	None	None	–	–
<i>Sphyrapicus ruber</i>	red-breasted sapsucker	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Coturnicops noveboracensis</i>	yellow rail	None	None	SSC	–
<i>Numenius americanus</i>	long-billed curlew	None	None	WL	–
<i>Psiloscoptes flammeolus</i>	flamulated owl	None	None	–	–
<i>Strix nebulosa</i>	great gray owl	None	Endangered	–	–
<i>Strix occidentalis occidentalis</i>	California Spotted Owl	None	None	SSC	–
<i>Plegadis chihi</i>	white-faced ibis	None	None	WL	–
<i>Selasphorus rufus</i>	rufous hummingbird	None	None	–	–
<i>Contopus cooperi</i>	olive-sided flycatcher	None	None	SSC	–
<i>Empidonax traillii</i>	willow flycatcher	None	Endangered	–	–
<i>Empidonax traillii brewsteri</i>	little willow flycatcher	None	Endangered	–	–
Animals – Fish					
<i>Cottus gulosus</i>	rifle sculpin	None	None	SSC	–
<i>Mylopharodon conocephalus</i>	hardhead	None	None	SSC	–
<i>Oncorhynchus mykiss irideus</i> pop. 11	steelhead - Central Valley DPS	Threatened	None	–	–
Animals – Insects					
<i>Bombus caliginosus</i>	obscure bumble bee	None	None	–	–
<i>Bombus morrisoni</i>	Morrison bumble bee	None	None	–	–
<i>Bombus occidentalis</i>	western bumble bee	None	Candidate Endangered	–	–
<i>Hydroporus leechi</i>	Leech's skyline diving beetle	None	None	–	–
<i>Atractelmis wawona</i>	Wawona riffle beetle	None	None	–	–
<i>Goeracea oregona</i>	Sagehen Creek goeracean caddisfly	None	None	–	–
<i>Desmona bethula</i>	amphibious caddisfly	None	None	–	–
<i>Rhyacophila spinata</i>	spiny rhyacophilan caddisfly	None	None	–	–
<i>Neothremma genella</i>	golden-horned caddisfly	None	None	–	–
Animals – Mammals					
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	None	None	SSC	–
<i>Canis lupus</i>	gray wolf	Endangered	Endangered	–	–
<i>Vulpes vulpes necator</i>	Sierra Nevada red fox	Candidate	Threatened	–	–
<i>Erethizon dorsatum</i>	North American porcupine	None	None	–	–
<i>Lepus americanus taboensis</i>	Sierra Nevada snowshoe hare	None	None	SSC	–
<i>Gulo gulo</i>	California wolverine	Proposed Threatened	Threatened	FP	–
<i>Martes caurina sierrae</i>	Sierra marten	None	None	–	–
<i>Pekania pennanti</i>	fisher - West Coast DPS	None	Threatened	SSC	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Taxidea taxus</i>	American badger	None	None	SSC	–
<i>Ochotona princeps schisticeps</i>	gray-headed pika	None	None	–	–
<i>Antrozous pallidus</i>	pallid bat	None	None	SSC	–
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	None	None	SSC	–
<i>Euderma maculatum</i>	spotted bat	None	None	SSC	–
<i>Lasionycteris noctivagans</i>	silver-haired bat	None	None	–	–
<i>Lasiurus blossevillii</i>	western red bat	None	None	SSC	–
<i>Lasiurus cinereus</i>	hoary bat	None	None	–	–
<i>Myotis evotis</i>	long-eared myotis	None	None	–	–
<i>Myotis lucifugus</i>	little brown bat	None	None	–	–
<i>Myotis thysanodes</i>	fringed myotis	None	None	–	–
<i>Myotis volans</i>	long-legged myotis	None	None	–	–
<i>Myotis yumanensis</i>	Yuma myotis	None	None	–	–
Animals – Mollusks					
<i>Margaritifera falcata</i>	western pearlshell	None	None	–	–
<i>Juga chacei</i>	Chace juga	None	None	–	–
<i>Anodonta californiensis</i>	California floater	None	None	–	–
<i>Anodonta oregonensis</i>	Oregon floater	None	None	–	–
<i>Gonidea angulata</i>	western ridged mussel	None	None	–	–
Animals – Reptiles					
<i>Emys marmorata</i>	western pond turtle	None	None	SSC	–
Community – Terrestrial					
–	Darlingtonia Seep	None	None	–	–
–	Montane Freshwater Marsh	None	None	–	–
–	Northern Interior Cypress Forest	None	None	–	–
–	Northern Vernal Pool	None	None	–	–
–	Sphagnum Bog	None	None	–	–
Plants – Bryophytes					
<i>Bruchia bolanderi</i>	Bolander's bruchia	None	None	–	4.2
<i>Buxbaumia viridis</i>	buxbaumia moss	None	None	–	2B.2
<i>Trichodon cylindricus</i>	cylindrical trichodon	None	None	–	2B.2
<i>Meesia triquetra</i>	three-ranked hump moss	None	None	–	4.2
<i>Meesia uliginosa</i>	broad-nerved hump moss	None	None	–	2B.2
<i>Mielichhoferia elongata</i>	elongate copper moss	None	None	–	4.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Plants – Lichens					
<i>Peltigera gowardii</i>	western waterfan lichen	None	None	–	4.2
Plants – Vascular					
<i>Allium sanbornii</i> var. <i>sanbornii</i>	Sanborn's onion	None	None	–	4.2
<i>Cymopterus globosus</i>	globose cymopterus	None	None	–	2B.2
<i>Lomatium foeniculaceum</i> ssp. <i>macdougali</i>	Macdougall's lomatium	None	None	–	2B.2
<i>Lomatium roseanum</i>	adobe lomatium	None	None	–	1B.2
<i>Artemisia tripartita</i> ssp. <i>tripartita</i>	threetip sagebrush	None	None	–	2B.3
<i>Erigeron eatonii</i> var. <i>nevadincola</i>	Nevada daisy	None	None	–	2B.3
<i>Erigeron inornatus</i> var. <i>calidipetris</i>	hot rock daisy	None	None	–	4.3
<i>Erigeron lassenianus</i> var. <i>deficiens</i>	Plumas rayless daisy	None	None	–	1B.3
<i>Erigeron nivalis</i>	snow fleabane daisy	None	None	–	2B.3
<i>Erigeron petrophilus</i> var. <i>sierrensis</i>	northern Sierra daisy	None	None	–	4.3
<i>Hymenoxys lemmonii</i>	alkali hymenoxys	None	None	–	2B.2
<i>Oreostemma elatum</i>	tall alpine-aster	None	None	–	1B.2
<i>Packera eurycephala</i> var. <i>lewisrosei</i>	Lewis Rose's ragwort	None	None	–	1B.2
<i>Pyrrocoma lucida</i>	sticky pyrrocoma	None	None	–	1B.2
<i>Senecio hydrophiloides</i>	sweet marsh ragwort	None	None	–	4.2
<i>Solidago lepida</i> var. <i>salebrosa</i>	Rocky Mountains Canada goldenrod	None	None	–	3.2
<i>Azolla microphylla</i>	Mexican mosquito fern	None	None	–	4.2
<i>Betula glandulosa</i>	dwarf resin birch	None	None	–	2B.2
<i>Hackelia amethystina</i>	amethyst stickseed	None	None	–	4.3
<i>Boechera constancei</i>	Constance's rockcress	None	None	–	1B.1
<i>Boechera microphylla</i>	small-leaved rockcress	None	None	–	3
<i>Cardamine bellidifolia</i> var. <i>pachyphylla</i>	fleshy toothwort	None	None	–	4.3
<i>Stanleya viridiflora</i>	green-flowered prince's plume	None	None	–	2B.3
<i>Brasenia schreberi</i>	watershield	None	None	–	2B.3
<i>Eremogone cliftonii</i>	Clifton's eremogone	None	None	–	1B.3
<i>Loeflingia squarrosa</i> var. <i>artemisiarum</i>	sagebrush loeflingia	None	None	–	2B.2
<i>Pseudostellaria sierrae</i>	Sierra starwort	None	None	–	4.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Silene occidentalis ssp. longistipitata</i>	long-stiped campion	None	None	–	1B.2
<i>Silene occidentalis ssp. occidentalis</i>	western campion	None	None	–	4.3
<i>Stellaria longifolia</i>	long-leaved starwort	None	None	–	2B.2
<i>Stellaria obtusa</i>	obtuse starwort	None	None	–	4.3
<i>Chenopodium simplex</i>	large-seeded goosefoot	None	None	–	4.3
<i>Sedum albomarginatum</i>	Feather River stonecrop	None	None	–	1B.2
<i>Hesperocyparis bakeri</i>	Baker cypress	None	None	–	4.2
<i>Bulbostylis capillaris</i>	thread-leaved beakseed	None	None	–	4.2
<i>Carex buxbaumii</i>	Buxbaum's sedge	None	None	–	4.2
<i>Carex davyi</i>	Davy's sedge	None	None	–	1B.3
<i>Carex geyeri</i>	Geyer's sedge	None	None	–	4.2
<i>Carex lasiocarpa</i>	woolly-fruited sedge	None	None	–	2B.3
<i>Carex limosa</i>	mud sedge	None	None	–	2B.2
<i>Carex petasata</i>	Liddon's sedge	None	None	–	2B.3
<i>Carex scabriuscula</i>	Siskiyou sedge	None	None	–	4.3
<i>Carex scoparia var. scoparia</i>	pointed broom sedge	None	None	–	2A
<i>Carex sheldonii</i>	Sheldon's sedge	None	None	–	2B.2
<i>Eleocharis torticulmis</i>	California twisted spikerush	None	None	–	1B.3
<i>Eriophorum gracile</i>	slender cottongrass	None	None	–	4.3
<i>Rhynchospora alba</i>	white beaked-rush	None	None	–	2B.2
<i>Rhynchospora capitellata</i>	brownish beaked-rush	None	None	–	2B.2
<i>Schoenoplectus subterminalis</i>	water bulrush	None	None	–	2B.3
<i>Drosera anglica</i>	English sundew	None	None	–	2B.3
<i>Polystichum lonchitis</i>	northern holly fern	None	None	–	3
<i>Arctostaphylos menziesii ssp. truei</i>	True's manzanita	None	None	–	4.2
<i>Vaccinium coccineum</i>	Siskiyou Mountains huckleberry	None	None	–	3.3
<i>Astragalus lemmonii</i>	Lemmon's milk-vetch	None	None	–	1B.2
<i>Astragalus lentiformis</i>	lens-pod milk-vetch	None	None	–	1B.2
<i>Astragalus pulsiferae var. coronensis</i>	Modoc Plateau milk-vetch	None	None	–	4.2
<i>Astragalus pulsiferae var. pulsiferae</i>	Pulsifer's milk-vetch	None	None	–	1B.2
<i>Astragalus pulsiferae var. suksdorfii</i>	Suksdorf's milk-vetch	None	None	–	1B.2
<i>Astragalus rattanii var. rattanii</i>	Rattan's milk-vetch	None	None	–	4.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Astragalus webberi</i>	Webber's milk-vetch	None	None	—	1B.2
<i>Astragalus whitneyi</i> var. <i>lenophyllus</i>	woolly-leaved milk-vetch	None	None	—	4.3
<i>Lupinus dalesiae</i>	Quincy lupine	None	None	—	4.2
<i>Lupinus nevadensis</i>	Nevada lupine	None	None	—	4.3
<i>Trifolium andersonii</i> ssp. <i>andersonii</i>	Anderson's clover	None	None	—	4.3
<i>Trifolium lemmonii</i>	Lemmon's clover	None	None	—	4.2
<i>Juncus dudleyi</i>	Dudley's rush	None	None	—	2B.3
<i>Juncus hemiendytus</i> var. <i>abjectus</i>	Center Basin rush	None	None	—	4.3
<i>Juncus luciensis</i>	Santa Lucia dwarf rush	None	None	—	1B.2
<i>Lycopus uniflorus</i>	northern bugleweed	None	None	—	4.3
<i>Monardella follettii</i>	Follett's monardella	None	None	—	1B.2
<i>Monardella stebbinsii</i>	Stebbins' monardella	None	None	—	1B.2
<i>Scutellaria galericulata</i>	marsh skullcap	None	None	—	2B.2
<i>Stachys pilosa</i>	hairy marsh hedge-nettle	None	None	—	2B.3
<i>Utricularia intermedia</i>	flat-leaved bladderwort	None	None	—	2B.2
<i>Utricularia minor</i>	lesser bladderwort	None	None	—	4.2
<i>Utricularia ocbroleuca</i>	cream-flowered bladderwort	None	None	—	2B.2
<i>Lilium humboldtii</i> ssp. <i>humboldtii</i>	Humboldt lily	None	None	—	4.2
<i>Sidalcea celata</i>	Redding checkerbloom	None	None	—	3
<i>Sidalcea gigantea</i>	giant checkerbloom	None	None	—	4.3
<i>Claytonia palustris</i>	marsh claytonia	None	None	—	4.3
<i>Lewisia cantelovii</i>	Cantelow's lewisia	None	None	—	1B.2
<i>Lewisia kelloggii</i> ssp. <i>hutchisonii</i>	Hutchison's lewisia	None	None	—	3.2
<i>Lysimachia thyrsiflora</i>	tufted loosestrife	None	None	—	2B.3
<i>Clarkia mildrediae</i> ssp. <i>lutescens</i>	golden-anthered clarkia	None	None	—	4.2
<i>Clarkia mildrediae</i> ssp. <i>mildrediae</i>	Mildred's clarkia	None	None	—	1B.3
<i>Clarkia mosquinii</i>	Mosquin's clarkia	None	None	—	1B.1
<i>Clarkia virgata</i>	Sierra clarkia	None	None	—	4.3
<i>Epilobium luteum</i>	yellow willowherb	None	None	—	2B.3
<i>Epilobium palustre</i>	marsh willowherb	None	None	—	2B.3
<i>Botrychium ascendens</i>	upswept moonwort	None	None	—	2B.3
<i>Botrychium crenulatum</i>	scalloped moonwort	None	None	—	2B.2
<i>Botrychium minganense</i>	Mingan moonwort	None	None	—	2B.2
<i>Botrychium montanum</i>	western goblin	None	None	—	2B.1

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Botrychium pinnatum</i>	northwestern moonwort	None	None	—	2B.3
<i>Corallorhiza trifida</i>	northern coralroot	None	None	—	2B.1
<i>Cypripedium californicum</i>	California lady's-slipper	None	None	—	4.2
<i>Cypripedium fasciculatum</i>	clustered lady's-slipper	None	None	—	4.2
<i>Cypripedium montanum</i>	mountain lady's-slipper	None	None	—	4.2
<i>Piperia colemanii</i>	Coleman's rein orchid	None	None	—	4.3
<i>Piperia leptopetala</i>	narrow-petaled rein orchid	None	None	—	4.3
<i>Castilleja lasenensis</i>	Lassen paintbrush	None	None	—	1B.3
<i>Diplacus pygmaeus</i>	Egg Lake monkeyflower	None	None	—	4.2
<i>Erythranthe filicifolia</i>	fern-leaved monkeyflower	None	None	—	1B.2
<i>Erythranthe percaulis</i>	Serpentine Canyon monkeyflower	None	None	—	1B.1
<i>Penstemon cinicola</i>	ash beardtongue	None	None	—	4.3
<i>Penstemon heterodoxus</i> var. <i>shastensis</i>	Shasta beardtongue	None	None	—	4.3
<i>Penstemon janishiae</i>	Janish's beardtongue	None	None	—	2B.2
<i>Penstemon personatus</i>	closed-throated beardtongue	None	None	—	1B.2
<i>Penstemon sudans</i>	Susanville beardtongue	None	None	—	1B.2
<i>Melica spectabilis</i>	purple onion grass	None	None	—	4.3
<i>Muhlenbergia jonesii</i>	Jones' muhly	None	None	—	4.3
<i>Orcuttia tenuis</i>	slender Orcutt grass	Threatened	Endangered	—	1B.1
<i>Panicum acuminatum</i> var. <i>thermale</i>	Geysers panicum	None	Endangered	—	1B.2
<i>Poa sierrae</i>	Sierra blue grass	None	None	—	1B.3
<i>Eriastrum sparsiflorum</i>	few-flowered eriastrum	None	None	—	4.3
<i>Eriogonum baileyi</i> var. <i>praebens</i>	Bailey's woolly buckwheat	None	None	—	4.3
<i>Eriogonum microthecum</i> var. <i>schoolcraftii</i>	Schoolcraft's wild buckwheat	None	None	—	1B.2
<i>Eriogonum ochrocephalum</i> var. <i>ochrocephalum</i>	ochre-flowered buckwheat	None	None	—	2B.2
<i>Eriogonum spectabile</i>	Barron's buckwheat	None	None	—	1B.2
<i>Eriogonum umbellatum</i> var. <i>ahartii</i>	Ahart's buckwheat	None	None	—	1B.2
<i>Polygonum polygaloides</i> ssp. <i>esotericum</i>	Modoc County knotweed	None	None	—	1B.3
<i>Potamogeton epihydrus</i>	Nuttall's ribbon-leaved pondweed	None	None	—	2B.2
<i>Potamogeton praelongus</i>	white-stemmed pondweed	None	None	—	2B.3
<i>Potamogeton robbinsii</i>	Robbins' pondweed	None	None	—	2B.3

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Ceanothus fresnensis</i>	Fresno ceanothus	None	None	—	4.3
<i>Frangula purshiana</i> ssp. <i>ultramafica</i>	Caribou coffeeberry	None	None	—	1B.2
<i>Rhamnus alnifolia</i>	alder buckthorn	None	None	—	2B.2
<i>Crataegus castlegarensis</i>	Castlegar hawthorne	None	None	—	3
<i>Ivesia aperta</i> var. <i>aperta</i>	Sierra Valley ivesia	None	None	—	1B.2
<i>Ivesia baileyi</i> var. <i>baileyi</i>	Bailey's ivesia	None	None	—	2B.3
<i>Ivesia sericoleuca</i>	Plumas ivesia	None	None	—	1B.2
<i>Ivesia webberi</i>	Webber's ivesia	Threatened	None	—	1B.1
<i>Darlingtonia californica</i>	California pitcherplant	None	None	—	4.2
<i>Hemiera ranunculifolia</i>	buttercup-leaf suksdorfia	None	None	—	2B.2
<i>Scheuchzeria palustris</i>	American scheuchzeria	None	None	—	2B.1
<i>Sparganium natans</i>	small bur-reed	None	None	—	4.3
<i>Viola tomentosa</i>	felt-leaved violet	None	None	—	4.2

Sources: 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 Critical Facilities

Table F-1 Plumas County Critical Facilities

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Name/Owner Specific Type	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPUG542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	South Feather Water and Power Agency	Zone D	Low	Very High															
WNER992	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	South Feather Water and Power Agency	Zone D	Moderate	Very High															
WPYR678	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	South Feather Water and Power Agency	Zone D	Moderate	Very High															
WPYS546	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	South Feather Water and Power Agency	Zone D	Moderate	Very High															
Port Wine Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Slate Creek - Bridge Number: 09C0014	Zone D	Low	Very High															
Port Wine Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Slate Creek Overflow - Bridge Number: 09C0027	Zone D	Low	Very High															
WNUJ527	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Yuba County Rural Fire Joint Powers Agency	Zone D	Low	Very High															
WQHVG72	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Yuba County Rural Fire Joint Powers Agency	Zone D	Low	Very High															

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WRV55	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
2020 Church Street	Essential Services Facilities	Essential Government Operations	Plumas County Public Works Yard	Plumas County Public Works Yard (La Porte)	Zone D	Low	Very High																
2181 Cedar Ln.,	Essential Services Facilities	Public Safety	Fire Station	La Porte FPD	Zone D	Low	Very High																
WHE264	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WPTV271	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
1127 Whitehawk Dr.	Essential Services Facilities	Public Safety	Fire Station	Gracagle FPD	Zone X (unshaded)	Low	Very High																
1197 Whitehawk Drive	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Whitehawk Ranch CSD	Zone X (unshaded)	Low	Very High																
WPTM878	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Whitehawk Ranch Mutual Water Company	Zone X (unshaded)	Low	Very High																
WPUG542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	South Feather Water and Power Agency	Zone D	Low	Non-Wildland/Non-Urban																
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Sulphur Creek - Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Sulpher Creek	Zone X (unshaded)	Low	High																
Clio-State 40A Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Middle Fork Feather River - Bridge Number: 09C0057	Zone A	Low	Very High								X			X					
unknown	Essential Services Facilities	Public Utility Plant and Substation Facilites	Public Utility District	Clio PUD	Zone X (unshaded)	Low	Very High											X					
Gold Lake Forest Highway	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Frazier Creek - Bridge Number: 09C0141	Zone D	Low	Very High																
WNDL759	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
KNEM208	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WNDL759	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
5267 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilites	Water Treatment Plant	Johnsville WTP	Zone X (unshaded)	Low	Very High																
5267 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilites	Water Treatment Plant	Johnsville WTP	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
5267 Main Street	Hazardous Materials Facilities	Unknown	Public Utility District	Johnsville PUD	Zone X (unshaded)	Low	Very High																
5267 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Public Utility District	Johnsville PUD	Zone X (unshaded)	Low	Very High																
5267 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Public Utility District	Johnsville PUD	Zone X (unshaded)	Low	Very High																
Frazier Creek - Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Frazier Creek	Zone A	Low	Very High																
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
1508 C-Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	C-Road CSD	Zone X (unshaded)	Low	Very High																
1508 C-Road	Essential Services Facilities	Public Safety	Fire Station	C-Road CSD (Under contract with EPFPD)	Zone X (unshaded)	Low	Very High																
Johnsville Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Jamison Creek - Bridge Number: 09C0045	Zone D	Low	Very High																
WQEW417	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Gracagle Meadows Golf Course	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Gracagle Creek - Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Gracagle Creek	Zone A	Low	Very High																
1103 Dream Maker	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Gold Mountain CSD	Zone X (unshaded)	Low	Very High																
7431 Highway 89	Hazardous Materials Facilities	Unknown	Community Services District	Gracagle Water Company	Zone X (unshaded)	Low	High																
7431 Highway 89	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Gracagle CSD	Zone X (unshaded)	Low	High																
7597 Highway 89	Essential Services Facilities	Emergency Medical	Clinic	Gracagle Medical Clinic	Zone X (unshaded)	Low	High																
WSB814	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone D	Low	Very High																
WPZX778	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra County Fire Protection District	Zone D	Low	Very High																
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
7620 Hwy 89	Essential Services Facilities	Public Safety	Fire Station	Gracagle FPD	Zone X (unshaded)	Low	High																
WNND325	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Feather River Rail Society	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WSW752	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Eastern Plumas Healthcare Ambulance	Zone D	Low	Very High																
WNDL759	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WNYH480	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	Zebal Jr., Earnest H.	Zone D	Low	Very High																
WNWB981	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Joy, Rick	Zone D	Low	Very High																
WPIV479	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sprint Communications Company, LP	Zone D	Low	Very High																
WPKC980	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	WPKC980	Zone D	Low	Very High																
1091 Maricopa Trail	Essential Services Facilities	Essential Government Operations	Plumas County Public Works Yard	Plumas County Public Works Yard (Graeagle)	Zone X (unshaded)	Low	Very High											X					
KFA398	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	AT&T California	Zone D	Low	Very High																
WQIC701	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone D	Low	Very High																
WQIX399	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WQLZ475	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone D	Low	Very High																
Beckwourth Peak site 3 miles SE of Portola	Essential Services Facilities	Communication Sites and Facilities	Cellular	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
WNNY304	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	Zebal, Earnest H.	Zone D	Low	Very High																
KML699	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KNFD873	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KQR536	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KUP342	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WKL96	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WNLZ658	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WNLZ741	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WNXG378	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WPMF290	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WPPG238	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Zebal, Earnest	Zone D	Low	Very High																
WPRL746	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Zebal, Earnest	Zone D	Low	Very High																
WPZX858	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Nevada, State of	Zone D	Low	Very High																
WQAI263	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra, County of	Zone D	Low	Very High																
WHE264	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WMQ915	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WMQ916	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WPTV270	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Beckwourth Peak	Essential Services Facilities	Communication Sites and Facilities	Unknown	Comsites West LLC	Zone D	Low	Very High																
KCI66 - Beckwourth Peak	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone D	Low	Very High																
KQI86	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone D	Low	Very High																
WAV50	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone D	Low	Very High																
WLH79	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone D	Low	Very High																
WMS923	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
WMS924	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
WMS925	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
	Essential Services Facilities	Communication Sites and Facilities	FM	Western Inspirational Broadcasters, Inc.	Zone D	Low	Very High																
KP4611	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra Pacific Industries	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KTA356	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra Pacific Industries	Zone D	Low	Very High																
KYQ505	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Northern California Emergency Medical Services, Inc.	Zone D	Low	Very High																
WPMF905	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Sierra Rural Electric Cooperative	Zone D	Low	Very High																
Beckwourth Peak	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Comsites West LLC	Zone D	Low	Very High																
WNMR691	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Zebal Jr., Earnest H.	Zone D	Low	Very High																
WPUG763	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Zebal Jr., Earnest H.	Zone D	Low	Very High																
KNCK524	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Graeagle Water Company	Zone X (unshaded)	Low	High																
KFN577	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone A	Low	High							X			X						
WQHJ997	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Unified School District	Zone A	Low	High							X			X						
Blairsdan Graeagle Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Middle Fork Feather River - Bridge Number: 09C0134	Zone A	Low	Moderate							X			X						

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPYM769	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Gold Mountain Homeowners Association	Zone X (unshaded)	Low	Very High																
KDD223	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	KDD223	Zone D	Low	Very High																
Beckwourth Peak site 3 miles SE of Portola	Essential Services Facilities	Communication Sites and Facilities	Cellular	Modoc RSA Limited Partnership	Zone D	Low	Very High																
WNGP412	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Moderate	Very High																
KGV99	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone D	Low	Very High																
KGW22	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone D	Low	Very High																
Middle Fork Feather River - Hwy 36	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Middle Fork Feather River	Zone A	Low	High								X			X					
WPWX991	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Roberti Ranch, Inc.	Zone X (unshaded)	Low	Non-Wildland/Non-Urban								X								
WHE264	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																
WPTV271	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Mohawk Highway Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Middle Fork Feather River - Bridge Number: 09C0003	Zone A	Low	High							X			X						
Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Blairsdan UP	Zone X (unshaded)	Low	High																
23 Mohawk Highway Rd.	Essential Services Facilities	Public Safety	Fire Station	USFS (Plumas NF) - Beckwourth Ranger District	Zone A	Low	High																
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
5585 Semaphore Rd.	Essential Services Facilities	Public Safety	Fire Station	East Plumas Rural FPD	Zone X (unshaded)	Low	Very High																
223 Sequoia Circle	Essential Services Facilities	Public Utility Plant and Substation Facilities	Wastewater Treatment Plant	Plumas Eureka CSD WWTP	Zone X (unshaded)	Low	Very High																
KD1667	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone D	Moderate	Very High																
WQHJ997	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Unified School District	Zone D	Moderate	Very High																
WPFY973	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Eureka Community Services District	Zone A	Low	Very High																
120 Lundy Lane	Essential Services Facilities	Public Safety	Fire Station	Plumas Eureka CSD	Zone A	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
204 Lundy Lane	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Plumas Eureka CSD	Zone A	Low	Very High																
Off of USFS Road 22N55C	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Portola (Num. of Lines: 2 / Volt: 69)	Zone D	Low	Very High																
Hwy 70 / 89	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	N.N. (Num. of Lines: 2 / Volt: 69)	Zone X (unshaded)	Low	Very High																
WPIF541	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WNDL759	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone A	Low	Very High											Grizzly Valley					
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone A	Low	Moderate																
94362 Hwy 70,	Essential Services Facilities	Public Safety	Fire Station	Sierra Valley FPD	Zone A	Low	Moderate																
UP RR & BNSF RY - Hwy 49	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Vinton	Zone X (unshaded)	Low	Moderate																
WPIM397	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	White Cap Ready Mix	Zone X (unshaded)	Low	High											X					

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WNFL748	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone A	Low	Non-Wildland/Non-Urban							X									
WFE882	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Moderate	Very High																
Lone Pine Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Chilcoot (Num. of Lines: 1 / Volt: 69)	Zone X (unshaded)	Low	Moderate																
	Essential Services Facilities	Public Utility Plant and Substation Facilities	Wastewater Treatment Plant	Portola WWTP	Zone AE	Low	High											X					
Delleker Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Water Treatment Plant	Grizzly Lake CSD	Zone AE	Low	High											X					
Humbug Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Humbug Creek	Zone A	Low	Very High											X					
74424 Highway 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	AmeriGas (Bi-State Propane)	Zone AE	Low	High								X	X		X					
Vinton	Essential Services Facilities	Public Safety	Fire Station	Sierra Valley FPD	Zone X (unshaded)	Low	Moderate								X								
WPTG286	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Moderate																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzly Creek Dam	Grizzly	Grizzly Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
119 Delleker Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Grizzly Lake CSD	Zone D	Low	Moderate																
151 Delleker Rd.	Essential Services Facilities	Public Safety	Fire Station	East Plumas Rural FPD	Zone D	Low	Moderate																
WPKH667	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Goodwin & Sons Ranch	Zone X (unshaded)	Low	Non-Wildland/Non-Urban																
81822 Highway 70	At Risk Populations Facilities	School	Combined	Sierra Valley Christian (Mennonite)	Zone X (unshaded)	Low	High																
WPDX581	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Plumas Corp, DBA Leonards	Zone A	Low	Non-Wildland/Non-Urban																
217 Maddalena Road	At Risk Populations Facilities	School	Combined	Greenwood Christian Academy	Zone X (unshaded)	Low	Moderate																
KRZ403	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
WPWK912	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Beckworth (Num. of Lines: 4 / Volt: 69)	Zone X (unshaded)	Low	Non-Wildland/Non-Urban																
82241 Highway 70	Essential Services Facilities	Transportation Lifeline Systems	Airport	Nervino (Beckwourth) - Airport ID O02	Zone A	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
209 Beckwourth Genesee Road	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas, County of	Zone X (unshaded)	Low	High																
180 Main Street	Essential Services Facilities	Public Safety	Fire Station	Beckwourth FPD	Zone X (unshaded)	Low	High																
Nervino Airport	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas County, Nervino Airport	Zone X (unshaded)	Low	High																
548 N. Industrial Way	Essential Services Facilities	Public Safety	Fire Station	USFS (Plumas NF) - BW Interagency Hotshot Crew	Zone X (unshaded)	Low	High																
WPYD620	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Clark Systems, Inc.	Zone X (unshaded)	Low	High											X					
Big Grizzly Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Big Grizzly Creek	Zone A	Low	High									X		X					
WPIF541	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
Camp Layman Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Middle Fork Feather River - Bridge Number: 09C0095	Zone X (unshaded)	Low	Very High							X				X					
WPXZ451	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Quincy-La Porte Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Nelson Creek - Bridge Number: 09C0005	Zone D	Low	Very High																
169 Spring Meadow Drive	Essential Services Facilities	Public Utility Plant and Substation Facilities	Water Treatment Plant	Grizzly Ranch WWRF	Zone X (unshaded)	Low	Very High																
169 Spring Meadow Drive	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Grizzly Ranch CSD	Zone X (unshaded)	Low	Very High																
WPND275	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Plumas Sierra Rural Electric Cooperative	Zone X (unshaded)	Low	Very High																
KHI57	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WQIT598	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Grizzly Creek Golf, LLC	Zone D	Low	Very High																
	Essential Services Facilities	Public Utility Plant and Substation Facilities	Wastewater Treatment Plant	ES District WWTP	Zone X (unshaded)	Low	Very High																
4076 Grizzly Rd.	Essential Services Facilities	Public Safety	Fire Station	Beckwourth FPD	Zone X (unshaded)	Low	Very High																
4076 Grizzly Rd.	Essential Services Facilities	Emergency Response	Fire Station	USFS (PNF) - Grizzly Station (shared with BW Fire)	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzly	Grizzly Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Quincy-La Porte Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Middle Fork Feather River - Bridge Number: 09C0004	Zone D	Low	Very High											X					
WQBH526	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High			X							X					X	X
WGQ517	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
Bucks Lake Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Big Grizzly Creek - Bridge Number: 09C0161	Zone D	Low	Very High																
Poplar Valley Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Middle Fork Feather River - Bridge Number: 09C0149	Zone A	Low	Very High							X				X					
WNQV792	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Norton, David C.	Zone D	Low	Very High																
Grizzly Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Grizzly Creek Bridge	Zone D	Low	Very High			X				X						X		X	X
WNLG545	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																X
WNUX256	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Very High																
WPTV470	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
16891 Bucks Lake Rd.	Essential Services Facilities	Public Safety	Fire Station	Bucks Lake FPD	Zone D	Low	Very High																
Grizzly Dome Tunnel	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Grizzly Dome Tunnel	Zone D	Low	Very High			X												X	X
Bucks Lake Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Haskins Creek - Bridge Number: 09C0140	Zone D	Low	Very High																
WPTU292	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Skips 4x4 and Diesel	Zone D	Low	Very High																
WPIF541	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High										X						
Sloat Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Long Valley Creek - Bridge Number: 09C0153	Zone X (unshaded)	Low	Very High																
58880 Hwy 70,	Essential Services Facilities	Public Safety	Fire Station	Long Valley CSD	Zone X (unshaded)	Low	Very High																
58880 Highway 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Long Valley CSD	Zone X (unshaded)	Low	Very High																
Elephant Butte Tunnel - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Elephant Butte Tunnel	Zone D	Low	Very High			X												X	X
WPTG286	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone A	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WHE263	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WHE264	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WPTD942	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Tap (Num. of Lines: 2 / Volt: 230)	Zone D	Low	Very High																
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Tap (Num. of Lines: 0 / Volt: 230)	Zone D	Low	Very High																
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Rock Creek (PG&E - Hydroelectric Power Plant)	Zone D	Low	Very High	X		X	X	X		X						X		X	X
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Rock Creek (Num. of Lines: 2 / Volt: 230)	Zone D	Low	Very High	X		X	X	X		X						X		X	X
WPTV470	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Very High																
WQDE954	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Bucks Lake Snow Drifters	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Little Last Chance Creek - Hwy 284	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Little Last Chance Creek	Zone D	Low	High							X									
1200 Grizzly Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Water Treatment Plant	Lake Davis WTP	Zone D	Low	Very High																
6796 Lake Davis Rd.	Essential Services Facilities	Public Safety	Fire Station	East Plumas Rural FPD	Zone D	Low	Very High																
KNRU957	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	Nextel of California, Inc.	Zone X (unshaded)	Low	Very High																
Claremont Peak Approximately 5 miles South of	Essential Services Facilities	Communication Sites and Facilities	Cellular	California Rural Service Area #1, Inc.	Zone X (unshaded)	Moderate	Very High																
WNPV371	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sprint Communications Company, LP	Zone X (unshaded)	Moderate	Very High																
WPMP905	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Sierra Rural Electric Cooperative	Zone X (unshaded)	Moderate	Very High																
WSB814	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Moderate	Very High																
KGV99	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Moderate	Very High																
KGW21	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Moderate	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KGW22	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Moderate	Very High																
WMS924	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Moderate	Very High																
WNTI966	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Moderate	Very High																
WNTI997	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Moderate	Very High																
WNTQ266	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Moderate	Very High																
	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Union Pacific Railroad Company	Zone X (unshaded)	Moderate	Very High																
WMS922	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Moderate	Very High																
WMS923	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Moderate	Very High																
KMG248	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Moderate	Very High																
WNUX256	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Moderate	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Quincy 39-53-00.00 N / 120-56-44.0 W	Essential Services Facilities	Communication Sites and Facilities	Repeater	Claremont Peak Repeater	Zone X (unshaded)	Moderate	Very High																
WPYB479	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra Pacific Industries	Zone X (unshaded)	Low	Very High																
14551 Bucks Lake Road	Essential Services Facilities	Emergency Response	Fire Station	USFS (Plumas NF) - Whitehorse (Engine Only)	Zone D	Low	Very High																
Lake Davis Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Lake Davis Spillway - Bridge Number: 09C0142	Zone D	Low	Moderate																
Little Last Chance Creek - Hwy 284	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Little Last Chance Creek	Zone D	Low	High							X									
WKL97	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Moderate																
Lake Davis Road	Essential Services Facilities	Public Utility Plant and Substation Facilites	Water Treatment Plant	Lake Davis Pike Eradication Project, Portola	Zone D	Low	High																
Little Last Chance Creek - Hwy 284	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Little Last Chance Creek	Zone D	Low	High							X									
Railroad Street	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Estray Creek - Bridge Number: 09C0151	Zone X (unshaded)	Low	Very High																
KN7050	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Moderate	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
North Fork Feather River - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Rock Creek Hwy 70	Zone D	Low	Very High	X		X	X	X								X		X	X
605 Frenchman Blvd.,	Essential Services Facilities	Emergency Response	Fire Station	USFS (Plumas NF) - Frenchman Lake Work Center	Zone D	Low	High																
WQBH526	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High															X	X
WQDT258	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High																
WNAV460	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
WQMC547	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMW36	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
WNTP346	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
Beckwourth-Genesee Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Crocker Creek - Bridge Number: 09C0163	Zone D	Low	High																
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Grizzley (Silicon Valley Power - Hydroelectric Power Plant)	Zone D	Low	Very High	X		X	X									X		X	X

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Grizzley (Num. of Lines: 0 / Volt: 0)	Zone D	Low	Very High	X		X	X									X		X	X
KMW33	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High			X												X	X
KMW36	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High			X												X	X
WNE5623	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High			X												X	X
WKL98	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Moderate																
Rock Creek Powerhouse - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Rock Creek Powerhouse	Zone D	Low	Very High	X		X	X									X		X	X
WQMF522	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Bucks Lake Homeowners Association	Zone X (unshaded)	Low	Very High																
2049 Red Bluff Trail	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Greenhorn Creek CSD	Zone X (unshaded)	Low	Very High																
2049 Red Bluff Cir.	Essential Services Facilities	Public Safety	Fire Station	Greenhorn Creek CSD	Zone X (unshaded)	Low	Very High																
KMW33	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High															X	

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WNES623	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High															X	
WPTG286	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Bucks Creek	Zone D	Low	Very High			X	X											X	X
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																
WHE263	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																
WHE264	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																
WPIF541	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
Greenhorn Creek UP RR BNSF - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Spring Garden BOH	Zone X (unshaded)	Low	Very High																
North Fork Feather River - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Storrie Bridge	Zone D	Low	Very High	X		X	X	X								X		X	X
KNCH597	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Wood, Robert D.	Zone X (unshaded)	Moderate	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WAW776	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
Schneider Creek Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Meadow Valley Creek - 9C0146 - Bridge Number: 09C0146	Zone A	Low	Very High																
1/2 mile South of Coburn Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Gansner (Num. of Lines: 2 / Volt: 69)	Zone X (unshaded)	Moderate	Very High																
WSJ634	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Quincy Community Services District	Zone X (unshaded)	Low	Very High																
WXT741	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (unshaded)	Low	Very High																
WPMG296	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (unshaded)	Low	Very High																
KFO62	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Moderate	Very High																
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Moderate	Very High																
1 Mile SW of Gansner Field	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Pacific Gas and Electric Company	Zone X (unshaded)	Moderate	Very High																
WSB814	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (shaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KNCH597	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Wood, Robert D.	Zone X (shaded)	Low	Very High																
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																
KZS81	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Low	Very High																
	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Pacific Bell Telephone Company - AT&T California	Zone X (unshaded)	Low	Very High																
180 Sierra Way	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Quincy Tow Service and Repair	Zone X (shaded)	Low	Very High																
KMW33	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMW36	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
WPXF985	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Tom F. Huth	Zone X (unshaded)	Low	Very High																
1834 E. Main Street	Essential Services Facilities	Essential Government Operations	Plumas County Public Works Yard	Plumas County Public Works Yard (Quincy)	Zone X (unshaded)	Low	Very High																
50 Abernethy Lane	Essential Services Facilities	Essential Government Operations	Plumas County Jail	Plumas County Jail	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
246 Alder Street	At Risk Populations Facilities	School	Elementary	Quincy (Pioneer-Quincy) Elementary School (Grades K-6)	Zone X (unshaded)	Low	Very High																
WPXX879	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
North Fork Feather River - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Tobin Hwy 70 Bridge	Zone D	Low	Very High			X												X	
1400 East Main Street	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas County Sheriff	Zone X (unshaded)	Low	Very High																
WAF80	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
WPJS461	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High																
1400 East Main Street	Essential Services Facilities	Public Safety	Law Enforcement	Plumas County Sheriff's Office - Station	Zone X (unshaded)	Low	Very High																
1894 E. Main Street	Essential Services Facilities	Essential Government Operations	Plumas County Public Works	Plumas County Public Works	Zone X (unshaded)	Low	High																
1690 E. Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	ER Energy (Thompson Gas)	Zone X (unshaded)	Low	Very High																
WPMC761	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (shaded)	Low	Moderate																
1879 E. Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	AmeriGas	Zone X (shaded)	Low	High																
49 Alta Avenue	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas, County of	Zone X (shaded)	Low	High																
49 Alta Ave.	Essential Services Facilities	Public Safety	Fire Station	Quincy FPD	Zone X (shaded)	Low	High																
1745 E. Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	Cal-Gas West, Inc.	Zone X (shaded)	Low	Moderate																
112 Buchanan Street	At Risk Populations Facilities	School	Adult	A.L.I.V.E. Plumas Rural Services	Zone X (unshaded)	Low	Very High																
WPXE829	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Education Media Foundation	Zone AE	Low	Very High																
WPXF985	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Tom F. Huth	Zone AE	Low	Very High																
UP Railroad & BNSF RY	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Tobin UP	Zone D	Low	Very High															X	
269 Jackson Street (aka 256 Jackson Street)	At Risk Populations Facilities	School	Adult	Feather River Adult Education	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPHQ870	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (shaded)	Low	High																
WPMT217	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	American Valley Animal Hospital	Zone X (shaded)	Low	Moderate																
50 Church Street	At Risk Populations Facilities	School	Combined	Plumas Charter #146	Zone X (unshaded)	Low	Very High																
520 Main Street	Essential Services Facilities	Essential Government Operations	County Offices including Courts	Plumas County Courthouse	Zone X (unshaded)	Low	Very High																
WPMG296	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (unshaded)	Low	High																
116 Circle Drive	At Risk Populations Facilities	Nursing, Congregate or Assisted Living	Assisted Living Facility	Mountain View Manor	Zone X (unshaded)	Low	Very High																
KNDM206	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (shaded)	Low	Very High																
Greenhorn Creek - Hwy 70/89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Greenhorn Creek	Zone AE Floodway	Low	Very High																
175 N. Mill Creek Road	At Risk Populations Facilities	School	Elementary	Quincy Elementary (Pioneer Campus)	Zone X (unshaded)	Low	Urban Unzoned																
49 S. Lindan Avenue	At Risk Populations Facilities	School	Day Care Center	Co-Pilots' Preschool	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzly Creek Dam	Grizzly	Grizzly Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
49 S. Lindan Avenue	At Risk Populations Facilities	School	Combined	Plumas Christian School	Zone X (unshaded)	Low	Very High																
555 Main Street	Essential Services Facilities	Essential Government Operations	Plumas Co. Planning, Building, Engineering	Plumas County Planning, Building and Engineering	Zone X (unshaded)	Low	Very High																
519 Main Street	At Risk Populations Facilities	School	Combined	Cornerstone Learning Center	Zone X (unshaded)	Low	High																
411 Main Street	Essential Services Facilities	Emergency Medical	Pharmacy	Quincy Pharmacy	Zone X (unshaded)	Low	High																
1 Crescent Street	Essential Services Facilities	Essential Government Operations	Plumas County Assessor	Plumas County Assessor	Zone X (unshaded)	Low	Very High																
40 East Main Street	Essential Services Facilities	Emergency Medical	Pharmacy	Rite Aid - 6093	Zone X (unshaded)	Low	Very High																
Manzanita Way	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Plumas (Num. of Lines: 3 / Volt: 69)	Zone X (unshaded)	Low	Moderate																
	Essential Services Facilities	Communication Sites and Facilities	FM	California State University, Sacramento	Zone X (unshaded)	Low	High																
WMV719	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Sierra Radio, Inc.	Zone X (unshaded)	Low	High																
541 Main Street	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Pilot Communications	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KCI67	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone X (unshaded)	Low	Very High																
KHH70	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone X (unshaded)	Low	Very High																
84 West Main Street	Essential Services Facilities	Public Safety	Law Enforcement	California State Highway Patrol	Zone X (unshaded)	Low	Very High																
61 Bradley Street	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Keily Miller	Zone X (unshaded)	Low	High																
	Essential Services Facilities	Communication Sites and Facilities	FM	Sierra Radio, Inc.	Zone X (unshaded)	Low	High																
522 Lawrence Street	Essential Services Facilities	Essential Government Operations	Plumas County Child Support Services	Plumas County Child Support Services	Zone X (unshaded)	Low	High																
	Essential Services Facilities	Communication Sites and Facilities	FM	New Life Broadcasting	Zone X (unshaded)	Low	High																
546 Lawrence Street	At Risk Populations Facilities	School	Elementary	Plumas Charter	Zone X (unshaded)	Low	High																
80 Main Street	At Risk Populations Facilities	School	Combined	Plumas Charter	Zone X (unshaded)	Low	Very High																
274 Lawrence Street	Essential Services Facilities	Designated Emergency Shelter	Shelter	Quincy Veteran's Memorial Hall	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPMG296	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (shaded)	Low	High																
535 Lawrence Street	At Risk Populations Facilities	School	Elementary	Plumas Charter	Zone X (unshaded)	Low	High																
211 Lawrence Street	Essential Services Facilities	Emergency Medical	Home Health Agency/Hospice	Quincy Home Medical Services	Zone X (unshaded)	Low	High																
KED52	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
KRA575	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
WPTD942	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
545 Lawrence Street	At Risk Populations Facilities	School	Day Care Center	Quincy Cooperative Preschool	Zone X (unshaded)	Low	High																
159 Lawrence Street	Essential Services Facilities	Public Safety	Fire Station	USFS (Plumas NF) - Supervisor Office	Zone X (unshaded)	Low	High																
505 Lawrence St.	Essential Services Facilities	Public Safety	Fire Station	Quincy FPD	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
6913 Bucks Lake Rd	Essential Services Facilities	Public Safety	Fire Station	Meadow Valley FPD	Zone X (unshaded)	Low	High																
WPTG286	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
WPTD942	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
505 Lawrence Street	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	County of Plumas	Zone X (unshaded)	Low	High																
WPHQ870	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (shaded)	Low	Urban Unzoned																
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (shaded)	Low	High																
KZS81	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (shaded)	Low	High																
25 W. Main Street	Essential Services Facilities	Communication Sites and Facilities	Unknown	Pacific Bell Telephone Company - AT&T California	Zone X (shaded)	Low	High																
6 Quincy Junction Road	At Risk Populations Facilities	School	Secondary	Quincy Junior-Senior High School	Zone X (unshaded)	Low	Very High																
188 Crescent Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	Hunt's Propane	Zone AE	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
204 Plumas Fairgrounds Road	At Risk Populations Facilities	School	Day Care Center	Quincy Head Start (Sierra Cascade)	Zone X (unshaded)	Low	High																
204 Plumas Fairgrounds Rd	Essential Services Facilities	Designated Emergency Shelter	Shelter	Plumas-Sierra County Fairgrounds	Zone X (unshaded)	Low	Very High																
KB63847	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WPKS354	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WPKS355	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WPKS947	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WPLH825	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WPLH826	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WPQE590	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
198 Andy's Way	Essential Services Facilities	Essential Government Operations	Plumas County Facility Services	Plumas County Facility Services	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WBE219	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Northern California Emergency Medical Services, Inc.	Zone X (shaded)	Low	Very High																
KFO62	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	High																
WQBH526	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High																
205 Railway Avenue	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Pacific Gas & Electric Company	Zone X (unshaded)	Low	High																
1065 Bucks Lake Road	Essential Services Facilities	Emergency Medical	Hospital	Plumas District Hospital	Zone X (unshaded)	Low	Very High																
WPYL675	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone AE	Low	High																
WNUW208	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Quincy Community Services District	Zone X (unshaded)	Low	High																
1065 Bucks Lake Road	Essential Services Facilities	Transportation Lifeline Systems	Heliport	Plumas District Hospital Heliport (Quincy) - Airport ID CL94	Zone X (unshaded)	Low	Very High																
291 Crescent Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	FerrellGas	Zone AE	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KMA389	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	High																
KMF246	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
KYQ456	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
WPMK704	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas District Hospital	Zone X (unshaded)	Low	High																
WPPZ691	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	High																
WPTD942	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
WQHJ997	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Unified School District	Zone X (unshaded)	Low	High																
WPXF985	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Tom F. Huth	Zone X (unshaded)	Low	Moderate																
Radio Hill	Essential Services Facilities	Communication Sites and Facilities	FM	John Regh	Zone X (unshaded)	Low	High																
Radio Hill	Essential Services Facilities	Communication Sites and Facilities	FM	Western Inspirational Broadcasters, Inc.	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
677 Radio Hill Road	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	SBA Monarch Towers I, LLC	Zone X (unshaded)	Low	High																
1538 Lee Road	Hazardous Materials Facilities	Industrial	Timber Products	Sierra Pacific	Zone X (shaded)	Low	Moderate																
Radio Hill Communications Site	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Western Inspirational Broadcasters, Inc.	Zone X (unshaded)	Low	High																
Radio Hill Communications Site	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	California, State of	Zone X (unshaded)	Low	High																
Radio Hill Communications Site	Essential Services Facilities	Communication Sites and Facilities	Unknown	Immaculate Heart Media, Inc.	Zone X (unshaded)	Low	High																
Radio Hill Communications Site	Essential Services Facilities	Communication Sites and Facilities	Unknown	Digital Path, Inc	Zone X (unshaded)	Low	High																
Quincy 39-56-24.6 N / 120-55-41.8 W	Essential Services Facilities	Communication Sites and Facilities	Repeater	Radio Hill Repeater	Zone X (unshaded)	Low	High																
Radio Hill Communications Site	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	AT&T Mobility Spectrum LLC	Zone X (unshaded)	Low	High																
Radio Hill Communications Site	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	California TV, LLC	Zone X (unshaded)	Low	High																
Radio Hill	Essential Services Facilities	Communication Sites and Facilities	FM	Sierra Broadcasting Corporation	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WSB814	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Moderate	Very High																
Lee Road (Sierra Pacific Industries)	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Quincy (Sierra Pacific Industries, Inc. - Renewable Energy Power Plant)	Zone X (shaded)	Low	Urban Unzoned																
Lee Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Quincy (Num. of Lines: 0 / Volt: 0)	Zone X (shaded)	Low	Urban Unzoned																
WNWC858	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Lazzarino, Michael G.	Zone X (unshaded)	Low	High																
1538 Lee Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Water Treatment Plant	Sierra Pacific / Quincy Division	Zone X (unshaded)	Low	High																
WPIF541	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WPMG296	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (shaded)	Low	High																
WPMG296	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (shaded)	Low	High																
WPMG296	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (unshaded)	Low	Moderate																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	County of Plumas	Zone X (unshaded)	Low	High																
KNHV670	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra Pacific Industries	Zone X (unshaded)	Low	High																
KWN483	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sierra Pacific Industries	Zone X (unshaded)	Low	High																
WQIC701	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone X (unshaded)	Low	High																
WQKA295	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone X (unshaded)	Low	High																
WQLZ572	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone X (unshaded)	Low	High																
WNWC858	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Lazzarino, Michael G.	Zone X (unshaded)	Moderate	Very High																
330 Spanish Creek Road	Essential Services Facilities	Transportation Lifeline Systems	Airport	Gansner Field (Quincy) - Airport ID 201	Zone X (shaded)	Low	Very High																
Gansner Field Airport	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas County, Gansner Field Airport	Zone X (shaded)	Low	Very High																
WPHQ870	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Clear Stream - Hwy 70/89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Clear Stream	Zone AE	Low	Very High														X		
Spanish Creek - Hwy 70/89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Spanish Creek	Zone X (unshaded)	Low	Very High														X		
Ranch Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Spanish Creek - Bridge Number: 09C0039	Zone A	Moderate	Very High														X		
WPHQ870	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone X (unshaded)	Low	Very High																
Bucks Lake Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Rock Creek - Bridge Number: 09C0021	Zone A	Moderate	Very High														X		
Spanish Ranch Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Spanish Creek - Bridge Number: 09C0038	Zone A	Moderate	Very High														X		
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
900 Spanish Creek Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Wastewater Treatment Plant	Quincy WWTP	Zone X (shaded)	Low	Very High																
900 Spanish Creek Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	American Valley CSD	Zone X (shaded)	Low	Very High																
KMW36	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Non-Wildland/Non-Urban																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WNEU805	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Non-Wildland/Non-Urban																
KRAC	Essential Services Facilities	Communication Sites and Facilities	AM	KRAC	Zone X (unshaded)	Low	High																
Snake Lake Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Spanish Creek - Bridge Number: 09C0148	Zone A	Moderate	Very High														X		
570 Golden Eagle Ave	At Risk Populations Facilities	School	Day Care Center	Feather Rive College Preschool	Zone X (unshaded)	Low	Very High																
570 Golden Eagle Avenue	At Risk Populations Facilities	School	Post Secondary	Feather River Community College	Zone X (unshaded)	Low	Very High																
270 County Hospital Road	Essential Services Facilities	Essential Government Operations	Public, Behavioral & Envr. Health; Social Serv	Plumas County Annex	Zone X (unshaded)	Low	Very High																
270 County Hospital Road	Essential Services Facilities	Public Safety	OES	Plumas County OES EOC	Zone X (unshaded)	Low	Very High																
270 County Hospital Road	Essential Services Facilities	Public Safety	Public Health Dept.	Plumas County Public Health (Court House Annex)	Zone X (unshaded)	Low	Very High																
270 County Hospital Road, #128	Essential Services Facilities	Essential Government Operations	Plumas County Probation	Plumas County Probation	Zone X (unshaded)	Low	Very High																
570 Golden Eagle Avenue	At Risk Populations Facilities	School	Day Care Center	Feather River College Child Care	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
527 Bell Lane	Essential Services Facilities	Emergency Medical	Wellness Center	Quincy Drop-in Center	Zone AH	Low	High																
WPHQ870	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	East Quincy Services District	Zone AH	Low	Very High																
Chambers Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Chambers Creek	Zone D	Low	Very High	X		X										X		X	
1646 Chandler Rd.	Essential Services Facilities	Public Safety	Fire Station	Quincy FPD	Zone X (unshaded)	Low	Very High																
KMW36	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High	X		X		X								X		X	
WNEU805	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High	X		X		X								X		X	
Quincy Junction Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Greenhorn Creek - Bridge Number: 09C0031	Zone AE Floodway	Low	High																
None assigned	Essential Services Facilities	Transportation Lifeline Systems	Heliport	Rodgers Flat Heliport (Belden) - Airport ID CN26	Zone D	Low	Very High	X		X										X		X	
Chandler Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	East Quincy (Num. of Lines: 2 / Volt: 69)	Zone AE	Low	Very High														X		
WPXD891	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Quincy Community Services District	Zone AE	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Dixie Valley Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Dixie Valley CSD	Zone D	Low	Very High																
Chandler Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Spanish Creek & Greenhorn Creek - Bridge Number: 09C0037	Zone AE Floodway	Low	Very High														X		
None assigned	Essential Services Facilities	Transportation Lifeline Systems	Airport	USFS Quincy Helitack Base - Airport ID 72CA	Zone X (unshaded)	Low	Very High																
WPIF541	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
Oakland Camp Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Spanish Creek - Bridge Number: 09C0101	Zone AE Floodway	Low	Very High														X		
39696 Hwy 70	Essential Services Facilities	Public Safety	Fire Station	USFS (Plumas NF) - Mt. Hough Ranger District	Zone X (unshaded)	Low	Very High																
WGQ517	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
WQBH526	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High																
WGQ517	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High															X	
Hwy 70	Essential Services Facilities	Public Utility Plant and	Power Plant	Bucks Creek (PG&E -	Zone D	Low	Very High	X		X		X								X		X	

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
		Substation Facilities		Hydroelectric Power Plant)																			
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Bucks Creek (Num. of Lines: 1 / Volt: 230)	Zone D	Low	Very High	X		X		X								X		X	
WPIF542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WPPV937	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Patterson Sand Gravel	Zone D	Low	Very High																
Chipps Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Chipps Creek	Zone D	Low	Very High			X		X										X	
WPIF542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WQBH526	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High															X	
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
WPTC853	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
WPTE555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPTG286	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
WLA699	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High	X		X		X										X	
Belden Town Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	North Fork Feather River - Bridge Number: 09C0042	Zone D	Low	Very High	X		X		X										X	
Yellow Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Yellow Creek	Zone D	Low	Very High	X		X		X										X	
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Belden (PG&E - Hydroelectric Power Plant)	Zone D	Low	Very High			X												X	
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Belden (Num. of Lines: 3 / Volt: 230)	Zone D	Low	Very High			X												X	
WLA701	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
KCY81	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
Butterfly Valley Twain Road	Essential Services Facilities	Public Utility Plant and	Electric Sub-Station	Keddie (Num. of Lines: 2 / Volt: 69)	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
		Substation Facilities																					
WPIF540	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High																
Round House Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Spanish Creek - Bridge Number: 09C0097	Zone X (unshaded)	Low	Very High														X		
Rich Bar Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	East Branch North Fork Feather River - Bridge Number: 09C0041	Zone D	Low	Very High	X															
WPIF542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone A	Low	Very High																
WNLG545	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High	X		X												X	
WPIF540	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High																
North Fork Feather River - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Howell's Bridge	Zone D	Low	Very High	X		X		X										X	
Hwy 70	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Grays Flat (Num. of Lines: 2 / Volt: 69)	Zone X (unshaded)	Moderate	Very High																
Round House Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Spanish Creek - Bridge Number: 09C0034	Zone A	Low	Very High														X		

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WPIF542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WPKM660	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone X (unshaded)	Low	Very High																
WQKI710	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone X (unshaded)	Low	Very High																
KMG248	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
WPXE427	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone X (unshaded)	Low	Very High																
Old Mill Drive	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Feather River Canyon CSD	Zone X (unshaded)	Moderate	Very High																
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Moderate	Very High																
WLR586	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone X (unshaded)	Moderate	Very High																
1113 Caribou Road,	Essential Services Facilities	Public Safety	Fire Station	USFS (Plumas NF) - Gansner Bar	Zone D	Low	Very High			X		X										X	
Old Utah Construction Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	East Branch North Fork Feather River - Bridge Number: 09C0033	Zone A	Moderate	Very High	X															

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Butterfly Valley Twain Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	East Branch North Fork Feather River - Bridge Number: 09C0032	Zone X (unshaded)	Low	Very High	X															
WPIF540	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Moderate	Very High																
WPIF540	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Moderate	Very High	X															
UP RR & BNSF RR	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Spanish Creek Tunnel OH	Zone X (unshaded)	Low	Very High																
Rush Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Rush Creek Bridge	Zone X (unshaded)	Moderate	Very High																
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
WPIF542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																
Spanish Creek Bridge	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Spanish Creek	Zone A	Low	Very High																
Beckwourth-Genesee Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Red Clover Creek - Bridge Number: 09C0136	Zone D	Low	Very High																
WPIF542	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Rush Creek Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Rush Creek - Bridge Number: 09C0058	Zone X (unshaded)	Moderate	Very High																
WHI484	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California State University, Chico	Zone D	Low	Very High																
WIA819	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California State University, Chico	Zone D	Low	Very High																
WIA820	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California State University, Chico	Zone D	Low	Very High																
WLA699	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WLA701	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
KNKO269	Essential Services Facilities	Communication Sites and Facilities	Paging	AT&T California	Zone D	Low	Very High																
KFA398	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	AT&T California	Zone D	Low	Very High																
KMB231	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KMF247	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Name/Owner Specific Type		Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KNFD869	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KRK995	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Union Pacific Railroad Company	Zone D	Low	Very High																
WNJH264	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Sprint Communications Company, LP	Zone D	Low	Very High																
WNLY665	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WNUX256	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Very High																
WPEW764	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Stimpel Wiebelhaus, Inc.	Zone D	Low	Very High																
WPIC506	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KZS79	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
KZS81	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WHE263	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WLA698	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WLR586	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
KMA276	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
WPCJ782	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMD581	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
WGQ517	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
WNAV460	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
WNVD876	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
WNYA416	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WQDB538	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																
Belden 39-47-41.6 N / 121-11-04.9 W	Essential Services Facilities	Communication Sites and Facilities	Repeater	Redhill Repeater Site	Zone D	Low	Very High																
KCI67 - Red Hill	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone D	Low	Very High																
KCI68	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone D	Low	Very High																
KGW22	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone D	Low	Very High																
WNTT965	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone D	Low	Very High																
WNTT997	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Union Pacific Railroad	Zone D	Low	Very High																
WQKK592	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone D	Low	Very High																
WQLZ572	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone D	Low	Very High																
WQLZ634	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KCY81	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
KFO62	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMW35	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMW36	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
KMW40	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
WNEY318	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Low	Very High																
WBY463	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Northern California Emergency Medical Services, Inc.	Zone D	Low	Very High																
WPW1606	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
WNDZ239	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Indian Falls Paxton Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Spanish Creek (Num. of Lines: 2 / Volt: 69)	Zone X (unshaded)	Low	Very High																
Paxton Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	East Branch North Fork Feather River - Bridge Number: 09C0006	Zone X (unshaded)	Low	Very High	X															
Indian Creek - Hwy 70	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Indian Creek	Zone X (unshaded)	Low	Very High	X															
Beckwourth-Taylorsville Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Indian Creek - Bridge Number: 09C0030	Zone A	Low	Very High	X															
KMA389	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High																
KYQ501	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Northern California Emergency Medical Services, Inc.	Zone X (unshaded)	Low	Very High																
WNUD893	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	WNUD893	Zone X (unshaded)	Low	Very High																
WQHJ997	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas Unified School District	Zone X (unshaded)	Low	Very High																
WSB814	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High																
WNNY372	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	WNNY372	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KGL479	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
KJY816	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
KRA487	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
WNXG378	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
WQBG888	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
Beckwourth-Genesee Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Red Clover Creek - Bridge Number: 09C0011	Zone X (unshaded)	Low	Very High																
KCI66 - Mount Hough	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone X (unshaded)	Low	Very High																
KCI67	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone X (unshaded)	Low	Very High																
KCI68 - Mount Hough	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone X (unshaded)	Low	Very High																
KHH70	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California, State of	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
MT HOUGH PLUMAS NATIONAL FOREST 4 MILES NE OF	Essential Services Facilities	Communication Sites and Facilities	Cellular	Modoc RSA Limited Partnership	Zone X (unshaded)	Low	Very High																
Keddie 40-02-32.6 N / 120-53-16.8 W	Essential Services Facilities	Communication Sites and Facilities	Repeater	MT. Hough Repeater	Zone X (unshaded)	Low	Very High																
WQKA295	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone X (unshaded)	Low	Very High																
WQLZ572	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone X (unshaded)	Low	Very High																
WQLZ634	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	DigitalPath, Inc.	Zone X (unshaded)	Low	Very High																
WNZS806	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	USA Mobility Wireless, Inc.	Zone X (unshaded)	Low	Very High																
KNKK806	Essential Services Facilities	Communication Sites and Facilities	Paging	Pilot Communications	Zone X (unshaded)	Low	Very High																
KNKO775	Essential Services Facilities	Communication Sites and Facilities	Paging	Pilot Communications	Zone X (unshaded)	Low	Very High																
Genesee Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Hosselkus Creek - Bridge Number: 09C0092	Zone X (unshaded)	Low	Very High	X															
WNPO352	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	FCI 900, Inc.	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KMD581	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WPQE590	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WQLZ267	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WHI484	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California State University, Chico	Zone X (unshaded)	Low	Very High																
WIA820	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California State University, Chico	Zone X (unshaded)	Low	Very High																
Red Hill (off Caribou Road)	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Oak Flat (PG&E - Hydroelectric Power Plant)	Zone D	Moderate	Very High																
Caribou Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Oak Flat (Num. of Lines: 1 / Volt: 69)	Zone D	Moderate	Very High																
5497 Fir Fork	Essential Services Facilities	Public Safety	Fire Station	Indian Valley CSD	Zone X (unshaded)	Low	Very High																
WPLR249	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Neff Family Ranch, Inc.	Zone X (unshaded)	Low	Very High																
WMV719	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Sierra Radio, Inc.	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Beckwourth-Genesee Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Indian Creek - Bridge Number: 09C0010	Zone A	Low	Very High	X															
4290 Nelson St.,	Essential Services Facilities	Public Safety	Fire Station	Indian Valley CSD	Zone X (unshaded)	Low	Very High																
Arlington Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Indian Creek - Bridge Number: 09C0009	Zone A	Low	Very High	X															
4289 Ann Street	At Risk Populations Facilities	School	Elementary	Taylorville Elementary School	Zone X (unshaded)	Low	Very High																
4352 Main Street	At Risk Populations Facilities	School	Combined	Indian Valley Academy (Charter School)	Zone X (unshaded)	Low	Very High																
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Moderate	Very High																
WLA698	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Moderate	Very High																
Off of USFS road 26N22	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Tap (Num. of Lines: 2 / Volt: 69)	Zone D	Low	Very High																
WQIY624	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone A	Low	Very High	X	X														
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Moderate	Very High			X												X	

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KMW40	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone D	Moderate	Very High			X												X	
Caribou Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Caribou 1 (PG&E - Hydroelectric Power Plant)	Zone D	Moderate	Very High			X												X	
Caribou Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Caribou 1 (Num. of Lines: 0 / Volt: 0)	Zone D	Moderate	Very High			X												X	
WPKM660	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone A	Low	Very High	X	X														
WQFY672	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone A	Low	Very High	X															
Caribou Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Caribou 1 (Num. of Lines: 6 / Volt: 69 min; 138 max)	Zone D	Moderate	Very High			X												X	
Arlington Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Indian Creek - Bridge Number: 09C0007	Zone A	Low	Very High	X	X														
WPTS202	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	BNSF Railway Company	Zone A	Low	Very High	X															
Nelson St	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Indian Creek - Bridge Number: 09C0008	Zone A	Low	Moderate	X															

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bedwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KZS80	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
WLA698	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	AT&T California	Zone D	Low	Very High																
36 Carter Street	Essential Services Facilities	Public Safety	Fire Station	Crescent Mills FPD	Zone X (unshaded)	Low	Very High																
WNZV937	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Commercial	Nextel of California, Inc.	Zone X (unshaded)	Low	Very High																
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
WGA270	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Humphrey, David L.	Zone X (unshaded)	Low	Very High																
WNNJ551	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Crescent Mills Fire District	Zone X (unshaded)	Low	Very High																
North Valley Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Lights Creek (Deadfall Br) - Bridge Number: 09C0012	Zone A	Low	Moderate	X															
Off of USFS road 27N26	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Caribou 2 (Num. of Lines: 4 / Volt: 138 min; 230 max)	Zone D	Low	Very High																
Stampfli Lane	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Indian Creek - Bridge Number: 09C0053	Zone A	Low	Moderate	X	X														

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Stampfli Lane	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Indian Creek - Bridge Number: 09C0029	Zone A	Low	Moderate	X	X														
WGL394	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	High																
KMW34	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
KMW35	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
Butt Reservoir Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Butt Reservoir Spillway - Bridge Number: 09C0061	Zone X (unshaded)	Low	Very High			X													
Butt Reservoir Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Caribou 2 (PG&E - Hydroelectric Power Plant)	Zone X (unshaded)	Low	Very High																
KMW35	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
Long Valley Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Round Valley Lake Outlet - Bridge Number: 09C0073	Zone D	Low	Non-Wildland/Non-Urban																
Seneca Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	North Fork Feather River - Bridge Number: 09C0043	Zone D	Low	Very High															X	
WMS922	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WQKU362	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Low	Very High																
	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	United States Cellular Corporation	Zone X (unshaded)	Low	Very High																
	Essential Services Facilities	Communication Sites and Facilities	TV NTSC	Catamount Broadcasting of Chico-Redding, Inc.	Zone X (unshaded)	Low	Very High																
KNJ66	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNJ66	Zone D	Low	Very High																
KPY55	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KPY55	Zone D	Low	Very High																
WPND273	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Plumas Sierra Rural Electric Cooperative	Zone D	Low	Very High																
North Arm Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Peters Creek - Bridge Number: 09C0145	Zone X (unshaded)	Low	Moderate																
WPDG595	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Evergreen Markets, Inc.	Zone A	Low	Moderate																
S. Main Street	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	North Canyon Creek - Bridge Number: 09C0074	Zone D	Low	Very High	X															
Main Street	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Wolf Creek - Bridge Number: 09C0015	Zone AE Floodway	Low	Very High	X															

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
BNSF RY - Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	South Greenville OH	Zone X (unshaded)	Low	Very High																
Wolf Creek - Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Wolf Creek	Zone X (unshaded)	Low	Very High																
KYF290	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High	X															
Greenville Park Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Wolf Creek - Bridge Number: 09C0152	Zone AE Floodway	Low	Very High	X															
127 Crescent Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Indian Valley CSD	Zone X (unshaded)	Low	Very High																
115 Crescent Street	Essential Services Facilities	Public Safety	Law Enforcement	Plumas County Sheriff's Office - Substation	Zone X (unshaded)	Low	Very High																
225 Main Street	Essential Services Facilities	Emergency Medical	Pharmacy	Village Drug Store	Zone X (unshaded)	Low	Very High																
128 Hot Springs Rd.	Essential Services Facilities	Emergency Response	Fire Station	USFS (Plumas NF) - Greenville Work Center	Zone X (unshaded)	Low	Very High																
Humbug Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Yellow Creek - Bridge Number: 09C0063	Zone A	Moderate	Moderate																
117 and 205 Grand Street	At Risk Populations Facilities	School	Secondary	Greenville Junior-Senior High School	Zone X (unshaded)	Low	Very High	X															

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KDB582	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
184 Hot Springs Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Water Treatment Plant	Geothermal Space Heating System	Zone X (unshaded)	Low	Very High		X														
121 NW Ann St.	Essential Services Facilities	Public Safety	Fire Station	Indian Valley CSD	Zone X (unshaded)	Low	Very High																
117 Grand Street	At Risk Populations Facilities	School	Middle	Wolf Creek Middle School (Greenville Jr/Sr High)	Zone X (unshaded)	Low	Very High		X														
WBE223	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Northern California Emergency Medical Services, Inc.	Zone X (unshaded)	Low	Very High		X														
WFE883	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
414 Main Street	Essential Services Facilities	Emergency Medical	Wellness Center	Greenville Wellness Center	Zone X (unshaded)	Low	Very High																
410 Main Street	Essential Services Facilities	Emergency Medical	Clinic	Greenville Ranceria Tribal Health Program	Zone X (unshaded)	Low	Very High																
184 Hot Springs Road	Essential Services Facilities	Transportation Lifeline Systems	Heliport	Indian Valley Hospital Heliport (Greenville) - Airport ID 30CA	Zone X (unshaded)	Low	Very High																
225 Grand Street	At Risk Populations Facilities	School	Elementary	Greenville (Indian Valley) Elementary School	Zone X (unshaded)	Low	High		X														

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
225 Grand Street	At Risk Populations Facilities	School	Day Care Center	Greenville State Preschool	Zone X (unshaded)	Low	High		X														
Off of USFS road 26N22	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Tap (Num. of Lines: 2 / Volt: 69)	Zone D	Low	Very High																
WGL395	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
Off of USFS road 27N38A	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Greenville (Num. of Lines: 1 / Volt: 69)	Zone D	Low	Very High																
Diamond Mountain Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Cooks Creek - Bridge Number: 09C0054	Zone A	Low	Moderate																
36 Williams Valley Road	Essential Services Facilities	Essential Government Operations	Plumas County Public Works Yard	Plumas County Public Works Yard (Greenville)	Zone X (unshaded)	Low	Very High																
Diamond Mountain Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Lights Creek - Bridge Number: 09C0044	Zone X (unshaded)	Low	Very High																
WPSE346	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Red Bluff Union Elementary School District	Zone X (unshaded)	Low	Very High																
6344 North Arm Road	Essential Services Facilities	Public Safety	Fire Station	Indian Valley CSD	Zone X (unshaded)	Low	Very High																
Setzer Camp Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Wolf Creek - Bridge Number: 09C0131	Zone A	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Old State Hwy (off of Hwy 89)	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Big Meadows (Num. of Lines: 3 / Volt: 69)	Zone X (unshaded)	Low	Very High																
WPKS354	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WPKS355	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WPKS947	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WPLH825	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
WPLH826	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
Lake Almanor Spillway Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Lake Almanor Spillway	Zone X (unshaded)	Low	Very High															X	
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone A	Low	Very High																
KMW34	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone A	Low	Very High																
KMW35	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone A	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KMW35	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone A	Low	Moderate																
Prattville Butt Reservoir Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Butt Valley (PG&E - Hydroelectric Power Plant)	Zone A	Low	Very High																
Prattville Butt Reservoir Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Butt Valley (Num. of Lines: 0 / Volt: 0)	Zone A	Low	Very High																
BNSF RY - Hwy 89	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Wolf Creek UP	Zone X (unshaded)	Low	Very High																
Prattville Butt Reservoir Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Butt Valley (Num. of Lines: 1 / Volt: 138)	Zone D	Low	Very High																
Greenville Wolf Creek Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Wolf Creek - Bridge Number: 09C0016	Zone A	Low	Very High																
WPKM660	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	BNSF Railway Company	Zone X (unshaded)	Low	Very High																
WKL95	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KN7050	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Pacific Gas and Electric Company	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KMW32	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
KMW35	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
Diamond Mountain Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Lights Creek - Bridge Number: 09C0056	Zone X (unshaded)	Low	Very High																
Humboldt Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Soldiers Meadow Creek - Bridge Number: 09C0072	Zone D	Low	Very High																
Humbug Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Butt Creek - Bridge Number: 09C0062	Zone A	Low	Very High																
FS Road 29N43 (aka Fruit Growers Blvd), Antelope Lake	Essential Services Facilities	Emergency Response	Fire Station	USFS (Plumas NF) - Boulder Creek Work Center	Zone D	Low	Very High																
2977 Scott Dr.	Essential Services Facilities	Public Safety	Fire Station	Prattville Fire (Under contract w/ W. Almanor CSD)	Zone X (unshaded)	Low	Very High																
WPTE555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
Diamond Mountain Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	Englemine Bridge - Bridge Number: 09C0068	Zone D	Low	Very High																
WPFV359	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Culver, Luke	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Dyer Mountain - WQFW814	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Edge Wireless, LLC	Zone X (unshaded)	Low	High																
Dyer Mountain - WQHE393	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Edge Wireless, LLC	Zone X (unshaded)	Low	High																
Dyer Mountain	Essential Services Facilities	Communication Sites and Facilities	FM	IHR Educational Broadcasting	Zone X (unshaded)	Low	Very High																
Dyer Mountain	Essential Services Facilities	Communication Sites and Facilities	FM	Living Proof, Inc.	Zone X (unshaded)	Low	Very High																
Dyer Mountain	Essential Services Facilities	Communication Sites and Facilities	FM	Education Media Foundation	Zone X (unshaded)	Low	Very High																
Dyer Mountain	Essential Services Facilities	Communication Sites and Facilities	FM	Calvary Chapel of Twin Falls, Inc.	Zone X (unshaded)	Low	Very High																
Dyer Mountain	Essential Services Facilities	Communication Sites and Facilities	FM	Calvary Chapel of Twin Falls, Inc.	Zone X (unshaded)	Low	Very High																
Dyer Mountain - WPXE829	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Education Media Foundation	Zone X (unshaded)	Low	Very High																
WPTE555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
947 Long Iron Drive	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	West Almanor CSD	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
947 Long Iron Drive	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	County of Plumas	Zone X (unshaded)	Low	High																
947 Long Iron Drive	Essential Services Facilities	Public Safety	Fire Station	West Almanor CSD	Zone X (unshaded)	Low	High																
WPRL700	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Valley Industrial Communications, Inc.	Zone A	Low	Moderate												X				
Diamond Mountain Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category B	East Branch Lights Creek - Bridge Number: 09C0069	Zone D	Low	Very High																
KNL61	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNL61	Zone X (unshaded)	Low	High																
WHO360	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	WHO360	Zone X (unshaded)	Low	High																
WPTE555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
801 Golf Club Rd.	Essential Services Facilities	Public Safety	Fire Station	Peninsula FPD (Station 2)	Zone X (unshaded)	Low	High																
Dyer Mountain - KER951	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Roseburg Forest Products Company	Zone X (unshaded)	Low	Very High																
KNL60	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNL60	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KNL61	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNL61	Zone X (unshaded)	Low	High																
WHO360	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	WHO360	Zone X (unshaded)	Low	High																
WNKF760	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone D	Low	Very High																
KBI337	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Holt Logging, Inc.	Zone A	Low	Moderate												X				
WPTE555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	High																
KNIK637	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Penninsula Fire Protection District	Zone X (unshaded)	Low	High																
KNCL581	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Lake Almanor Country Club	Zone X (unshaded)	Low	High																
WPND272	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Plumas Sierra Rural Electric Cooperative	Zone D	Low	Non-Wildland/Non-Urban																
WMS922	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Low	Very High																
WQKU361	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
SE 1/4 SW 1/4 Section 22, T-28-N, R-8-E	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	United States Cellular Corporation	Zone X (unshaded)	Low	Very High																
WQGV833	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Lake Almanor Country Club	Zone X (unshaded)	Low	High																
Hwy 147	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Hamilton Branch (PG&E - Hydroelectric Power Plant)	Zone A	Low	Moderate												X				
497 Firehouse Rd.la	Essential Services Facilities	Public Safety	Fire Station	Peninsula FPD (Station 1)	Zone X (unshaded)	Low	High																
WPKG251	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Hamilton Branch Community Services District	Zone X (unshaded)	Low	Very High																
WPT555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Very High																
Big Springs Rd//A13	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Hamilton Branch Creek - Bridge Number: 09C0035	Zone X (unshaded)	Low	Very High												X				
3791 Big Springs Rd.	Essential Services Facilities	Public Safety	Fire Station	Hamilton Branch FPD	Zone X (unshaded)	Low	Very High																
3749 County Route A-13 (Walker Memorial Road)	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Hamilton Branch CSD	Zone X (unshaded)	Low	Very High																
Park Hill Drive	Essential Services Facilities	Public Utility Plant and	Electric Sub-Station	Hamilton Branch (Num. of Lines: 3 / Volt: 69)	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
		Substation Facilities																					
Stover Mountain	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
WMS923	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
WQKU361	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
WQKU362	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	United States Cellular Corporation	Zone D	Low	Very High																
4 Miles WSW of Chester	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	EIP Communications I, LLC	Zone D	Low	Very High																
1033 Highway 36	Essential Services Facilities	Transportation Lifeline Systems	Airport	Rogers Field Airport (Chester) - Airport ID O05	Zone X (unshaded)	Low	Very High																
2610 County Route A-13 (Walker Memorial Road)	At Risk Populations Facilities	School	Day Care Center	Lake Almanor Christian Preschool	Zone X (unshaded)	Low	Very High																
2610 Highway A-13	At Risk Populations Facilities	School	Combined	Lake Almanor Christian School (Grades K-8)	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Stover Mountain Site 5 Miles SW Hwy 36	Essential Services Facilities	Communication Sites and Facilities	Cellular	California Rural Service Area #1, Inc.	Zone D	Low	Very High																
4 MILES WSW OF CHESTER	Essential Services Facilities	Communication Sites and Facilities	Cellular	Modoc RSA Limited Partnership	Zone D	Low	Very High																
KMA498	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Collins Pine Company	Zone D	Low	Very High																
WNHQ447	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	WNHQ447	Zone D	Low	Very High																
WNMG862	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	WNMG862	Zone D	Low	Very High																
WNUX256	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone D	Low	Very High																
KNL60	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNL60	Zone D	Low	Very High																
WHA573	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	WHA573	Zone D	Low	Very High																
WHA575	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	WHA575	Zone D	Low	Very High																
WHA576	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	WHA576	Zone D	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
Stover Mountain	Essential Services Facilities	Communication Sites and Facilities	Repeater	Stover Mountain Repeater	Zone D	Low	Very High																
WQLB965	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Very High																
Rogers Field Airport	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas County, Rogers Field Airport	Zone X (unshaded)	Low	Very High																
1013 Highway 36	Essential Services Facilities	Essential Government Operations	Plumas County Public Works Yard	Plumas County Public Works Yard (Chester)	Zone X (unshaded)	Low	Very High																
939 Highway 36	Essential Services Facilities	Transportation Lifeline Systems	Heliport	USFS Chester Airtanker Base	Zone X (unshaded)	Low	Very High																
939 Highway 36	Essential Services Facilities	Transportation Lifeline Systems	Heliport	USFS Chester Heliport - Airport ID 5Q2	Zone X (unshaded)	Low	Very High																
KTE632	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	California, State of	Zone X (unshaded)	Low	Very High																
WQLB965	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	High																
900 and 930 Main Street (Hwy 36)	Essential Services Facilities	Public Safety	Fire Station	USFS (Lassen NF) - Chester (Almanor Ranger District)	Zone X (unshaded)	Low	Very High																
251 Chester Airport Road	Essential Services Facilities	Public Safety	Fire Station	Chester FPD	Zone X (unshaded)	Low	High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
251 Chester Airport Road	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Chester PUD	Zone X (unshaded)	Low	High																
710 Red River Drive	Essential Services Facilities	Public Utility Plant and Substation Facilities	Community Services District	Walker Ranch CSD	Zone X (unshaded)	Low	High																
683 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	FerrellGas	Zone X (unshaded)	Low	Moderate						X										
881 First Avenue	Hazardous Materials Facilities	Unknown	Wastewater Treatment Plant	Chester Public Utility District	Zone X (unshaded)	Low	Very High						X										
881 First Avenue	Essential Services Facilities	Public Utility Plant and Substation Facilities	Wastewater Treatment Plant	Chester WWTP	Zone X (unshaded)	Low	Very High						X										
Collins Drive (Collin's Pine)	Essential Services Facilities	Public Utility Plant and Substation Facilities	Power Plant	Collins Pine (Collin's Pine - Renewable Energy Power Plant)	Zone X (unshaded)	Low	High						X										
Collin's Pine	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Collins Pine (Num. of Lines: 0 / Volt: 0)	Zone X (unshaded)	Low	High						X										
500 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Water Treatment Plant	Chester Sawmill	Zone X (unshaded)	Low	Very High						X										

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
612 First Avenue & 314 First Street	At Risk Populations Facilities	School	Secondary	Chester Junior-Senior High School	Zone X (unshaded)	Low	Moderate						X										
612 First Avenue & 314 First Street	At Risk Populations Facilities	School	Secondary	Almanor Continuation High School	Zone X (unshaded)	Low	Moderate						X										
386 Main Street	At Risk Populations Facilities	School	Infant Center	Mountain Methodist Children's Center	Zone X (unshaded)	Low	High						X										
386 Main Street	At Risk Populations Facilities	School	Day Care Center	Mountain Methodist Children's Center	Zone X (unshaded)	Low	High						X										
KGZ470	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Collins Pine Company	Zone X (unshaded)	Low	High						X										
KMA498	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Collins Pine Company	Zone X (unshaded)	Low	High						X										
WNHQ447	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	WNHQ447	Zone X (unshaded)	Low	High						X										
372 Main Street	Essential Services Facilities	Emergency Medical	Wellness Center	Chester Wellness Center	Zone X (unshaded)	Low	Moderate						X										
KNL60	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNL60	Zone X (unshaded)	Low	High						X										
KNL61	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	KNL61	Zone X (unshaded)	Low	High						X										

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
WHA575	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	WHA575	Zone X (unshaded)	Low	High						X										
SE CORNER OF 2ND STREET AT 4TH	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Citizens Telecommunications Company of California Inc.	Zone X (unshaded)	Low	High						X										
WPXK401	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Phillips, Brian T.	Zone X (unshaded)	Low	Urban Unzoned						X										
Bailey Creek - Hwy 36	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Bailey Creek	Zone X (unshaded)	Low	High																
150 Brentwood Drive	At Risk Populations Facilities	Nursing, Congregate or Assisted Living	Nursing	Seneca District Hospital D/P SNF	Zone X (unshaded)	Low	High						X										
WBE219	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Northern California Emergency Medical Services, Inc.	Zone X (unshaded)	Low	High						X										
158 Aspen Street, #14	At Risk Populations Facilities	School	Day Care Center	Chester State Preschool	Zone X (unshaded)	Low	Urban Unzoned						X										
150 Brentwood Drive	Essential Services Facilities	Emergency Medical	Hospital	Seneca District Hospital	Zone X (unshaded)	Low	High						X										
158 Aspen Street	At Risk Populations Facilities	School	Elementary	Chester Elementary School	Zone X (unshaded)	Low	Urban Unzoned						X										
WPDH727	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Chester Public Utility District	Zone X (unshaded)	Low	Moderate						X										

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
199 Reynolds Road	Essential Services Facilities	Emergency Medical	Clinic	Lake Almanor Clinic	Zone X (unshaded)	Low	High																
WPTU639	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Community Development Commission	Zone X (unshaded)	Low	Very High						X										
366 Meadowbrook Loop	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	Plumas County Community Development Commission	Zone X (unshaded)	Low	Very High						X										
County Road 322A	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Bailey Creek - Bridge Number: 09C0159	Zone X (unshaded)	Low	Very High																
400 Meadow Brook Loop	At Risk Populations Facilities	Nursing, Congregate or Assisted Living	Assisted Living Facility	Wildwood Village	Zone X (unshaded)	Low	Very High						X										
271 Main Street	Essential Services Facilities	Emergency Medical	Pharmacy	Lassen Drug Company	Zone X (unshaded)	Low	Moderate						X										
WQDX896	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Almanor Residential Wildwood Senior Living	Zone X (unshaded)	Low	High						X										
	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	SBA Steel LLC	Zone X (unshaded)	Low	Very High																
222 First Avenue	Essential Services Facilities	Public Safety	Law Enforcement	Plumas County Sheriff's Office - Substation	Zone X (unshaded)	Low	Moderate						X										
1st Avenue	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	North Fork Feather River - Bridge Number: 09C0137	Zone A	Low	Moderate						X										

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Critical Facility Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
North Fork Feather River - Hwy 36	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	North Fork Feather River	Zone A	Low	Moderate						X										
225 Gay Street	Essential Services Facilities	Designated Emergency Shelter	Shelter	Chester Veteran's Memorial Hall	Zone X (unshaded)	Low	Urban Unzoned						X										
WPTE555	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas County Fire	Zone X (unshaded)	Low	Moderate						X										
198 Main Street	At Risk Populations Facilities	School	Combined	St. Andrews Academy	Zone X (unshaded)	Low	Moderate						X										
198 MAIN STREET	Essential Services Facilities	Communication Sites and Facilities	Antenna Structure Registration	County of Plumas	Zone X (unshaded)	Low	Moderate						X										
135 Main Street	At Risk Populations Facilities	School	Combined	Chester Learning Center	Zone X (unshaded)	Low	Urban Unzoned						X										
KSR930	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Plumas, County of	Zone X (unshaded)	Low	Moderate						X										
146 Main Street	Essential Services Facilities	Public Utility Plant and Substation Facilities	Propane Station	AmeriGas	Zone X (unshaded)	Low	Moderate						X										
Chester Flood Control Channel - Hwy 36	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Chester Flood Control Channel	Zone X (unshaded)	Low	Moderate																
Feather River Dr	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Branch Creek - Bridge Number: 09C0048	Zone A	Low	Very High						X										

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Specific Type	Name/Owner	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
KAA387	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Chester Fire Protection District	Zone X (unshaded)	Low	Moderate						X										
Hamilton Branch - Hwy 36	Essential Services Facilities	Transportation Lifeline Systems	Bridge - State Hwy	Hamilton Branch	Zone A	Low	Very High																
WPFV359	Essential Services Facilities	Communication Sites and Facilities	Land Mobile Private	Culver, Luke	Zone X (unshaded)	Low	Moderate						X										
WPXZ452	Essential Services Facilities	Communication Sites and Facilities	Fixed Microwave	Pacific Gas and Electric Company	Zone X (unshaded)	Low	Very High																
Chester-Warner Valley Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Warner Creek - Bridge Number: 09C0162	Zone D	Low	Very High																
Off of USFS road 29N38E	Essential Services Facilities	Public Utility Plant and Substation Facilities	Electric Sub-Station	Chester (Num. of Lines: 1 / Volt: 69)	Zone D	Low	Very High																
Old Red Bluff Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	North Fork Feather River - Bridge Number: 09C0052	Zone D	Low	High																
Chester Warner Valley Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category C	Warner Creek - Bridge Number: 09C0050	Zone D	Low	Very High																
Chester Warner Valley Road	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Warner Creek - Bridge Number: 09C0067	Zone D	Low	Very High																
Dyer Mountain 40-14-20.6 N / 121-01-55.9 W	Essential Services Facilities	Communication Sites and Facilities	Repeater	Dyer Mtn. Repeater	Zone X (unshaded)	Low	Very High																

Address	Critical Facility Category	Critical Facility Subcategory	Critical Facility Name/Owner Specific Type	Flood Zone	Landslide Incidence	FHSZ	Antelope Dam	Bidwell Lake Dam	Butt Valley Dam	Bucks Diversion Dam	Caribou Afterbay	Chester Diversion Dam	Cresta Dam	Frenchman Dam	Grizzley Creek Dam	Grizzley	Grizzley Valley	Indian Ole Dam	Rock Creek Dam	Silver Lake Dam	Lake Almanor Dam	Bucks Storage
St Louis Rd	Essential Services Facilities	Transportation Lifeline Systems	Bridge (Local) - Category A	Slate Creek - Bridge Number: 09C0154	Zone D	Low	Very High															

Source: Plumas County GIS



Appendix G Wildfire History

Table G-1 Plumas County Wildfire History

Wildfire Name	Date	Cause Description	GIS Acres
(blank)	–	Unknown / Unidentified	163,031
CHIPS	7/28/2012	Campfire	76,346
MOONLIGHT	9/3/2007	Equipment Use	64,512
STORRIE	8/17/2000	Railroad	55,729
(blank)	–	Miscellaneous	38,396
BUCKS	8/23/1999	Lightning	27,888
WHEELER	7/5/2007	Lightning	22,330
PLUMAS NF #531 (CLARK)	8/30/1987	Miscellaneous	19,391
BTU LIGHTNING COMPLEX	7/2/2008	Lightning	16,476
MILK RANCH	9/11/1951	Miscellaneous	14,505
(blank)	(blank)	Lightning	12,926
SCOTCH	6/21/2008	Lightning	9,799
ELEPHANT	9/17/1981	Lightning	6,852
INGALLS (ASSIST #12)	9/17/1981	Unknown / Unidentified	6,697
RICH	7/29/2008	Railroad	6,111
COLD	6/21/2008	Lightning	5,600
BABCOCK	8/2/1977	Lightning	5,056
HORTON 2	8/24/1999	Equipment Use	4,942
PIDGEON	8/23/1999	Lightning	4,714
LAYMAN	9/6/1989	Miscellaneous	4,450
MINERVA 5	7/29/2017	Arson	4,340
MADDALENA	7/25/1996	Equipment Use	3,976
STREAM	7/25/2001	Lightning	3,526
FERRIS	6/25/1974	Miscellaneous	3,289
BOULDER	6/25/2006	Lightning	2,919
LOOKOUT	8/23/1999	Lightning	2,615
(blank)	10/30/1978	Railroad	2,596
WILL	9/18/1979	Miscellaneous	2,396
RAMELLI	8/31/1950	Unknown / Unidentified	2,178
CARMAN #2	8/9/1972	Lightning	1,790
CHILCOOT	7/20/2003	Lightning	1,770
(blank)	7/5/1972	Miscellaneous	1,676

Wildfire Name	Date	Cause Description	GIS Acres
CASHMAN	7/30/1977	Smoking	1,556
WALKER	8/6/1990	Lightning	1,496
DEVILS GAP	8/22/1999	Lightning	1,480
PLUMAS N.F. #2	8/4/1959	Miscellaneous	1,409
RACK	7/8/1989	Miscellaneous	1,399
LITTLE	6/22/2008	Lightning	1,291
COOKS	8/9/1996	Equipment Use	1,138
BELL	8/25/1970	Miscellaneous	1,082
ASSIST P.N.F.	8/31/1987	Unknown / Unidentified	1,047
BAR	7/31/2010	Arson	1,039
CHILCOOT	8/6/2017	Lightning	1,020
GARNIER	8/8/1950	Miscellaneous	1,009
SLOAT	7/21/1981	Miscellaneous	907
HOT SPRINGS	8/14/1980	Arson	838
(blank)	8/2/1973	Equipment Use	775
PEAK	7/28/2012	Debris	709
JUNCTION	9/26/1974	Miscellaneous	678
RENO	9/1/1969	Unknown / Unidentified	610
COTTONWOOD	5/4/2004	Debris	567
(blank)	8/29/1988	Lightning	528
HUNGRY	6/25/2006	Lightning	512
COOKS	7/24/1964	Miscellaneous	501
GREENHORN	6/29/1990	Playing With Fire	497
ROSS	8/8/1977	Arson	475
STAG	8/23/1999	Lightning	467
CABIN W.P.R.R. #2	6/28/1976	Unknown / Unidentified	452
EUREKA	9/5/2017	Lightning	446
CHAMBERS CREEK	9/6/1957	Miscellaneous	432
(blank)	8/18/1987	Equipment Use	409
BABCOCK PEAK	7/5/2007	Lightning	407
HAY	9/3/1952	Miscellaneous	401
GREASE	7/16/2006	Arson	366
BECKWITH (TAHOE NF)	7/30/1984	Unknown / Unidentified	344
(blank)	10/24/1972	Miscellaneous	344
RIDGE/HEIGHTS	8/18/2013	Lightning	336
HARTMAN	6/21/2008	Lightning	331
MARTINECK	8/12/1996	Lightning	331

Wildfire Name	Date	Cause Description	GIS Acres
COYOTE	9/9/1973	Miscellaneous	319
SILVER	9/19/2009	Miscellaneous	311
CAMP	11/8/2018	Powerline	306
MILLFORD	9/2/1950	Miscellaneous	301
(blank)	6/13/1979	Miscellaneous	297
LONE ROCK VALLEY	8/7/1950	Lightning	293
MILFORD GRADE	4/22/2009	Lightning	284
POINT	8/14/1980	Unknown / Unidentified	284
ELEPHANT	8/16/2009	Miscellaneous	270
TOBIN	9/26/2016	Miscellaneous	248
CUB	6/21/2008	Lightning	190
WILSON	9/28/2018	Miscellaneous	187
EAGLE	7/7/1989	Lightning	179
CLAREMONT	8/23/1999	Lightning	178
SOUTH-FREY	6/21/2008	Lightning	171
CARMAN #1	8/8/1972	Lightning	158
(blank)	11/6/1971	Debris	140
CHROME	8/23/1999	Miscellaneous	135
MARTIN	11/2/2004	Debris	131
WARD	6/2/2015	Unknown / Unidentified	129
(blank)	7/5/1983	Arson	119
(blank)	8/14/1986	Smoking	118
MURPHY	8/7/2018	Miscellaneous	117
SQUIRREL	9/27/2017	Arson	113
(blank)	5/29/1984	Arson	108
GULCH	7/25/2010	Lightning	103
(blank)	8/11/1972	Miscellaneous	102
CATEYES	5/2/1996	Debris	96
JOHNSON	8/18/2013	Lightning	91
STONY	4/27/2004	Debris	91
CROCKER	7/24/2018	Lightning	87
RANCH	9/6/2017	Lightning	84
KEDDIE	6/21/2008	Illegal Alien Campfire	78
CLIFTON	5/10/2007	Debris	77
MILLS	9/3/2017	Miscellaneous	75
BIG	6/21/2008	Lightning	74
(blank)	5/6/1974	Railroad	72

Wildfire Name	Date	Cause Description	GIS Acres
(blank)	8/26/1984	Lightning	71
(blank)	8/19/1984	Miscellaneous	68
(blank)	8/9/1988	Lightning	63
ROCK	8/13/2010	Arson	62
(blank)	9/1/1981	Equipment Use	62
TOLL	8/20/2017	Arson	58
(blank)	8/30/1987	Lightning	55
CRESCENT	6/30/2017	Arson	53
CORRECO	7/27/2003	Lightning	52
CINDER	9/25/2003	Miscellaneous	49
ELEPHANT	7/29/2017	Lightning	31
MARK	8/16/1955	Miscellaneous	16
(blank)	11/9/1989	Debris	9
(blank)	6/28/1973	Lightning	7

Source: CAL FIRE, from data dated 5/1/2019

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