Annex G Plumas Eureka Community Services District

G.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Plumas Eureka Community Services District (PECSD or District), a new participating jurisdiction to the 2026 Plumas County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides information specific to the PECSD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

G.2 Planning Process

As described above, the PECSD followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Plumas County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table G-1. Additional details on Plan participation and District representatives are included in Appendix A.

Table G-1 Plumas Eureka Community Services District– Planning Team

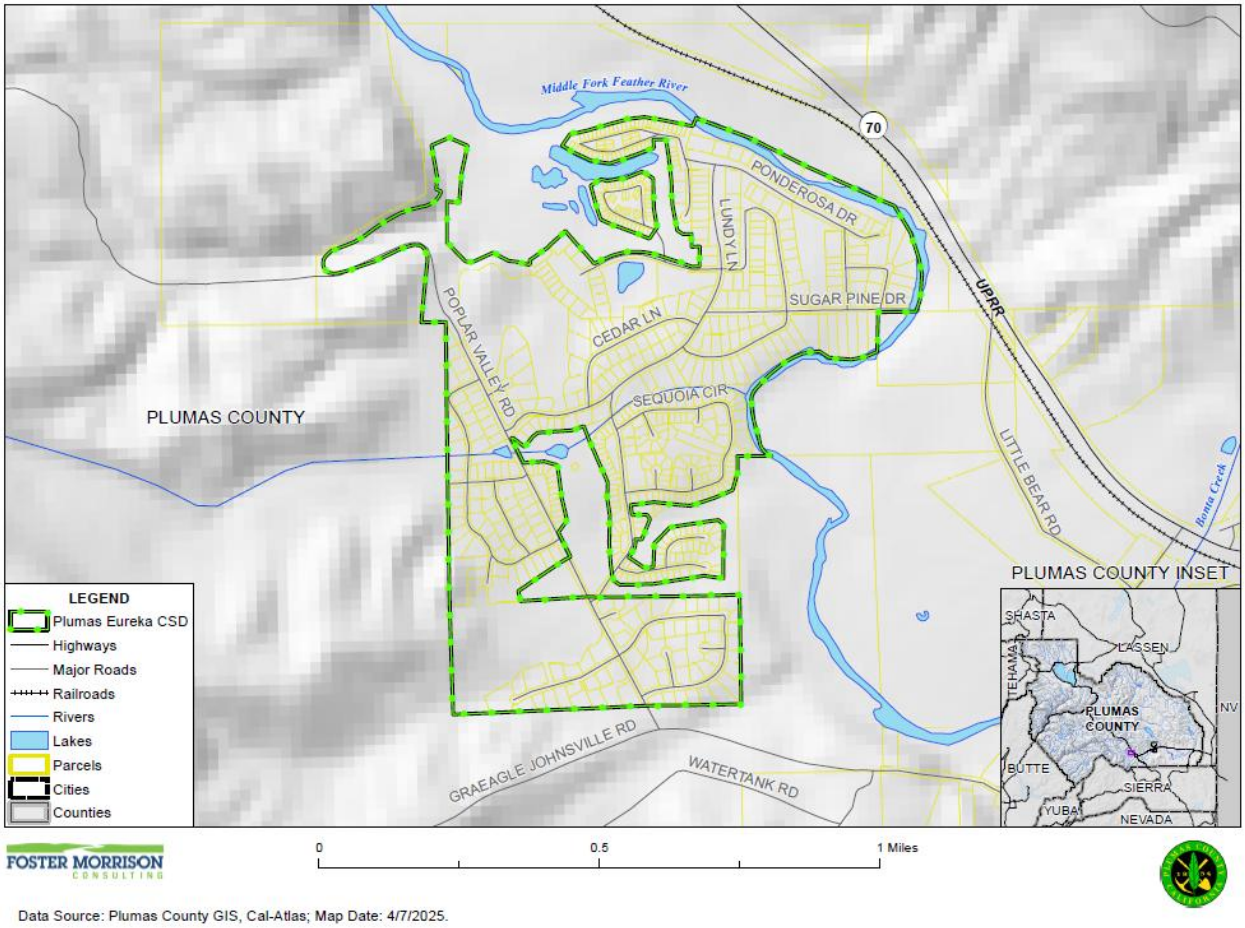
Name	Position/Title	How Participated
Jamar Tate	General Manager	Attend meetings, review previous plan, provide plan updates
John Rowden	Extra help	Consultation

Source: PECSD

G.3 District Profile

The community profile for the PECSD is detailed in the following sections. Figure G-1 displays a District map and the location of PECSD within Plumas County. Figure G-2 shows the parcels inside the District, as well as the location of water and the golf course.

Figure G-1 Plumas Eureka Community Services District



Data Source: Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Figure G-2 Plumas Eureka Community Services District – Parcels Map

Source: PECSD

G.3.1. Overview and Background

PECSD provides fire suppression, emergency medical, water, wastewater, snow removal and road maintenance services. PECSD was formed in 1993 as an independent special district. The area was originally served by County Service Area (CSA) 8, until 1989 when the CSA was dissolved. Following the dissolution, the Board of Directors (County Board of Supervisors) of the dissolved CSA formed the CSD to continue providing services formerly provided by the CSA to the residents and land owners of Plumas-Eureka Estates and Eureka Springs Subdivision, such as water and wastewater. In addition, the newly formed CSD took on the responsibility of fire services, which had been operating under the direction of the developer of the community with cooperation from Plumas County since 1981. The District currently provides the same services as when it was formed. PECSD is considering adding parks and recreation to the list of its services. A piece of land was donated to PECSD in 2010, and the District is now planning to turn it into either a dog park or a picnic area.

The PECSD boundary is entirely within Plumas County. The District's boundaries encompass approximately half of a square mile. There has been one annexation to and no detachments from the District since its formation. In 1994, the District annexed Eureka Springs Subdivision, which encompassed 62 acres or 0.1 square miles. Now the District consists of the Plumas Eureka Estates, the Eureka Springs Subdivision, and the Village of Plumas Pines Subdivision, and surrounds the Plumas Pines golf course. Many of the residential homes are located adjacent to the golf course.

Through an informal agreement with the Sheriff's Office, which is discussed in more detail in the Fire Service Section, the District responds outside of its boundaries. The District's fire service area extends beyond its boundaries to the east and south and includes an area of 20 square miles compared to half a mile of boundary area. PECSD provides fire protection services to two property owners in the community of Johnsville. The District provides extra-territorial fire services to the communities of Blairsden, Graeagle, Clio and Whitehawk under a joint automatic aid dispatch with GFPD. It also has informal mutual aid agreements with all other fire service providers in Eastern Plumas County. The District does not provide any extra-territorial water and wastewater services.

G.4 Risk Assessment

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

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

Building on the District Profile above, a risk assessment was performed for the District. This includes the following sections:

- G.4.1 Assets Inventory and Growth and Development Trends
- G.4.2 Hazard Identification
- G.4.3 Hazard Profiles and Vulnerability to Specific Hazards

G.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the PECSD's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the PECSD's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section G.4.3 Hazard Profiles and Vulnerability to Specific Hazards.

- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

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

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section G.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and are served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District. The District has four full-time staff members, not including the volunteer fire department. In addition to District staff, the District provides services to 320 year-round residents and 1,000 seasonal.

The median age in Plumas Eureka, according to census data is 67.5 years of age, accounting for 57.3% of the population. This age demographic is considered elderly. In the event of wildfire or other catastrophic event, evacuation of this population may be difficult.

Structures and Critical Facilities

This section considers the PECSD's assets at risk, with a focus on key District assets such as critical facilities and infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in***

severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

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

Table G-2 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. PECSD's physical assets, valued at over $18 million, consist of structures and infrastructure to support the District's operations.

Table G-2 PECSD Critical Facilities and Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Fire Station/CSD Offices	Emergency response, administrative	$704,680	Wildfire, high winds, earthquake
Wastewater Treatment Plant #6	Wastewater treatment	$480,737	Wildfire, high winds, flooding, earthquake
Wastewater Treatment Plant #7	Wastewater Treatment	$ 1,857,242	Wildfire, high winds, earthquake
Well 1b	Potable Water Supply	$88,276	Wildfire, high winds, earthquake, drought
Well 2	Potable Water Supply	$88,276	Wildfire, high winds, drought, earthquake
Water Distribution System	Water Supply Infrastructure	$10,000,000	Earthquake
Wastewater Collection System	Wastewater Conveyance Infrastructure	$3,000,000	Earthquake
Water Storage Tanks	Potable Water Supply/Storage	$1,800,000	Earthquake, Wildfire
Sequoia Lift Station	Pump Station- Raw Sewer	$80,000	Earthquake
Tank House	Effluent Storage	$84,148	Earthquake, high winds,
Lift Station- Poplar Valley Road	Pump Station	$157,614	Earthquake
Total		**$18,340,973**	

Source: PECSD

Community Lifelines

Assessing the vulnerability of the PECSD to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.

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

Community lifelines, as defined by FEMA, include the following:

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

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Plumas County Planning Area serving as a partnership between the city, local special districts and agencies, and Plumas County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the District and how they may be affected by a hazard event or disaster are discussed in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the PECSD to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.

- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

PECSD has a variety of natural resources of value to the District. These natural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. Specifically, the District values its groundwater, surface water & riparian corridors, wetlands, timber/mixed conifer forests, as well as the wild & scenic river (Feather River).

Historic and Cultural Resources

PECSD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallel that of Plumas County as a whole. Information can be found in Section 4.2.1 of the Base Plan. PECSD does not have any unique historical or cultural resources within District boundaries but there are resources adjacent to the District such as Plumas-Eureka State Park, historic mining town of Johnsville, and Johnsville Historic Ski Bowl.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the PECSD to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

The primary economic asset in Plumas Eureka is the golf resort of Plumas Pines. Plumas Pines is the major employer in our jurisdiction, employing approximately 20-30 people seasonally, including the Longboards Restaurant. Resort events include numerous golf tournaments, weddings, reunions, prom, and other special events. Rental properties are another economic asset in Plumas Eureka, many homes are rented during the peak golf season, bringing an increase in population to the jurisdiction. Hazard events would impact these economic drivers and assets by limiting accessibility of patrons to these businesses and homes. A catastrophic event would hinder the income of the golf resort and potential cause closure if the hazard event damage was significant.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community

Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This inventory section details future development/redevelopment projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc.
- Plans for expansion or build out of the District's service area, including new service hookups, and other District functions related to where the District will be expanding services.

Population Trends and Projections

Currently, there is no expected growth or development areas within District boundaries. Like the rest of the County, the District expects population to be flat or slowly shrink. The District noted that it has no control over future populations it serves, it only reacts to population changes by providing additional (or reduced) services.

Future Development Areas

It is important to review future development plans for the District. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards. While there is no expected growth or development areas within District boundaries, PECSD is currently in the design process for a water treatment facility. It is anticipated that this facility will be completed within 2-3 years and will be designed to meet the standards for arsenic, iron, and manganese.

G.4.2. Hazard Identification

The PECSD identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table G-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard to the District. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table G-3 PECSD—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Likely	Critical	Low	Medium
Climate Change	Limited	Unlikely	Limited	Medium	--
Dam Failure	Extensive	Likely	Limited	Low	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Occasional	Catastrophic	High	High
Earthquake (w/subhazards)	Significant	Likely	Limited	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Likely	Limited	Low	Medium
Floods: Localized Stormwater	Significant	Occasional	Limited	Medium	Medium
Hazardous Materials Transport	Limited	Unlikely	Negligible	Low	--
Landslide, Mudslide, Debris Flow	Extensive	Likely	Negligible	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Highly Likely	Negligible	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Critical	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Significant	Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Negligible	Low	Medium
Volcano	Extensive	Unlikely	Limited	Low	Low
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

G.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the PECSD (as identified in the Significance column of Table G-3). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Plumas County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Vulnerability Overview** – A general discussion of the hazard vulnerability and related issues is detailed here.
- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section G.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are common to all jurisdictions and are fully covered in Section G.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development will affect or influence each hazard over time is also included. This considers both new District assets and improvements as well as any changes in service area.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from causing a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires can be much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

PECSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment. The District noted that there have been no Power Outages, including those associated with PSPS events, that have affected them.

Plumas Eureka CSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The District falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the PECSD, the Plumas County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

PECSD Events

The District noted that climate change is occurring, but could recall no events related directly to climate change.

Vulnerability to Climate Change

The whole of the District is at some measure of vulnerability to climate change. The District Planning Team has concerns that the vulnerability of the District to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the District's assets at risk, and impacts to this hazard.

Local Concerns

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

Prolonged periods of heat and dryness that contribute to drought and water shortages are of major concern to the District. This impacts their aquifer levels and contributes to tree mortality which is a large issue for PECSD. The District has seen an increase in tree mortality due to drought related issues. Specifically, the invasive species, bark beetles. In addition, climate change can be linked to other hazards the District is concerned about.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time.

While all populations (District staff and those served by the District) can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people,

people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section G.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities and Infrastructure

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the District are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the District support rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the District are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the extreme heat and drought hazard, areas of wetlands in the District may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the District is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.

- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

PECSD faces a tighter, more volatile operating environment as climate change shifts snowmelt earlier, lengthens dry seasons, and raises summer peaks—reducing late-season groundwater and stressing wells just as demand climbs. Heavier downpours and rain-on-snow events elevate localized flooding, erosion, and access issues, and a longer wildfire season drives smoke exposure, PSPS power outages, and tree mortality.

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

Future Conditions/Future Development

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

Future Conditions

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

- As climate change continues to accelerate over time, climate related impacts to the District will continue to increase.
- Population projections for the area served by the District show shrinking populations, which should reduce the affect of this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect climate change impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Climate change can influence future development in the District over time. The District could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are

currently no formal studies of specific migration patterns expected to impact the District, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the secondary hazards of drought in the Plumas County Planning Area, that can also affect PECSD, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue. Current drought conditions in the District are shown in Section 4.3.9 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Plumas County. This can be seen in Table G-4. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County since 2012.

Table G-4 Plumas County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 2 NCDC drought events in Plumas County since 1993. These most likely had some impact on the District.

PECSD Events

Based on historical information, the occurrence of drought in California, including the PECSD, is cyclical, driven by weather patterns. Section 4.3.9 of the Base Plan notes that five droughts have occurred in the past 86 years that likely affected the District. Drought has occurred in the past and will occur in the future.

In 2024, PECSD spent $8,200 for the removal of large Ponderosa Pine trees that required the use of crane due to the location of the surrounding homes and underground infrastructure. Trees on District property are being removed yearly due to tree mortality. Drought is an annual occurrence in the District.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California

must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.9 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the PECSD to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

Chief concern with drought for the District is the recovery of ground water aquifers over an extended period of drought. The District noted that, so far, this has not been an issue of urgency but will be monitored. PECSD does have two groundwater wells but has not experienced any water shortage. Water levels in the wells have monitoring equipment and recover after use, especially in the "off season" for irrigation. Summer months see an increase in water demand due to irrigation practices. PECSD has water conservation measures in place during the summer months to reduce the misuse of water.

The District's water supply is vulnerable to recurring droughts and long-term climate variability, which threaten water reliability for both residential and community needs. Current water demand for non-potable uses such as irrigation places unnecessary strain on potable supplies. Without diversifying supply and reducing reliance on potable water for irrigation and landscaping, the District faces increased risk of water shortages during extended dry periods.

In recent years our District has seen an increase in tree mortality. In 2024, PECSD spent $8,200 for the removal of large Ponderosa Pine trees that required the use of crane due to the location of the surrounding homes and underground infrastructure. Trees on District property are being removed yearly due to tree

mortality. Also, as precautionary measures, Plumas-Sierra Rural Electric Co-Op has been removing dead or dying trees yearly that pose a risk to overhead powerlines in the area. Approximately 5-7 trees were removed by PSREC within District boundaries in 2024.

There are no relevant plans in place for drought, the District has water conservation measures in place to address misuse of water. The District does not have a plan in place to address the tree mortality issue, invasive insects such as the bark beetle have wreaked havoc on the tree population due to the drought conditions. It is difficult to anticipate which trees will be affected from year to year.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities. The District noted the following assets in Table G-5 at risk from drought.

Table G-5 PECSD Assets at Risk from Drought

Name of Asset	Facility Type	Replacement Value
Well 1b	Potable Water Supply	$88,276
Well 2	Potable Water Supply	$88,276

Source: PECSD

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, golf course watering, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

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

Future Conditions

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

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Planning Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

Future Development

The District's water supply is vulnerable to recurring droughts and long-term climate variability, which threaten water reliability for both residential and community needs. Current water demand for non-potable uses such as irrigation places unnecessary strain on potable supplies. Without diversifying supply and reducing reliance on potable water for irrigation and landscaping, the District faces increased risk of water shortages during extended dry periods.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–Extremely High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. The PECSD, Plumas County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the District are shown in Section 4.3.10 of the Base Plan. These include the Almanor Fault,

Butt Creek Fault Zone, the Mohawk Valley Fault, and others that traverse the County. The Indian Valley Fault is also considered an active fault located within the County. A significant seismic event on any of these major faults could cause damage in the PECSD.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.10 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of some magnitude occur.. Seismic shaking maps for the area in Section 4.3.10 of the Base Plan show Plumas County and the District fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Plumas County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

PECSD Events

Plumas County has numerous small seismic events per year, some are felt within the jurisdiction, while others are not. In May of 2023, a 5.5 magnitude earthquake in the Lake Almonor area was felt throughout the County including Plumas Eureka. As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The HMPC noted no past occurrences of earthquakes that affected the District in any meaningful way.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. More urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Plumas County Planning Area,

seismic hazard mapping indicates that the District has low to moderate seismic hazard potential. There is the potential for the District and Plumas County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

The whole of the District is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

The biggest concerns in an earthquake are damage to critical facilities and infrastructure. In a significant seismic event, PECSD's water distribution system and sewer collection would be vulnerable. PECSD operates welded/bolted steel ground storage tanks that predate modern seismic standards. This vulnerability was identified in a Preliminary Engineering Report (PER) by Stantec Engineering in 2016. A significant earthquake could cause tank shell buckling, roof/shell failures, piping breaks, or foundation distress—resulting in major water loss, service outages, contamination risk, and inability to provide required fire flows to the community. Seismic retrofits or replacement are needed to maintain life-safety functions and continuity of operations.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those residing in the District Service Area) are at risk from earthquake shaking and associated hazards. The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County and District may be affected is included in Section 4.3.10 of the Base Plan.

Structures and Critical Facilities and Infrastructure

Many structures and critical facilities and infrastructure in the District are vulnerable to earthquakes, depending on the severity and location of the event. These can be seen in Table G-6. The Hazus scenarios conducted for the entire Plumas County Planning Area show how structures may be affected.

Table G-6 PECSD Assets at Risk to Earthquake

Name of Asset	Facility Type	Replacement Value
Fire Station/CSD Offices	Emergency response, administrative	$704,680
Wastewater Treatment Plant #6	Wastewater treatment	$480,737
Wastewater Treatment Plant #7	Wastewater Treatment	$ 1,857,242
Well 1b	Potable Water Supply	$88,276
Well 2	Potable Water Supply	$88,276
Water Distribution System	Water Supply Infrastructure	$10,000,000
Wastewater Collection System	Wastewater Conveyance Infrastructure	$3,000,000
Water Storage Tanks	Potable Water Supply/Storage	$1,800,000
Sequoia Lift Station	Pump Station- Raw Sewer	$80,000
Tank House	Effluent Storage	$84,148
Lift Station- Poplar Valley Road	Pump Station	$157,614
Total		**$18,340,973**

Source: PECSD

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.10 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the PECSD staff, residents, and visitors. Other impacts to the District could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake. The District has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

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

Future Conditions

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

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. A new water treatment facility is in the design process currently for the District and will follow and enforce the California Building Code, which mandates construction techniques that minimize seismic hazards. Future development in the District is subject to these building codes and land use planning.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the District and the Plumas County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The PECSD is subject to localized flooding throughout the District. This is discussed in Table G-7 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the District vary by location. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the District tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 19 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 15 flood related events for the entire County Planning Area reported since 1993.

PECSD Events

PECSD noted an event in January 2017 where localized flooding was an issue in the District. Heavy rains caused localized flooding. The wastewater collection system was inundated with flood water, damaging sewer pumps. There was erosion to roads and water main right of way. The District saw costs from the removal of debris from fallen trees. Golf course is the major business in this area, it was closed at the time of the event, but golf course did incur cost for repairs from the damage. Damage to Golf course fairways and greens, requiring clean-up and repair. Extensive damage to Golf Course drainage system located near maintenance shop, requiring major repairs.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized floods. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the District. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the District are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the District are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

Due to homes and critical facilities being located near and around the Middle Fork Feather River, localized flooding can cause major damage. Historically, the District has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the District and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the District. The lack of or inadequate drainage infrastructure in the District contributes to localized flooding issues.

The District tracks localized flooding areas. Affected localized flood areas identified by the PECSD are summarized in Table G-7.

Table G-7 PECSD – List of Localized Flooding Problem Areas

Road/Area Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Ponderosa Drive	X		X	X		X	X
Sugar Pine Drive	X			X		X	
Sugar Pine Ct.	X					X	

Source: PECSD

The District noted that evacuation routes are not currently clearly identified or communicated to residents, which could result in confusion and delays during an emergency. Additionally, the District lacks a coordinated notification system to quickly alert residents of evacuation orders and emergency updates. This gap creates a significant risk to public safety during hazard events. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

Wastewater Treatment Plant 6 (WWTP6) is in an area subject to seasonal flooding during periods of heavy rainfall and snowmelt. Flooding has the potential to overwhelm treatment facilities, damage mechanical/electrical components, contaminate effluent discharge, and create public health hazards. The facility's location and lack of protective flood control infrastructure increase operational risks.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for District staff and District residents to travel throughout the District.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many open spaces take overflow water and release it into the

underlying soils and natural areas. Wetlands areas in the District actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical District infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to District facilities. Standing water can cause damage to crops, roads, and foundations of District facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

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

Future Conditions

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

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development

traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the District, such as the water treatment plant, will add to the drainage issues already faced by the District, unless adequate drainage facilities are installed in new development locations.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)

- Road building, excavation, and grading
- Earthquake

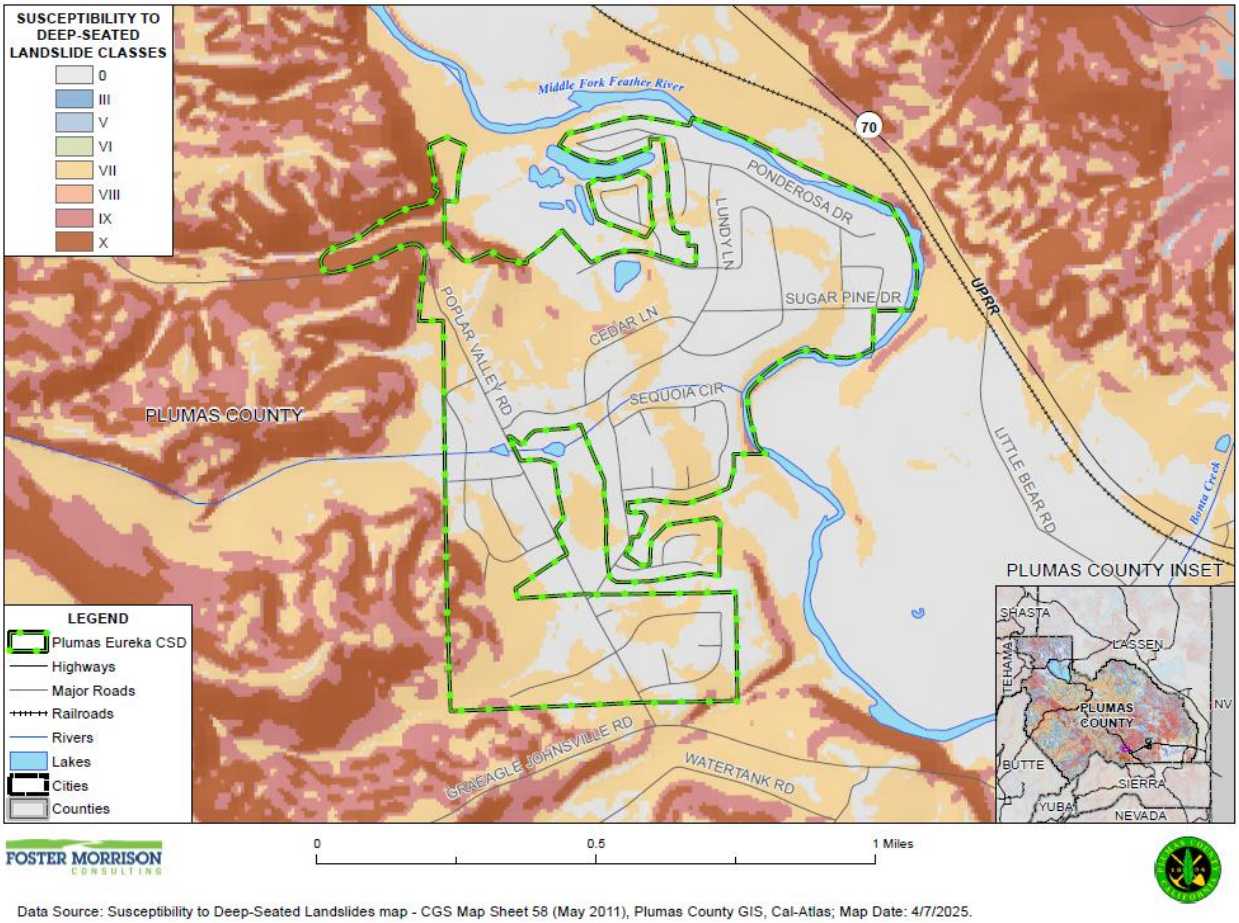
The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas bordering the District mainly to the west and partially to the east where the topography is characterized by rolling hills and ridges.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

Figure G-3 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure G-3 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table G-8. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the western portions of the District and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure G-3 PECSD – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Table G-8 PECSD – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Jurisdiction/ Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	207	59.7%	103	61.7%	104	57.7%
III	0	0%	0	0%	0	0%
V	0	0%	0	0%	0	0%
VI	0	0%	0	0%	0	0%
VII	118	33.9%	52	31.0%	66	36.6%
VIII	0	0%	0	0%	0	0%
IX	11	3.2%	4	2.6%	7	3.7%
X	11	3.2%	8	4.7%	3	1.9%
Grand Total	**348**	**100.0%**	**168**	**100.0%**	**180**	**100.0%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Plumas County; however, as shown in Table G-9, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table G-9 Plumas County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains 21 records for landslides or debris flows in Plumas County since 1993.

PECSD Past Occurrences

In 2017, there was damage to the District from erosion. Fortunately, a full landslide did not occur from the erosion. The District's main water transmission line, an eight inch PVC pipe that conveys water from the source wells to the storage tanks, was left exposed by erosion that removed cover from where the line crossed the creek. Options for protecting the water line included

- Boring under the creek and reburying the water line.
- Boring under the creek, encapsulating the water line and reburying the line under the creek
- Rerouting the water line so it does not go under the creek.

A very preliminary cost estimate was done for the first option of $50,000.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the District are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. Post wildfire areas are also more prone to landslide events. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure

to landslide. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

During landslide, transportation routes may be cut off. Currently, evacuation routes are not clearly identified or communicated to residents, which could result in confusion and delays during an emergency. Additionally, the District lacks a coordinated notification system to quickly alert residents of evacuation orders and emergency updates. This gap creates a significant risk to public safety during hazard events.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and District residents) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. Most vulnerable are those people working or residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in the District service areas as well as District staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Landslides can affect the built environment of the District and those structures and critical facilities located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure G-3 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area District, since most of this occurs in the less developed areas of the District.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the District susceptible to landslide. Based on the risk assessment, there is potential for significant landslides to occur in the District. Most, but not all, of the historic landslides in the District have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

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

Future Conditions

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

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the District to landslide.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the District. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the District would place additional values at risk to landslide. New District facilities will take landslide into account when siting new facilities.

Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Excess snow can cause avalanches to occur. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are some of the most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to agricultural industry.

Location and Extent

Extreme cold and freeze events occur on a regional basis. Due to the elevation of the District, the winter months can see temperatures dip as low as 17ºF as the average high with sub-zero temperatures possible in the evenings. There is no scale for extreme cold and freeze other than temperatures below 32°F. Extreme cold and freeze have a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Extreme cold can occur in any location of the City. All portions of the District and County are at risk to extreme cold and freeze.

Snowfall can affect almost all areas of the County and the District. Average annual snowfall can be up to 54” with an average of 13” throughout the District. Depending on the elevation of any given area, severe snowstorms are some of the most common extreme weather events that occur in the City and Plumas County. There is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of snowfall other than snow depths. Heavy snow has a slow to moderate onset and can generally be predicted in advance for the County. Snow events can last for hours or for days, and snow can stay on the ground for weeks to months at a time.

Avalanche affects only certain areas of the County and the District. PECSD is at a moderate to high risk for avalanches during winter due to heavy snowfall, steep terrain, and cold climate conducive to unstable snowpack. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement to create an avalanching episode. Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This scale can be seen in Section 4.3.2 of the Base Plan.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declarations for extreme cold and freeze. There were no disasters from snow or from avalanche. Table G-10 shows the dates of the disaster declarations. There have been USDA disaster declarations (2016, twice in 2022, 2023) from freeze since 2012.

Table G-10 Plumas County – Federal and State Disaster Declarations for Freeze 1950-2025

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

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 549 extreme cold, freeze, and snow incidents for Plumas County since 1993, some of which likely affected the District.

PECSD Events

The District noted no known past events that have caused lasting impacts.

Climate Change and Extreme Cold, Freeze, and Snow (w/avalanche)

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

Vulnerability to Extreme Cold, Freeze, and Snow (w/avalanche)

Extreme cold and freeze events happen in the District each year. Snow occurs regularly and can contribute to avalanches occurring in sloped areas. Cold, freeze, snow, and avalanche can impact both structures and populations in the Planning Area and in extreme conditions, may affect the ability of the District to operate. The whole of the District and County Planning Area has some measure of vulnerability to extreme cold, freeze, and snow, including avalanches.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to District. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

Vulnerable populations in the District, specifically the elderly, are a high concern to PECSD. If a power outage were to occur from extreme cold or freeze, loss of heat sources could be deadly. Along with this, heavy snow could cause problems for emergency services, decreasing response time and causing apparatus to be immobile if roads have not yet been plowed.

The District is also concerned with rain on snow events, which can cause greater flooding in the District.

PECSD's key vulnerabilities include single-point dependencies (single access routes to facilities), power and communications exposure (PSPS/outages, SCADA/cellular interruptions), winter road/access constraints, and small-staff call-out depth. Extreme cold and freeze events can immobilize service lines, sampling lines, valves, hydrants, and tank appurtenances. Heavy snow and ice routinely bury hydrants and valves, block access to wells, tanks, and leach-field boxes, and disrupt power/telecom; priority actions include a dedicated facility snow route with on-call plowing, road/gate, hydrant staking, clearing access to hydrants, pre-winter preparation of facilities.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and populations the District serve are at some vulnerability to extreme cold, freeze, and snow, as well as avalanches. Some employees may face a risk while working outdoors. All populations served by the District are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside (including District staff). Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Snow has an effect on buildings, but its effect on people and populations are minimal. Avalanche can affect populations, though the District has few developed areas at risk to avalanche.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur and can be heavy enough to damage structures. Transportation networks, communications, and utilities

infrastructure are the most vulnerable physical assets in the District. Infrastructure such as roads, highways, and bridges can become slippery or blocked by large snow events, causing accidents and road closures. Buildings in the upper elevations of the District can be affected directly by avalanche events. Most of these events occur away from structures in the District.

Natural, Historic, and Cultural Resources

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

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

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the District. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the District can include interruption in business and school activities.

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

One of the most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur during extended periods of snow when new snow is deposited on the existing snow pack causing stress on the layers beneath and triggering a collapse resulting in an avalanche. Avalanches can also be triggered by severe weather such as high winds and unusually warm weather and even earthquake events. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

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

Future Conditions

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

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow (and avalanche) and their associated impacts to the District.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District area are expected to be limited in the near future and thus are not likely to affect extreme cold and freeze and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current State of California and Plumas County codes provide such provisions for new construction. New wells and appurtenances will be built inside insulated buildings, reducing the risk of loss of potable water due to frozen pipes.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the District, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought

can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the District. Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues.

Location and Extent

Extreme heat events occur on a regional basis. In a higher elevation climate, the District typically has mild summers, however, can still experience periods of significant heat. The temperature average is around 80ºF but can get as high as 90ºF and even more rare, 95ºF. Extreme heat can occur in any location of the District. Extreme heat occurs throughout the District primarily during the summer months.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 7 extreme heat incidents for Plumas County since 1993, some of which likely affected the District.

PECSD Events

The District could not recall any past events of note.

Climate Change and Extreme Heat

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

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

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the District. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the District is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

The elderly are at a higher vulnerability to extreme heat, but all individuals can experience heat related illnesses, which is of high concern for the District. In addition, the District is concerned that heat may stress drought damaged trees, increasing the risk of wildfires.

Extreme heat drives higher peak demand (especially irrigation) just as groundwater performance can dip, stressing wells and storage. Water quality is harder to maintain: higher demand results in increased level of constituents such as arsenic, iron and manganese. Equipment—VFDs, motors, control panels—runs hotter, increasing over-temperature trips without added ventilation or shading. Regional heat waves also elevate grid outage/PSPS risk, while generators run harder and consume more fuel. Finally, worker safety is impacted: heat illness risk shortens safe field windows and slows responses, especially when smoke + heat occur together.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to extreme heat. Those District employees that work outdoors or inside facilities without proper cooling systems are likely to be most affected by extreme heat conditions.

Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues. All populations served by the District are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers (like District staff); individuals that lack the resources to afford heat; and the young, old, or medically fragile

individuals are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures and Critical Facilities and Infrastructure

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

Natural, Historic, and Cultural Resources

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

Impacts from Severe Weather: Extreme Heat

The District experiences temperatures in excess of 90°F during the summer and fall months. The temperature moves to 95°F in rather extreme situations. During these times, drought conditions may worsen, and the District may see an increase in dry fuels contributing to the wildfire hazard. Extreme heat can damage agricultural assets in the District service territory. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

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

Future Conditions/Future Development

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

Future Conditions

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

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heat and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

Future development in the District will take extreme heat into account. In the event of grid-tied power outages, a reliable backup power source must be included in development plans. Additionally, implementing energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

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

Location and Extent

Rains and storms can occur in any location of the District. All portions of the District are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the District as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table G-7 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the District and Plumas County. Duration of severe storms in the District can range from minutes to hours to days.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the District. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table G-11. IN addition, there have been two USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) since 2012.

Table G-11 Plumas County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1964, 1963, 1964, 1969, 1970 1980, 1986, 1993, 1992*, 1995 (twice*), 1996, 1997, 2006, 2017 (twice*), 2023 (twice*)	19	1950, 1955, 1958 (twice), 1963, 1964, 1969, 1970, 1986, 1992 (twice), 1995 (twice), 1997, 2006*, 2017 (twice*), 2023 (twice*)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 132 hail, heavy rain, and storm incidents for Plumas County since 1950.

PECSD Events

A severe weather event in 2017 with heavy rains, snow and high winds causing flooding, erosion and fallen trees. Private property damage occurred and the total of insured losses is unknown. On January 8, high surface and ground water levels resulted in extraordinary infiltration into the District's two sewage collection systems. The System at WWTP #6 overflowed inside the sewer plant flooding three pumps described in project 5 and resulting in a brief spill outside the plant. WWTP#7 also flooded internally, but did not damage any equipment. The two District system operators were required to work overtime to contain the problems at both facilities.

On February 9, 2017, the Middle Fork of the Feather River inundated condominiums by the flooding River. The manholes on Ponderosa Drive were flooded. The Wastewater treatment plant that is located in the area and serves the area was monitored through the evening hours and shutdown. The Volunteer fire department was asked to help to notify and evacuate residents.

Over the period of repetitive storms during January and February, the Driveway leading to Wastewater Treatment Plant #7 at 245 Sequoia Circle sustained heavy damage due to erosion. The driveway had never sustained this level of damage in the past. Based on two bids, the estimated repair cost is $4500.

In addition to this, the District noted that heavy rains and storms are an annual occurrence often resulting in flooding. Events causing flood issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Plumas County and the PECSD. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the District. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the District, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the District is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

Heavy rains on top of snow have caused flooding in the District in the past and is a major concern for the private structures and critical facilities. The District also noted that one of the primary issues associated with heavy rains and storms is the resulting flooding caused by large precipitation events. A list of localized flooding problem areas are shown on Table G-7 above. The District is also concerned with rain on snow events, which can cause greater flooding in the District.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and the populations served by the District are at some vulnerability to heavy rains and storms. Those District employees that work outdoors could be affected to a limited extent by this hazard. All populations served by the District have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

District facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the District. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

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

Future Conditions/Future Development

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

Future Conditions

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

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its service territory, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

Future Development

New District facilities follow state and local building codes which should reduce the risk to future development in the District from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the District.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the PECSD. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountainous areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires also occur in more populated developed areas. There is also the concern of wildfires occurring in these more remote, forested areas, that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Plumas County Planning Area and the District.

Wildfire Smoke and Air Quality

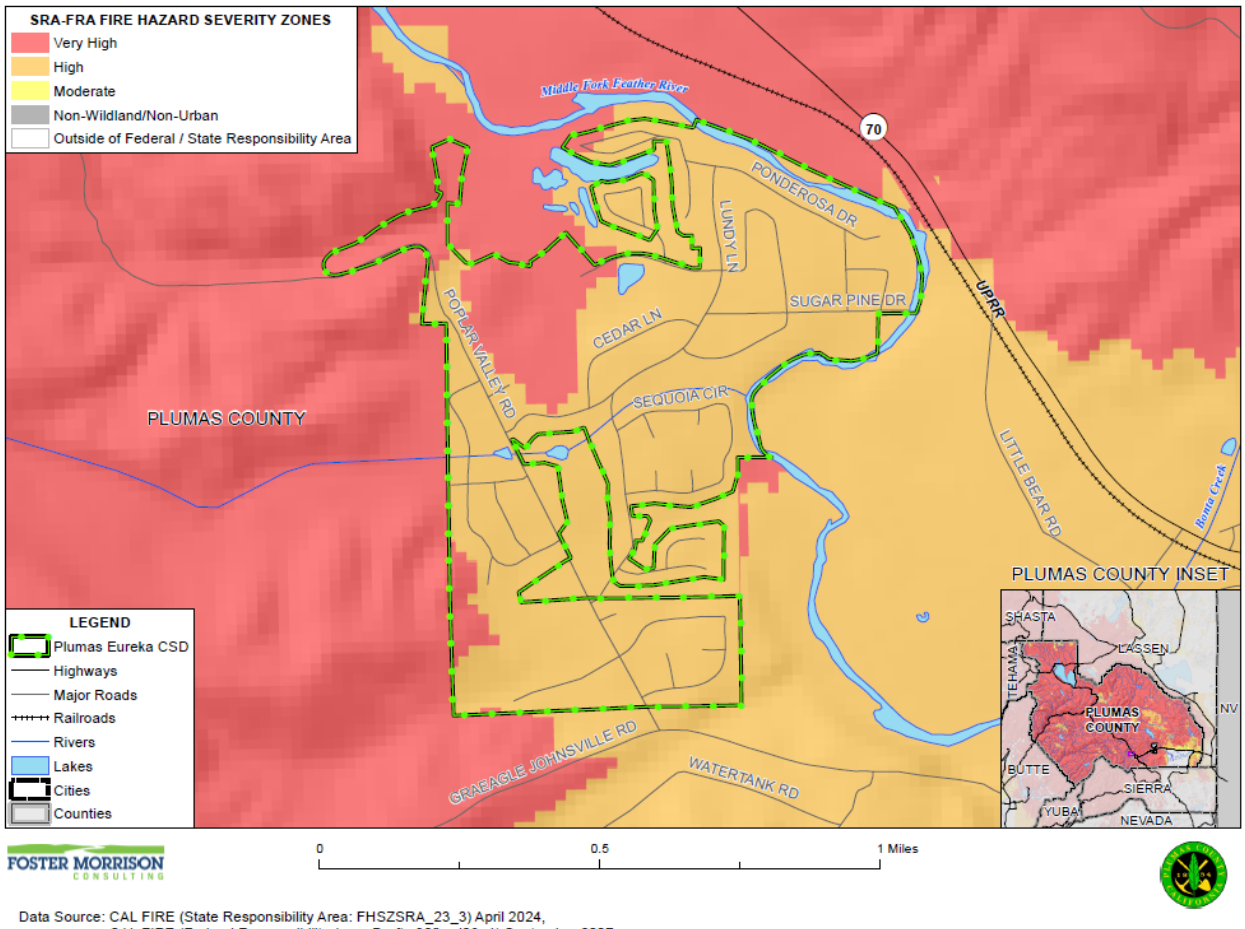
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Plumas County, nearby northern California communities, and elsewhere have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the Plumas County Planning Area.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, wildfire maps for the PECSD were created. Figure G-4 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure G-5 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Moderate to Very High.

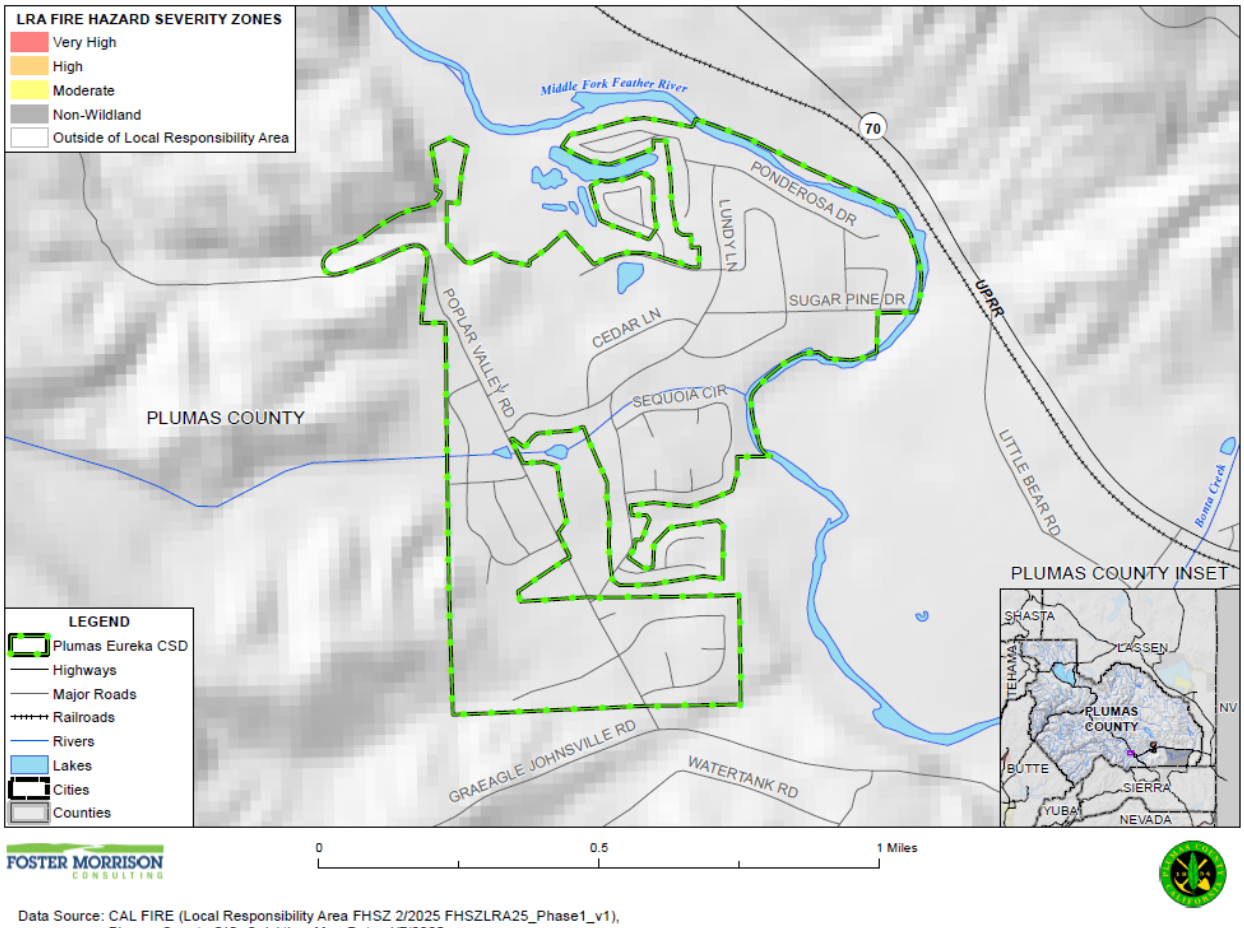
Figure G-4 PECSD – CAL FIRE SRA/FRA Fire Hazard Severity Zones



FOSTER MORRISON CONSULTING

Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c32fhszl06_1) September 2007,
Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Figure G-5 PECSD – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area FHSZ 2/2025 FHSZLRA25_Phase1_v1), Plumas County GIS, Cal-Atlas; Map Date: 4/7/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table G-12, while extents in the LRA are shown on Table G-13.

Table G-12 PECSD – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	52	15.0%	23	13.6%	30	16.4%
High	295	85.0%	145	86.4%	150	83.6%
Moderate	0	0%	0	0%	0	0%
Non-Wildland/Non-Urban	0	0%	0	0%	0	0%
Outside of Federal / State	0	0%	0	0%	0	0%

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Responsibility Area						
Grand Total	**348**	**100.0%**	**168**	**100.0%**	**180**	**100.0%**

Source: CAL FIRE

Table G-13 PECSD – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0%	0	0%	0	0%
High	0	0%	0	0%	0	0%
Moderate	0	0%	0	0%	0	0%
Non-Wildland	0	0%	0	0%	0	0%
Outside of Local Responsibility Area	348	100.0%	168	100.0%	180	100.0%
Grand Total	**348**	**100.0%**	**168**	**100.0%**	**180**	**100.0%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been eight state and six federal disaster declarations due to fire, as shown in Table G-14.

Table G-14 Plumas County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	8	1960 (unnamed), 1987(Clarks Fire), 1999 (Bucks Fire), 2020 (twice – Bear Fire, North Complex Fire), 2021 (three – Dixie Fire, Monument Fire, Lava Fire/Beckwourth Complex)	6	1999 (Bucks Fire), 2008 (BTU Lightning Complex), 2020 (twice – Bear Fire, North Complex Fire), 2021 (twice – Dixie Fire, Lava Fire/Beckwourth Complex)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 15 wildfire events in the County dating back to 1993. Many more fires have occurred, but were not reported to the NCDC database.

PECSD Events

In 2021, the Dixie Fire caused poor air quality in the District due to heavy smoke. Other fires have caused air quality issues as well. The District noted no fires that have directly affected them.

Climate Change and Wildfire

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

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.16 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Plumas County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Plumas County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

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

Plumas Eureka is surrounded by Plumas National Forest. In the event of a wildfire, egress from the District could be challenging depending on the location of the fire. The main ingress and egress route for the District is E. Poplar Valley that intersects Johnsville Road. The west end of Poplar Valley Road within the District leads into forested areas. With an elderly population in the District, evacuation efforts could be challenging. The District is also concerned about their facilities being burned by wildfires.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include the unhoused, infants and children under age five and their caregivers, the elderly (65 and older), individuals with disabilities, individuals' dependent on medical equipment, individuals who exercise, recreate, or work (like District staff) outdoors, and individuals with impaired mobility.

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. The District is most concerned with the assets listed in Table G-15.

Table G-15 PECSD – Assets at Risk to Wildfire

Name of Asset	Facility Type	Replacement Value
Fire Station/CSD Offices	Emergency response, administrative	$704,680
Wastewater Treatment Plant #6	Wastewater treatment	$480,737
Wastewater Treatment Plant #7	Wastewater Treatment	$ 1,857,242
Well 1b	Potable Water Supply	$88,276
Well 2	Potable Water Supply	$88,276
Water Storage Tanks	Potable Water Supply/Storage	$1,800,000

Source: PECSD

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources, and total destruction of natural resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures, critical facilities and infrastructure, and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause

short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E, Plumas Sierra REC, or Liberty Utilities to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts to the District include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. Plumas Eureka CSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment. Without backup electricity generation, water and wastewater could not be conveyed. Water quality will also suffer if water treatment functionality is compromised. The economic impact alone to the District including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

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

Future Conditions

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

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- Population projections for the area served by the District show the population to be shrinking, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus would have possible associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard. With adherence to development standards, future losses to new development should be minimal.

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered when assessing future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional assets at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, District building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

G.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

G.5.1. Regulatory Mitigation Capabilities

Table G-16 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the PECSD.

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will

conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located.

Table G-16 PECSD's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Does not address hazards, used to identify infrastructure improvements.
Climate Change Adaptation Plan		
Community Wildfire Protection Plan		
General Plan/Comprehensive Plan/Master Plan		
Continuity of Operations Plan		
Economic Development Plan		
Land Use Plan		
Local Emergency Operations Plan		
Stormwater Management Plan		
Transportation Plan		
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use		
Building code		
Flood insurance rate maps		
Floodplain ordinance		
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)		
Subdivision ordinance		
Zoning ordinance		
Other		
How can these capabilities be expanded and improved to reduce risk?		
The creation of a continuity of operations plan will help PECSD by providing guidance of how to continue operations of the District's critical infrastructure, including administrative functions during disaster event. This plan should identify the potential hazards and a plan of operation should the hazard impact the community.		

Source: PECSD

G.5.2. Administrative/Technical Mitigation Capabilities

Table G-17 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the PECSD.

Table G-17 PECSD's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N/A	
Civil Engineer, including dam and levee safety	N/A	
Community Planner	N/A	
Emergency Manager	N/A	
Floodplain Administrator	N/A	
GIS Coordinator	N/A	
Planning Commission	N/A	
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	Grants have been used to obtain standby power for facilities and purchase of fire equipment
Hazard data and information	N/A	
GIS analysis	N/A	
Mutual aid agreements	Y	Fire Department has mutual aid agreements with neighboring Departments. District is also registered with CalWarn mutual aid for water systems.
Other		
How can these capabilities be expanded and improved to reduce risk?		
An area of improvement that the District is currently working on is GIS of the community to provide accurate mapping and tracking of assets. PECSD has many critical facilities that are vital public health and safety. Another area for improvements is hazard data and information to identify and track hazard events in the District. Participating in the LHMP is a positive step to help the District in this area.		

Source: PECSD

G.5.3. Fiscal Mitigation Capabilities

Table G-18 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table G-18 PECSD's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Resource has been used to fund various infrastructure improvement projects.
Community Development Block Grant		
Federal funding programs (non-FEMA)		
Fees for water, sewer, gas, or electric services	Y	Funding of operations & maintenance activities. These funds are allocated to water and sewer enterprise activities.
Impact fees for new development		
State funding programs	Y	State Revolving Fund (SRF) used as loan for the planning of a water treatment facility.
Stormwater utility fee		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Pursue funding sources through grants or other resources to address and mitigate hazards to the community.		

Source: PECSD

G.5.4. Mitigation Education, Outreach, and Partnerships

Table G-19 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table G-19 PECSD's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	Semi-annual distribution to all customers.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Firewise meets multiple times per year. Updates to Firewise activities are included in newsletter.
Local news		
Organizations that interact with underserved and vulnerable communities		
Social media		
How can these capabilities be expanded and improved to reduce risk?		
Continue to educate the community of the hazards and risks through the newsletter, website, and community events.		

Source: PECSD

G.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation projects/efforts that include the following:

- There has been an increase in dead trees due to the invasive bark beetle. Dozens of dead or dying trees are removed yearly from both District and private property. The biggest impact is the costs associated with tree removal, in 2024 the District spent $8,200 for the removal of two very large Ponderosa Pine trees requiring the use of a crane.
- The District does have evacuation plan pamphlets that are distributed to new homeowners/customers. These pamphlets are also distributed to Fire Department related function such as Pancake Breakfast on Memorial Weekend and Labor Day BBQ. PECSD also worked with Feather River Resource Conservation in 2022 to reduce fuels on District owned properties.
- Plumas Eureka CSD has standby power at critical facilities. In 2021, the District was awarded a grant through CalOES PSPS program to upgrade the facilities standby power equipment.

G.6 Mitigation Strategy

G.6.1. Mitigation Goals and Objectives

The PECSD adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

G.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Some of the District's projects work to reduce impacts from flooding thus furthering the objectives of the NFIP.

G.6.3. Mitigation Actions

The Planning Team for the PECSD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning based on criteria detailed in Chapter 5:

- Climate Change
- Drought & Water Shortage
- Earthquake
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow (w/avalanche)
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Wildfire (w/smoke and air quality)

Non-priority hazards for mitigation planning include:

- Agricultural Hazards (Severe Weather/Pests/Invasive Species)
- Dam Failure
- Floods: 1%/0.2% annual chance
- Hazardous Materials Transport
- Severe Weather: High Winds and Tornado
- Volcano

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this LHMP's multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

Action 1. Establishment of Evacuation Routes and Resident Notification System

Hazards Addressed: Earthquake, Localized Flood, Landslide, Severe Winter Storms, and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Plumas Eureka CSD is located in a high-risk wildfire area and is also subject to hazards such as winter storms, flooding, and seismic activity. Currently, evacuation routes are not clearly identified or communicated to residents, which could result in confusion and delays during an emergency. Additionally, the District lacks a coordinated notification system to quickly alert residents of evacuation orders and emergency updates. This gap creates a significant risk to public safety during hazard events.

Project Description: The District will develop and implement a comprehensive evacuation planning and notification program. Project components include:

- Identification and mapping of primary and secondary evacuation routes for the community
- Installation of signage and wayfinding indicators along evacuation routes
- Development of an emergency notification system using multiple platforms (reverse 911, text/email alerts, sirens, and community bulletin boards)
- Coordination with Plumas County Office of Emergency Services, local fire agencies, and law enforcement to ensure consistent procedures
- Conducting community outreach, education workshops, and evacuation drills to familiarize residents with routes and protocols

- Integration of evacuation planning into the District's Emergency Operations Plan (EOP) and Local Hazard Mitigation Plan (LHMP)

Other Alternatives: Rely on county-wide evacuation procedures without PECSD-specific planning. Use door-to-door notification only, which is time-intensive and may not reach all residents in a timely manner.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Local Hazard Mitigation Plan (LHMP), Plumas County Emergency Response and Evacuation Plan, Coordination with CAL FIRE and local fire department response plans

Responsible Office/Partners: Plumas Eureka Community Services District (PECSD), Plumas County Office of Emergency Services, Plumas Eureka Fire Department, Plumas County Sheriff's Office, Local community groups and homeowner associations

Benefits (Losses Avoided): Improved life safety by reducing confusion and delays during evacuation. Faster and more reliable communication with residents during emergencies. Reduced burden on first responders through proactive planning and community preparedness. Increased resilience and confidence among community members

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMGP), FEMA Pre-Disaster Mitigation (PDM) program, California Office of Emergency Services (Cal OES) funding opportunities, Local District funds and partnerships with homeowner associations, USDA Rural Development emergency preparedness grants

Timeline: Route mapping and planning: 6–12 months. Notification system development and implementation: 1–2 years. Community education and ongoing drills: Continuous/Annual

Project Priority (High, Medium, Low): High

Action 2. Flood Risk Reduction for Wastewater Treatment Plant 6 (WWTP6)

Hazards Addressed: Localized Flooding, Severe Weather: Heavy Rains and Storms, Infrastructure Vulnerability

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): Wastewater Treatment Plant 6 (WWTP6) is in an area subject to seasonal flooding during periods of heavy rainfall and snowmelt. Flooding has the potential to overwhelm treatment facilities, damage mechanical/electrical components, contaminate effluent discharge, and create public health hazards. The facility's location and lack of protective flood control infrastructure increase operational risks.

Project Description: This project will assess and implement measures to reduce flooding risks at WWTP6. The project will include:

- Completion of a hydrologic and hydraulic (H&H) flood study to evaluate flood risk, flow patterns, and site-specific vulnerabilities.
- Topographic survey and mapping of flood-prone areas around WWTP6.
- Evaluation of climate change projections for increased rainfall intensity and snowmelt impacts.
- Feasibility study of flood protection measures such as berms, floodwalls, or site grading.
- Development of an emergency response and flood monitoring plan for WWTP6 operations.
- Implementation of selected protective actions (e.g., constructing berms, improving site drainage, elevating equipment, installing floodproof electrical controls).

Other Alternatives: Relocate WWTP6 to a less flood-prone area – Cost prohibitive. Rely on sandbagging and temporary emergency measures – Not reliable or sustainable for long-term resilience. Do nothing – Continues exposure to flood risk and potential regulatory violations.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PECSD Capital Improvement Plan (CIP), Plumas County Local Hazard Mitigation Plan (LHMP), Wastewater Operations & Maintenance Plan

Responsible Office/Partners: Plumas Eureka Community Services District (PECSD), Consulting Engineers (DOWL, Bastian Engineering, ProWest, etc.), Plumas County Office of Emergency Services, California State Water Resources Control Board

Benefits (Losses Avoided): Protection of critical wastewater infrastructure from flood damage. Prevention of untreated wastewater release into waterways. Reduction of regulatory and environmental liability. Improved community safety and resilience. Reduced costs of emergency response and system repairs.

Potential Funding (Local Budgets, Grant Funds, etc.): State Revolving Fund (SRF) Loan/Grant Programs, FEMA Hazard Mitigation Grant Program (HMGP), USDA Rural Development (RD), Local PECSD Capital Reserves

Timeline: Flood study and vulnerability assessment: 12 months. Design of protective measures: 12 months. Construction/implementation: 18–24 months. Total estimated project duration: 3–4 years

Project Priority (High, Medium, Low): High

Action 3. Recycled Water Use

Hazards Addressed: Drought, Water Supply Shortages, Extreme Heat, Climate Change Impacts

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): The District's water supply is vulnerable to recurring droughts and long-term climate variability, which threaten water reliability for both residential and community needs. Current water demand for non-potable uses such as irrigation places unnecessary strain on potable supplies. Without diversifying supply and reducing reliance on potable water for irrigation and landscaping, the District faces increased risk of water shortages during extended dry periods.

Project Description: The District will implement a recycled water use program by developing infrastructure to capture, treat, and distribute treated wastewater effluent for non-potable applications such as irrigation of public parks, golf courses, and landscaping around public facilities. Project components include:

- Feasibility study and engineering design for recycled water distribution system
- Construction of storage, treatment, and pumping facilities for recycled water
- Installation of purple pipe distribution lines to identified non-potable use areas
- Development of public education and outreach on recycled water benefits
- Integration of monitoring and reporting mechanisms to ensure compliance with state regulations

Other Alternatives: Continue reliance on potable water for irrigation, increasing vulnerability during drought.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Local Hazard Mitigation Plan (LHMP), Capital Improvement Plan (CIP), State and Regional Water Board permits and approvals

Responsible Office/Partners: Plumas Eureka Community Services District (PECSD), California Regional Water Quality Control Board, Engineering consultants and contractors

Benefits (Losses Avoided): Reduced demand on potable water supplies during drought conditions. Cost savings over the long term by reducing potable water treatment and pumping for irrigation. Enhanced drought resilience and climate change adaptation. Increased community awareness and acceptance of sustainable water practices

Potential Funding (Local Budgets, Grant Funds, etc.): State Revolving Fund (SRF) for water recycling projects, FEMA Hazard Mitigation Grant Program (HMGP), Potential federal infrastructure grants, Local District capital improvement funds

Timeline: Planning and design: 1–2 years. Construction: 2–4 years. Full implementation and monitoring: 5 years

Project Priority (High, Medium, Low): High

Action 4. Water Storage Tank Retrofit or Replacement

Hazards Addressed: Earthquake and Wildfire (loss of water service and fire flow)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background (Problem Statement): PECSD operates welded/bolted steel ground storage tanks that predate modern seismic standards. This vulnerability was identified in a Preliminary Engineering Report (PER) by Stantec Engineering in 2016. A significant earthquake could cause tank shell buckling, roof/shell failures, piping breaks, or foundation distress—resulting in major water loss, service outages,

contamination risk, and inability to provide required fire flows to the community. Seismic retrofits or replacement are needed to maintain life-safety functions and continuity of operations.

Project Description: Retain a licensed hydrogeologist and structural engineer to complete a phased program.

The project will replace PECSD's existing water storage tanks with new, code-compliant steel reservoirs designed to current seismic standards (e.g., AWWA D100 and ASCE 7) to ensure post-earthquake service and fire flow. Work includes geotechnical evaluation and upgraded foundation, tank procurement and construction with adequate freeboard and internal baffles (as needed), seismically robust anchorage and shell/roof details, and modernization of appurtenances (vents, overflows, hatches, level instruments, ladders, cathodic protection). Piping will be reconfigured with flexible couplings/seismic joints, thrust restraint, and seismically actuated isolation where appropriate. The project provides temporary bypassing to maintain service during construction, followed by demolition of the old tanks, site restoration, integration with SCADA, commissioning, and as-built documentation. This retrofit/replacement will reduce the risk of catastrophic tank failure, minimize outage and water-quality impacts, and improve system resilience and fire protection.

Other Alternatives: No action (accept service interruption and damage risk). Intertie with neighboring systems to provide emergency supply only.

Existing Planning Mechanism(s) through which Action Will Be Implemented: PECSD Capital Improvement Plan; PECSD Emergency Response Plan; Plumas County LHMP

Responsible Office/Partners: PECSD General Manager (lead); PECSD Operations Staff; Consulting Hydrogeologist; Structural Engineer; Geotechnical Engineer

Benefits (Losses Avoided): Maintains potable supply and fire flow post-earthquake; reduces risk of catastrophic tank failure, water loss, environmental release, boil water notices, extended outages, costly emergency repairs, and regulatory violations; improves community resilience and life safety.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Assistance (BRIC, HMGP), Cal OES Hazard Mitigation, California SRF (planning/construction), USDA RD Water & Waste Disposal, CDBG, local capital reserves.

Timeline: Planning/assessment/design: 9–12 months; Permitting/bid: 3–6 months; Construction: 6–12 months. Total: ~18–30 months from notice-to-proceed.

Project Priority (High, Medium, Low): High