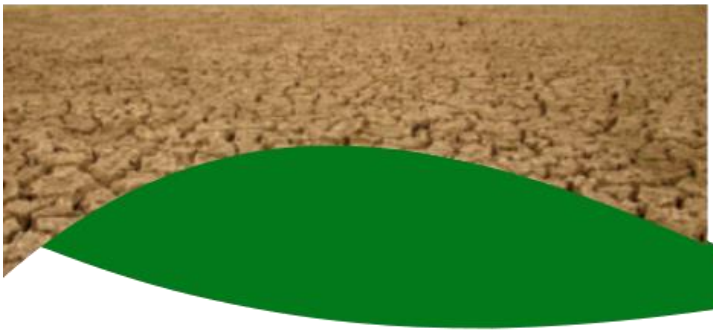
Nevada County
Local Hazard Mitigation Plan Update
August 2017



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Executive Summary

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Nevada County and six participating jurisdictions developed this Local Hazard Mitigation Plan (LHMP) update to make the County and its residents less vulnerable to future hazard events. This plan serves to update the 2011 Federal Emergency Management Agency (FEMA) approved Nevada County LLHMP and the 2013 City of Nevada City Annex to the 2011 Nevada County LHMP. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 so that Nevada County would be eligible for the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant programs. This plan was also developed in order for the County and participating jurisdictions to be eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) Program, and the Flood Mitigation Assistance (FMA) Program.

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

LHMP Plan Development Process

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

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

Table ES-1 Local Hazard Mitigation Planning Process

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies

DMA Process	Modified CRS Process
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

The planning process began with the organizational phase to establish the hazard mitigation planning committee (HMPC) comprised of key County representatives, and other local and regional stakeholders; to involve the public; and to coordinate with other departments and agencies. A detailed risk assessment was then conducted followed by the development of a focused mitigation strategy for Nevada County. Once approved by Cal OES and FEMA, this plan will be adopted and implemented by the County over the next five years.

Risk Assessment

The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the County and participating jurisdictions, assessed the vulnerability of the planning area to these hazards, and examined the existing capabilities to mitigate them.

The County is vulnerable to numerous hazards that are identified, profiled, and analyzed in this plan. Floods, earthquakes, drought, liquefaction, landslides, wildfires, and other severe weather events are among the hazards that can have a significant impact on the County. Table ES-2 details the hazards identified for the County LHMP.

Table ES-2 Nevada County Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Significant	Highly Likely	Critical	High	High
Avalanche	Limited	Highly likely	Negligible	Low	Low
Climate Change	Extensive	Likely	Critical	Medium	High
Dam Failure	Significant	Occasional	Catastrophic	High	Low
Drought and Water Shortage	Extensive	Likely/ Occasional	Critical	Medium	Low
Earthquake	Extensive	Unlikely	Critical	Medium	Low
Flood: 100/500–year	Extensive	Occasional/Unlikely	Critical	High	Medium
Flood: Localized/Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Hazardous Materials Transportation (interstates, railroads, pipelines)	Limited	Likely	Limited	Medium	Low
Landslide, Debris & Mud Flows	Significant	Likely	Critical	Medium	Low
Levee Failure	Limited	Unlikely	Limited	Low	Low
Severe Weather: Extreme Cold, Snow, and Freeze	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Significant	Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms (wind/tornado/hail, lightning)	Significant	Highly Likely	Critical	Medium	High
Subsidence	Significant	Likely	Negligible	Medium	Medium
Volcano	Significant	Unlikely	Limited	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Extensive	Highly Likely	Catastrophic	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

Mitigation Strategy

Based on the results of the risk assessment, the HMPC developed a mitigation strategy for reducing the County's risk and vulnerability to hazards. The resulting Mitigation Strategy for Nevada County is comprised of LHMP goals and objectives and a mitigation action plan which includes a series of mitigation action projects and implementation measures.

Based on the risk assessment, the HMPC identified goals and objectives for reducing the County's vulnerability to hazards. The goals and objectives of this multi-hazard mitigation plan are:

- **Goal 1: Minimize risk and vulnerability of Nevada County to natural hazards and protect lives and prevent losses to property, public heath, economy, and the environment.**
  - ✓ Objective 1.1: Provide protection for existing and future development.
  - ✓ Objective 1.2: Provide protection for critical facilities, utilities, and services.
  - ✓ Objective 1.3: Provide protection for natural resources and the environment.

- **Goal 2: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote participation and voluntary compliance to reduce hazard-related losses.**
  - ✓ Objective 2.1: Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.
  - ✓ Objective 2.2: Emphasize preparedness and self-responsibility to residents.

- **Goal 3: Improve communities' capabilities to prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event.**
  - ✓ Objective 3.1: Continued improvements to emergency services and management capabilities.
  - ✓ Objective 3.2: Develop/improve warning, evacuation, and sheltering procedures and information for residents and businesses.
  - ✓ Objective 3.3: Continue to coordinate jurisdictional responsibilities for various hazards through County and community disaster/emergency response plans and exercises.
  - ✓ Objective 3.4: Improve interagency communications; Ensure functionality and redundancy of communications, information technology, and other critical systems.
  - ✓ Objective 3.5: Promote/maintain coordination, interoperability, and use of shared resources among agencies operating in Nevada County.
  - ✓ Objective 3.6: Increase use of technologies.
  - ✓ Objective 3.7: Improvements to safety-related infrastructure, services, and effectiveness – numbers, locations, levels, and responses.
  - ✓ Objective 3.8: Increase response capabilities for hazardous materials incidents.

- **Goal 4: Reduce fire severity and intensity in Nevada County**
  - ✓ Objective 4.1: Reduce the wildfire risk and vulnerability in Nevada County
  - ✓ Objective 4.2: Reduce life safety issues, property loss, and damages associated with wilfires.
  - ✓ Objective 4.3: Develop a fuels management implementation strategy focusing on fuels reduction, education, and assistance
  - ✓ Objective 4.4: Promote implementation of fuels management activities by all landowners on both public and private lands.

- ✓ Objective 4.5: Promote Tree Mortality mitigation activities
- ✓ Objective 4.6: Continued enhancement and implementation of wildfire awareness, education, and outreach program(s).

- **Goa1 5: Improve community resiliency to flooding in Nevada County**
  - ✓ Objective 5.1: Reduce the flood risk and vulnerability in Nevada County
  - ✓ Objective 5.2: Reduce life safety issues, property loss, and damages associated with flooding.
  - ✓ Objective 5.3: Review appropriate flood protection infrastructure improvements and implement where feasible and economically viable.
  - ✓ Objective 5.4: Promote public awareness and education concerning the risks associated with creek, stream and river flooding.

- **Goal 6: Maintain FEMA eligibility for grant funding**
  - ✓ Objective 6.1: Assure conformance to federal and state hazard mitigation initiatives and maximize potential for mitigation implementation.
  - ✓ Objective 6.2: Monitor and communicate available grant programs, timelines, and processes to all communities.
  - ✓ Objective 6.3: Implement and complete identified high priority projects listed in the plan.
  - ✓ Objective 6.4: Consider environment as part of mitigation strategy implementation.

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

Table ES-3 Nevada County Planning Area Mitigation Actions

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Madera County						
Multi-Hazard Actions						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	County and all jurisdictions	2011 Action	X	X		Prevention
Action 2. Improved Public Outreach	County and all jurisdictions	2011 Action	X	X	X	Public Information
Action 3. Review and Bring Current County Plans	County and all jurisdictions	New action	X	X		Public Information
Action 4. Shelter Emergency Plan	County and all jurisdictions	New action	X	X		Prevention Emergency Services
Action 5. Training & Exercises	County and all jurisdictions	New action	X	X		Prevention Emergency Services
Action 6. Recovery Plan	County and all jurisdictions	New action	X	X		Prevention Emergency Services
Action 7. Countywide GIS Data Base	County and all jurisdictions	New action	X	X		Prevention Emergency Services
Action 8. Community Pet Education and Disaster Preparedness	County and all jurisdictions	New Action	X	X		Prevention Emergency Services
Agricultural Actions						
Action 9. Agriculture Emergency Plan	County and all jurisdictions	New action	X	X		Prevention Emergency Services
Climate Change Actions						
Action 10. Climate Adaptation Plan	County and all jurisdictions	New action	X	X		Prevention
Dam Failure Actions						
Action 11. Dam Monitoring	County and all jurisdictions	New action	X	X		Prevention Emergency Services

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Drought Actions						
Action 12. Well Rehabilitation Program	County and all jurisdictions	New action	X	X		Property Protection
Action 13. Public Water Systems	County and all jurisdictions	New action	X	X		Property Protection Natural Resource Protection
Action 14. Expand Surface Water Locations	County and all jurisdictions	New action	X	X		Property Protection Structural Projects
Earthquake Actions						
Action 15. Bridge Retrofits and Replacements	County and all jurisdictions	2011 action	X	X		Property Protection Structural Projects
Flood Actions						
Action 16. Relocate County fire station out of floodplain	County and all jurisdictions	New action	X	X	X	Property Protection Structural Projects
Action 17. Relocation of Government Facilities in the Floodplain	County and all jurisdictions	2011 action	X	X	X	Property Protection Structural Projects
Action 18. Erosion Repair and Restoration Projects	County and all jurisdictions	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 19. Woody Debris Removals	County and all jurisdictions	New action	X	X	X	Property Protection Natural Resource Protection
Action 20. Flood Insurance Promotion	County and all jurisdictions	New action	X	X	X	Prevention Public Information
Action 21. Stormwater Management Plan	County and all jurisdictions	New action	X	X	X	Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 22. Flood Studies and Action Project	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 23. Ash Slough Arundo Removal and Channel Clearing	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 24. Berenda Creek Arundo Removal, Channel Clearing and Levee Repairs	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 25. Berenda Slough Arundo Removal and Channel Clearing	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 26. Cottonwood Creek Channel Clearing and Levee Repairs	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Action 27. Dry Creek Channel Clearing and Levee/Embankment Repairs	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 28. Fresno River Channel Clearing and Levee/Embankment Repairs	County and all jurisdictions	New action	X	X	X	Prevention Property Protection Structural Projects Natural Resource Protection
Hazardous Materials Actions						
Action 29. Crude Oil Emergency Response	County and all jurisdictions	New action	X	X		Emergency Services
Action 30. Hazardous Materials Decontamination Kits	County and all jurisdictions	New action	X	X		Emergency Services
Action 31. Ethanol Emergency Response	County and all jurisdictions	New action	X	X		Emergency Services
Action 32. Madera County ICS typing of Hazardous Materials Team	County and all jurisdictions	New action	X	X		Emergency Services
Action 33. Mutual Aid Agreements	County and all jurisdictions	New action	X	X		Emergency Services
Action 34. HAZ-MAT Response	County and all jurisdictions	New action	X	X		Emergency Services
Extreme Heat/Cold Actions						
Action 35. Cooling/Warming Centers	County and all jurisdictions	New action	X	X		Prevention Public Information
Wind and Tornado Actions						
Action 36. Woody Debris Removal - Roadway	County and all jurisdictions	New action	X	X		Property Protection Natural Resource Protection
Winter Storms/Snow Actions						
Action 37. Snow Removal Plan	County and all jurisdictions	New action	X	X		Property Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Wildfire Actions						
Action 38. Educate the public on fire safety and hazard reduction	County and all jurisdictions	New action	X	X		Public Information
Action 39. Fuel Reduction	County and all jurisdictions	New action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 40. Pre-suppression plan and Wildland urban interface map	County and all jurisdictions	New action	X	X		Prevention Property Protection
Action 41. Fire Fighting Access Issues	County and all jurisdictions	New action	X	X		Property Protection Natural Resource Protection
Action 42. Tree Mortality	County and all jurisdictions	New action	X	X		Property Protection Structural Projects Natural Resource Protection
Action 43. FireWise Communities	County and all jurisdictions	New action	X	X		Prevention Property Protection
Action 44. Community Chipping Program	County and all jurisdictions	New action	X	X		Prevention Property Protection
Action 45. Reforestation Projects	County and all jurisdictions	New action	X	X		Natural Resource Protection
City of Chowchilla						
Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City, County, and all jurisdictions	2011 Action	X	X		Prevention
Action 2.Public awareness, education, outreach, and preparedness program enhancements for all hazards (simplify, multi-media, educate and clarify various emergency systems, messaging and training; promote self- responsibility)	City, County, and all jurisdictions	2011 Action	X	X	X	Public Information

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 3.Conduct evacuation and shelter planning for all communities and populations (to include all critical hazards, at risk populations, medical, ADA, animals, and with outreach and security components)	City, County, and all jurisdictions	New Action	X	X		Prevention Emergency Services
Action 4.Enhance and maintain GIS mapping of City assets and critical facilities	City, County, and all jurisdictions	New Action	X	X		Prevention Emergency Services
Action 5.Explore additional surface water resources for City	City, County, and all jurisdictions	New Action	X	X		Property Protection Structural Projects
Action 6.Provide backup generators for wells	City, County, and all jurisdictions	New Action	X	X		Property Protection
Action 7. Evaluate joining the National Flood Insurance Program	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Natural Resource Protection
Action 8.Erosion repair	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Natural Resource Protection
Action 9.Implement stormwater master plans	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 10. Undergrounding of stormwater system – Downtown area	City, County, and all jurisdictions	2011 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
City of Madera						
Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City, County, and all jurisdictions	New Action	X	X		Prevention
Action 2.Installation of variable frequency drives onto wells to increase capacity	City, County, and all jurisdictions	New Action	X	X		Property Protection

Action Title	Jurisdictions Benefitting from Action (s)	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 3.Install backup motors for wells with an emphasis on critical facilities. Provide backup generators for wells.	City, County, and all jurisdictions	New Action	X	X		Property Protection
Action 4.Install Variable Frequency Drives (VFD) on Existing City Wells to Increase Capacity	City, County, and all jurisdictions	New Action	X	X		Property Protection
Action 5.Provide Backup Generators for City Wells	City, County, and all jurisdictions	New Action	X	X		Property Protection
Action 6.Implement Improvements Recommended in the Storm Drainage System Master Plan	City, County, and all jurisdictions	2011 Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 7.4th Street Flooding Improvements Installed in accordance with that recommended in the Storm Drainage System Master Plan	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 8.Conduct New Studies/Modeling and Mapping of the Fresno River within the City's Growth Boundary	City, County, and all jurisdictions	New Action	X	X	X	Prevention
North Fork Rancheria						
Action 1.Prescription Burning Projects	Rancheria, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 2.Defensible Space Projects	Rancheria, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 3.Community Emergency Preparedness Meeting	Rancheria, County, and all jurisdictions	New Action	X	X		Prevention Emergency Services

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Chapter 1 Introduction

1.1 Purpose

Nevada County and 6 other jurisdictions, in conjunction with a planning committee, prepared this Local Hazard Mitigation Plan (LHMP) update to the 2011 Federal Emergency Management Agency (FEMA) approved Nevada County Local Hazard Mitigation Plan and the 2013 City of Nevada City Annex to the 2011 Nevada County LHMP. The purpose of this Plan Update is to guide hazard mitigation planning to better protect the people and property of the County from the effects of hazard events. This plan demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed, among other things, to ensure Nevada County and participating jurisdictions' continued eligibility for certain federal disaster assistance: specifically, the FEMA Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation Program (PDM), and the Flood Mitigation Assistance Program (FMA).

1.2 Background and Scope

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

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

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

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

- Nevada County*
- City of Grass Valley*
- City of Nevada City**
- Town of Truckee*
- Nevada Irrigation District*
- Truckee Public Utility District*
- Washington County Water District

* Participated in 2011 Plan

** Participated in their own 2013 Plan

Although the above list notes who participated in the 2011 Nevada County LHMP, including the 2013 City of Nevada City Annex to the Nevada County LHMP, only Nevada County and the City of Nevada City ever received formal FEMA approval of the plans, and thus are the only jurisdictions for which the full LHMP Update requirements apply.

This Plan Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). This planning effort also follows FEMA's 2013 Plan Preparation Guidance. Because the Nevada County Planning Area is subject to many kinds of hazards, access to these programs is vital.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The Planning Area has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

1.3 Community Profile

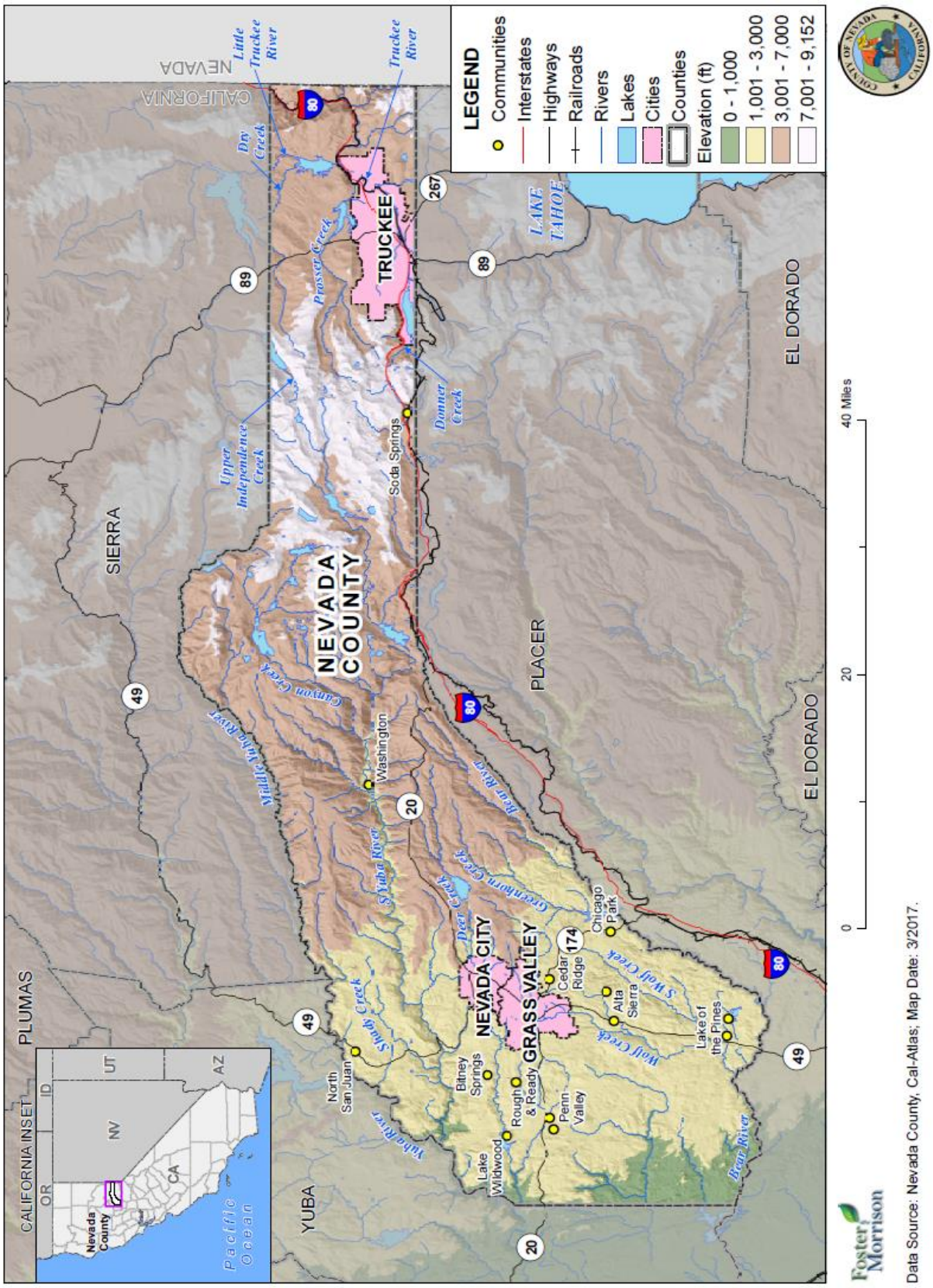
Nevada County, in northeastern California, is a strip of land, 10 to 25 miles wide, that extends some 70 miles across the north-central Sierra Nevada range from Yuba County to the California-Nevada State line. It is bordered by Washoe County, Nevada to the east; Sierra County to the north; Yuba County to the west; and Placer County to the south. The total land area of Nevada County is 625,920 acres, and it is one of the smaller counties in California. Nearly all of the County is mountainous. The main crest of the Sierra Nevada range extends across 9,000 feet. The County contains three incorporated jurisdictions: the cities of Grass Valley, Nevada City (the County seat), and the Town of Truckee. U.S. Highway 80 serves the area, supplemented by State Highway 20, 49, 89, and 174 which traverse the County.

Tributaries of the Yuba and Big Bear Rivers make up the major portion of the County's drainage system. The Truckee River enters Nevada County near the Town of Truckee and flows northeasterly to the

California-Nevada State line. The eastern one-fourth of the County drains easterly into tributaries of the Truckee River. The Yuba and Bear Rivers drain the western portion of the county. Both rivers have been developed for irrigation and power. There are many lakes and reservoirs. Stampede Dam and Reservoir, northeast of Truckee, was completed in 1970 and is used for flood control, water storage and recreation.

A map of the County is shown in Figure 1-1.

Figure 1-1 Nevada County



1.3.1. History

Prior to the beginning of the gold rush, the region now known as Nevada County was primarily populated by Nisenan and Maidu Native Americans. Gold was discovered at Coloma, Placer County in 1848 and by 1849 the streams and creeks of the Nevada County region counted miners who were searching for "placer" gold. The gold rush cities of Nevada and Grass Valley were well established by the time Nevada County was formed out of Yuba County in September 1851 with Nevada (city) as the “seat of justice.” Nevada had to add the word "City" when (the state of) Nevada became the 36th State. Donner Summit entered into history in the winter of 1847-48 as the Donner Party met its cruel fate near the present-day Town of Truckee. Come 1859, the end of available "placer gold" and the discovery of the Comstock Lode in Nevada nearly finished Nevada County's flash in history. Astoundingly, in 1850 a ledge of hard rock gold was discovered in Grass Valley, which gave rise to an underground gold mining industry that endured into the 1950's. In the mid-twentieth century the Empire and Northstar Mines closed their mining operations and one, the Empire, became a famous California State Park. There was also, a less savory mining technique, hydraulic mining, which endured until the seminal Sawyer Decision. Large areas of alluvial sand and gravel deposits were washed away with hydraulic "monitors" while creating famous moonscapes at Malakoff Diggins State Park and Alpha/Omega diggings on the Yuba River. The muddy debris flowing into rivers, a byproduct of hydraulic mining was finally outlawed by Judge Lorenzo Sawyer by federal decision in January 1884.

Truckee, the site of a major construction camp of the Central Pacific Transcontinental railroad in the 1860's, continued strongly into the 20th century as a lumber, ice harvesting and snow skiing industry town. By the 1990's Truckee had become an incorporated town and the fastest growing area in the County. Agricultural pursuits have traditionally been horse and cattle ranching, wine grape production, fruit production primarily in the Chicago Park-Peardale area, and timber production. While most of these pursuits have endured into the 21st century, timber production has declined from its historic high level.

In terms of population, Nevada County remained a small rural county with barely 26,000 residents until the boom years of the middle 1970's.

1.3.2. Geography and Climate

The western portion of the county is characterized by mild winters, with little snow. Winters along the crest of the Sierra Nevada range and eastward are long and cold, with heavy snowfalls. Annual precipitation ranges from approximately 35 inches in the west to nearly 70 inches at the summits of the ranges. Peak summer temperatures in July average between 95° F and 100° F, and the winter temperatures in January average between 35° F and 55° F. The growing season (free from freezing temperatures) varies from in excess of 250 days in the western portions of the county (usually from mid-March to November), to as low as 25 days in the eastern portions (usually from mid-June to July).

Nevada County has generally shallow soils (typically loams and sandy loams underlain with clay substratum or no substratum with a pronounced amount of rock outcrop) overlying dense igneous and metamorphic rock. Vegetation in Nevada County has an extreme range in type due to the large variation in elevation, climate, and soil. Nevada County ranges in elevation from nearly 100 feet above sea level in the south and west (Penn Valley) to over 10,000 feet above sea level in the east.

1.3.3. Population and Demographics

The California Department of Finance 2016 estimates for population of the County and its jurisdictions are shown in Table 1-1.

Table 1-1 Nevada County Population by Jurisdiction

Jurisdiction	Total Population
City of Grass Valley	12,955
City of Nevada City	3,260
Town of Truckee	15,370
Unincorporated County	66,510
Total	**98,095**

Source: California Department of Finance, 2016 E-1 Report

Select social and economic information for the County and participating jurisdictions are shown in Table 1-2.

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

Statistic	Number
Populations	
Population under 5	4.4%
Population over 65	19.4%
Median Age	47.6
White	91.4%
Black or African American	0.4%
American Indian or Alaska Native	1.1%
Asian	1.2%
Native Hawaiian or Pacific Islander	0.1%
Some Other Race	2.7%
Two or more races	3.2%
Median income	$69,203
Mean Income	$85,689
Poverty rate	
All families	8.1%
All people	12.7%
Unemployment Rate (December 2016)	4.4%

Source: 2010 US Census, 2015 US Census Bureau American Community Survey, Bureau of Labor Statistics

1.4 Economy and Tax Base

Nevada County has a diverse economy. US Census estimate show economic characteristics for the County. These are shown in Table 1-3.

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

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	590	1.4%
Construction	3,713	9.0%
Manufacturing	2,939	7.1%
Wholesale trade	696	1.7%
Retail trade	4,349	10.5%
Transportation and warehousing, and utilities	1,531	3.7%
Information	954	2.3%
Finance and insurance, and real estate and rental and leasing	2,248	5.4%
Professional, scientific, and management, and administrative and waste management services	5,222	12.6%
Educational services, and health care and social assistance	9,127	22.0%
Arts, entertainment, and recreation, and accommodation and food services	5,296	12.8%
Other services, except public administration	2,459	5.9%
Public administration	2,349	5.7%

Source: US Census Bureau American Community Survey 2015 Estimates

Major employers in the County are shown in Table 1-4.

Table 1-4 Major Employers in Nevada County

Employer Name	Location	Industry
American Rivers Inc	Nevada City	Organizations
Boreal Mountain Resort	Truckee	Resorts
Briarpatch Community Market	Grass Valley	Grocers-Retail
Clear Capital	Truckee	Real Estate Buyers & Brokers
Golden Empire Convalescent Hosp	Grass Valley	Nursing & Convalescent Homes
Interfaith Food Ministry	Grass Valley	Non-Profit Organizations
Jehovah's Witnesses	Grass Valley	Churches
Kmart	Grass Valley	Department Stores
Lodge At Tahoe Donner	Truckee	Restaurants
Milhous School Inc	Nevada City	Schools
Networked Insurance Agents LLC	Grass Valley	Insurance
Nevada County Charter Co-Op	Nevada City	County Government-General Offices

Employer Name	Location	Industry
Nevada Irrigation District	Grass Valley	Water & Sewage Companies-Utility
Nevada Union High School	Grass Valley	Schools
R S Clark Septic	Not Available	Septic Tanks
Raley's	Grass Valley	Grocers-Retail
Robinson Enterprises Inc	Nevada City	Logging Companies (mfrs)
Safeway	Truckee	Grocers-Retail
Safeway	Grass Valley	Grocers-Retail
Sierra Nevada Memorial Hosp	Grass Valley	Hospitals
Sierra Nv Meml-Miners Hsptls	Grass Valley	Hospitals
Tahoe Forest Hospital District	Truckee	Hospitals
Thurston Manufacturing	Grass Valley	Furniture-Dealers-Wholesale
Union Hill Charter Home School	Grass Valley	Schools

Source: America's Labor Market Information System (ALMIS) Employer Database, 2017 1st Edition.

The County has a wide and varied tax base. Tax base information is tracked and maintained by the Nevada County Assessor's Office. The following tables show the tax base for the County as well as for the incorporated jurisdictions. Table 1-5 shows the secured real property value by property type for the entire County. Table 1-6 shows the secured real property value by jurisdiction.

Table 1-5 2016-2017 Nevada County Planning Area Distribution of Value by Property Use

Property Use	2016-2017 Value ($)	Percent of Current Roll
Agricultural	$166,658,116	1.0%
Commercial	$1,081,556,434	6.2%
Government	$23,530,437	0.1%
Industrial	$207,128,623	1.2%
Institutional	$109,212,982	0.6%
Miscellaneous	$12,136,197	0.1%
Residential	$15,879,830,720	90.8%
Totals	**$17,480,053,509**	**100.0%**

Source: Nevada County Assessor's Office

Table 1-6 Local Assessment Roll Totals by Jurisdiction

Jurisdiction	2016-17 Value ($)	Percent of Current Roll
City of Grass Valley	$2,047,746,567	11.7%
City of Nevada City	$985,911,204	5.6%
Town of Truckee	$5,894,685,141	33.7%
Unincorporated Area	$8,551,710,597	48.9%
Total Value	$17,480,053,509	**100.0%**

Source: Nevada County Assessor's Office

1.5 Plan Organization

This Nevada County 2017 LHMP Update is a multi-jurisdictional plan that geographically covers the entire area within Nevada County's jurisdictional boundaries (i.e., the Planning Area). Participating jurisdictions within the Nevada County Planning Area include: Unincorporated Nevada County, the three incorporated communities, and 3 special districts.

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

The Nevada County Local Hazard Mitigation Plan Update is organized as follows:

The **Base Plan** provides the overall framework for this multi-jurisdictional LHMP. It is the umbrella document that includes the planning process, methodologies, and procedural requirements for all participating jurisdictions (i.e., unincorporated County and all Jurisdictional Annexes). As such, Chapters 1-7 of the Base Plan apply to the unincorporated County, the three incorporated communities and the three special districts as participants to this LHMP update seeking FEMA approval of the plan. Because this is a multi-jurisdictional plan, the Base Plan addresses the LHMP hazard mitigation planning elements for all participating jurisdictions and includes data, information, and analysis specific to: The Nevada County Planning Area (which includes all participating jurisdictions and the entire geographic boundary of Nevada County) and unincorporated Nevada County.

The **Jurisdictional Annexes** detail the hazard mitigation planning elements specific to each participating jurisdiction to this 2017 Nevada County LHMP Update. Each Annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan document. As such, all Chapters 1-7 of the Base Plan, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction. The Annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy.

The **Appendices** provide additional information, data, and planning process documentation that applies to all participating jurisdictions (i.e., Unincorporated County and all Jurisdictional Annexes) to this Nevada County 2017 LHMP Update.

Chapter 2 What's New

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

The 2011 Nevada County Local Hazard Mitigation Plan and the 2013 City of Nevada City Annex to the 2011 Nevada County LHMP contained detailed descriptions of the planning process, the risk assessments of identified hazards for the Nevada County Planning Area and mitigation strategies for reducing the risk and vulnerability from these hazards. Since approval of these plans by FEMA, much progress has been made by Nevada County and the participating communities on implementation of the mitigation strategies. As part of this 2017 LHMP Update, a thorough review and update of the 2011 Plan and 2013 Annex was conducted to ensure that this Plan Update reflects current community conditions and priorities in order to realign the updated mitigation strategy for the next five-year planning period. This section of the plan includes the following:

- **What's New in the Plan Update**. This section provides an overview of the approach to updating the plans and identifies new analyses, data and information included in this Plan Update to reflect current community conditions. This includes a summary of new hazard and risk assessment data as it relates to the Nevada County Planning Area as well as information on current and future development trends affecting community vulnerability and related issues. The actual updated data, discussions, and associated analyses are contained in their respected sections within this 2017 LHMP Update.
- **Summary of Significant Changes to Current Conditions and Hazard Mitigation Program Priorities**. This section provides a summary of significant changes in current conditions, changes in vulnerability, and any resulting modifications to the community's mitigation program priorities since their previous FEMA-approved LHMP.
- **2011 Mitigation Strategy Status and Successes**. This section provides a description of the status of mitigation actions from the 2011 Plan and 2013 Annex and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2017 mitigation strategy. This section also highlights key mitigation success stories of the County and participating jurisdictions since the 2011/2013LHMP.

This What's New section provides documentation of Nevada County Planning Area's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completion of this 2017 LHMP Update further provides documentation of the Nevada County community's continued commitment and engagement in the mitigation planning process

2.1 What's New in the Plan Update

This LHMP Update involved a comprehensive review and update of each section of the 2011 Plan and 2013 Annex and includes an assessment of the success of the participating communities in evaluating, monitoring, and implementing the mitigation strategy outlined in the initial plan. Only the information and

data still valid from the 2011 Plan and 2013 Annex was carried forward as applicable into this LHMP Update.

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

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

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

As part of its comprehensive review and update of each section of the plans, Nevada County and participating jurisdictions recognized that updated data, if available, would enhance the analysis presented in the risk assessment and utilized in the development of the updated mitigation strategy. Highlights of new data used for this Plan Update is identified below in this Section and is also sourced in context within Chapter 4, Risk Assessment. Specific data used is sourced throughout this plan document. This new data and associated analysis provided valuable input for the development of the mitigation strategy presented in Chapter 5 of this plan.

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

- Multiple new hazards were added – including climate change, drought and water shortage, levee failure, extreme heat, extreme cold, snow, and freeze.
- Multiple hazards from the previous plan were dropped, due to their lack of planning significance in the County. This includes human health hazard, pandemic flu, and airborne hazards.
- More detailed discussion of vulnerability to the County from agricultural hazards was included.
- Climate change has been addressed as a stand-alone hazard as well as within the hazard profiles of each identified hazard to assist the County in considering climate change issues when identifying future mitigation actions for the Planning Area.
- New dam data provided by Cal OES was used for the Dam inventory and analysis. This data included an updated hazard classification for identified dams.
- The drought hazard was added and included water shortage impacts to the County, to better align with the State of California Hazard Mitigation Plan and to reflect the significant issues related to drought conditions resulting from the current and ongoing drought within the County and State of California.
- More detailed GIS analysis was performed for earthquake, including a Hazus earthquake simulation to show risk to the County from earthquake.
- More detailed GIS analysis was performed for the flooding hazard for both 100- and 500-year floods, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.

- More detailed GIS analysis was performed for hazardous materials, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.
- More detailed GIS analysis was performed for landslides and debris flows, including values at risk, critical facilities at risk, population at risk, future development, and general community impacts.
- An entire rework of the risk assessment for each identified hazard. This included reworking the hazard profile and adding new hazard event occurrences; redoing the entire vulnerability analysis to add items identified below and updating the vulnerability assessment based on more recent hazard data as well as using the most current parcel and assessor data for the existing built environment.
- Utilizing updated critical facility GIS mapping for the Planning Area to provide an updated inventory of critical facilities by jurisdiction and a GIS analysis of critical facilities to mapped hazards.
- An enhanced vulnerability assessment which added a GIS analysis of updated future development areas in the Planning Area and specific to each of the mapped hazards.
- Incorporation and analysis of the new 2010 Census data was utilized for this LHMP update.
- Also, as required by current FEMA planning guidance, an analysis of each jurisdictions' ongoing and continued compliance with the NFIP was included in this LHMP Update.

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

This section provides a summary by hazard of significant changes in current conditions, Planning Area vulnerability, and any resulting modifications to the community's mitigation program priorities since the 2011 LHMP:

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Agricultural Hazards			X

- Recent drought conditions have stressed local crops, timber, and grazing lands making them more susceptible to insect infestation, and other issues.
- Changing access and availability of water to agricultural users due to recent drought conditions has further impacted the ag industry
- Noxious weeds are more drought tolerant – better able to compete for water over local crops and vegetation.
- Drought increased the tree mortality in the County further impacting the wildfire hazard.
- Sell-off of cattle/animals due to drought conditions resulting in economic impacts?
- An emergency waiver of standards for solid waste facilities has been implemented to address overwhelmed rendering plants as a result of recent conditions.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Avalanche		X	

- Avalanche risk changes from year to year depending on weather conditions, but overall Planning Area vulnerability to Avalanche has not changed.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Climate Change			X

- NWS data indicates temperatures are increasing resulting in more extreme heat days.
- Snowpack levels have been occurring at higher elevations in recent years.
- Data also suggests that changing climate conditions influence multiple hazards identified in the Planning Area as described in this LHMP Update.
- Other impacts include, impacts to food sources and food-related diseases, eco-system changes, public health issues, etc.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Dam Failure		X	

- With more people moving into dam inundation areas, the vulnerability increases due to an increase in potentially affected populations, but not due to an increased risk of dam failure. However, population growth in the last five years has been limited in Nevada County, thus not notably affecting dam vulnerability in the Planning Area.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Drought and Water Shortage			X

- Since the 2011 planning process, current drought conditions, including water supply access issues, have had a significant impact on the Nevada County Planning Area and California. As a result, the drought hazard has become a significant priority for mitigation planning.
- State drought mandates, including conservations measures, to protect water supply throughout California have been implemented and continue within the Planning Area.
- Although other communities in California have experienced significant impacts to their water supply, the Planning Area has experienced fewer impacts than other areas due to more constant and diverse water resources of regional watersheds.
- Drought conditions have contributed to an increase in tree mortality issues and general increase in wildfire conditions.
- Water quality issues have been more of an issue with less flows in streams, combined with drawing down of water tables.
- Over the last few years, the drought has had a significant economic impact on recreation in the County, with rivers running substantially lower and a lower snowpack, less people have been vacationing and undertaking water/snow dependent recreational activities.
- Drought conditions further impacted fisheries, aquatic habitats, and other environmental systems due to a decrease in water availability and delivery to these resources.
- Although drought impacts were significant the first four years of the County's last LHMP planning cycle, the winter storms of 2017 provided substantial relief from the most recent drought.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Earthquake		X	

- With the exception of the far eastern side of the County which has recently shown moderate seismic activity, the Planning Area is generally at low risk of a significantly damaging earthquake. The primary factor to change earthquake vulnerability, is additional development and more people moving to the area; this is not the case in Nevada County.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: 1%/0.2% events		X	

- Overall, the net increase or decrease in vulnerability depends on the location within the Planning Area.
- The risk and vulnerability of 1% and 0.2% flood events remain somewhat constant, changing from year to year based on weather and new development in the Planning Area.
- With the winter storms of 2017, heavy rains and snow resulted in significant snowpack, full reservoirs and high rivers; however, the Planning Area did not experience significant flooding or inundation in the FEMA floodplains.
- Effective land use planning, flood control measures, and adherence to development requirements in identified floodplains have minimized additional exposure to this hazard in the Planning Area, even in years of heavy storms.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: Localized Stormwater Flooding			X

- Increased development in unmapped flood hazard areas could result in a net increase in vulnerability should these areas experience increased stormwater/localized flooding. However, development requirements that require mitigation of stormwater runoff work to mitigate this hazard.
- Climate change issues may result in more localized flooding as the climate warms and more frequent, wetter storms create more runoff.
- 2017 winter storms, including significant snow and heavy rains, resulted in more localized flooding throughout the Planning Area. County OES reported that during 2017, over 30,000 sandbags were distributed compared to 5,000 bags during a more normal year.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Hazardous Materials Transportation			X

- With an improved economy leading to increased commerce statewide, the County experienced an increase in volumes and shipping of hazardous materials through the Planning Area.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Landslides, Debris and Mud Flows			X

- Over the last couple of years, with the severe drought, much of the vegetation along sloped areas is failing to thrive, thus there is a lack of vegetation to hold soil contributing to the landslide/mudslide potential.
- Combined with recent heavy rains from 2017 contributing to saturated soils, the landslide potential increased in the Planning Area, especially in post fire areas.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Levee Failure		X	

- With no levees located within the Planning Area, this is not a hazard of concern and risk and vulnerability is not affected.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Extreme Cold, Snow and Freeze			X

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season. Since the 2011 LHMP, previous years of mild winters was followed by a 2017 winter season of heavy snow.
- Although, the Planning Area has in recent years experienced an increase in gridlock and traffic related incidents on key transportation corridors during severe winter weather likely caused by an increase in commuters and tourism to the area.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Extreme Heat			X

- Climate change issues will continue to increase heat related impacts.
- The heat, combined with drought conditions, has increased the potential for wildfires.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Fog		X	

- This low priority hazard has not changed over the last five years.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Heavy Rains and Storms		X	

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season. Although the last five years have been on the mild side, the 2017 winter season brought significant and heavy rains causing adverse impacts to the County. The HMPC noted that during this last 2017 winter, the storms seemed to be more intense and more frequent than in years proceeding this last drought.
- Climate change brings renewed concern moving forward for heavy rains, storms and associated issues to the County.

2017 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Wind and Tornadoes		X	

- This hazard has not changed in the Planning Area over the last five years.

2016 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Subsidence			X

- Subsidence vulnerability increased with heavy rains in 2017 following several years of drought as evidenced by the recent sinkholes in the County.

2016 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Volcano		X	

- This low priority hazard has not changed over the last five years.

2016 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Wildfire (Burn Area, Smoke, Conglagration)			X

- Compounded by current drought conditions, the wildfire hazard has substantially increased and is no longer just a seasonal issue. The wildfire season, including the potential for a catastrophic wildfire, is now a year around concern.

- The vulnerability of Nevada County to increased occurrence of a devastating wildfire has increased as exacerbated by the recent drought, increases in tree mortality, and overall increase in wildfire conditions.
- The increased development in WUI areas within the County also contributes to an increase in vulnerability.
- With large wildfires occurring throughout California, the Planning Area has seen a significant change in air quality from smoke resulting in more recorded bad air days.
- Although, the HMPC noted that even with an increase in wildfire risk and vulnerability due to recent is conditions as described above, ongoing and aggressive wildfire mitigation activities in the Planning Area continue to effectively mitigate and prevent out-of-control, damaging wildfires (See Success Stories in this Section).

2.3 2011/2013 LHMP Mitigation Strategy Successes and Status

Nevada County and participating jurisdictions have been very successful in implementing actions identified in the 2011 and 2013 LHMP Mitigation Strategies, thus, working diligently towards meeting their 2011 goals and objectives of:

Goal 1: Prevent Future Hazard Related Losses of Life and Property

- Objective 1.1: Provide protection, to the extent possible, for existing and future development.
- Objective 1.2: Provide protection for critical public facilities, utilities, and services.
- Objective 1.3: Promote/maintain coordination and interoperability among all Nevada County public agencies.
- Objective 1.4: Promote agricultural planning and animal health.

Goal 2: Increase community awareness and involvement to promote participation and voluntary compliance.

- Objective 2.1: Inform and educate residents and businesses about the types of hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.
- Objective 2.2: Emphasize preparedness and self-responsibility to residents.
- Objective 2.3: Develop an outreach program and provide educational resources for all hazards included in the plan.

Goal 3: Improve Community Emergency Services/Management Capability

- Objective 3.1: Develop/improve warning and evacuation procedure and information for residents and businesses.
- Objective 3.2: Continue to coordinate jurisdictional responsibilities for various hazards through County and community disaster/emergency response plans and exercises.

Goa1 4: Reduce the threat of flooding in Nevada County

- Objective 4.1: Review appropriate flood protection infrastructure improvements and implement where feasible and economically viable.
- Objective 4.2: Prepare public information materials concerning the risk associated with creek, stream and river flooding.

Goal 5: Reduce fire severity and intensity through fuels management

- Objective 5.1: Improve awareness and understanding of the Nevada County fire adapted ecosystem.
- Objective 5.2: Develop a fuels management implementation strategy focusing on education and assistance.
- Objective 5.3: Provide fuels management consulting for private homeowners.
- Objective 5.4: Develop, organize and fund a property owner assistance program.

Goa1 6: Implement and complete identified high priority projects listed in the plan.

- Objective 6.1: Monitor and report on implementation of previous goals, priorities, and projects.
- Objective 6.2: Collect and review lessons learned, results of applicable research, and other scientific, technical data and knowledge to strengthen mitigation.

Goal 7: Maintain FEMA Eligibility for Grant Funding

- Objective 7.1: Monitor and communicate available grant programs, timelines, and processes to all communities.

Where possible, Nevada County and the participating jurisdictions used existing plans and programs to implement the 2011 and 2013 mitigation strategies. Examples include implementation of wildfire mitigation actions through Fire Safe Alliances and existing community wildfire protection plans (CWPPs), implementation of flood mitigation actions through County programs including existing plans, studies, and projects, and implementation of a variety of projects through the County's Capital Improvement Program.

2.3.1. Success Stories

Local, state, and federal agencies and others such as the Fire Safe Council of Nevada County have been working to reduce the fuels in western Nevada County for many years. In the area east and northeast of Scotts Flat Lake and the Cascade Shores just outside Nevada City, several projects in different ownerships are coalescing to provide better wildfire defense and improved forest health. The Nevada County Community Shaded Fuel Break project has been in progress for over 10 years. With an over 25,000-acre project area, and over 6,000 acres of treatments, landscape level wildfire mitigation and forest restoration is in progress in western Nevada County. They Dry Creek Community Shaded Fuel Break was worked on in 2012. Before and after pictures are shown in Figure 2-1.

Figure 2-1 Deer Creek Community Shaded Fuel Break Before and After Treatment

Source: Nevada County

2.3.2. 2011/2013 Mitigation Strategy Update

The 2011/2013 mitigation strategy contained 33 separate mitigation actions benefiting one or more communities within the Nevada County Planning Area. 31 of these were from the 2011 Plan, and 2 from the 2013 Annex. Of these 33 actions, 8 have been completed, 3 are completed but are still ongoing, 12 are ongoing, 5 have not been started, and 5 were unknown as the lead jurisdiction for those projects is not participating in this Plan Update. Because many of these projects, such as the various fuels management projects, are implemented on an annual or other continuous basis and some of the projects have yet to be funded or have otherwise not been initiated, 10 2011 projects have been identified for inclusion in this Plan Update.

Table 2-1 provides a status summary of the mitigation action projects from the 2011 LHMP and 2013 Annex. Following the table is a description of the status of each project.

Table 2-1 Nevada County's 2011/2013 LHMP Update: Mitigation Action Status Summary

Mitigation Action	Lead Jurisdiction	Complete	Ongoing	Not Started	Project in 2017 Update
Multi-Hazard Mitigation Actions					
Banner Taylor Water Storage Replacement	Nevada Irrigation District	X			N
Brushing and Debris Chipping	Town of Truckee		X		Y
Chlorine Gas System Replacement	Nevada Irrigation District	X			N
Emergency Mass Burial Site	Nevada Cemetery District			X	N
Fire Hydrant Installation	Nevada Irrigation District	X	X		N

Mitigation Action	Lead Jurisdiction	Complete	Ongoing	Not Started	Project in 2017 Update
Generator for Networked Computer System	Nevada Joint Union High School District			Unknown	N
Grass Valley Conflagration Mitigation	City of Grass Valley			X	N
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Nevada County and all Incorporated Communities		X		Y
Intertie - Cascade Shores	Nevada Irrigation District	X			N
Intertie -Grass Valley	Nevada Irrigation District	X			N
Pioneer Trail Extension	Town of Truckee		X		N
Tree Management	Nevada Joint Union High School District			Unknown	N
Waterline Installation	Nevada Irrigation District	X			N
Wildfire Mitigation Actions					
Billy Project Vegetation Management	USFS			Unknown	N
Community Assistance Program	Nevada County		X		Y
Deer Creek Community Fuel Break	Nevada County		X		N
Defensible Space Chipping	Nevada County		X		N
Fire Break -North San Juan	North San Juan Fire District			Unknown	N
Fuel Break -Deer Creek Environs	Nevada City		X		N
Joey Project Vegetation Management	USFS			Unknown	N
Public Education and Training	Nevada County		X		Y
Roadside Brush Clearing	Nevada County		X		Y
Sugar Loaf Mountain	Nevada City		X		Y
Water Storage and Supply	Nevada County			X	N
Brush clearing and ladder fuel reduction*	Nevada City		X		Y
Downtown Fire Suppression System*	Nevada City		X		N
Flood Mitigation Actions					
Diversion Reinforcement - Newtown Canal	Nevada Irrigation District		X		Y
Drainage Culvert - Donner Lake	Truckee Donner Public Utility District	X			N
Drainage Improvements - Donner Lake Road	Town of Truckee	X			N
Gregory Creek Debris Clearing and Restoration	Town of Truckee			X	N

Mitigation Action	Lead Jurisdiction	Complete	Ongoing	Not Started	Project in 2017 Update
Relocate Trout Creek Power Lines	Truckee Donner Public Utility District	X			N
South Shore Drainage	Town of Truckee	X	X		Y
Trout Creek Restoration	Town of Truckee	X	X		Y

*From 2013 Nevada City Annex

Nevada County Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The LHMP was integrated with the Nevada County General Plan on October 28, 2014. During next update of Safety Element the date of the updated Mitigation Plan will be inserted.

Community Assistance Program

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Firesafe Council of Nevada County has implemented a Community Assistance program for low income residents to provide defensible space at low or no cost. During the FY 16/17 eleven properties received assistance in maintain defensible space. Additionally, 268 properties used the Chipping program to assist in maintaining defensible space. The Chipping Program is funded through donations and local grants.

Deer Creek Community Fuel Break

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Project is in the NEPA/CEQA stage. Project will treat approximately 4,321 acres of National Forest which is adjacent to residential properties. Additionally, the USFS will be repairing several sections of access roads to improve accessibility for firefighting operations and public ingress and egress in the event of a wildfire in this area.

Defensible Space Chipping

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The Firesafe Council of Nevada County provides a chipping service for residents within the county. During the FY 16/17, 268 properties used the Chipping program to assist in maintaining defensible space and removing fuel loads. The Chipping Program is funded through donations and local grants.

Public Education and Training

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): All participating jurisdictions/agencies have some type of Public Education and training program. Wildland fire is by far the biggest risk in the county and receives more attention than any other risk. However, with all outreach or trainings we emphasize "All Hazards" preparedness measures. The Firesafe Council of Nevada County provides educational trainings several times each month. The Firesafe Council of Nevada County held several public awareness presentations informing citizens on what they can do to protect their property and mitigate the impacts of the drought and bark beetle epidemic.

Nevada County Office of Emergency Services maintains a "Preparedness Center" at the main county building which has brochures, fliers and checklists for citizens. The theme of the Preparedness Center changes with the seasons so citizens can get current information.

The Nevada County of Emergency Services does many disaster preparedness presentations to schools, camps, service groups and Access and Functional Needs audiences. During the last year, "Mr. Preparedness" has spoken to several young audiences to ensure they are aware of being prepared for disasters.

Roadside Brush Clearing

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): All jurisdictions have done roadside brush clearing but funding prevents more treated areas. Nevada County has increased its allocation of 6% of roads treated every year to 10% which will reduce frequency of treatment from 17 years to 10 years. The Nevada County Public Works Department applied for a State grant to purchase a chipper to assist in increasing treated areas. Unfortunately, Public Works was not awarded the grant but plans to apply again this year.

Water Storage and Supply

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was not implemented due to lack of funding and staffing.

City of Grass Valley

Grass Valley Conflagration Mitigation

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This program was not implemented during the last planning cycle due to funding and staffing shortages within the City.

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This program was not implemented due to staffing changes and will be completed in the next planning cycle.

City of Nevada City

Fuel Break -Deer Creek Environs

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing and is completed on an annual basis.

Sugar Loaf Mountain

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project continues to reduce risk and is ongoing annually.

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This program was not implemented due to staffing changes and will be completed in the next planning cycle.

Brush clearing and ladder fuel reduction*

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project continues to reduce risk and is ongoing annually.

Downtown Fire Suppression System*

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing, there are many old and historic buildings in the downtown district. Each time a permit is pulled for a remodel project the City requires sprinkler installation.

Town of Truckee

Brushing and Debris Chipping

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is ongoing.

Pioneer Trail Extension

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project continues to wait for funding and public approval. The project will require a completely new roadway be built for this subdivision.

Drainage Improvements - Donner Lake Road

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was completed. In the Winter of 2017 (one of the heaviest on record recently) there were no issues related to this area and project with run-off.

Gregory Creek Debris Clearing and Restoration

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project is no longer a viable project for the Town to handle. Part of it was mitigated with the installation upstream by the State of California of drainage and retention ponds for the Interstate. The rest of the project is mostly on private property with limited access.

South Shore Drainage

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was completed in the recent 5 year hazard mitigation plan, however during the Winter of 2017 it flooded again. Plans and agreements are currently being adopted to address this location. It is a bi-agency issue as part of it is in Placer County and part of it is in the Town of Truckee.

Trout Creek Restoration

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): 2 reaches have been completed with a 3rd pending. The 2 completed reaches reduced flooding into the Downtown area. The last reach to be completed connects the Downtown area to the confluence of Trout Creek and the Truckee River. This area is slated for development within the next 5 years that should complete this area.

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): This project was completed. It was added to the Safety Element during the most recent General Plan update.

Nevada Cemetery District

Emergency Mass Burial Site

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?):

The project does not have an update, as the Cemetery District is not a participant in this Plan Update.

Nevada Irrigation District

Banner Taylor Water Storage Replacement

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Complete & In Service

Chlorine Gas System Replacement

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Complete & In Service

Fire Hydrant Installation

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Numerous fire hydrants installed and NID continues to work with fire departments to benefit community.

Intertie - Cascade Shores

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Complete & In Service

Intertie -Grass Valley

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Existing confirmed intertie to be available

Waterline Installation

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Replacement of aged waterlines is done on a regular basis to improve water service and reliability.

Diversion Reinforcement - Newtown Canal

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): Design is complete. Scheduled by maintenance for replacement in 2017.

Nevada Joint Union High School District

Generator for Networked Computer System

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project does not have an update, as the Cemetery District is not a participant in this Plan Update.

Tree Management

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project does not have an update, as the Cemetery District is not a participant in this Plan Update.

North San Juan Fire District

Fire Break -North San Juan

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project does not have an update, as the Cemetery District is not a participant in this Plan Update.

Truckee Donner Public Utility District

Drainage Culvert - Donner Lake

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project was completed in 2015. The culvert was increased in size and diverted around the substation to meet back up with the original natural flow channel. The District was experiencing ground saturation due to flooding and by increasing and diverting the culvert and flow the District was able to expand the substation and prevent ground saturation and flooding within the substation. With the rain events of the 2017 Winter, the District did not experience any flooding or ground saturation within the substation due to the work performed.

Relocate Trout Creek Power Lines

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The relocation of the Trout Creek Power Lines were relocated in 2014. This project was part of the Town of Truckee's Trout Creek Restoration Project. The power lines were relocated out of the Trout Creek channel and flood plan. At the same time the electric lines were installed underground. Evidence of loss avoidance, there was no flooding of Trout Creek in any rain event of the 2016-2017 winter.

USFS

Billy Project Vegetation Management

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project does not have an update, as the Cemetery District is not a participant in this Plan Update.

Joey Project Vegetation Management

Progress to Date (Consider: Was the project implemented – why or why not? Did the project reduce risks? Can you provide evidence of loss avoidance?): The project does not have an update, as the Cemetery District is not a participant in this Plan Update.

Chapter 3 Planning Process

Requirements §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and

3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Nevada County and 6 other jurisdictions, in conjunction with a planning committee, prepared this Local Hazard Mitigation Plan (LHMP) update to the 2011 Federal Emergency Management Agency (FEMA) approved Nevada County Local Hazard Mitigation Plan and the 2013 City of Nevada City Annex to the 2011 Nevada County LHMP.

Nevada County recognized the need and importance of the update process for their 2011 Local Hazard Mitigation Plan (LHMP) and initiated its development. After receiving a grant from the Federal Emergency Management Agency (FEMA), which served as the primary funding source for this plan, the County contracted with Foster Morrison Consulting, Ltd. (Foster Morrison) to facilitate and develop the plan. Jeanine Foster, a professional planner with Foster Morrison, was the project manager in charge of overseeing the planning process and the development of this LHMP update. Chris Morrison, also a professional planner with Foster Morrison, was the lead planner for the development of this update. The Foster Morrison's team's role was to:

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

3.1 Local Government Participation

Nevada County, the three incorporated communities, and three participating special districts made a commitment to this 2017 LHMP Update, as participating jurisdictions. The DMA planning regulations and guidance stress that each local government (i.e., participating jurisdiction) seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

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

For the Nevada County Planning Area's HMPC, "participation" meant the following:

- Providing facilities and printed materials for meetings;
- Attending and participating in the HMPC meetings;
- Completing and returning the Data Collection Worksheets;
- Collecting and providing other requested data (as available);
- Coordinating information sharing between internal and external agencies;
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts; including annexes
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the governing boards.

The County and all jurisdictions with annexes to this plan seeking FEMA approval met all of these participation requirements. In most cases one or more representatives for each jurisdiction attended the HMPC meetings described in Table 3-3 and also brought together a local planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on plan drafts. Appendix A provides additional information and documentation of the planning process.

In order to promote the integration of CRS into this planning process, the HMPC representatives were selected based on their areas of expertise relative to the CRS mitigation categories as detailed in Table 3-1 and Table 3-2. In addition, the Nevada County Planning Department Planning Director in association with planners from the incorporated communities and Foster Morrison Planners were involved in the development of this Plan Update. In addition to attending meetings, providing draft text for inclusion in the plan, reviewing plan documents, and coordinating input from other departments and stakeholders, these planners also provided information on development since the last plan, mapping data, plan text, details on future development areas, and input on current mitigation capabilities.

Table 3-1 Nevada County LHMP Staff Capability with Six Mitigation Categories

Jurisdiction/Departments	Prevention	Property Protection	Natural Resource Protection	Emergency Services	Structural Flood Control Projects	Public Information	Other
Nevada County							
John Gulserian, Office of Emergency Services		X	X	X	X	X	X
Brian Foss, Planning Director	X	X	X		X	X	X
Sarah Deal, GIS	X			X			X
Grant Eisen, Environmental Health	X		X			X	X

Specific individuals representing Nevada County, incorporated communities, and other jurisdictions participating in this LHMP Update were actively involved throughout the Plan Update process as identified in Appendix A in the sign-in sheets for the meetings and as evident through the data, information and input provided by HMPC representatives for the development of this LHMP Update. This Chapter 3 and Appendix A provides additional information and documentation of the planning process and participants to this LHMP Update.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for updating the Nevada County LHMP Update using the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

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

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

Table 3-2 shows how the modified 10-step process fits into FEMA's four-phase process. The sections that follow describe each planning step in more detail.

Table 3-2 Mitigation Planning Processes Used to Develop the Nevada County Local Hazard Mitigation Plan Update

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

This LHMP Update involved a comprehensive review and update of each section of the 2011 plan and 2013 Annex and includes an assessment of the success of the participating communities in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan, as previously described in more detail in Chapter 2 and throughout Chapter 4.

The process followed to update the plan is detailed in the above table and the sections that follow and is in conformance with the latest DMA planning guidance and the CRS 2013 Coordinator's Manual. As part of this LHMP Update, all sections of the plan were reviewed and updated to reflect new data, processes, participating jurisdictions, and resulting mitigation strategies. Only the information and data still valid from the 2011 plan and 2013 Annex was carried forward as applicable into this LHMP Update.

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With Nevada County's, incorporated communities' and other participating jurisdictions' commitment to participate in the DMA planning process, Foster Morrison worked with the County's Office of Emergency Services (County OES), as overall project lead, to establish the framework and organization for development of the plan. An initial meeting was held with key community representatives to discuss the organizational and process aspects of this Plan Update process.

The initial kick-off meeting was held on February 15, 2017. Invitations to the kickoff meeting was extended to key county departments, the three incorporated communities, special districts located within the Planning

Area, as well as to other federal, state, and local stakeholders that might have an interest in participating in the planning process. Representatives from participating jurisdictions and HMPC members to the 2011/2013 Plans were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The list of initial invitees is included in Appendix A.

The HMPC was established as a result of the initial meeting, as well as through interest generated through the initial public meeting and outreach conducted throughout this project as detailed later in this section. The HMPC, comprising key county, city, special district, and other government and stakeholder representatives, developed the plan with leadership from the County OES and facilitation by Foster Morrison. Each participating jurisdiction seeking FEMA approval of the plan had representation on the HMPC. The following participated on the HMPC:

Nevada County

- Ag Commissioner
- Animal Control
- Airport Manager
- Assessor
- Board of Supervisors
- Building Department
- Community Development Agency
- Consolidated Fire
- Environmental Health
- GIS
- Office of Emergency Services
- Planning Department
- Public Works
- Sherriff's Office
- Waste Water Operations Manager

Participating Incorporated Communities

- City of Grass Valley*
- City of Nevada City*
- Town of Truckee*

*Indicates participating jurisdiction seeking FEMA approval of this plan

Other Government and Stakeholder Representatives:

- Nevada County Fire Safe Council
- CAL FIRE
- Higgins Fire District
- Nevada Irrigation District*
- North San Juan Fire
- Ophir Hill Fire
- Peardale Chicago Park Fire
- Penn Valley Fire
- Rose Water System
- Rough & Ready Fire

- Truckee Public Utility District*
- Washington County Water District*

*Indicates participating jurisdiction seeking FEMA approval of this plan

A list of participating HMPC representatives for each participating jurisdiction is included in Appendix A. The above list of HMPC members also includes several other government and stakeholder representatives that were invited to participate and contributed to the planning process. This list includes all HMPC members that attended one or more HMPC meetings detailed in Table 3-3. In addition to providing representation on the HMPC, participating jurisdictions formulated their own internal planning teams to collect and provide requested data and to conduct timely reviews of the draft documents as further detailed in each annex to this plan and as detailed in the list of HMPC representatives for Nevada County and all jurisdictions.

Table 3-1 demonstrates the Nevada County HMPC members' expertise in the six mitigation categories (Prevention, Property Protection, Emergency Services, Natural Resource Protection, Structural Flood Control Projects, and Public Information). The Nevada County and Incorporated Community's staff responsible for community land use and comprehensive planning for the County Planning Area were active participants on the HMPC and provided data and information to support development of the plan. The support of staff from all participating jurisdictions were called upon to collect and provide requested data and to conduct timely reviews of the draft documents. Note that the above list of HMPC members also includes several other government and stakeholder representatives that contributed to the planning process. Specific participants from these other agencies are identified above and, with supporting documentation included in Appendix A.

Meetings

The planning process officially began with a kick-off meeting held in the Nevada County offices on February 15, 2017, followed by public kick-off meeting held the same day at 6:00 pm at the Grass Valley Veteran's Hall. The meetings covered the scope of work and an introduction to the DMA, CRS, and FMA requirements. During the HMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the plan. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to each of the participating jurisdictions, quantify values at risk to identified hazards, inventory existing capabilities, record possible mitigation actions, and to capture information on the status of mitigation action items from the 2011 plan. A copy of the worksheets for this project are included in Appendix A. The County and each jurisdiction seeking FEMA approval of this Plan Update completed and returned the worksheets to Foster Morrison for incorporation into the plan document.

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

- Nevada County – https://www.mynevadacounty.com/nc/igs/oes/Pages/LocalHazardMitigation.aspx

The HMPC met formally five times during the planning period (February 2017 – July 2017) which adequately covers the four phases of DMA and the 10-Step CRS planning process. The formal meetings held and topics discussed are described in Table 3-3. Agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-3 HMPC Meetings

Meeting Type	Meeting Topic	Meeting Date(s)	Meeting Location(s)
HMPC #1 Kick-off Meeting	1) Introduction to DMA and the planning process 2) Overview of current LHMP; 3) Organize Resources (CRS Steps 1,2,&3): the role of the HMPC, planning for public involvement, coordinating with other agencies/stakeholders 4) Introduction to Hazard Identification	2/15, 2017	Nevada County Board of Supervisor's Room
HMPC #2	1) Risk assessment overview and work session -CRS Step 4: Assess the Hazard -CRS Step 5: Assess the Problem	4/12, 2017	Nevada County Emergency Operations Center
HMPC #3	1) Review of risk assessment summary 2) Review and update of mitigation goals -CRS Step 6: Set Goals -CRS Step 7: Review possible activities	4/25, 2017	Nevada County Emergency Operations Center
HMPC #4	1) Review of mitigation alternatives 2) Review and update of mitigation actions from the 2011 plan 3) Identify updated list of mitigation actions by hazard 4) Review of mitigation selection criteria 5) Update and prioritize mitigation actions 6) Mitigation Action Strategy Implementation and Draft Action Development -CRS Step 7: Review possible activities -CRS Step 8: Draft an Action Plan	4/26, 2017	Nevada County Emergency Operations Center
HMPC #5	1) Review of final HMPC, jurisdictional and public comments and input to plan 2) Review and documentation of changed conditions, vulnerabilities and mitigation priorities 3) CRS Step 8: Draft an Action Plan 4) CRS Step 9 & 10: Plan maintenance and Implementation Procedures	7/27, 2017	Grass Valley Fire Station #2

Planning Step 2: Involve the Public

Up-front coordination discussions with the Nevada County OES and the HMPC established the initial plan for public involvement. Public involvement activities for this Plan Update included press releases, social media communications, stakeholder and public meetings, development of an LHMP webpage and associated website postings, the collection of public and stakeholder comments on the draft plan through a variety of mechanisms, and other public outreach activities as further described below. Information provided to the public included an overview of the mitigation status and successes resulting from implementation of the 2011 plan and 2013 Annex as well as information on the processes, new risk

assessment data, and proposed mitigation strategies for this Plan Update. As part of the plan development process, a Public Involvement Strategy was also developed to ensure a meaningful public process. At the planning team kick-off meetings, the HMPC discussed additional strategies for public involvement and agreed to an approach using established public information mechanisms and resources within the community.

Early Public Meeting

Public outreach for this Plan Update began at the beginning of the plan development process with an advertisement placed in the local newspaper and other local outreach methods to inform the public of the purpose of the DMA and the hazard mitigation planning process for the Nevada County Planning Area and to invite the public to an early public meeting held in Nevada County to kick-off the project on February 15, 2017 at the Grass Valley Veteran's Hall in Grass Valley.

Final Public Meeting

The first draft of the plan was provided to the HMPC in June of 2017, with a public review draft provided in July of 2017. A public meeting was held on July 26, 2017 to present the draft LHMP and to collect public comments on the plan prior to finalization and submittal to Cal OES/FEMA. Public meetings were advertised in a variety of ways to maximize outreach efforts to the public at large and included an advertisement in a local newspaper inviting the public to attend the public meeting. The advertisement in the local newspaper included information on the date, location and time of the meeting, where the draft plan could be accessed in the community, and how to provide comments on the draft plan. In addition to a copy of the draft plan being placed on the County website in advance of these meetings, hard copies of the draft of the plan were made available to interested parties at two Nevada County Public Libraries: The Madelyn Helling library in Nevada City and the Truckee library in Truckee.

Documentation to support the final public meeting can be found in Appendix A. In addition to advertisement for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders with an interest in the Nevada County Planning Area. The majority of these people reside in Nevada County or in surrounding communities. Because this is a multi-jurisdictional planning effort, all public outreach activities for this Plan Update were conducted in cooperation with and on behalf of Nevada County, the incorporated communities, and all participating jurisdictions. The formal public meetings for this project are summarized in Table 3-4.

Table 3-4 Schedule of Public and Stakeholder Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Early Public Meetings	1) Intro to DMA, CRS and mitigation planning 2) 2017 LHMP Update Process	2/15, 2017	Grass Valley Veteran's Hall in Grass Valley
Final Public Meeting	1)Presentation of Draft LHMP and solicitation of public and stakeholder comments	7/ 26, 2017	Nevada County Board of Supervisor Chambers

Where appropriate, stakeholder and public comments and recommendations were incorporated into the final plan throughout the plan development process, including the sections that address mitigation goals and strategies. No formal comments were provided on the draft plan. All press releases, newspaper advertisements and articles, website postings, and public outreach efforts are on file with the Nevada County OES and are included in Appendix A.

Other Public Outreach Efforts

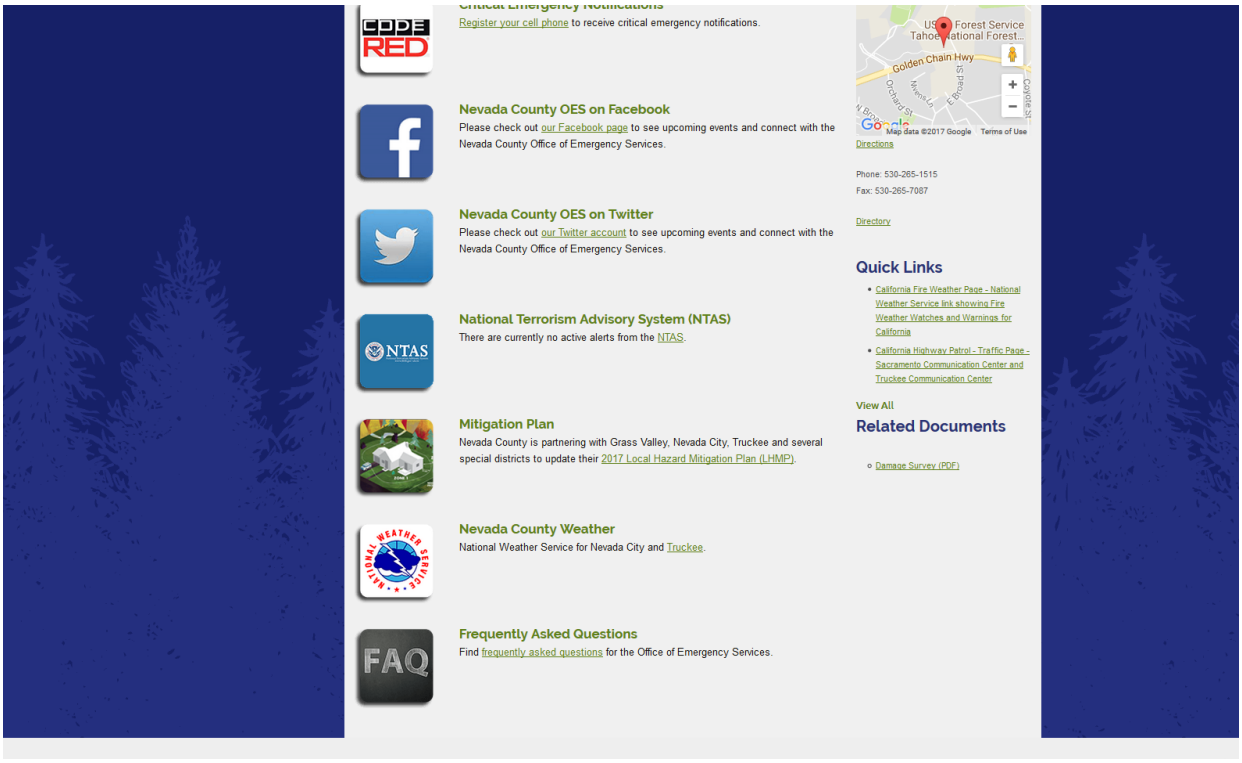
Beyond these more formal public involvement activities, the LHMP Update process also included the following public outreach activities included in Table 3-5 which are further documented and described in Appendix A. The public outreach activities described here were conducted with participation from and on behalf of all jurisdictions participating in this plan,

Table 3-5 Other Public Outreach Efforts

Effort	Description
Article in Newspaper	An article was published in the Union newspaper on February 1, 2017 to make citizens in the County aware of the hazard mitigation update process and invite participation and attendance at upcoming HMPC and Public Meetings
Nevada County LHMP Update Website	Information on the Plan update process and location of documents, and final HMPC and public meeting locations were posted on the County website. Links to the County website were placed on websites from the other incorporated communities.
Article in Newspaper	An article was published in the Union newspaper on July 18, 2017 to invite public review and comment on the draft plan prior to submittal to Cal OES and FEMA.
Press Release on Yuba.net	A press release was published online on Yuba.net to invite public review and comment on the draft plan prior to submittal to Cal OES and FEMA.
Public Outreach at Madelyn Helling Public Library, Nevada City	The County placed the draft plan in the reference section at the main library, Madelyn Helling Library in Nevada City.
Public Outreach at Truckee Public Library, Truckee	The County placed the draft plan in the reference section at the Truckee Public Library, in Truckee.

The draft plan is currently available online on the Nevada County website at: https://www.mynevadacounty.com/nc/igs/oes/Pages/LocalHazardMitigation.aspx. This can be seen on Figure 3-1. The public outreach activities described here were conducted with participation from and on behalf of all jurisdictions participating in this plan.

Figure 3-1 Nevada County – OES Website



Planning Step 3: Coordinate with Other Departments and Agencies

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

- American Red Cross
- CAL FIRE
- Cal OES
- Cal Trans
- California Department of Water Resources
- Community Services Districts
- Emergency Services Departments
- Incorporated communities in Nevada County
- Fire Protection Districts
- Fire Departments
- Fire Safe Alliance
- National Weather Service
- Neighboring Communities
- NFIP Program Coordinators
- Pacific Gas and Electric
- State Fish and Game

- State Parks
- US Forest Service
- Water Districts

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Coordination involved contacting these agencies through a variety of mechanisms and informing them on how to participate in the Plan Update process and if they had any expertise or assistance they could lend to the planning process, risk assessment, or specific mitigation strategies. Coordination with these groups included, holding face-to-face meetings, sending outreach letters or e-mails, some with follow up phone calls; and making phone calls alone to out of area agencies. All of these groups and agencies were solicited asking for their assistance and input, telling them how to become involved in the Plan Update process, and inviting them to HMPC meetings.

In addition, as part of the overall stakeholder and agency coordination effort, the HMPC coordinated with and utilized input to the LHMP update from the following agencies:

- Cal-Adapt
- Cal OES
- CAL FIRE
- California Department of Finance
- California Department of Water Resources
- California Geological Survey
- California State University System
- FEMA Region IX
- Library of Congress
- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Response Center
- National Weather Service
- United States Army Corps of Engineers
- United States Bureau of Land Management
- United States Bureau of Reclamation
- United States Department of Agriculture
- United States Farm Service Agency
- United States Forest Service
- United States Geological Survey
- Western Regional Climate Center

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

submittal to CAL OES and FEMA. In addition, as part of the review of the draft plan, key agency stakeholders were contacted and their comments specifically solicited as described further in this Section and included in Appendix A.

Other Community Planning Efforts and Hazard Mitigation Activities

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

- Cal-Adapt plans
- CAL FIRE plans
- CAL OES plans
- California Geological Survey reports
- California Department of Finance demographic documents
- California DWR plans
- Emergency Operations Plans
- FEMA mitigation planning documents
- Flood Insurance Studies
- General Plans
- Habitat Conservation Plans
- National Weather Service documents
- Stormwater Master Plans
- US Fish and Wildlife reports
- USGS Reports

Specific source documents are referenced at the beginning of each section of Chapter 4 and Appendix B. These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and documents were incorporated into the risk assessment and hazard vulnerability sections of the plan. Where the data from the existing studies and reports is used in this Plan Update, the source document is referenced throughout this Plan Update. The data was also used in determining the capability of the community in being able to implement certain mitigation strategies. Appendix B, References, provides a detailed list of references used in the preparation of this Plan Update.

3.2.2. Phase 2: Assess Risks

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

Foster Morrison led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact the Planning Area. Starting with the 2011 plan, natural hazards of concern

were added, deleted, and modified for this LHMP Update. Data collection worksheets and jurisdictional annexes were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

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

3.2.3. Phase 3: Develop the Mitigation Plan

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

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

Planning Step 8: Draft an Action Plan

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

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

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

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

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes

key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7 Plan Implementation and Maintenance.

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

Implementation and Maintenance Process: 2011

The 2011 Nevada County, California Local Hazard Mitigation Plan Update included a process for plan maintenance and implementation of the mitigation strategy as well as formal updates to the plan document. The 2011 process called for annual reviews with the status of mitigation strategy implementation documented in an annual report. In addition, the 2011 process called for a formal plan update as required by DMA regulations every 5 years. In accordance with the process outlined in the 2011 plan, formal annual reviews were conducted and documented by the Nevada County OES and other participating jurisdictions, and this LHMP update, once complete, will meet the DMA formal update requirements.

Specifically, Nevada County's existing plan was completed and adopted by the County in 2011. It was anticipated that in compliance with the five-year update requirement, the next complete update of the plan would be in 2016. This current Plan Update process was initiated in January 2017, and finished in August 2017 with the submittal of this LHMP update to Cal OES and FEMA Region IX.

As stated, documented reviews of the 2011 plan took place on an annual basis by the County and participating jurisdictions, and the 2011 LHMP was integrated into many other planning mechanisms in the County. The 2011 LHMP was adopted and incorporated by reference into the Nevada County General Plan Safety Element. The risk assessment portion and other areas of the 2011 LHMP was relied on and further integrated into other planning mechanisms. Table 3-6 lists the planning mechanism the 2011 LHMP was integrated into by Nevada County. Each of the jurisdictional annexes have similar tables that show how the 2011 plan was specifically integrated into their local community planning mechanisms.

Table 3-6 Incorporation of Nevada County 2011 LHMP into Other Planning Mechanisms

Planning Mechanism 2011 LHMP Was Incorporated or Implemented Through	Details
Nevada County General Plan	The County adopted the 2011 LHMP Update into the Safety Element of the General Plan.
Nevada County EOP	The 2011 LHMP and its hazard information is utilized in the County Emergency Operations Plan.

The plan implementation and maintenance process as set forth in the 2011 LHMP has been updated for this LHMP Update. The revised update implementation and maintenance process for the Nevada County 2017

LHMP Update is set forth in Section 7 of this plan document. A strategy for continued public involvement for this update process is also included in Chapter 7.

Chapter 4 Risk Assessment

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

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

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

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

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

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

- **Section 4.1: Hazard Identification: Natural Hazards** identifies the natural hazards that threaten the Nevada County Planning Area (Planning Area) and describes why some hazards have been omitted from further consideration.
- **Section 4.2: Hazard Profiles** discusses the threat to the Planning Area and describes previous occurrences of hazard events and the likelihood of future occurrences.
- **Section 4.3: Vulnerability Assessment** assesses the Planning Areas' exposure to natural hazards; considering assets at risk, critical facilities, future development trends, and, where possible, estimates potential hazard losses.
- **Section 4.4: Capability Assessment** inventories existing mitigation activities and policies, regulations, plans, and projects that pertain to mitigation and can affect net vulnerability.

This risk assessment covers the entire geographical extent of Nevada County, including the incorporated communities and other participating jurisdictions. Since this plan is a multi-jurisdictional plan, the Hazard Mitigation Planning Committee (HMPC) is required to evaluate how the hazards and risks vary from jurisdiction to jurisdiction and across the Planning Area. While these differences are noted in this chapter,

they are expanded upon in the annexes of the participating jurisdictions. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire Nevada County Planning Area.

This LHMP update involved a comprehensive review and update of each section of the 2011 risk assessment. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this risk assessment update are summarized in Chapter 2 What's New and also detailed in this Risk Assessment portion of the plan.

4.1 Hazard Identification

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

The Nevada County HMPC conducted a hazard identification study to determine the hazards that threaten the Planning Area. This section details the methodology and results of this effort.

Data Sources

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

- HMPC input
- 2013 State of California Hazard Mitigation Plan
- FEMA Disaster Declaration Database

4.1.1. Results and Methodology

Using existing hazards data and input gained through planning meetings, the HMPC agreed upon a list of hazards that could affect Nevada County. Hazards data from the California Office of Emergency Services (Cal OES), FEMA, California Department of Water Resources, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the Planning Area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The hazards evaluated as part of this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment.

The following hazards in Table 4-1, listed alphabetically were identified and investigated for this LHMP Update. As a starting point, the 2013 California State Hazard Mitigation Plan was consulted to evaluate the applicability of new hazards of concern to the State to the (Planning Area. Building upon this effort, hazards from the past plan were also included, and comments explain how hazards were updated from the previous plan. Most hazards from the 2011 plan were profiled in this plan, with the exception of human

health hazards, pandemic hazards, and airborne hazards, which have been eliminated from further consideration in this LHMP Update, as they were determined to be better addressed in other County planning mechanisms. Mine related hazards were included in the subsidence hazard, and arson and commercial fires were included in the wildfire discussion. New hazards include climate change, drought and water shortage, localized flooding, levee failure, extreme heat, and extreme cold/snow/freeze.

Table 4-1 Nevada County Hazard Identification and Comparison

2017 Hazards	2011 Hazards	Comment
Ag Hazards: Severe Weather/Insect Pests	Agricultural Hazards	More detailed discussion of vulnerability to the County from ag hazards was included.
Avalanche	Avalanche	Similar analysis was performed, with updated information.
Climate Change	–	This is a new hazard for the LHMP Update.
Dam Failure	Dam Failure	Similar analysis was performed.
Drought and Water Shortage	–	This is a new hazard for the LHMP Update.
Earthquake	Earthquake	More detailed GIS analysis was performed, including a Hazus earthquake simulation to show risk to the County from earthquake.
Flood: 100/500–year	Floods	More detailed GIS analysis was performed, including values at risk, critical facilities at risk, population at risk, and general community impacts.
Flood: Localized/Stormwater	–	This is a new hazard for the LHMP Update.
Hazardous Materials Transportation (interstates, railroads, pipelines)	Hazardous Materials	More detailed GIS analysis was performed, including values at risk, critical facilities at risk, population at risk, and general community impacts.
Landslide, Debris & Mud Flows	Landslides	More detailed GIS analysis was performed, including values at risk, critical facilities at risk, population at risk, and general community impacts.
Levee Failure	–	This is a new hazard for the LHMP Update.
Severe Weather: Extreme Heat	–	This is a new hazard for the LHMP Update.
Severe Weather: Extreme Cold, Snow, and Freeze	–	This is a new hazard for the LHMP Update.
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Severe Weather (Wind, Lightning, Snow, Freezing, Heavy Rain	Similar analysis was performed.
Subsidence	Land subsidence	More detailed GIS analysis was performed, including values at risk, critical facilities at risk, population at risk, and general community impacts.
Volcano	Volcano	Similar analysis was performed, with updated information.

2017 Hazards	2011 Hazards	Comment
Wildfire (smoke, tree mortality, conflagration)	Urban Interface Wildland Fires	More detailed GIS analysis was performed, including values at risk, critical facilities at risk, population at risk, and general community impacts.
	Mine related Hazards	This will be included in the subsidence profile in the LHMP Update.
–	Human Health Hazard	This hazard will not be profiled in the LHMP Update.
–	Pandemic Flu	This hazard will not be profiled in the LHMP Update.
–	Arson and Commercial Fires	This will be considered inside the wildfire hazard in the LHMP Update.
	Airborne Hazards	This hazard will not be profiled in the LHMP Update.

Table 4-2 was completed by the County and HMPC to identify, profile, and rate the significance of identified hazards. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment. Table 4-35 in Section 4.2.19 Hazards Summary provides an overview of these significant hazards.

Table 4-2 Nevada County Hazard Identification

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Significant	Highly Likely	Critical	High	High
Avalanche	Limited	Highly likely	Negligible	Low	Low
Climate Change	Extensive	Likely	Critical	Medium	High
Dam Failure	Significant	Unlikely	Catastrophic	High	Low
Drought and Water Shortage	Extensive	Likely/ Occasional	Critical	Medium	Low
Earthquake	Extensive	Unlikely	Critical	Medium	Low
Flood: 1%/0.2% Annual Chance	Extensive	Occasional/Unlikely	Critical	High	Medium
Flood: Localized/Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Hazardous Materials Transportation (interstates, railroads, pipelines)	Limited	Likely	Limited	Medium	Low
Landslide, Debris & Mud Flows	Significant	Likely	Critical	Medium	Low
Levee Failure	Limited	Unlikely	Limited	Low	Low
Severe Weather: Extreme Cold, Snow, and Freeze	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Significant	Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms (wind/tornado/hail, lightning)	Significant	Highly Likely	Critical	Medium	High
Subsidence	Significant	Likely	Negligible	Medium	Medium
Volcano	Significant	Unlikely	Limited	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Extensive	Highly Likely	Catastrophic	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

4.1.2. Disaster Declaration History

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

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

A USDA declaration will result in the implementation of the Emergency Loan Program through the Farm Services Agency. This program enables eligible farmers and ranchers in the affected county as well as contiguous counties to apply for low interest loans. A USDA declaration will automatically follow a major disaster declaration for counties designated major disaster areas and those that are contiguous to declared counties, including those that are across state lines. As part of an agreement with the USDA, the SBA offers low interest loans for eligible businesses that suffer economic losses in declared and contiguous counties that have been declared by the USDA. These loans are referred to as Economic Injury Disaster Loans. These are discussed in Section 4.2.5.

Based on the disaster declaration history provided in Table 4-3, Nevada County is among the many counties in California susceptible to disaster. Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and Cal OES and compiled in chronological order in Table 4-3. A review of state declared disasters indicates that Nevada County received 18 state declarations between 1950 and 2017. Of the 18 state declarations: 11 were associated with severe winter storms, heavy rains, or flooding; 3 were for wildfires; 2 were for drought; 1 was for freeze and severe weather conditions; and 1 was for an energy emergency. A review of federal disasters shows 16 federal disaster declarations. Of these 16 federal declarations: 12 were associated with severe winter storms, heavy rains, or flooding; 3 were for wildfire, and 1 was for hurricane (a nationwide declaration for Katrina evacuations).

Table 4-3 Nevada County State and Federal Disasters Declaration, 1950-2017

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2017	Severe Winter Storms, Flooding, Mudslides	Storms	Storms	DR-4308	–	4/3/2017

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2017	Severe Winter Storms, Flooding, and Mudslides	Storms	Storms	DR-4301	–	2/14/2017
2014	California Drought	Drought	Drought	GP 2014-13	1/17/2014	–
2009	Yuba Fire	Wildfire	Wildfire	FM 2825	–	8/15/2009
2008	2008 January Storms	Flood	Storms	GP 2008-01	1/5/2008	–
2006	2006 June Storms	Flood	Storms	DR-1646	–	6/5/2006
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	-	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	-	9/13/2005
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97-1/31/97	1/4/1997
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95-3/14/95	1/13/1995
1990	1990 Severe Storms	Flood	Storms	GP 989-06	2/22/1990	–
1988	Forty-Niner Fire	Fire	Fire	FM-2071	–	9/13/1998
1988	Forty-Niner Fire	Fire	Fire	DR 815	9/11-9/20/1988	9/13/1998
1987	1987 Wildland Fires	Fire	Fire	GP	9/3/1987, 6/10/1987	–
1986	1986 Storms	Flood	Storms	DR-758	2/18-86-3/12/86	2/18/1986
1983	Winter Storms	Flood	Flood	DR-677	12/8/82-3/21/83	2/9/1983
1976	1976 Drought	Drought	Drought	EM-3023	2/9/1976, 2/13/1976, 2/24/1976, 3/26/1976, 7/6/1976	–
1972	1972 Freeze	Freeze	Freeze	–	4/17/1972, 5/22/1972, 5/31/1972	–
1964	1964 Late Winter Storms	Flood	Storms	DR-183	-	12/24/1964

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1963	1963 Floods	Flood	Storms	DR 145	2/7/1963, 2/26/1963, 2/29/1963, 4/22/1963	2/25/1963
1961	1961 Widespread Fires	Fire	Fire	–	9/28/1961	–
1958	1958 April Storms and Floods	Flood	Storms	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	OCD 50-01	11/21/1950	–

Source: Cal OES, FEMA

This disaster history suggests that Nevada County experiences a major event worthy of a federal disaster declaration every 4.2 years. The County has a 23.8 percent chance of receiving a federal disaster declaration in any given year. With the exception of state and federal declarations for wildfire, energy emergency, and the hurricane evacuation, every other disaster declaration resulted directly or indirectly from severe weather. Similarly, most disaster-related injuries to people and damage to property and crops resulted from severe weather conditions.

Disasters since 2011

There have been two FEMA Emergency Management declarations since the 2011 plan, both from the heavy rains in early 2017. There has been a state disaster declaration for drought in 2014. In addition, the County declared a local disaster for tree mortality on September 16, 2016.

4.2 Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

The hazards identified in Section 4.1 Hazard Identification are profiled individually in this section. In general, information provided by planning team members is integrated into this section with information from other data sources. These profiles set the stage for Section 4.3 Vulnerability Assessment, where the vulnerability is quantified, as data is available, for each of the priority hazards.

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the Nevada County Planning Area. Where known, this includes information on the hazard extent, area, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical incidents, including impacts where known. The extent or location of the hazard within or near the Nevada County Planning Area is also included here. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.
- **Frequency/Likelihood of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of experiencing a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
  - ✓ **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year
  - ✓ **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less
  - ✓ **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years
  - ✓ **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.
- **Climate Change**—This section contains the effects of climate change (as applicable). The possible ramifications of climate change on the hazard are discussed.

Section 4.2.19 Hazards Summary provides an initial assessment of the profiles and assigns a level of significance or priority to each hazard. Those hazards determined to be of high or medium significance were characterized as priority hazards that required further evaluation in Section 4.3 Vulnerability Assessment. Those hazards that occur infrequently or have little or no impact on the Planning Area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. The ability of a community to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the Planning Area, enabling the County to focus resources where they are most needed.

The following sections provide profiles of the hazards that the HMPC identified in Section 4.1 Hazard Identification. The severe weather hazards are discussed first because it is the secondary hazards generated by severe weather (e.g., flood and wildfire) that can result in the most significant losses. The other hazards follow alphabetically.

Data Sources

The following data sources formed the basis for this Hazard Profiles portion of the plan:

- 2013 State of California Multi-Hazard Mitigation Plan

- CAL FIRE Wildfire History Database
- Cal-Adapt
- California Climate Adaptation Strategy
- California Department of Conservation, Office of Mine Reclamation
- California Department of Water Resources Best Available Maps
- California Department of Water Resources Division of Safety of Dams
- California Division of Mines and Geology
- California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.
- Climate Change Impacts in the United States
- Enhanced Fujita Scale. National Oceanic and Atmospheric Administration Storm Prediction Center.
- Federal Emergency Management Agency – Wind Zones in the United States
- Federal Emergency Management Agency: Building Performance Assessment: Oklahoma and Kansas Tornadoes
- Federal Emergency Management Agency: Multi-Hazard Identification and Risk Assessment.
- Galloway, Jr Dr. Gerald E. Levees in History: The Levee Challenge. Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.
- Intergovernmental Panel on Climate Change
- Johnstone, J. and Dawson, T. Climatic context and ecological implications of summer fog decline in the coast redwood region. Proceedings of the National Academy of Sciences, January 7, 2010.
- National Aeronautics and Space Administration
- National Climatic Data Center Storm Events Database.
- National Drought Mitigation Center
- National Flood Insurance Program
- National Integrated Drought Information System
- National Oceanic and Atmospheric Administration Storm Prediction Center
- National Oceanic and Atmospheric Administration's National Climatic Data Center
- National Park Service
- National Performance of Dams Program
- National Weather Service Heat Index
- National Weather Service Wind Chill Index
- Nevada County Community Wildfire Protection Plan
- Nevada County Emergency Operations Plan
- Nevada County Flood Insurance Study
- Nevada County General Plan
- Nevada County General Plan Environmental Impact Report
- Nevada County Housing Element
- Nevada County Master Environmental Inventory
- Nevada County Public Works
- North San Juan Fire Protection District Community Wildfire Protection Plan
- North Sierra Precipitation Index
- Public Policy Institute of California. If drought continues: Environment and poor rural communities most likely to suffer. [press release].
- Sacramento Bee
- Sierranevadaphotos.com
- State of California Department of Conservation Farmland Mapping and Monitoring Program

- Truckee Fire Protection District Community Wildfire Protection Plan
- Underwood, E. Models predict longer, deeper US droughts. Science, 347(6223) 707 DOI: 10.1126/science.347.6223.707. 2015.
- United State Geologic Survey. Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.
- US Army Corps of Engineers
- US Bureau of Reclamation
- US Department of Agriculture Secretarial Disasters Declarations
- US Department of Transportation Pipeline and Hazardous Materials Safety Administration
- US Drought Monitor
- US Geological Survey Karst Maps
- USA Today
- Western Regional Climate Center

4.2.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs in the Nevada County Planning Area as localized storms that bring heavy rain, lightning, and strong winds.

The National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 993 severe weather events that occurred in Nevada County between January 1, 1950, and December 31, 2016. Table 4-4 summarizes these events.

*Table 4-4 NCDC Severe Weather Events for Nevada County 1950-12/31/2016**

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Astronomical Low Tide	1	0	0	0	0	$0	$0
Avalanche	10	7	0	5	0	$0	$0
Blizzard	2	0	0	0	0	$30,000	$0
Cold/Wind Chill	3	0	0	0	0	$0	$2,400,000
Debris Flows	5	0	0	0	0	$62,000	$0
Dense Fog	8	0	2	0	0	$200,000	$0
Dense Smoke	2	0	0	0	0	$0	$0
Drought	33	0	0	0	0	$0	$0
Dust Devil	1	0	0	0	0	$0	$0
Flash Flood	1	0	0	0	0	$0	$0
Flood	22	2	0	1	0	$1,065,000	$0
Frost/Freeze	5	0	0	0	0	$0	$0
Hail	15	0	0	0	0	$0	$0

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Heat	9	1	0	0	0	$0	$0
Heavy Rain	14	0	0	0	0	$0	$0
Heavy Snow	529	1	3	6	1	$575,000	$0
High Surf	1	0	0	0	0	$0	$0
High Wind	96	2	1	3	0	$11,744,000	$30,011,000
Landslide	1	0	0	0	0	$0	$0
Lightning	3	1	0	0	0	$15,000	$0
Strong Wind	18	1	0	0	0	$1,521,600	$0
Thunderstorm Wind	3	0	0	0	0	$0	$0
Tornado	1	0	0	0	0	$0	$0
Wildfire	24	2	0	35	12	$500,025,000	$0
Winter Storm	143	3	1	3	1	$115,000	$0
Winter Weather	43	3	1	0	0	$10,000	$0
Total	**993**	**23**	**8**	**53**	**14**	**$515,362,600**	**$32,411,000**

Source: NCDC

*Note: Losses reflect totals for all impacted counties/areas

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

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

- Extreme Cold, Freeze, and Snow
- Extreme Heat
- Heavy Rains and Storms (Hail/Lightning/Wind/Tornadoes)

The eastern portion of Nevada County is situated in the Sierra Nevada Foothills, ranging in altitude from 100 ft. elevation in Penn Valley, to 2,400 ft. elevation in Grass Valley, and 2,500 ft. in Nevada City. The western portion of the County is located in the Central Valley. Thus, the climates vary by season and location. Nevada County experiences warmer, dryer California temperatures in the summer to colder weather in the winter with annual snowfall down to the 2400 ft. elevation and, on rare occasion, snow falling in the lower areas of Rough and Ready and Penn Valley. Due to size of the County and changes in elevation and climate, weather conditions can vary greatly across the County. For purposes of this hazard profile, the County will be divided into two distinct sections, as applicable: western Nevada County, which is predominantly below an elevation of 2,500 feet above msl; and eastern Nevada County, which is generally above 2,500 feet above msl ranging to above 6,000 feet above msl and receives more snowfall. The profiles that follow provide information, where possible, from two weather stations located in these

two different parts of the County: Grass Valley (elevation: 2,400 feet above msl) in west Nevada County and Truckee Ranger Station (elevation: 6,020 feet above msl), in eastern Nevada County.

4.2.2. Severe Weather: Extreme Cold, Snow, and Freeze

Hazard/Problem Description

According to the NWS and the WRCC, winter snow storms can include heavy snow, ice, and blizzard conditions. Heavy snow can immobilize a region, closing roads, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns.

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until the damage can be repaired. Power outages can have a significant impact on communities, especially critical facilities such as public utilities. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

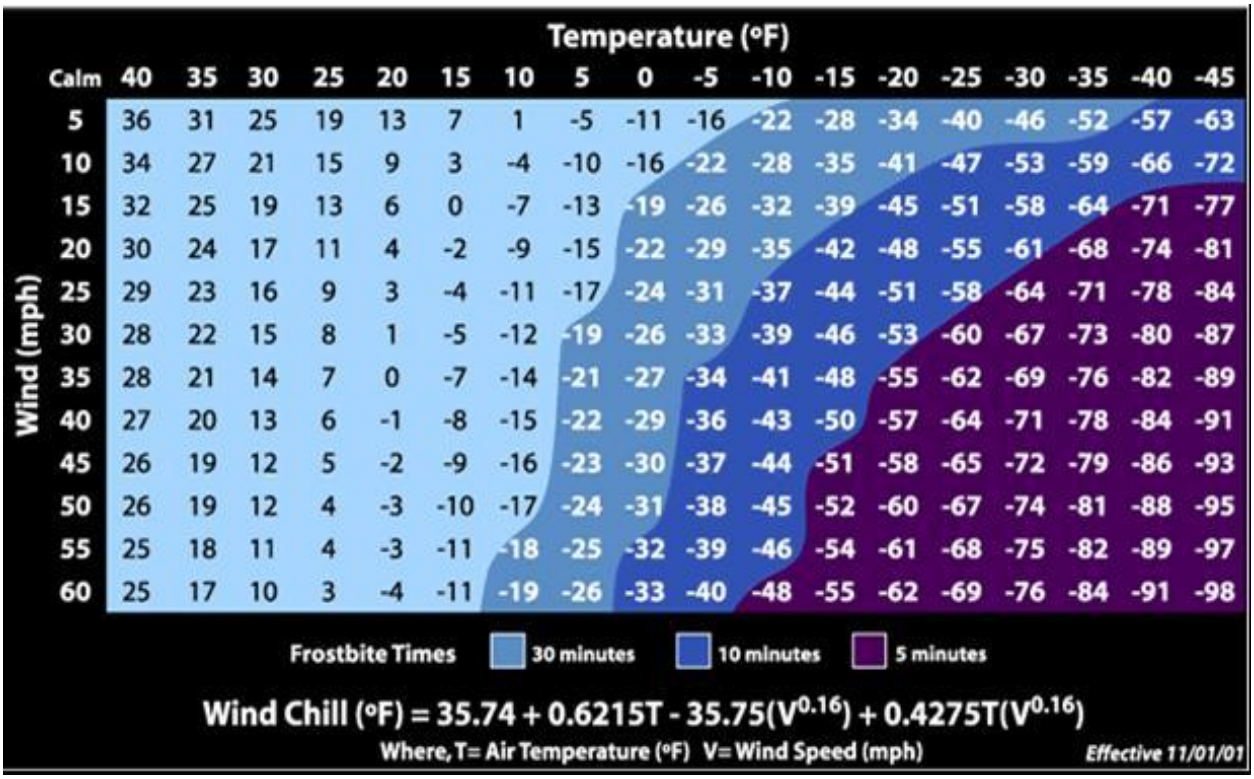
Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds accompanying these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibility to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents with injuries and deaths can result.

The western portion of the Nevada County Planning Area does experience periodic snowfall on a seasonal basis; however, the and eastern portions of the County receive an abundance of snow, mostly between the months of November through March. Winter snow storms in this part of the County, including strong winds and blizzard conditions can result in localized power and phone outages and closures of streets, highways, schools, businesses, and nonessential government operations. During periods of heavy snow there is also an increase in the number and severity of traffic accidents. People can become isolated in their homes and vehicles and are unable to receive essential services. Snow removal costs can impact budgets significantly. Heavy snowfall during winter can lead to flooding or landslides during the spring if the area snowpack melts too quickly and also create numerous challenges for emergency responders. One of the challenges the HMPC noted in the Sierra Nevada area is with household propane tanks. As snow shifts, it can break lines or regulators. This can leave homes without a heat source. Several homes have been lost due to propane explosions.

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry. The effects of freezing temperatures on agriculture in Nevada County are discussed further in Section 4.2.5 Agricultural Hazards.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-1), which is reproduced below. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-1 Wind Chill Temperature Chart



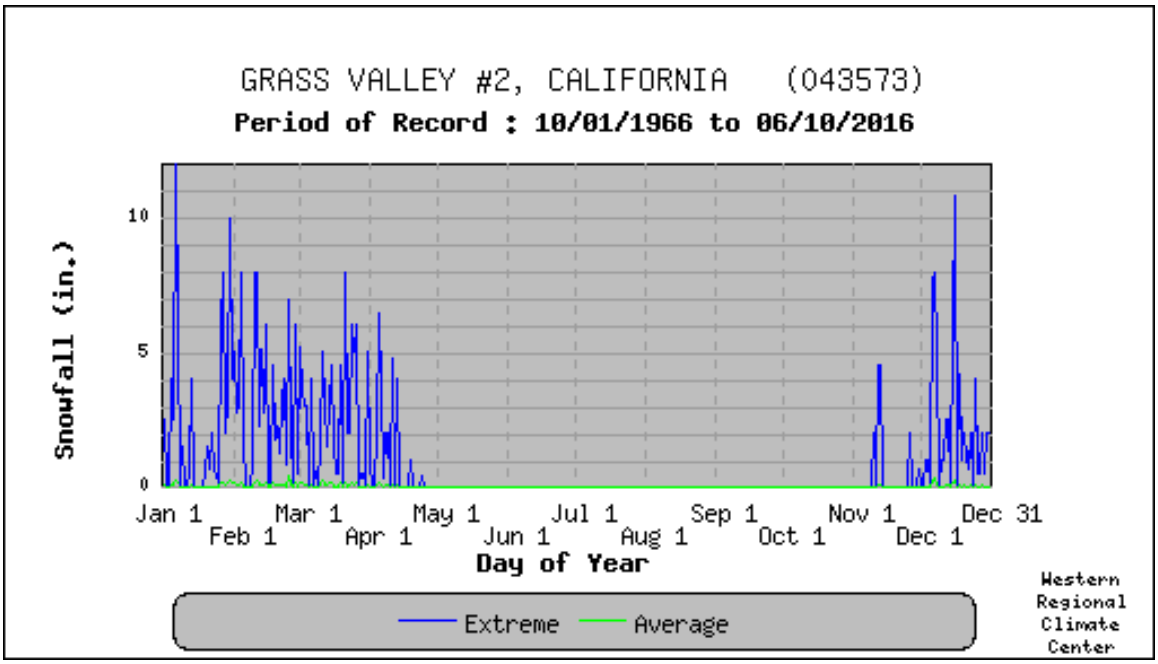
Source: National Weather Service

Information from the two representative weather stations introduced in Section 4.2.1 Severe Weather: General is summarized below and in Figure 4-8 and Figure 4-9 in the previous section.

Nevada County—West (Grass Valley Weather Station, Period of Record 1966 to 2016)

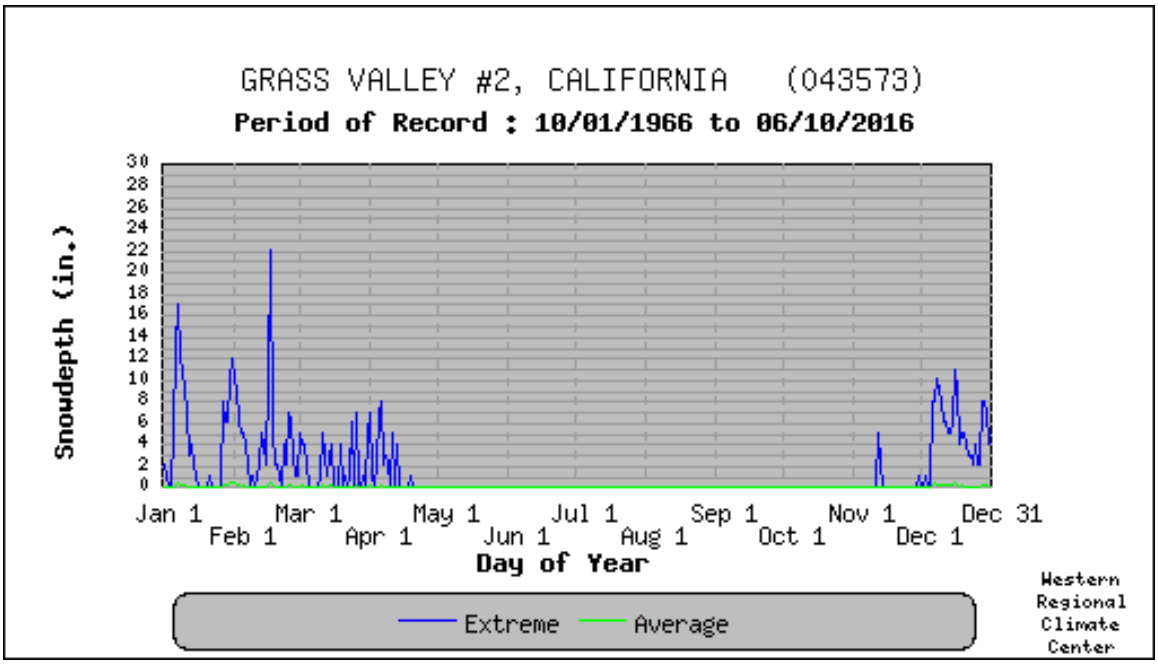
According to the WRCC, in the western portion of Nevada County, monthly average minimum temperatures from November through April range from the low to mid-30s. The lowest recorded daily extreme was 3°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 72.7 days with no days falling below 0°F. Table 4-5 shows the record low temperatures by month for western Nevada County. Average snowfall is 10.0 inches, as shown in Figure 4-2. The highest annual snowfall fell in 1972, when 26.7 inches fell. Highest monthly snowfall accumulation came in March of 1974, when 23.0 inches fell. Average snow depths in January through March fall at 1 inch. This can be seen in Figure 4-3.

Figure 4-2 Nevada County—West Snowfall Averages and Extremes



Source: Western Regional Climate Center

Figure 4-3 Nevada County—West Snowdepth Averages and Extremes



Source: Western Regional Climate Center

Table 4-5 Nevada County – West Record Low Temperatures

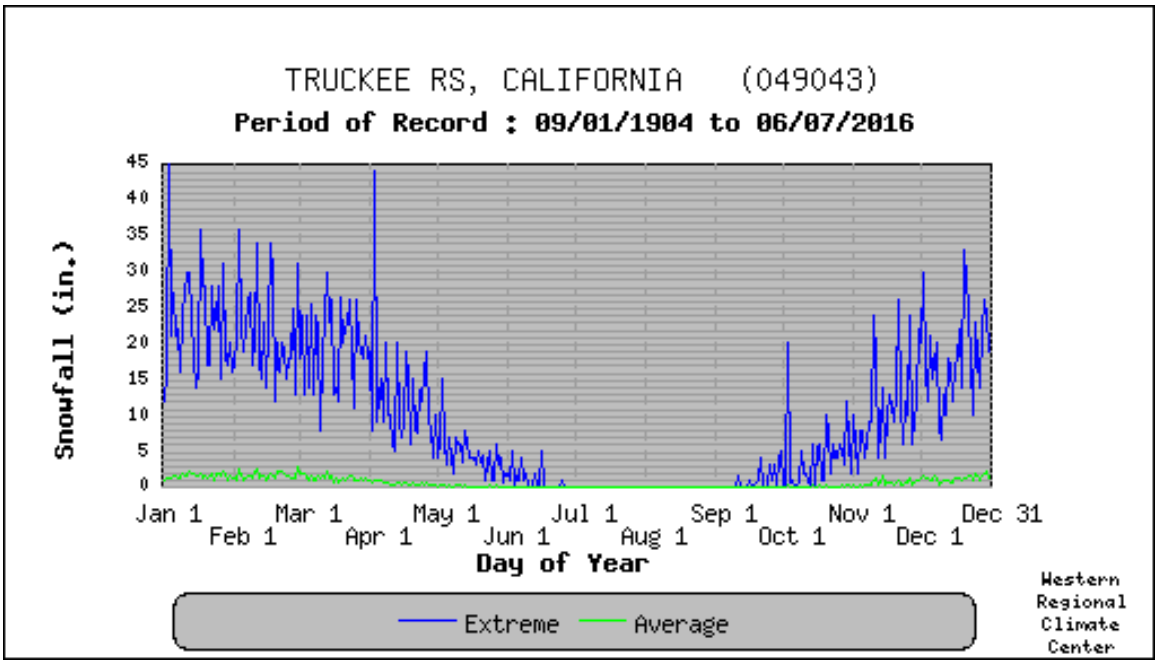
Month	Record Low	Date	Month	Record Low	Date
January	15°	1/29/1979	July	40°	7/22/1987
February	9°	2/6/1989	August	41°	8/30/1989
March	19°	3/2/1970	September	35°	9/28/1986
April	26°	4/29/1981	October	27°	10/2/2001
May	27°	5/29/1984	November	19°	11/1/1996
June	36°	6/5/1988	December	3°	12/16/1980

Source: Western Regional Climate Center

Nevada County—East (Truckee Ranger Station Weather Station, Period of Record 1904 to 2016)

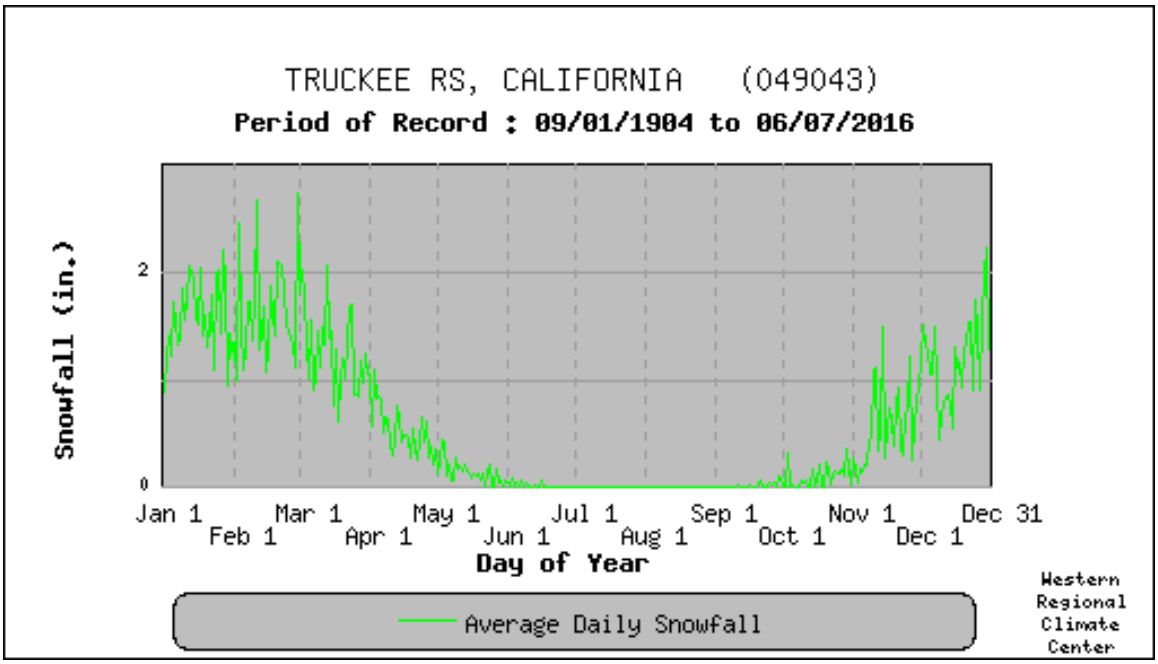
According to the WRCC, in the eastern portion of Nevada County, monthly average minimum temperatures from November through April range from the mid-20s to the upper 30s. The lowest recorded daily extreme was -28°F on January 17, 1917. In a typical year, minimum temperatures fall below 32°F on 229.8 days with 2.1 days falling below 0°F. Table 4-6 shows the record low temperatures by month for eastern Nevada County. Average snowfall is 201.8 inches, as shown in Figure 4-4. The highest annual snowfall fell in 1952, when 401.4 inches fell. Highest monthly snowfall accumulation came in February of 1938, when 196.0 inches fell. Average snow depths in January through March fall between 18 and 30 inches. This can be seen in Figure 4-5.

Figure 4-4 Nevada County—East Snowfall Averages and Extremes



Source: Western Regional Climate Center

Figure 4-5 Nevada County—East Snow Depth Averages and Extremes



Source: Western Regional Climate Center

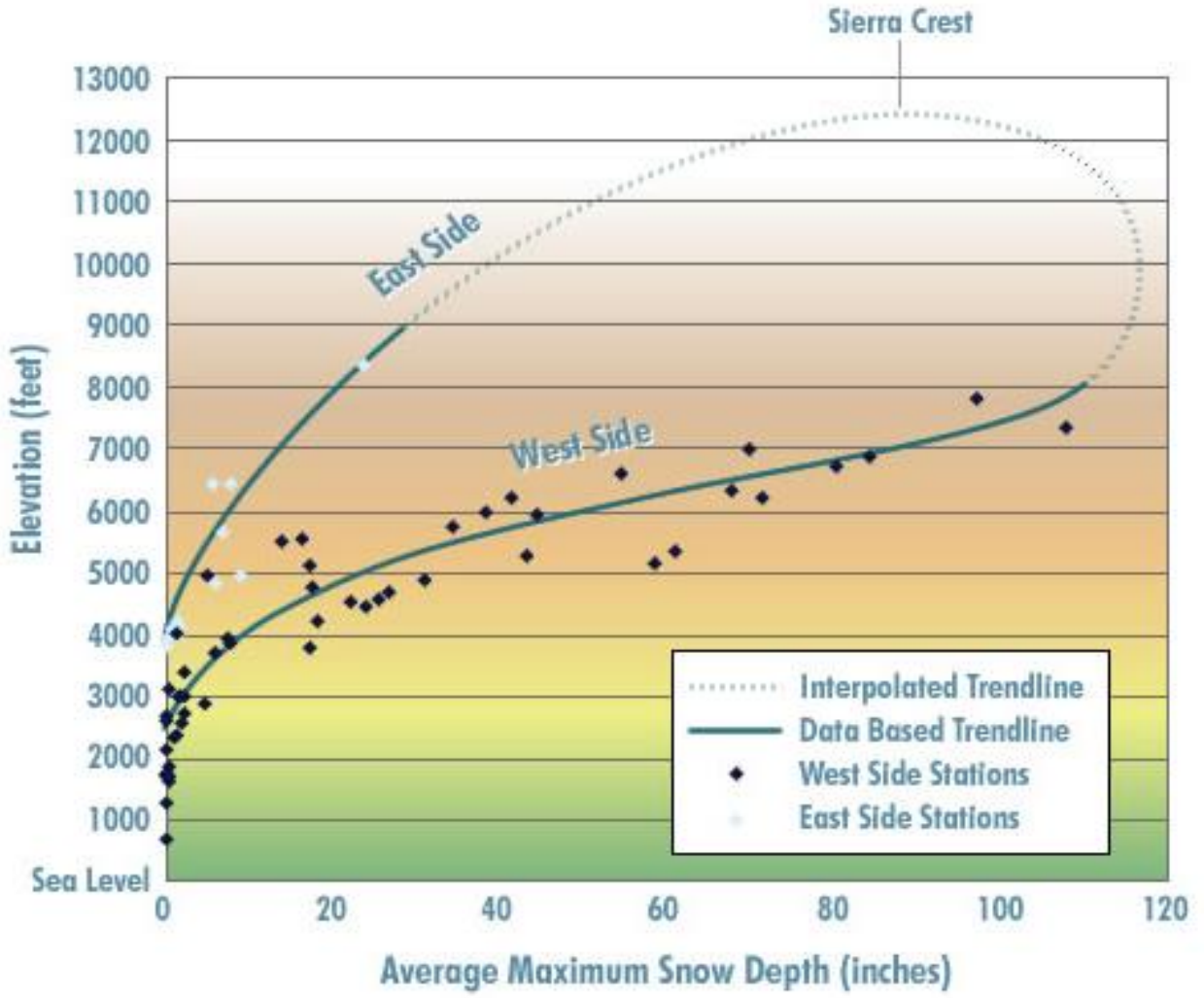
Table 4-6 Nevada County – East Record Low Temperatures

Month	Record Low	Date	Month	Record Low	Date
January	-28°	1/17/1917	July	15°	7/1/1976
February	-23°	2/27/1962	August	20°	8/25/1910
March	-18°	3/16/1917	September	16°	9/30/1950
April	1°	4/27/1955	October	5°	10/31/1919
May	10°	5/2/1915	November	-14°	11/30/2004
June	19°	6/5/1962	December	-22°	12/26/1911

Source: Western Regional Climate Center

Snow accumulation does not directly follow precipitation in the Sierra Nevada. While the greatest total precipitation occurs in the northern part of the range, the greatest snow accumulation occurs in the central and high southern parts of the range, due to higher elevations and colder temperatures which inhibit snow melt. The western slope of the Sierra Nevada acts as trap for winter storms, wringing out the moisture before it can get to the east side. Weather stations located on the west side begin registering measurable snow between 2,500 and 3,000 feet elevation. On the east side, measurable snow accumulation doesn't begin until about 4,000 feet and increases more slowly with altitude. Snow depths drop dramatically on the east side of the range due to the rain shadow effect as illustrated in the comparative east side/west side snow depth chart shown on Figure 4-6.

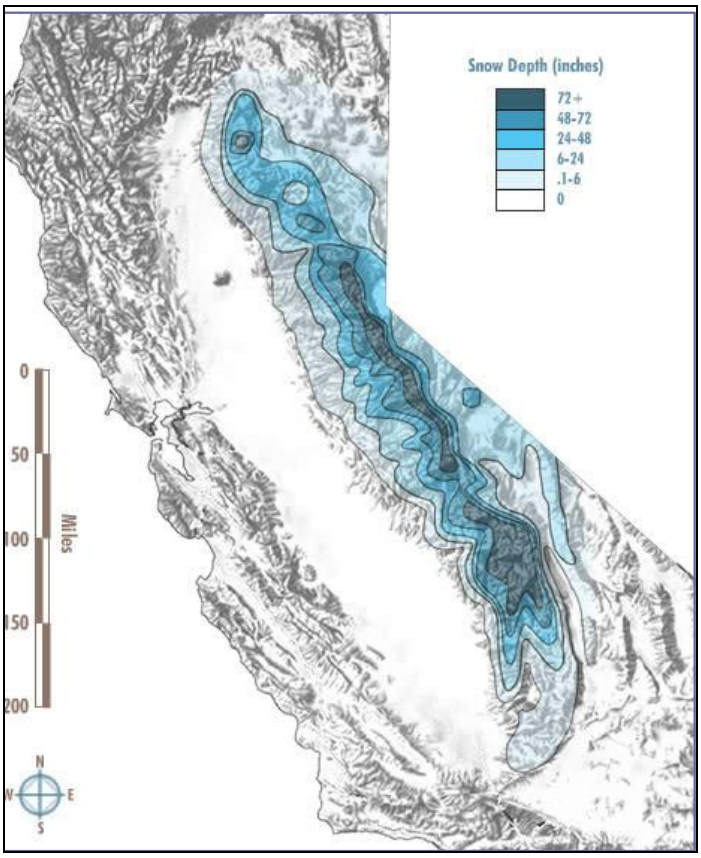
Figure 4-6 Snow Accumulation with Directional Variations



Source: http://www.sierranevadaphotos.com/geography/east_west_snow_depth.html

Figure 4-7 shows the average maximum measured snow depth in the Sierra Nevada for the month of March (the month of greatest average snow depths).

Figure 4-7 Average Maximum Snow Depths of Sierra Nevada Mountains in March



Source: http://www.sierranevadaphotos.com/geography/snow_depth.asp

Temperature Inversion

Periodically Nevada County experiences temperature inversions, primarily in the eastern side of the County. Temperature inversion layers are areas where the normal decrease in air temperature with increasing altitude is reversed and air above the ground is warmer than the air below it. According to the NOAA, inversion layers are significant to meteorology because they block atmospheric flow which causes the air over an area experiencing an inversion to become stable. During an inversion episode, temperatures increase with increasing altitude. The warm inversion layer then acts as a cap and stops atmospheric mixing.

Topography can also play a role in creating a temperature inversion since it can sometimes cause cold air to flow from mountain peaks down into valleys. This cold air then pushes under the warmer air rising from the valley, creating the inversion. Some of the most significant consequences of temperature inversions are the extreme weather conditions they can sometimes create. One example of these is freezing rain. This phenomenon develops with a temperature inversion in a cold area because snow melts as it moves through the warm inversion layer. The precipitation then continues to fall and passes through the cold layer of air near the ground. When it moves through this final cold air mass it becomes "super-cooled" (cooled below freezing without becoming solid).

Intense thunderstorms and tornadoes (discussed in Section 4.2.4) are also associated with inversions because of the intense energy that is released after an inversion blocks an area's normal convection patterns.

Past Occurrences

Disaster Declaration History

A disaster declaration for Nevada County was issued by the state government in 1972 for freeze and severe weather conditions.

NCDC Events

The NCDC data recorded 725 freeze and snow incidents for Nevada County since 1993. A summary of these events is shown in Table 4-7. Specific events from the NCDC database that detailed injuries, deaths, or damages in Nevada County are discussed below the table.

*Table 4-7 NCDC Winter Storms and Extreme Cold Events in Nevada County 1993 to 12/31/2016**

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	2	0	0	0	0	$30,000	$0
Cold/Wind Chill	3	0	0	0	0	$0	$2,400,000
Frost/Freeze	5	0	0	0	0	$0	$0
Heavy Snow	529	1	3	6	1	$575,000	$0
Winter Storm	143	3	1	3	1	$115,000	$0
Winter Weather	43	3	1	0	0	$10,000	$0
Total	**725**	**7**	**5**	**9**	**2**	**$730,000**	**$2,400,000**

Source: NCDC

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

- **February 15, 1990**. Heavy cold weather system that dropped 4 feet of snow in Washington California overnight. The road wasn't plowed until February 18. A lot of damage from down trees. No structure damage was reported. Hundreds of trees down across all of the roads around town. Washington, Alpha Toll, Alpha Loop, Maybert, Old Washington, Relief Hill, & Gaston Roads. Washington Road was closed for 2 ½ days due to deep snow and trees, so no deliveries for businesses in town. All roads and school was closed.
- **December 20, 1996** – The heaviest snow in many years caused a number of problems in the Shasta-Cascades region and in the Sierra Nevada range. A storm total of 8 feet fell in the Lake Tahoe area. 4-foot accumulations in 30 hours occurred at the 3,000 to 4,000-foot elevations. Heavy snow fell as low as 1,500 feet, and lighter accumulations fell as low as 500 feet. The heavy snow pulled down numerous trees, taking power lines with them. About 120,000 people in the Sierra Nevada and its foothills lost power for several days, with some getting back power late Christmas Eve, and most regaining power by the day after Christmas. The snow closed most roads and several major highways in the region,

including state route 70, Interstate 80 (closed nearly two days), and US Route 50 (closed nearly 3 days). The Amtrak passenger train California Zephyr derailed in the Sierra Nevada near the town of Blue Canyon. Small avalanches at a ski resort injured two people. The storm also caused two fatalities. These heavy snows would not melt until the end of the year, when they contributed to some of the worst flooding in state history.

- **April 3, 1999** – 6 inches of snow in 3 hours with visibilities ranging from 0 to 300 feet in the Lake Tahoe area. No deaths or injuries were reported, but $30,000 in damages was estimated.
- **April 15, 2002** – A heavy snow shower, creating low visibility and a slick roadway, caused a 21-vehicle pile-up on Interstate 80 about 5 miles east of Truckee, CA. Several trucks were involved in the accident with at least one semi-trailer destroyed. Four injuries were reported, but no deaths. Property damage was estimated at $500,000.
- **January 14, 2007** – A very cold arctic airmass settled over the region and temperatures in the Central Valley of California dropped sharply for a relatively prolonged period of time. Many temperature records were tied and broken during the episode and the damage to area crops was extensive. Extensive crop damage was caused by the prolonged sub-freezing temperatures. No deaths or injuries were reported, but crop damages of $5,000,000 and property damage of $200,000 were reported.
- **December 6, 2009** – A very cold airmass brought a hard freeze and record cold to the northern Central Valley. Many pipes in homes and businesses froze and burst, including those for fire sprinkler systems. Some crop damage in orchards was also reported. A hard freeze caused pipes and sprinkler systems to burst throughout the Motherlode area, causing water damage to homes and businesses. There were 287 residential breaks reported in El Dorado County alone. In Nevada County, the Rood Government Center had flooding due to a burst sprinkler system, resulting in the evacuation of 400 employees. In addition, a bank in Nevada City was also evacuated due to damaged ceiling panels caused by a broken sprinkler system pipe. No deaths or injuries were reported. $50,000 in property damage was estimated to have taken place.
- **December 17, 2010** – Very cold low pressure remained off the Pacific Northwest coast for several days bringing very heavy snow to the Sierra and periods of strong, damaging winds. The very heavy snowfall increased the high Sierra snowpack from 150 to 160 percent of normal to over 220 percent of normal in just four days. Ski resorts accumulated an average of 5 to 8 feet of snow. 20 to 30 inches of snow fell north and west of Lake Tahoe below 7,000 feet. Heavy wet snow caused a rock slide on highway 50 which closed the road on the 19th. In addition to snow, numerous reports of downed trees and associated damage were noted on the 19th. Falling trees were responsible for one destroyed house in South Lake Tahoe, with winds gusting to 63 mph and 68 mph in Truckee and South Lake Tahoe, respectively, and up to 155 mph over the crest. Finally, a tree fell on a ski lift cable at the Sierra-at-Tahoe resort and caused two skiers to be ejected and injured. No deaths occurred. Property damage was estimated at $400,000.

HMPC Events

The HMPC noted an event that occurred in Soda Springs, as well in nearby Placer County. In the Lake Tahoe region in March, April, and May 2011 the community was hit by a continuous stream of storms that dumped record setting amounts of snow on the area. Approximately 700 of the structures in Serene Lakes are served by propane and the high snow levels led to one home explosion, 43 identified propane leaks, a voluntary evacuation order, a protective sheriff's patrol and a very anxious community. No lives were lost and there were no major injuries, but it was just luck that the community avoided human catastrophe. None of the installations that leaked met current code requirements. The principal reason for propane leaks was

failure of piping in all areas. While Soda Springs had smaller problems, the HMPC noted that during heavy snows in winters like those experienced in the winter of 2016/2017, this can be an ongoing problem.

Likelihood of Future Occurrence

Highly Likely—Extreme cold, freeze, and snow are likely to continue to occur annually in the Nevada County Planning Area. This is especially true for the eastern portion of the County where elevations are higher. Closure of roads and highways due to blowing snow is a common and annual event above 5,000 feet in the Sierra Nevada.

Climate Change and Freeze and Snow

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

4.2.3. Severe Weather: Extreme Heat

Hazard/Problem Description

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980 more than 1,250 people died. Extreme heat can also affect the agricultural industry. Extreme heat as it affects agriculture in Nevada County is discussed further in the agricultural hazards discussion in Section 4.2.5.

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

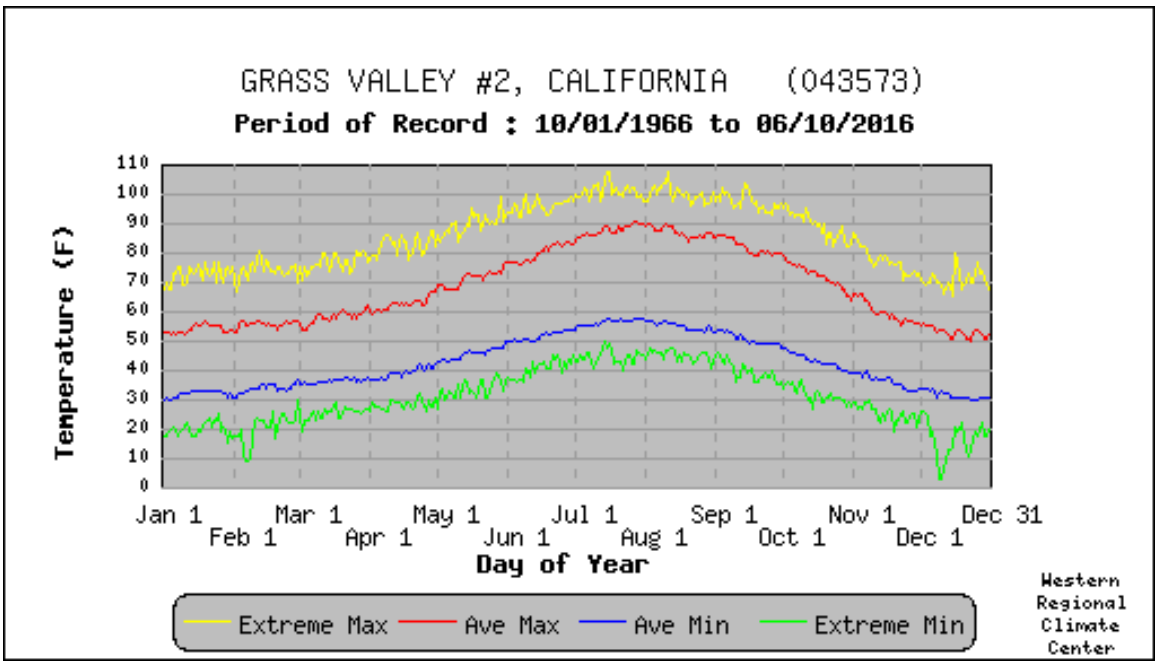
Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. While heat waves are obviously less dramatic, they are potentially more deadly. According to the 2013 California State Hazard Mitigation Plan, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths.

The Western Regional Climate Center (WRCC) maintains data on weather normal and extremes in the western United States. WRCC data for the County is summarized below and in Figure 4-8 and Figure 4-9.

Nevada County—West (Grass Valley Weather Station, Period of Record 1966 to 2016)

According to the WRCC, in the western portion of Nevada County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the upper 80s. The highest recorded daily extreme was 108°F on August 11, 1971. In a typical year, maximum temperatures exceed 90°F on 36.6 days.

Figure 4-8 Nevada County—West Daily Temperature Averages and Extremes



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Table 4-8 Nevada County – West Record High Temperatures

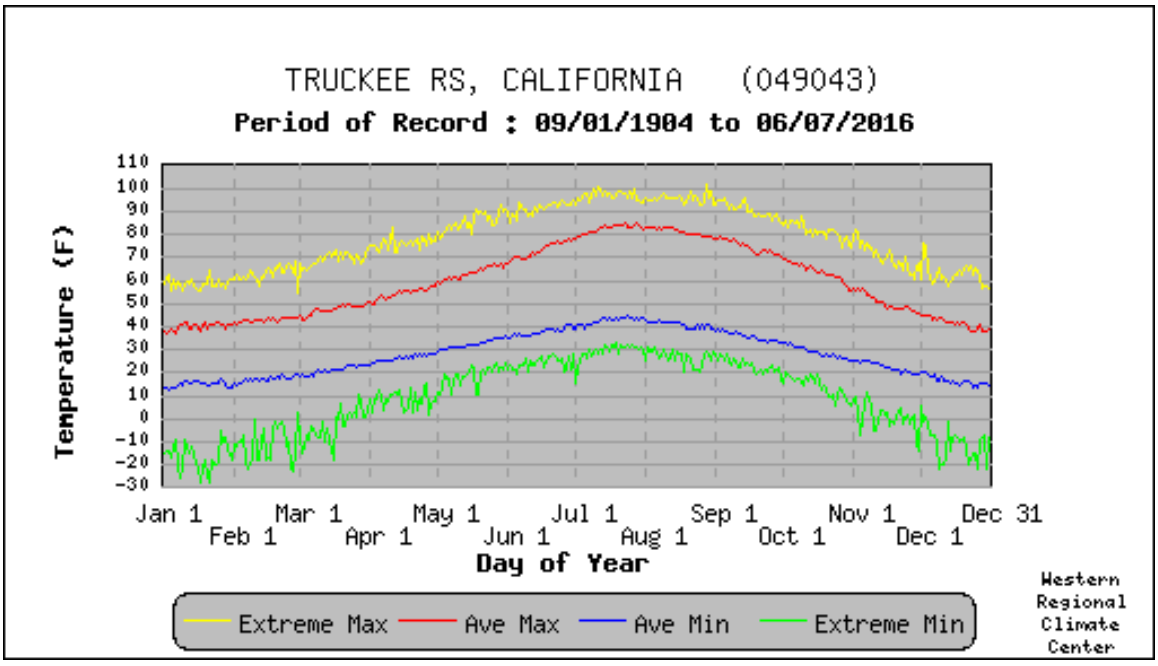
Month	Record High	Date	Month	Record High	Date
January	77°	1/23/1968	July	108°	7/15/1972
February	81°	2/12/1971	August	108°	8/11/1971
March	81°	3/26/1970	September	104°	9/14/1971
April	88°	4/29/1981	October	97°	10/2/2001
May	99°	5/29/1984	November	87°	11/1/1966
June	100°	6/14/2000	December	80°	12/16/1980

Source: Western Regional Climate Center

Nevada County—East (Truckee Ranger Station Weather Station, Period of Record 1904 to 2016)

According to the WRCC, in the eastern portion of Nevada County, monthly average maximum temperatures in the warmest months (May through October) range from the low 70s to the low 80s. The highest recorded daily extreme was 101°F on August 28, 1915. In a typical year, maximum temperatures exceed 90°F on 0.5 days.

Figure 4-9 Nevada County—East Daily Temperature Averages and Extremes



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Table 4-9 Nevada County – East Record High Temperatures

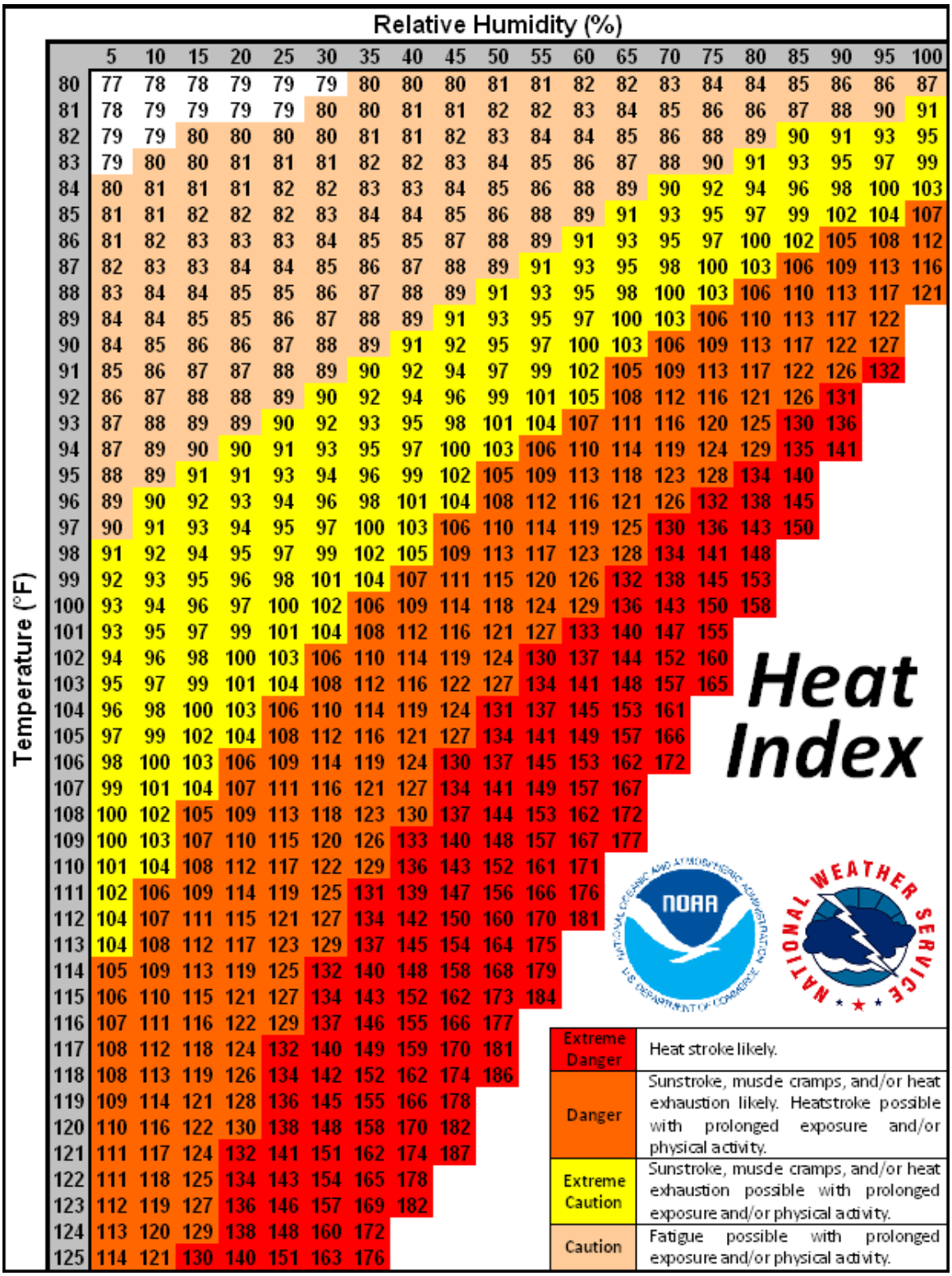
Month	Record High	Date	Month	Record High	Date
January	64°	1/21/1950	July	100°	7/11/2002
February	68°	2/28/1986	August	101°	8/28/1915
March	73°	3/31/1966	September	95°	9/14/1937
April	83°	4/11/1915	October	87°	10/9/1996
May	92°	5/29/1910	November	82°	11/2/1913
June	94°	6/30/1950	December	76°	12/2/1949

Source: Western Regional Climate Center

Figure 4-10 shows the Heat Index (HI) that the National Weather Service uses to show the relationship between heat and relative humidity. The Heat Index describes how hot the heat-humidity combination makes it feel. As relative humidity increases, the air seems warmer than it actually is because the body is less able to cool itself via evaporation of perspiration. As the HI rises, so do health risks.

- When the HI is 90°F, heat exhaustion is possible with prolonged exposure and/or physical activity.
- When it is 90°-105°F, heat exhaustion is probable with the possibility of sunstroke or heat cramps with prolonged exposure and/or physical activity.
- When it is 105°-129°F, sunstroke, heat cramps or heat exhaustion is likely, and heatstroke is possible with prolonged exposure and/or physical activity.
- When it is 130°F and higher, heatstroke and sunstroke are extremely likely with continued exposure. Physical activity and prolonged exposure to the heat increase the risks.

Figure 4-10 Heat Index



Temp (°F) \ RH (%)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
80	77	78	78	79	79	79	80	80	80	81	81	82	82	83	84	84	85	86	86	87
81	78	79	79	79	79	80	80	81	81	82	82	83	84	85	86	86	87	88	90	91
82	79	79	80	80	80	80	81	81	82	83	84	84	85	86	88	89	90	91	93	95
83	79	80	80	81	81	81	82	82	83	84	85	86	87	88	90	91	93	95	97	99
84	80	81	81	81	82	82	83	83	84	85	86	88	89	90	92	94	96	98	100	103
85	81	81	82	82	82	83	84	84	85	86	88	89	91	93	95	97	99	102	104	107
86	81	82	83	83	83	84	85	85	87	88	89	91	93	95	97	100	102	105	108	112
87	82	83	83	84	84	85	86	87	88	89	91	93	95	98	100	103	106	109	113	116
88	83	84	84	85	85	86	87	88	89	91	93	95	98	100	103	106	110	113	117	121
89	84	84	85	85	86	87	88	89	91	93	95	97	100	103	106	110	113	117	122	
90	84	85	86	86	87	88	89	91	92	95	97	100	103	106	109	113	117	122	127	
91	85	86	87	87	88	89	90	92	94	97	99	102	105	109	113	117	122	126	132	
92	86	87	88	88	89	90	92	94	96	99	101	105	108	112	116	121	126	131		
93	87	88	89	89	90	92	93	95	98	101	104	107	111	116	120	125	130	136		
94	87	89	90	90	91	93	95	97	100	103	106	110	114	119	124	129	135	141		
95	88	89	91	91	93	94	96	99	102	105	109	113	118	123	128	134	140			
96	89	90	92	93	94	96	98	101	104	108	112	116	121	126	132	138	145			
97	90	91	93	94	95	97	100	103	106	110	114	119	125	130	136	143	150			
98	91	92	94	95	97	99	102	105	109	113	117	123	128	134	141	148				
99	92	93	95	96	98	101	104	107	111	115	120	126	132	138	145	153				
100	93	94	96	97	100	102	106	109	114	118	124	129	136	143	150	158				
101	93	95	97	99	101	104	108	112	116	121	127	133	140	147	155					
102	94	96	98	100	103	106	110	114	119	124	130	137	144	152	160					
103	95	97	99	101	104	108	112	116	122	127	134	141	148	157	165					
104	96	98	100	103	106	110	114	119	124	131	137	145	153	161						
105	97	99	102	104	108	112	116	121	127	134	141	149	157	166						
106	98	100	103	106	109	114	119	124	130	137	145	153	162	172						
107	99	101	104	107	111	116	121	127	134	141	149	157	167							
108	100	102	105	109	113	118	123	130	137	144	153	162	172							
109	100	103	107	110	115	120	126	133	140	148	157	167	177							
110	101	104	108	112	117	122	129	136	143	152	161	171								
111	102	106	109	114	119	125	131	139	147	156	166	176								
112	104	107	111	115	121	127	134	142	150	160	170	181								
113	104	108	112	117	123	129	137	145	154	164	175									
114	105	109	113	119	125	132	140	148	158	168	179									
115	106	110	115	121	127	134	143	152	162	173	184									
116	107	111	116	122	129	137	146	155	166	177										
117	108	112	118	124	132	140	149	159	170	181										
118	108	113	119	126	134	142	152	162	174	186										
119	109	114	121	128	136	145	155	166	178											
120	110	116	122	130	138	148	158	170	182											
121	111	117	124	132	141	151	162	174	187											
122	111	118	125	134	143	154	165	178												
123	112	119	127	136	146	157	169	182												
124	113	120	129	138	148	160	172													
125	114	121	130	140	151	163	176													

Source: National Weather Service

Note: Since HI values were devised for shady, light wind conditions, exposure to full sunshine can increase HI values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Table 4-10.

Table 4-10 National Weather Service Heat Risk Categories

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

Source: National Weather Service

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

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

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disasters related to extreme heat.

NCDC Events

The NCDC data shows 9 extreme heat incidents for Nevada County since 1993. These are shown in Table 4-11.

*Table 4-11 NCDC Extreme Heat Events in Nevada County 1993 to 12/31/2016**

Event	Date	Deaths	Injuries	Property Damage	Crop Damage
Heat	7/11/1999	0	0	$0	$0
Heat	5/21/2000	0	0	$0	$0
Heat	6/13/2000	0	0	$0	$0
Heat	6/13/2000	1	0	$0	$0

Event	Date	Deaths	Injuries	Property Damage	Crop Damage
Heat	7/29/2000	0	0	$0	$0
Heat	9/18/2000	0	0	$0	$0
Heat	6/7/2013	0	0	$0	$0
Heat	6/28/2013	0	0	$0	$0
Heat	7/1/2013	0	0	$0	$0
Total		**1**	**0**	**$0**	**$0**

Source: NCDC

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

HMPC Events

While the HMPC did not identify any specific events, they noted that severe heat events occur each year.

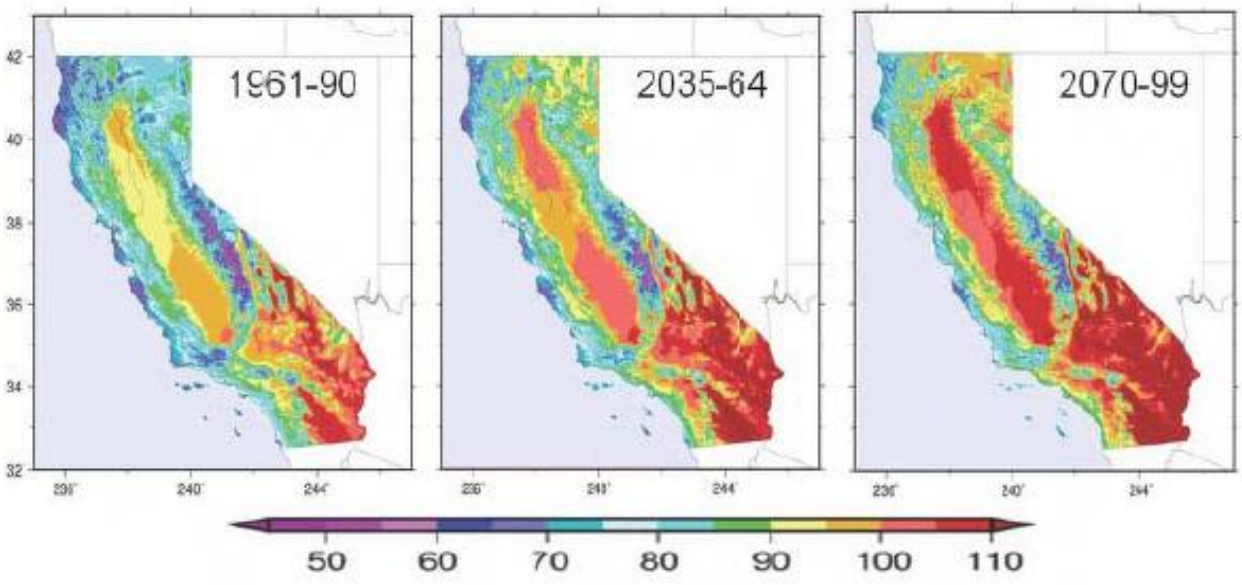
Likelihood of Future Occurrence

Likely—Temperature extremes are likely to continue to occur annually in the Nevada County Planning Area. Extreme heat is less likely in eastern portions of the county at higher elevations, than in the western portion. Temperatures at or above 90°F are common most summer days in the western part of the County.

Climate Change and Extreme Heat

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-11.

Figure 4-11 California Historical and Projected Temperature Increases – 1961 to 2099



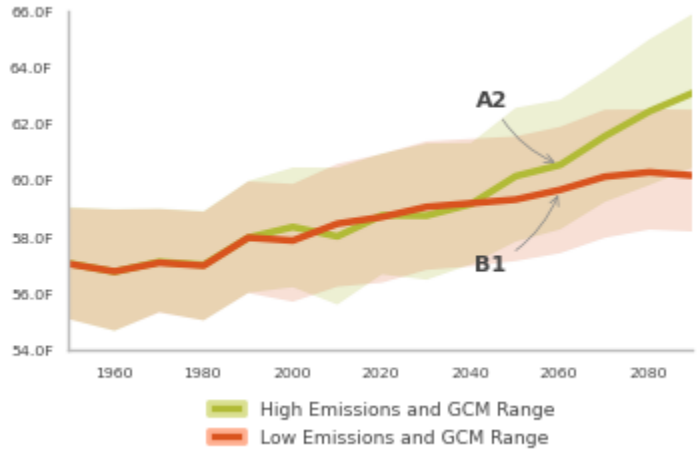
Source: Dan Cayan; California Climate Adaptation Strategy

As temperatures increase, California and Nevada 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 CAS report and the 2013 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 Nevada County.

Cal Adapt noted that overall temperatures are expected to rise substantially throughout this century. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (A2) are approximately twice as high as those projected in the lower emissions scenario (B1).

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. Future temperature estimates from Cal-Adapt are shown in Figure 4-12.

Figure 4-12 Nevada County – Future Temperature Estimates in High and Low Emission Scenarios



Source: Cal-Adapt – Temperature: Decadal Averages Map

4.2.4. Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

Hazard/Problem Description

Storms in the Nevada County Planning Area 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 Nevada County falls mainly in the fall, winter, and spring months.

Heavy Rain and Storms

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

According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. With increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue. In addition to the flooding that often occurs during these storms,

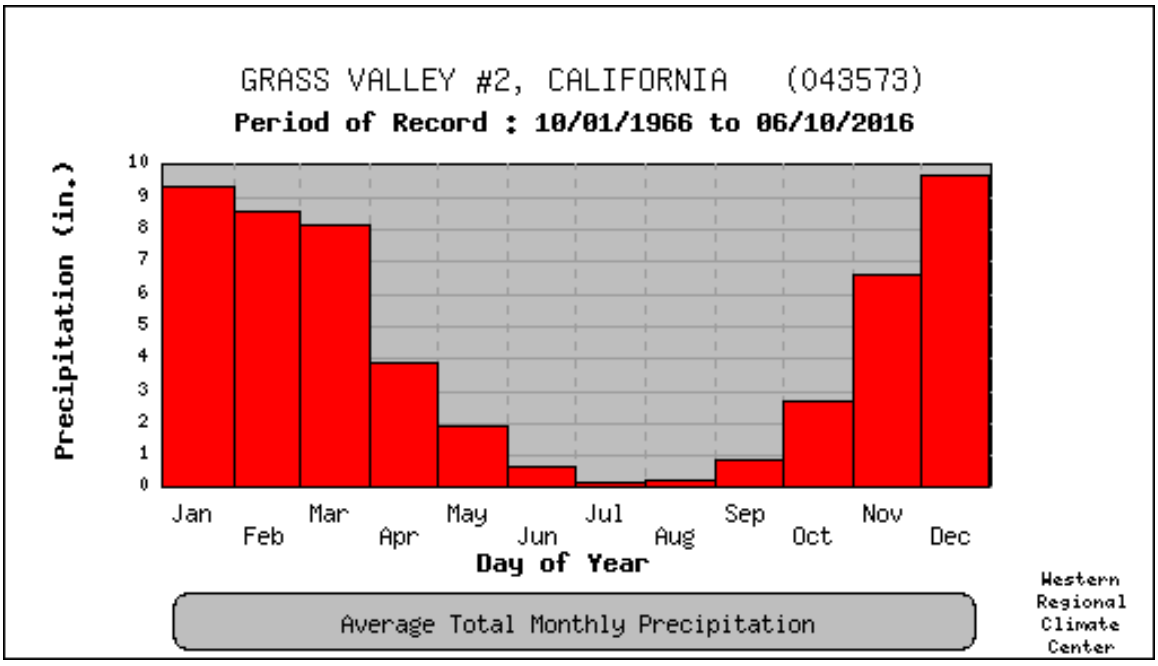
strong winds, when combined with saturated ground conditions, can down very mature trees and cause landslides and other slope failures.

Information from the two representative weather stations introduced in Section 4.2.1 Severe Weather: General, is summarized below.

Nevada County—West (Grass Valley Weather Station, Period of Record 1966 to 2016)

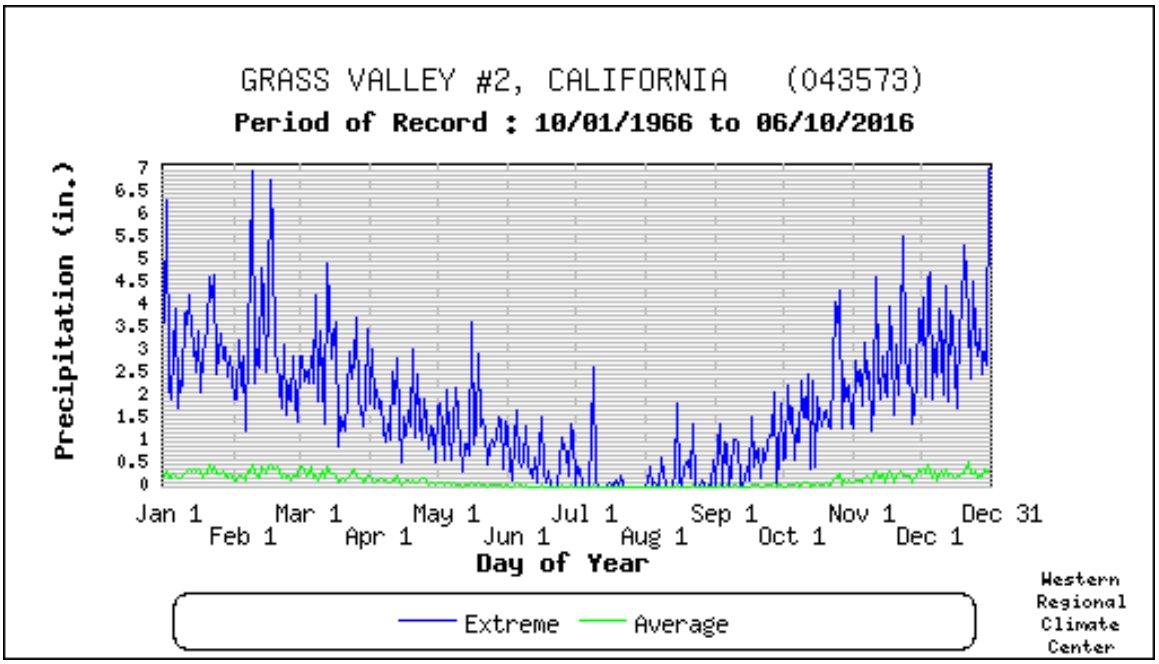
According to the WRCC, average annual precipitation in the western side of Nevada County is 53.26 inches per year. The highest recorded annual precipitation is 94.77 inches in 1983; the highest recorded precipitation for a 24-hour period is 7.02 inches on December 31, 2005. The lowest recorded annual precipitation was 16.51 inches in 1976. Average monthly precipitation for western Nevada County is shown in Figure 4-13. Daily average and extreme precipitations are shown in Figure 4-14.

Figure 4-13 Nevada County—West Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 4-14 Nevada County—West Daily Average and Extreme Precipitation

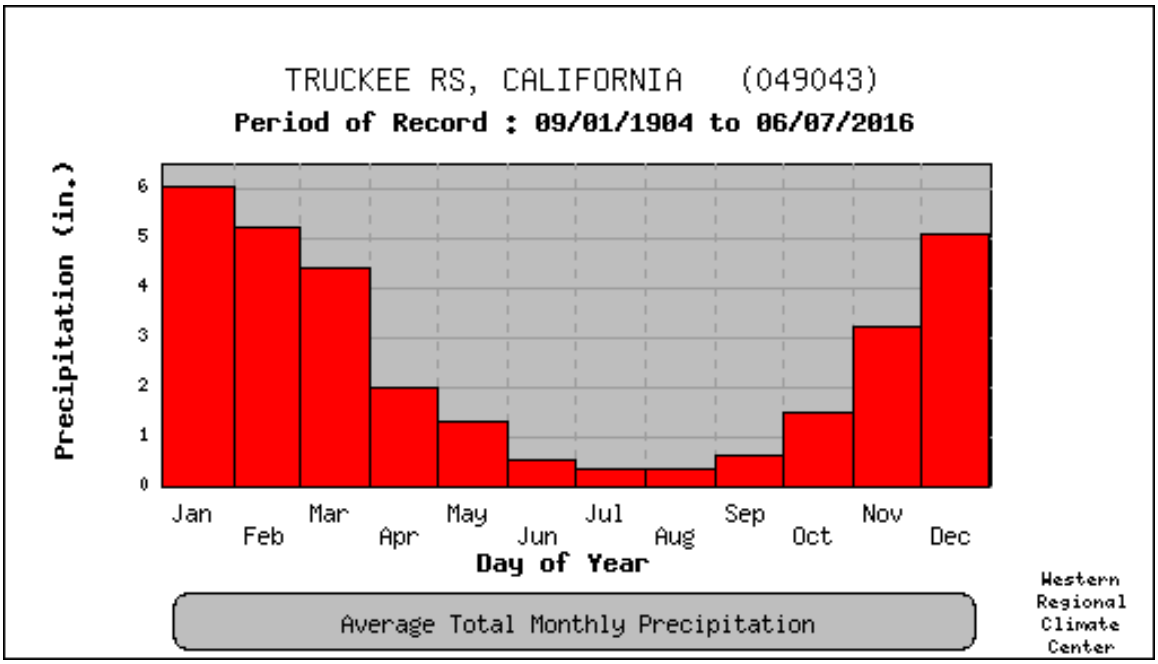


Source: Western Regional Climate Center, www.wrcc.dri.edu/

Nevada County—East (Truckee Ranger Station, Period of Record 1904 to 2016)

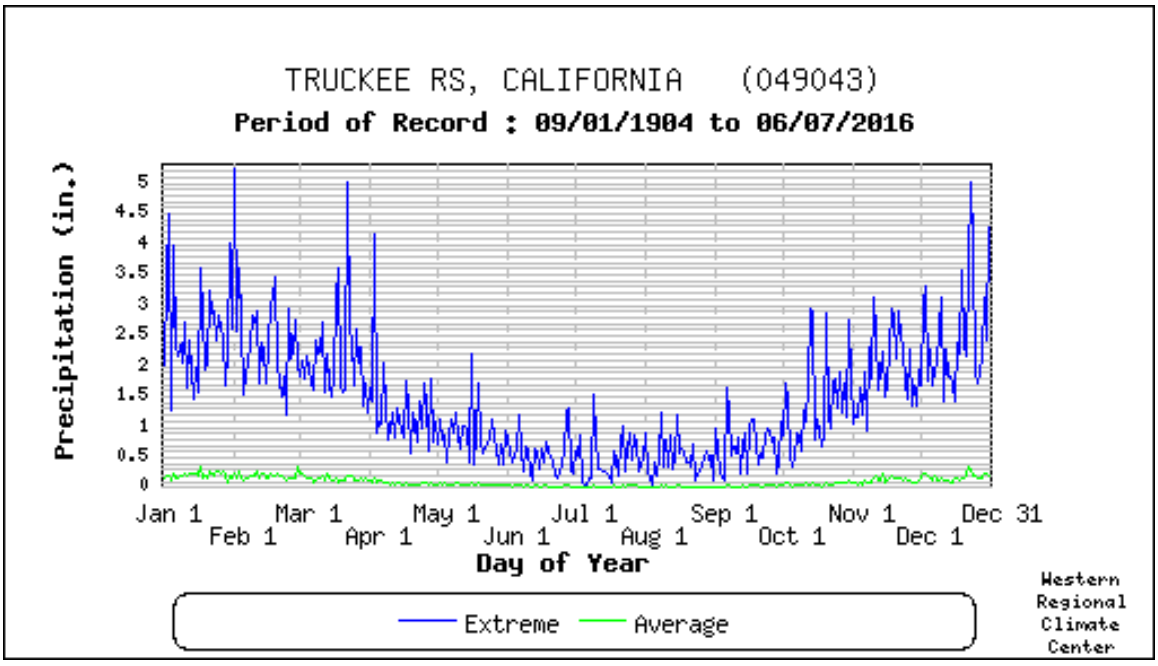
According to the WRCC, average annual precipitation in the eastern portion of Nevada County is 30.15 inches per year. The highest recorded annual precipitation is 54.62 inches in 1996; the highest recorded precipitation for a 24-hour period is 5.21 inches on February 1, 1963. The lowest recorded annual precipitation is 16.04 inches in 1976. Average yearly precipitation for eastern Nevada County is shown in Figure 4-15. Daily average and extreme precipitations are shown in Figure 4-16.

Figure 4-15 Nevada County—East Monthly Average Total Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Figure 4-16 Nevada County—East Daily Average and Extreme Precipitation



Source: Western Regional Climate Center, www.wrcc.dri.edu/

Hail

Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the

Nevada County Planning Area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-12 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-12 Hailstone Measurements

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

Source: National Weather Service

Lightning

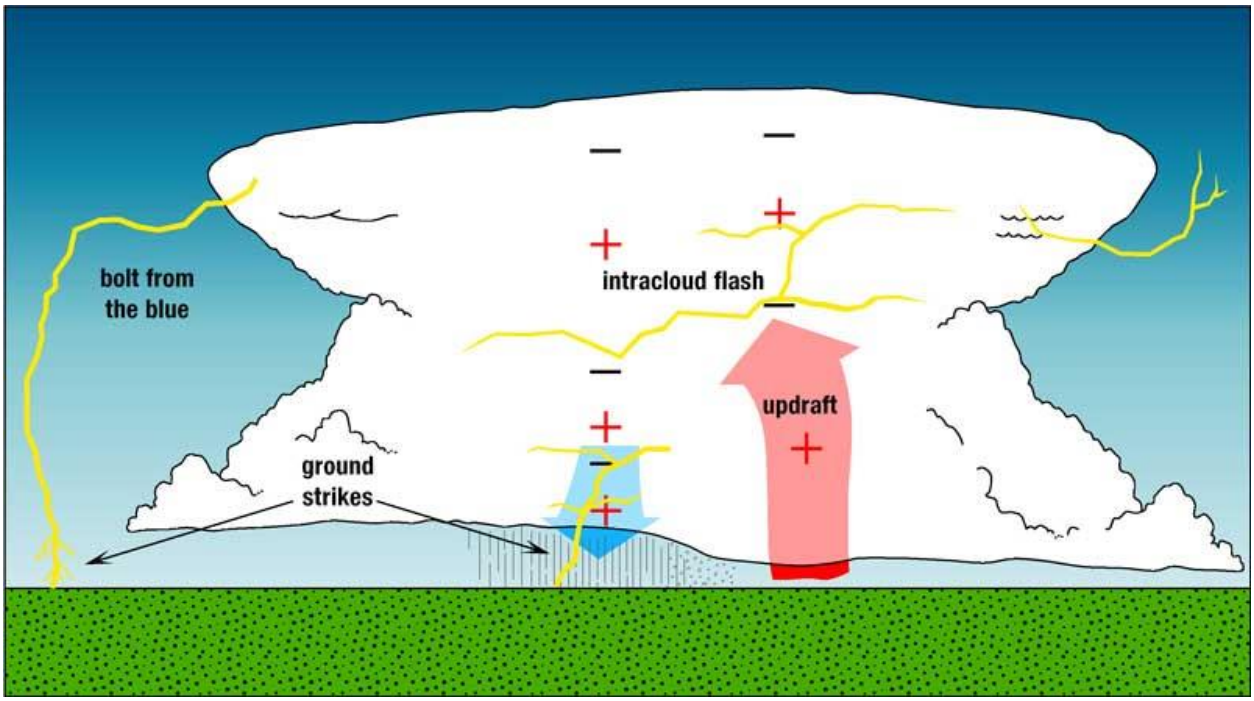
Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of

total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-17). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-17 Cloud to Ground Lightning



Source: National Weather Service

Lightning in the County is also a concern due to the number of fires that have been started by lightning strikes. Wildfire is discussed in more detail in Section 4.2.18.

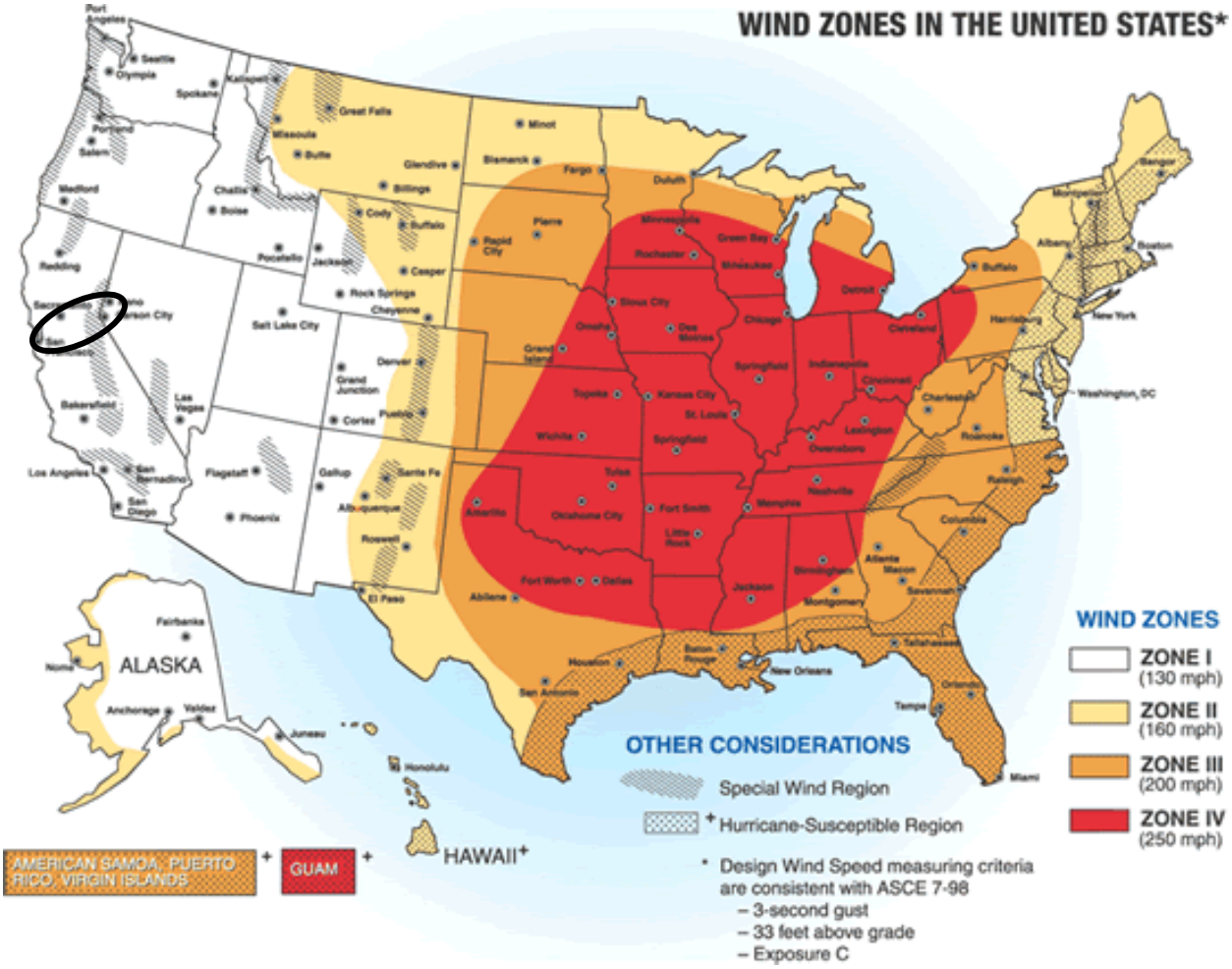
Winds

High winds, often accompanying severe storms and thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

The Planning Area is subject to significant, non-tornadic (straight-line), winds. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms. Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snow storms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Figure 4-18 depicts wind zones for the United States. The map denotes that Nevada County falls into Zone I, which is characterized by high winds of up to 130 mph. Portions of the County also fall into a Special Wind Region.

Figure 4-18 Wind Zones in the United States



Source: Federal Emergency Management Agency

Tornadoes

Tornadoes and funnel clouds can also occur during these types of severe storms. Tornadoes are another severe weather hazard that in rare instances affectsthe Nevada County Planning Area, primarily during the rainy season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential across a path only 300 yards wide or less as 300-mile-wide hurricanes. Figure 4-19 illustrates the potential impact and damage from a tornado.

Figure 4-19 Potential Impact and Damage from a Tornado

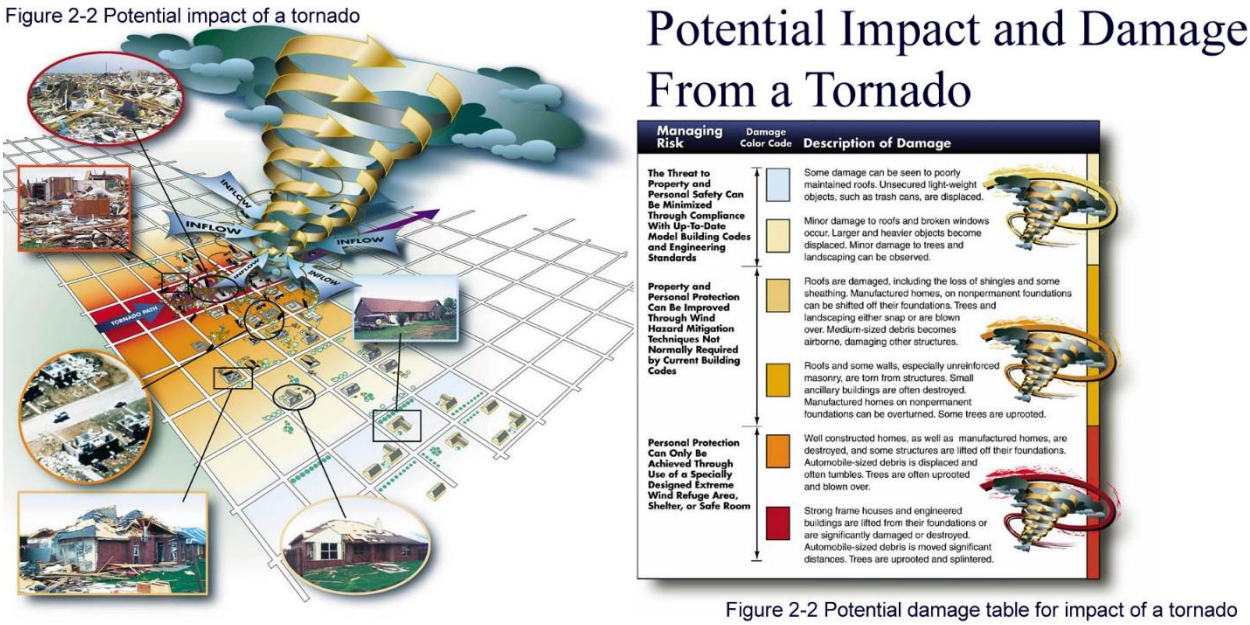


Figure 2-2 Potential damage table for impact of a tornado

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

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures damaged by a tornado. Table 4-13 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-14 shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 4-13 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/f-scale.html

Table 4-14 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

Tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple severe storm events. 11 state disaster declarations have occurred in the County – 1950, 1955, 1958 (twice), 1963, 1982, 1986, 1990, 1995, 1997, and 2008. 9 federal disaster declarations have occurred in the County – 1955, 1958, 1963, 1964, 1983, 1986, 1995, 1997, and twice in 2006.

NCDC Events

The NCDC data recorded 150 hail, heavy rain, wind, and tornado incidents for Nevada County since 1950. A summary of these events is shown in Table 4-15 Events in the NCDC database specific to Nevada County showing damages, deaths, or injuries are detailed below the table.

Table 4-15 NCDC Severe Weather Events in Nevada County 1950-12/31/2016

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	15	0	0	0	0	$0	$0
Heavy Rain	14	0	0	0	0	$0	$0

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
High Wind	96	2	1	3	0	$11,744,000	$30,011,000
Lightning	3	1	0	0	0	$15,000	$0
Strong Wind	18	1	0	0	0	$1,521,600	$0
Thunderstorm Wind	3	0	0	0	0	$0	$0
Tornado	1	0	0	0	0	$0	$0
Total	**150**	**4**	**1**	**3**	**0**	**$13,280,600**	**$30,011,000**

Source: NCDC

- **October 22, 2000** – High winds struck Nevada and Placer County. Newspaper report of several boats damaged during wind storm. Two were sunk and five were beached. Coast Guard estimated damage to be over $50,000.
- **November 8, 2002** – Strong winds blew a 3-foot diameter pine tree onto a garage in the Tahoe Donner area just north of Truckee, CA. The garage was destroyed, causing $50,000 in damages.
- **December 14, 2002** – strong cold front moving through northern California on December 14 brought near-record high winds to northeast California and western Nevada. Wind gusts reports in the 60-80 mph range were common throughout the day across the entire region, with a few gusts near 100 mph. Remote wind sensors along the Sierra Crest measured wind gusts in excess of 130 mph. The strongest winds occurred just before the cold front moved into the area at about 5:30 p.m. Hundreds of trees and thousands of tree limbs were blown down across the region. In addition, there was widespread damage to roofs, fences, commercial billboards and signs, and power lines. Numerous power outages occurred, some lasting for several days after the event in rural areas. A few relatively minor traffic accidents resulted from the low visibilities. From these, a few minor injuries were reported but fortunately no serious injuries or deaths were reported. The regional electric utility lost 140 power poles and 18 transmission line due to the strong winds, with damages and repair costs estimated at over $3M. Total regional wind damage costs were estimated at nearly $10M.
- **January 4, 2008** –A powerful Pacific storm brought widespread winds gusting to 60 mph and in some areas to more than 80 mph across interior Northern California, causing extensive damage and numerous power outages. Rainfall and liquid equivalent amounts ranged from 2 to 3 inches in the northern Central Valley and 4 to 11 inches in the mountains of Shasta County. Snowfall totals of 3 to 11 feet were reported in the northern Sierra Nevada Mountains, with winds up to and possibly exceeding 100 mph coupled with heavy snow bringing blizzard conditions. A spotter in Nevada City reported a gust to 92 mph on his weather station. He also reported numerous 3-foot diameter white fir and cedar trees down in the vicinity of Banner Mountain and the Maryland Rd. and Idaho Rd. intersection. A 70-mph gust was reported by Read Ranch RAWS automated weather station, located 7 miles northwest of Nevada City. Numerous buildings were damaged due directly to the wind and/or to flying debris and falling trees and branches. Power was out to thousands of customers for up to seven days. No injuries or deaths were reported. The storm was estimated to have done $1.27 million in damages, though not all in Nevada County.
- **July 23, 2012** – A 71-yr-old man was struck and killed by lightning during an early morning thunderstorm at Donner Memorial State Park just west of Truckee, CA. He had been camping with family in the Park and was outside in an area of tall trees.
- **October 12, 2012** – A strong low pressure system moved through northern California, bringing several feet of snow to the mountains, significant rainfall to the valley and foothills, and tornadic supercells in

the valley. Supercells developed behind the cold front along a north-south boundary in the middle of the Central Valley, where both instability and shear were large. A tornado touched down in Nevada County near Wolf. The Fire Department reported a tornado touchdown at approximately 4:30pm. The estimated damage path length was approximately 4 miles with wind speeds estimated at 90-100mph. The tornado touched down near highway 49 and Combie Rd and snapped tree trunks of 1 to 3 ft in diameter. Many trees were uprooted and a few power lines were blown over. Some buildings were also badly damaged in the area. No deaths or injuries were attributed to this tornado.

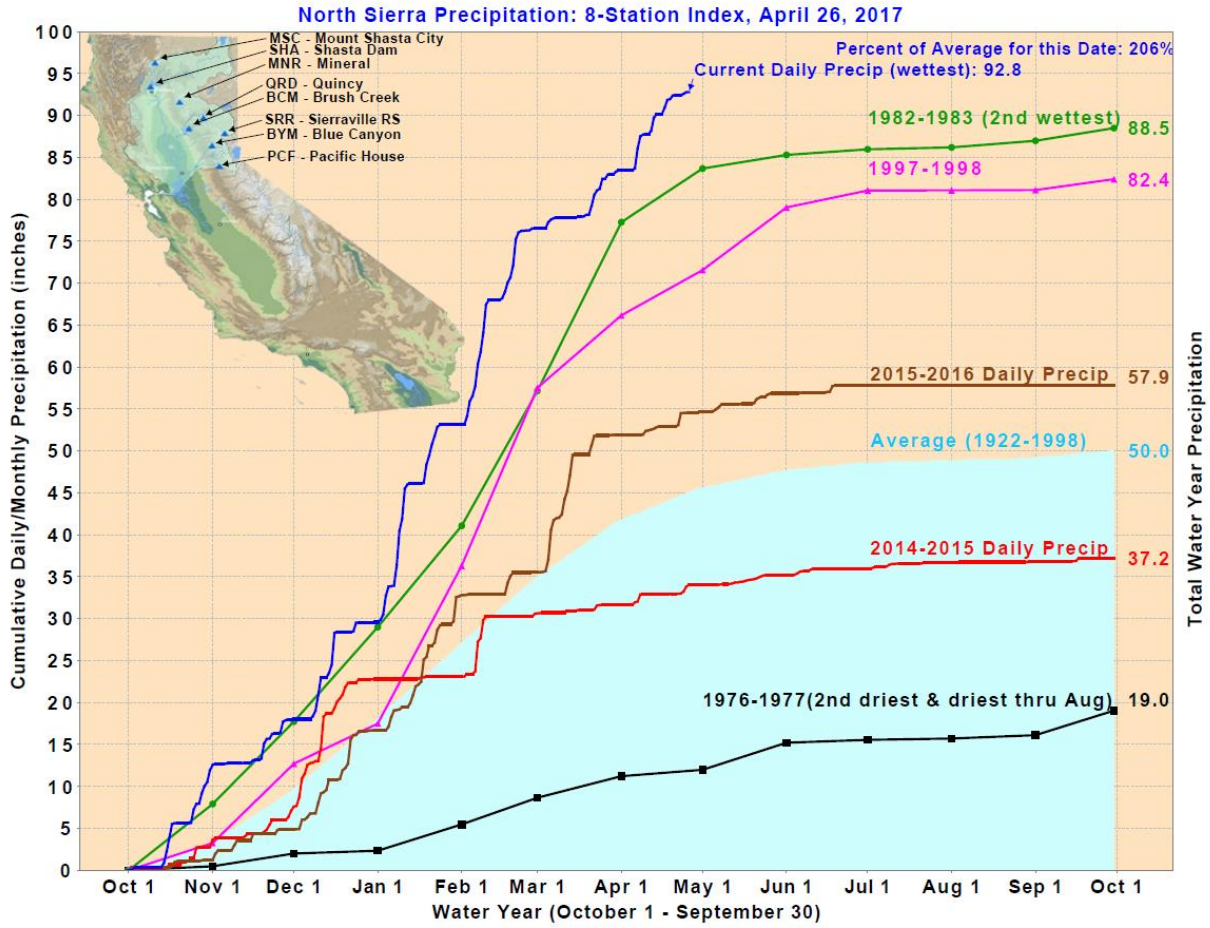
- **December 11, 2014** – Winds gusted to 60 and 70 mph at the Truckee and South Lake Tahoe airports, respectively, on the morning of the 11th. Over the Sierra ridges, winds gusted as high as 135 mph. Numerous trees and power lines were downed, along with damage to several homes and vehicles due to fallen trees. The power outages, some lasting up to 2 days, caused South Lake Tahoe schools to be closed through the 12th. Finally, winds downed a tree which caused the death of a teenager in a heavily wooded area. Damages from this event were estimated at $700,000.

HMPC Events

The HMPC noted the following events:

- The HMPC noted that there have been approximately 27 years out of the past 50 with above average snow water content. This occurs in the Sierra Nevada snowpack around Donner Summit near the west end of Truckee. Recent years that this has occurred are 2016/2017, 2011/2012, 2005/2006, 1994/1995, and 1992/1993. Many of these years are associated with flood events in the County and the downstream areas.
- An event in **June of 2008** that affected Nevada County and northern California as a whole. Large amounts of lightning struck large areas in northern California, igniting multiple wildfires. Ordinarily, fires begin in the lower elevations – generally state jurisdiction areas– and only later move into the forests. This allows federal resources to assist the state, then the reverse. The 2008 lightning siege struck 10 of the 11 state response units in northern California and 11 of the 20 federal units. All resources were immediately engaged on their local units, with none to spare for neighbors. Because the storm was unpredicted, no extra resources had been staged for ready reserves.
- The winter of **2016/2017** featured many storms and heavy rains. It is one of the wettest winters on record. This can be seen in Figure 4-20. The HMPC noted an event that occurred on January 3rd and again on the 11th of 2017. A storm caused tree damages in the County. Many trees fell into roadways, causing transportation difficulties. Schools were cancelled due to the fact that busses couldn't reach schools.

Figure 4-20 2016/2017 Winter Precipitation Totals



Source: NOAA

Likelihood of Future Occurrence

Highly Likely – Based on NCDC data and HMPC input, 150 heavy rain, hail, lightning, tornado, and thunderstorm wind incidents over a 67-year period (1950-2016) equates to a severe storm event every year and a 100 percent chance of a severe storm in any given year. This database doesn't report all heavy rain, hail, lightning, tornado, and wind events. Severe weather is a well-documented seasonal occurrence that will continue to occur annually in the Nevada County Planning Area.

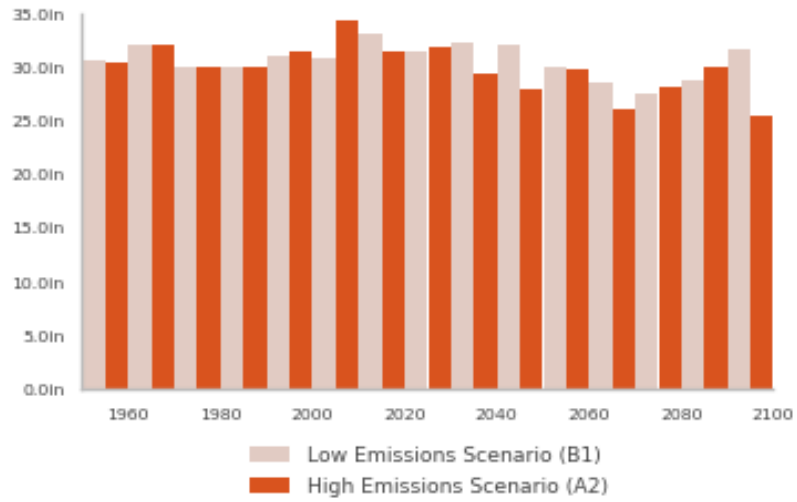
Climate Change and Heavy Rains and Storms

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. It is unlikely that hail will become more common in the County. The amount of lightning and tornadoes is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend

during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate models projects slightly wetter winters, and another projects slightly drier winters with a 10 to 20 percent decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized in some areas. Future precipitation estimates for the County are shown in Figure 4-21.

Figure 4-21 Nevada County– Future Precipitation Estimates: High and Low Emission Scenarios



Source: Cal-Adapt – Precipitation: Decadal Averages Map

4.2.5. Agricultural Hazards

Hazard/Problem Description

Agriculture has always been an integral part of Nevada County and has continually grown and changed along with the county. The beginning of major agriculture pursuits began concurrently with the discovery of gold in California. With the sudden influx of miners there was also a need for food. This need, along with the high prices miners were willing to pay, made it attractive for farmers (many of whom had been miners) to start raising crops in the western end of the county. This area, with its mild climate and good soils, attracted a large number of farmers who grew a variety of crops, including fruit of all varieties, small grains, hay, potatoes, and wine grapes.

Today, the soils and climate of Nevada County make it an ideal area to sustain many agricultural endeavors. Agriculture in Nevada County is a mosaic of farm land intermingled with other uses in the rural setting which typifies the County. This land provides marketable products, open space, wildlife habitat, watershed and an aesthetic environment. According to the California Department of Conservation's Farmland Mapping and Monitoring Program (FMPP), the County has approximately 309 acres of prime farmland, 1,274 acres of farmland of statewide importance, 476 acres of unique farmland, 23,141 acres of farmland

of local importance, and 117,278 acres of grazing land. These numbers have been reduced since 2004 due to increased development in the County. (see Table 4-16).

Table 4-16 Nevada County Farmland Inventory, 2004, 2014

Soil Category	2004 Acres	2014 Acres
Prime Farmland	658	309
Farmland of Statewide Importance	3,076	1,274
Unique Farmland	457	476
Farmland of Local Importance	22,850	23,411
Grazing Land	121,984	117,278
Urban and Built-Up Land	17,167	17,579
Water	2,145	2,145
Other Land	123,049	128,963
Total Area Inventoried	**291,387**	**291,935**

Source: State of California Department of Conservation Farmland Mapping and Monitoring Program, www.conservation.ca.gov/

According to the 2015 Nevada County Crop Report, many commodities are grown in Nevada County. This includes vegetable crops; nursery and flower products; timber products; fruit and nut crops; livestock and poultry; apiary, eggs, and wool products; and pasture and rangeland. The top three commodities for the County are livestock and poultry; pasture and rangeland; and timber products.

According to the 2015 crop report, the gross value of Nevada County's agricultural production for 2015 was $22,013,600, down 1% from the 2014 value. The livestock industry experienced a 15% decrease in gross value in 2015, mainly due to a 15% decrease in total cattle values affected by a decreased price per unit. Timber products saw an increase in value in 2015, but did not come close to its 2013 value. Fire salvage timber harvesting in surrounding counties continues to monopolize the industry and flood the mills with supply. A summation of crop production values, sourced from the Nevada County Ag Commissioner's Annual Crop Reports, from 2011-2015 for Nevada County is shown below.

- 2011 Nevada County Crop Production – $18,145,200
- 2012 Nevada County Crop Production – $16,897,200
- 2013 Nevada County Crop Production – $23,245,300
- 2014 Nevada County Crop Production – $23,253,100
- 2015 Nevada County Crop Production – $22,013,600

According to the HMPC, agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, heat, and drought. The 2013 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, and noxious weeds.

Natural Disasters and Severe Weather

According to the US Department of Agriculture (USDA), every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include: contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature.

Insect Pests

Nevada County is threatened by a number of insects that, under the right circumstances, can cause severe economic and environmental harm to the agricultural industry. Insects of concern to plants and crops include the gypsy moth, Japanese beetle, European grapevine moth, light brown apple moth, European pine shoot moth, exotic fruit flies, and glassy-winged sharpshooter. The Nevada County Department of Agriculture traps and monitors all of these agricultural pests. Pest detection is a proactive program that seeks to identify exotic, invasive insects. These pests have a wide host ranges and are difficult and costly to manage once established. Early detection is essential for quick and efficient eradication. Public participation is critical to the success of this program, since staff relies on the goodwill of property owners who allow traps to be placed on their properties. The Agriculture Department deployed 440 traps between spring and fall in 2015.

Weeds

Noxious weeds, defined as any plant that is or is liable to be troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, are also of concern. Noxious weeds within the Planning Area include those listed on Table 4-17.

Table 4-17 Nevada County Weeds of Concern

Species of Concern					
Bull Thistle	Himalayan Blackberry	Oblong Spurge	Rush Skeletonweed	Scotch Thistle	Yellow Starthistle
Canada Thistle	Klamathweed	Perrenial Pepperweed	Russian Knapweed	Spotted Knapweed	
Dalmation Toadflax	Lens-podded Hoary Cress	Purple Loosestrife	Russian Thistle	Stinkwort	
Diffuse Knapweed	Musk Thistle	Red Sesbania	Scotch Broom	Tree of Heaven	

The Nevada County Department of Agriculture uses mechanical and chemical control measures to contain all of these agricultural pests. In cooperation with the California Department of Food and Agriculture,

Agricultural Inspectors actively conduct surveys for invasive pest species. In 2015, approximately 4,346 shipments were inspected for live exotic pests, and resulted in 16 live pest finds.

Noxious weeds have been introduced in the Planning Area by a variety of means, including through commercial nurseries. An absence of natural controls, combined with the aggressive growth characteristics and unpalatability of many of these weeds, allows these weeds to dominate and replace more desirable native vegetation. Negative effects of weeds include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat;
- Reduced cropland and farmland production; and
- Reduced land value and sale potential.

According to the HMPC, the consequences of agricultural disasters to the Planning Area include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products). When these hazards can cause a mass die-off of livestock, other issues occur that include the disposal of animals, depopulation of affected herds, decontamination, and resource problems. Those disasters related to severe weather may also require the evacuation and sheltering of animal populations. Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community and the entire Nevada County Planning Area.

Past Occurrences

Disaster Declaration History

Located on the western slope of the Sierra Nevada between 1,000 and 6,000 feet in elevation, the agricultural lands of Nevada County have historically been affected by weather related events such as heavy rain, freezing temperatures (including late spring frosts and early fall frosts) and drought. The severe weather events can have devastating effects on fruit set and harvest causing losses in yield and affecting quality. The Nevada County Department of Agriculture provided information on disaster declarations from 2012 through 2016. These are shown in Table 4-18.

Table 4-18 Nevada County – USDA Disaster Declarations

Disaster Declaration Number	Disaster Cause	Primary or Contiguous County	Crop Disaster Year
S3268	Drought-FAST TRACK	Contiguous	2012
S3283	Drought-FAST TRACK	Contiguous	2012
S3379	Drought	Contiguous	2012
S3440	Drought-FAST TRACK	Primary	2012

Disaster Declaration Number	Disaster Cause	Primary or Contiguous County	Crop Disaster Year
S3462	Drought-FAST TRACK	Contiguous	2013
S3569	Drought-FAST TRACK	Primary	2013
S3631	Drought-FAST TRACK	Contiguous	2014
S3637	Drought-FAST TRACK	Primary	2014
S3743	Drought	Contiguous	2014
S3797	Drought	Primary	2014
S3784	Drought-FAST TRACK	Primary	2015
S3789	Drought-FAST TRACK	Contiguous	2015
S3963	Drought	Contiguous	2015
S3952	Drought-FAST TRACK	Primary	2016
S3953	Drought-FAST TRACK	Contiguous	2016

Source: Nevada County Agricultural Commissioner, US Farm Service Agency

NCDC Events

The NCDC does not track agriculture events.

HMPC Events

The HMCP noted that agriculture events occur yearly, though with varying levels of damages.

Likelihood of Future Occurrence

Likely—As long as severe weather events, insects, and weeds continue to be an ongoing concern to the Nevada County Planning Area, the potential for agricultural losses remains.

Climate Change and Agricultural Hazards

According to the CAS, addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

4.2.6. Avalanche

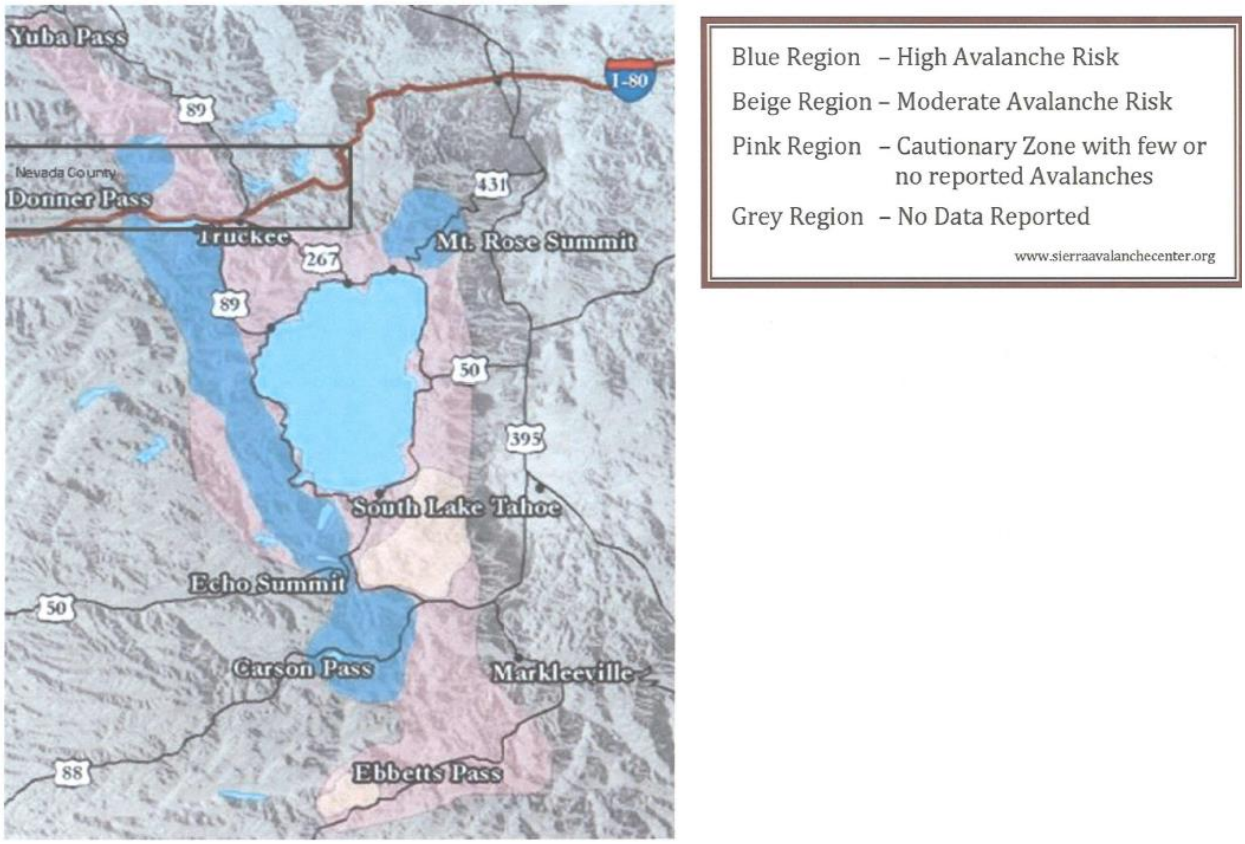
Hazard/Problem Description

Avalanche hazard areas are generally located on high, mountainous slopes and terrain at elevations above 7,000 feet. Avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during or shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers, who

venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement creates avalanches. Areas prone to avalanche hazards include hard to access areas deep in the backcountry. Avalanche hazards exist in eastern Nevada County where combinations of the above criteria occur.

Four avalanche hazard zones are defined, ranging from no hazard (most of Nevada County) to high hazard. High hazard refers to those areas where avalanches that could damage standard wood frame structures and/or bury automobiles are expected to occur with a probability of one chance in twenty per year. Identified high hazard areas within Nevada County include portions of Donner Lake, Tahoe-Donner and the Soda Springs areas. This is shown on Figure 4-22.

Figure 4-22 Nevada County – Avalanche Hazard Areas



Source: Sierra Avalanche Center

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations related to avalanche in Nevada County.

NCDC Events

The NCDC database shows 10 avalanche events in Nevada County since 1993. These are shown in Table 4-19. Specific information for each event is discussed below the table. It should be noted that, due to the way data is reported to the NCDC, that most of the deaths and injuries occurred outside of Nevada County.

Table 4-19 NCDC Avalanche Events in Nevada County and Region 1950-12/31/2014

Date	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
12/21/1996	0	0	2	0	$0	$0
1/19/1999	0	0	0	0	$0	$0
2/6/1999	1	0	3	0	$0	$0
12/25/2008	1	0	0	0	$0	$0
3/3/2009	1	0	0	0	$0	$0
3/1/2012	1	0	0	0	$0	$0
12/24/2012	1	0	0	0	$0	$0
12/24/2012	1	0	0	0	$0	$0
1/14/2016	1	0	0	0	$0	$0
2/18/2016	0	0	0	0	$0	$0
Total	**7**	**0**	**5**	**0**	**$0**	**$0**

Source: NCDC

- **December 25, 2012** – One fatality occurred when a male snowboarder, age 49, was caught in an avalanche at Donner Ski Ranch on Dec. 24th that occurred between 11am and noon. The man's body was found under 2-3 feet of snow at the base of the avalanche. The wind had blown snow to depths of 7 feet or more where the man was snowboarding.

HMPC Events

- The HMPC noted that the town of Truckee has avalanche slide paths in the town. Four slide paths have been identified. Two avalanche warnings were issued in 2017 for the Donner Lake Zone, but no avalanches occurred that affected citizens in the County or in Truckee.

Likelihood of Future Occurrence

Highly Likely—Injuries and loss of life from an avalanche are usually due to people recreating in remote areas at the wrong time. Given the topography and amount of snow falling on an annual basis in eastern Nevada County, avalanches and resulting damages, including injuries and loss of life, will continue to occur. Avalanche warnings are posted after winter storms and there is an organized ski patrol monitoring high risk areas each year to reduce the risk to life and property. Nevada County and the Town of Truckee have established mitigation measures in their General Plans to identify avalanche hazard areas and to control new development in identified avalanche areas.

Climate Change and Avalanche

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

4.2.7. Climate Change

Hazard/Problem Description

Climate change is the distinct change in measures of weather patterns over a long period of time, ranging from decades to millions of years. More specifically, it may be a change in average weather conditions such as temperature, rainfall, snow, ocean and atmospheric circulation, or in the distribution of weather around the average. While the Earth's climate has cycled over its 4.5-billion-year age, these natural cycles have taken place gradually over millennia, and the Holocene, the most recent epoch in which human civilization developed, has been characterized by a highly stable climate – until recently.

This LHMP is concerned with human-induced climate change that has been rapidly warming the Earth at rates unprecedented in the last 1,000 years. Since industrialization began in the 19th century, the burning of fossil fuels (coal, oil, and natural gas) at escalating quantities has released vast amounts of carbon dioxide and other greenhouse gases responsible for trapping heat in the atmosphere, increasing the average temperature of the Earth. Secondary impacts include changes in precipitation patterns, the global water cycle, melting glaciers and ice caps, and rising sea levels. According to the Intergovernmental Panel on Climate Change (IPCC), climate change will "increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems" if unchecked.

Through changes to oceanic and atmospheric circulation cycles and increasing heat, climate change affects weather systems around the world. Climate change increases the likelihood and exacerbates the severity of extreme weather – more frequent or intense storms, floods, droughts, and heat waves. Consequences for human society include loss of life and injury, damaged infrastructure, long-term health effects, loss of agricultural crops, disrupted transport and freight, and more. Climate change is not a discrete event but a long-term hazard, the effects of which communities are already experiencing.

Climate change adaptation is a key priority of the State of California. The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Nevada County, the HMPC noted that each year it seems to get a bit warmer and snow seems to start at higher levels. It was also noted that 2017 was one of the wettest years ever. California's Adaptation Planning Guide: Understanding Regional Characteristics has divide California into 11 different regions

based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Nevada County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. Table 4-20 provides a summary of Cal-Adapt Climate Projections for the North Sierra Region.

Table 4-20 North Sierra Region and Nevada County Planning Area – Cal Adapt Climate Projections

Effect	Ranges
Temperature Change, 1990-2100	January increase in average temperatures: 2.5 °F to 4°F by 2050 and 6°F to 7°F by 2100. The largest changes are observed in the southern part of the region. July increase in average temperatures: 4 °F to 5°F by 2050 and I 0°F by the end of the century, with the greatest change in the northern part of the region. (Modeled average temperatures; high emissions scenario)
Precipitation	Precipitation decline is projected throughout the region. The amount of decrease varies from 3 to 5 inches by 2050 and 6 inches to more than 10 inches by 2100, with the larger rainfall reductions projected for the southern portions of the region. (CCSM3 climate model; high carbon emissions scenario)
Heat wave	Heat waves are defined as five consecutive days over 83 °F to 97°F depending on location. By 2050, the number of heat waves per year is expected to increase by two. A dramatic increase in annual heat waves is expected by 2100, eight to I 0 more per year.
Snowpack	Snowpack levels are projected to decline dramatically in many portions of the region. In southern portions of the region, a decline of nearly 15 inches in snowpack levels - a more than 60 percent drop - is projected by 2090. (CCSM3 climate model; high carbon emissions scenario)
Wildfire	Wildfire risk is projected to increase in a range of I. I to I 0.5 times throughout the region, with the highest risks expected in the northern and southern parts of the region. (GFDL climate model; high carbon emissions scenario)

Source: Cal-Adapt

Past Occurrences

Disaster Declaration History

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

NCDC Events

The NCDC does not track climate change events.

HMPC Events

The HMPC noted no specific past events of climate change. They also noted that since it is a slow moving hazard, tracking past events is difficult.

Likelihood of Future Occurrence

Likely – Climate change is virtually certain to continue without immediate and effective global action. According to NASA, 2016 was on track to be the hottest year on record, and 15 of the 17 hottest years ever

have occurred since 2000. Without significant global action to reduce greenhouse gas emissions, the Intergovernmental Panel on Climate Change (IPCC) concludes in its Fifth Assessment Synthesis Report (2014) that average global temperatures is likely to exceed 1.5 C by the end of the 21st century, with consequences for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges.

Climate Scenarios

The United Nations IPCC developed several greenhouse gas (GHG) emissions scenarios based on differing sets of assumptions about future economic growth, population growth, fossil fuel use, and other factors. The emissions scenarios range from "business-as-usual" (i.e., minimal change in the current emissions trends) to more progressive (i.e., international leaders implement aggressive emissions reductions policies). Each of these scenarios leads to a corresponding GHG concentration, which is then used in climate models to examine how the climate may react to varying levels of GHGs. Climate researchers use many global climate models to assess the potential changes in climate due to increased GHGs.

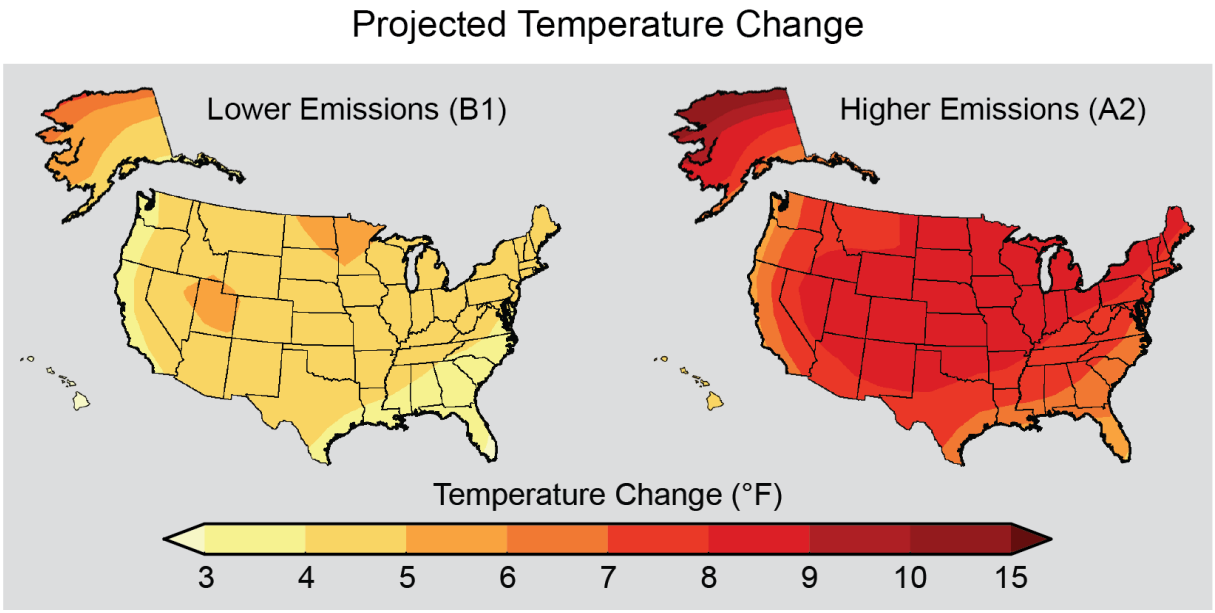
Key Uncertainties Associated with Climate Projections

- Climate projections and impacts, like other types of research about future conditions, are characterized by uncertainty. Climate projection uncertainties include but are not limited to:
  - ✓ Levels of future greenhouse gas concentrations and other radiatively important gases and aerosols,
  - ✓ Sensitivity of the climate system to greenhouse gas concentrations and other radiatively important gases and aerosols,
  - ✓ Inherent climate variability, and
  - ✓ Changes in local physical processes (such as afternoon sea breezes) that are not captured by global climate models.

Even though precise quantitative climate projections at the local scale are characterized by uncertainties, the information provided can help identify the potential risks associated with climate variability/climate change and support long term mitigation and adaptation planning.

Maps show projected change in average surface air temperature in the later part of this century (2071-2099) relative to the later part of the last century (1970-1999) under a scenario that assumes substantial reductions in heat trapping gases and a higher emissions scenario that assumes continued increases in global emissions. These are shown in Figure 4-23.

Figure 4-23 Projected Temperature Change – Lower and Higher Emissions Scenario



Source: National Climate Assessment

According to the California Natural Resource Agency (CNRA), climate change is already affecting California and is projected to continue to do so well into the foreseeable future. Current and projected changes include increased temperatures, sea level rise, a reduced winter snowpack altered precipitation patterns, and more frequent storm events. Over the long term, reducing greenhouse gases can help make these changes less severe, but the changes cannot be avoided entirely. Unavoidable climate impacts can result in a variety of secondary consequences including detrimental impacts on human health and safety, economic continuity, ecosystem integrity and provision of basic services.

The CNRA's 2014 Climate Adaptation Strategy (CAS) delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, and drought.:

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Nevada County and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these

changes may increase the probability of floods and levee and dam failures, along with creating issues related to salt water intrusion.

- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

4.2.8. Dam Failure

Hazard/Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following causes:

- Earthquake;
- Inadequate spillway capacity resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity;
- Improper design;
- Improper maintenance;
- Negligent operation; and/or
- Failure of upstream dams on the same waterway.

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

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

The California Department of Water Resources Division of Safety of Dams has jurisdiction over impoundments that meet certain capacity and height criteria. Embankments that are less than six feet high and impoundments that can store less than 15 acre-feet are non-jurisdictional. Additionally, dams that are less than 25 feet high can impound up to 50 acre-feet without being jurisdictional. The California Department of Water Resources (Cal DWR) Division of Safety of Dams assigns hazard ratings to large dams within the State. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in three categories that identify the potential hazard to life and property:

- High hazard indicates that a failure would most probably result in the loss of life
- Significant hazard indicates that a failure could result in appreciable property damage
- Low hazard indicates that failure would result in only minimal property damage and loss of life is unlikely

According to data provided by Nevada County, Cal DWR, and Cal OES, there are 48 dams in Nevada County constructed for flood control, storage, electrical generation, and recreational purposes. Of the 48 dams, 6 are rated as High Hazard, 7 as Significant Hazard, 29 as Low Hazard, and 6 were not rated. Dams in the County are owned and/or operated by a variety of entities including the USACE, PG&E, and the Nevada Irrigation District (NID).

Figure 4-24 identifies the 48 dams located in the Nevada County Planning Area.

Figure 4-24 Nevada County and Area Dam Inventory

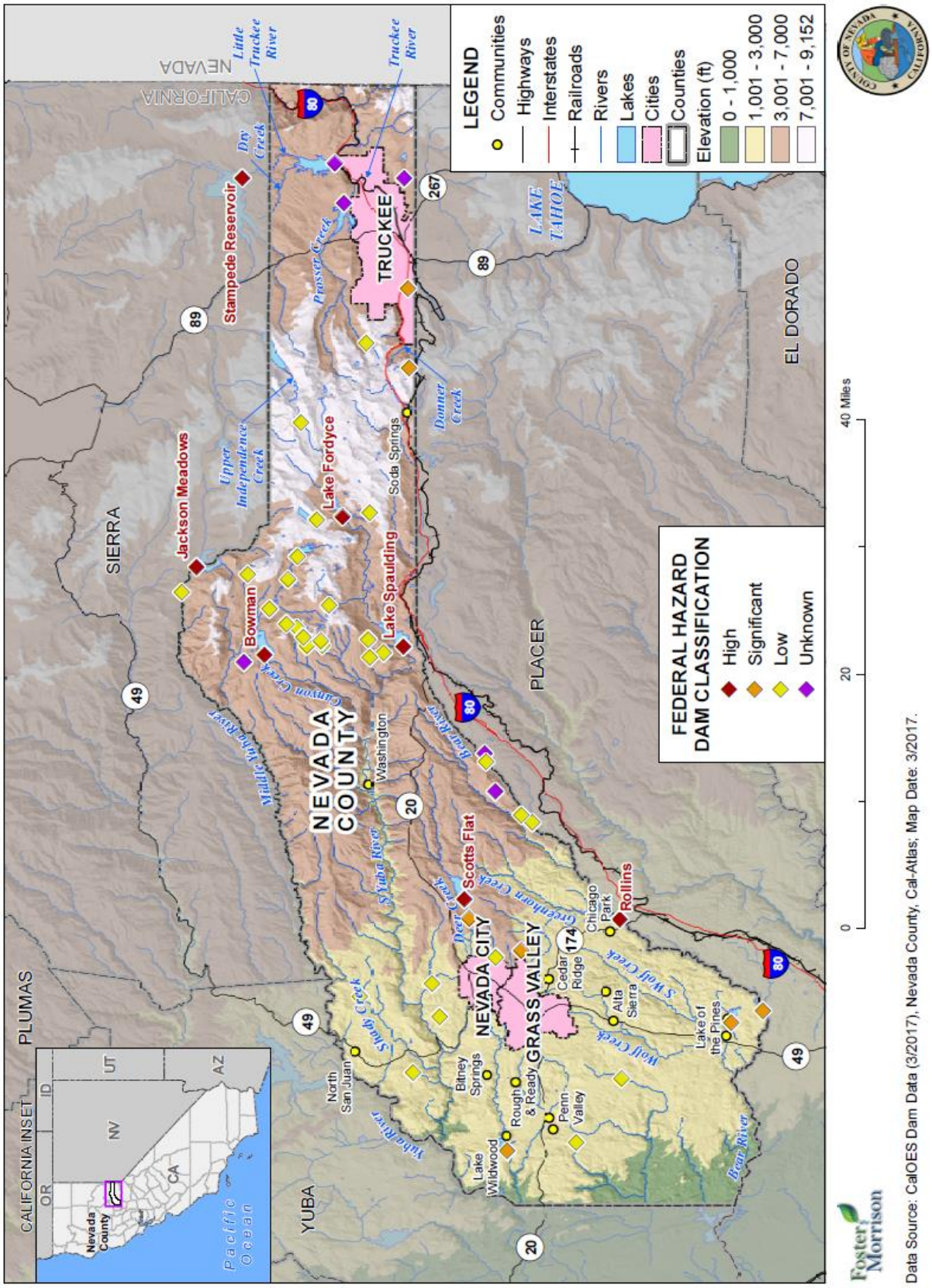


Table 4-21 Nevada County Dam Inventory

Name	Hazard Classification	Dam Type		Structural Height (ft)	Maximum Storage (acre-ft)
Anderson Ranch	Low	Rockfill	Irrigation	14.3	30
Anthony House	Significant	Rockfill	Water Supply	22.9	3,840
Bellett	Low	Rockfill	Irrigation	16.5	90
Big Downey Lake	Low	Gravity	Water Supply	3.7	162
Blue Lake	Low	Rockfill	Hydroelectric	6.4	1,200
Boca	–	Earth	Irrigation	35.4	32,870
Bowman	High	Rockfill	Irrigation	50.9	63,670
Combie	Significant	–	–	–	–
Culbertson	Low	Rockfill	Hydroelectric	6.1	950
Deer Creek Diversion	Significant	Arch	Irrigation	28	1,400
Donnner Euer Val	Low	Rockfill	Water Supply	6.4	80
Donner Lake	Significant	–	Irrigation	4.9	10300
Drum Afterbay	–	Concrete; Arch	Hydroelectric	31.1	180
Dutch Flat Afterbay	Low	Rockfill	Irrigation	50.3	1,900
Dutch Flat 2 Forebay	Low	Rockfill	Irrigation	23.5	162
Faucherie	Low	Rockfill	Irrigation	16.2	3,980
French Lake	Low	Rockfill	Irrigation	30.5	13,800
Fuller Lake	Low	Rockfill	Hydroelectric	11.9	1,100
Jackson Lake	Low	Rockfill	Irrigation	6.7	1,330
Jackson Meadows	High	Rockfill	Water Supply	59.7	53,100
Lake Angela	Significant	Gravity	Water Supply	8.5	310
Lake Fordyce	High	Rockfill	Hydroelectric	44.2	46,700
Lake Spaulding	High	Arch	Hydroelectric	84.1	74,700
Lake Sterling	Low	Rockfill	Hydroelectric	9.8	1,700
Lake Vera	Low	–	Water Supply	4.9	136
Liberty Hill	–	–	–	–	–
Loma Rica Airport	Significant	Rockfill	Irrigation	12.5	94
Lower Feeley Lake	Low	Rockfill	Hydroelectric	5.8	150
Lower Lindsey Lake	Low	Rockfill	Hydroelectric	4.9	300
Magnolia	Significant	Rockfill	Water Supply	20.7	4,200
Martis Creek	High	Earth	Flood Control	28.3	20,400
Meadow Lake	Low	Rockfill	Hydroelectric	11.6	4,900
Mid Lindsey Lake	Low	Rockfill	Hydroelectric	2.4	120
Milton Diversion	Low	Concrete; Arch	Water Supply	11.3	200

Name	Hazard Classification	Dam Type		Structural Height (ft)	Maximum Storage (acre-ft)
Nevada City Raw Water	Low	Rockfill	Water Supply	14.6	53
New Drum Afterbay	Low	Arch	Hydroelectric	29	341
Penn Valley WW Fac	Low	Rockfill	Irrigation	11.9	52
Pine Grove	Low	Rockfill	Water Supply	12.8	155
Prosser Creek	–	Earth	Flood Control	49.7	29,840
Rollins	High	Earth	Water Supply	69.5	65,988
Rucker Lake	Low	Rockfill	Hydroelectric	6.7	660
Sawmill Lake	Low	Rockfill	Irrigation	18.3	3,030
Scotts Flat	High	Rockfill	Fire Protection, Stock, Or Small Fish Pond	50.6	48,500
Swan	Low	Rockfill	Water Supply	18	550
Upper Feeley Lake	Low	Earth	Hydroelectric	7	730
Upper Rock Lake	Low	Earth	Hydroelectric	2.4	20
Weaver	–	Rockfill	Hydroelectric	5.2	190
White Rock Lake	Low	Rockfill	Hydroelectric	4	85

Source: Cal OES and the National Performance of Dams Program

*One Acre Foot=326,000 gallons

The County has six high hazard dams of concern and the Martis Creek dam which is unrated:

- Bowman
- Jackson Meadows
- Lake Fordyce
- Lake Spaulding
- Martis Creek
- Rollins
- Scotts Flat

With respect to the unrated Martis Creek Dam, a failure of that dam could impact both people and property as detailed in their Emergency Action Plan (EAP), which should make this a high hazard dam.

There is also one additional facility outside of Nevada County with the potential to impact the Nevada County Planning Area – the Stampede Dam in nearby Sierra County. Its location is shown on Figure 4-24.

Dams not in Inventory

Members of the HMPC noted that there are 2 dams near the Washington community that aren't on the County inventory list.

- About 500 ft. upstream from the mouth on Scotchman Creek is a Cement Debris dam that is 70-80 ft. tall and 100 ft. plus wide, the tailings are level with the top of the dam and continue upstream for about ¾ mile totaling probably several million yards of material.
- About .4 mile upstream from the first water crossing on Spanish Mine Road on Poorman Creek is a cement dam 6-8 ft. tall and 50 ft. + wide.

Past Occurrences

Disaster Declaration History

There have been no disasters declarations related to dam failure in Nevada County.

NCDC Events

There have been no NCDC dam failure events in Nevada County.

NPDP Events

The National Performance of Dams Program at Stanford University tracks dam failures. A search of the National Performance of Dams Program database showed no past dam failure events in Nevada County.

HMPC Events

According to the HMPC, there has been past releases from area dams:

- In 1883, the "English Dam" on the Middle Fork of the Yuba River broke and unleashed 650 million cubic feet of water. A wave 60 feet high went downstream at 10 miles per hour. Eight or nine men are thought to have been killed.
- During the winter storms of 1997, there were concerns that both the Spaulding and Bowman dams might overtop or fail.
- Likewise, during the January 2017 winter storms, there were concerns that the French Dam might overtop.
- The HMPC noted that Martis Dam dam is leaking and there is a fault underneath. A failure would cut off the Flenshire subdivision; I-80 would be impacted, as well as the City of Reno.
- It was also noted by the HMPC, that while no failure has occurred, the Scotts Flat dam has damage to its spillway.

Likelihood of Future Occurrence

Unlikely—The County remains at risk to dam breaches/failures from numerous dams under a variety of ownership and control and of varying ages and conditions. Although, there is no history of past dam failures, given the number and types of dams in the County and their ages, a potential exists for future dam issues, including failures, in the Nevada County Planning Area. Thus, the HMPC determined the likelihood of future occurrence to be Occasional. In addition to the aging dam infrastructure, this ranking was based on the recent issues with the nearby Oroville dam, that was at risk of overtopping and failure during the Winter 2017 storms. There is concern that many of the State's older dams, including those in Nevada County, could start experiencing similar problems.

Climate Change and Dam Failure

Increases in both precipitation and heat causing snow melt could increase the potential for dam failure and uncontrolled releases in Nevada County.

4.2.9. Drought and Water Shortage

Hazard/Problem Description

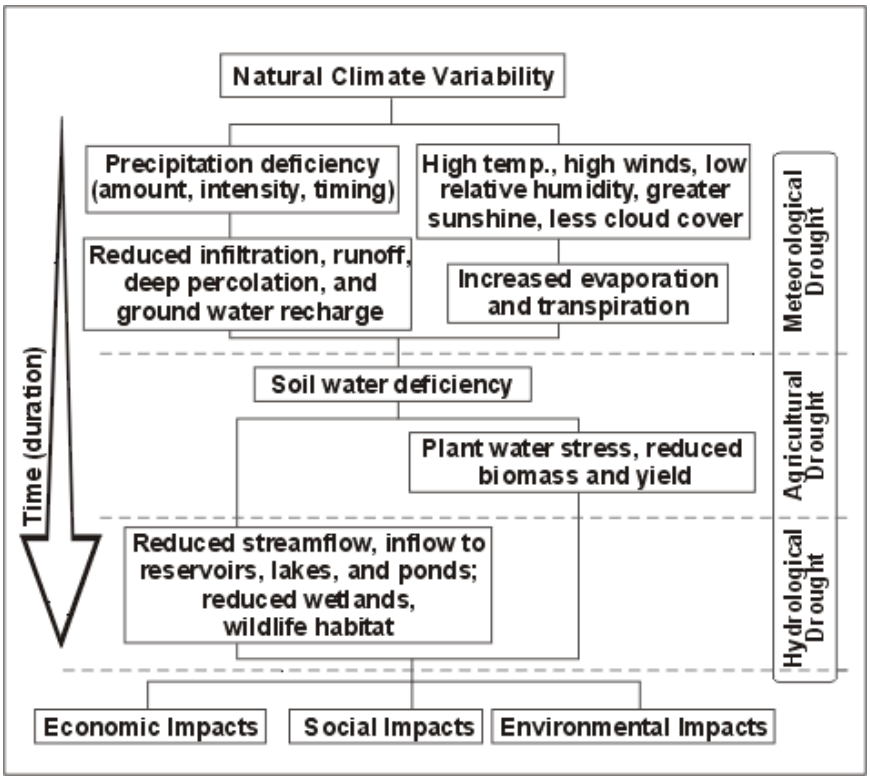
Drought

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends. Water districts normally require at least a 10-year planning horizon to implement a multiagency improvement project to mitigate the effects of a drought and water supply shortage.

Drought is a complex issue involving (see Figure 4-25) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- Meteorological drought is usually defined by a period of below average water supply.
- Agricultural drought occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- Hydrological drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- Socioeconomic drought occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

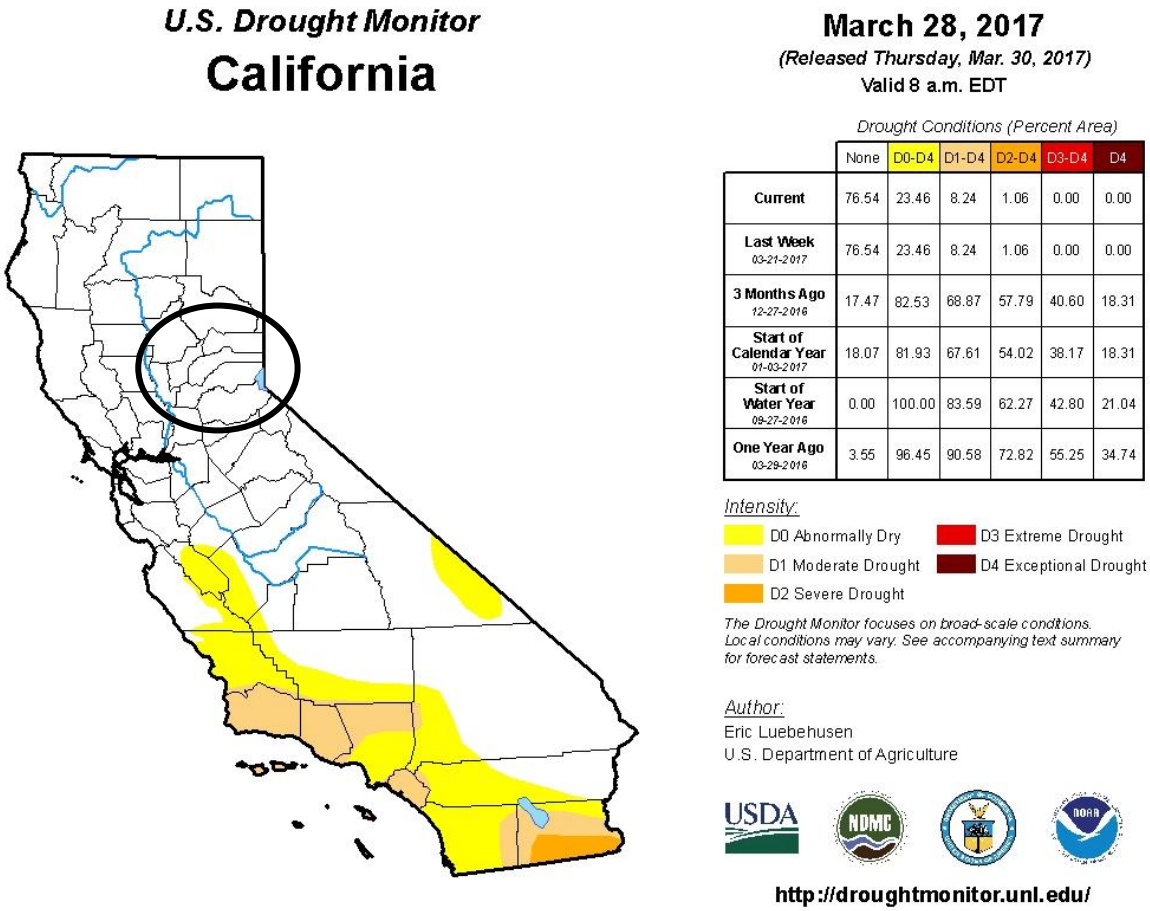
Figure 4-25 Causes and Impact of Drought



Source: National Drought Mitigation Center

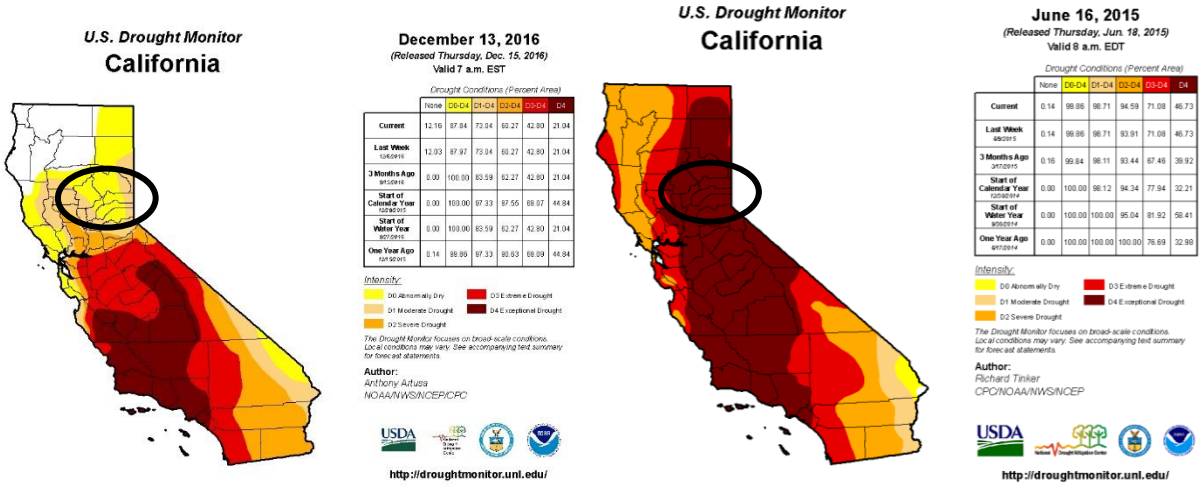
Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the drought conditions in California and the Planning Area can be found in Figure 4-26. A snapshot from 2015 and 2016 is shown in Figure 4-27.

Figure 4-26 Current Drought Status in Nevada County



Source: US Drought Monitor

Figure 4-27 Previous Drought Status in Nevada County



Source: US Drought Monitor

The California Department of Water Resources (DWR) says the following about drought:

> *One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.*

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between farming and federally protected fish habitats in California contributes to this issue.

Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer in Mediterranean climates, such as in California. This is particularly true in Northern California where drought impacts are delayed for most of the population by the wealth of stored surface and ground water. The drought complications normally appear more than a year after a drought begins. In most areas of California, ranchers that rely on rainfall to support forage for their livestock are the earliest and most affected by drought. Even below normal water years could affect ranchers depending on the timing and duration of precipitation events. It is difficult to quantitatively assess drought impacts to Nevada County because not many county-specific studies have been conducted. Some factors to consider include the impacts of fallowed agricultural land, habitat loss and associated effects on wildlife, and the drawdown of the groundwater table. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in Nevada County. It can be assumed, however, that the loss of production in one sector of the economy would affect other sectors.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Some communities in higher elevations with shallow bedrock do not have a significant source of groundwater.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in the Planning Area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Also, during a drought, allocations go down and water costs increase, which results in reduced water availability. Voluntary conservation measures are a normal and ongoing part of system operations and actively implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding and erosion.

Water Shortage

Northern Sacramento Valley counties, including Nevada County, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought. For example, Northern California agencies, including those from Nevada County, were major participants in the Governor's Drought Water Bank of 1991, 1992, and 1994. The HMPC noted that given the groundwater resources in the County, impacts to water supply in Nevada County is much less than compared to other communities with limited groundwater resources.

Past Occurrences

Disaster Declaration History

There has been two state disasters related to drought and water shortage in Nevada County issued in 1976 and 2014.

2014 Governor's Drought Declaration

California's ongoing response to its five-year drought has been guided by a series of executive orders issued by Governor Edmund G. Brown Jr. that are listed below beginning with the most recent and continuing in reverse chronological order:

- Executive Order B-37-16, May 9, 2016: The Governor's latest drought-related executive order established a new water use efficiency framework for California. The order bolstered the state's drought resilience and preparedness by establishing longer-term water conservation measures that include permanent monthly water use reporting, new urban water use targets, reducing system leaks and eliminating clearly wasteful practices, strengthening urban drought contingency plans and improving agricultural water management and drought plans.
- Executive Order B-36-15, November 13, 2015: This executive order called for additional actions to build on the State's ongoing response to record dry conditions and assist recovery efforts from 2015's devastating wildfires.
- Executive Order B-29-15, April 1, 2015: Key provisions included ordering the State Water Resources Control Board (Board) to impose restrictions to achieve a 25-percent reduction in potable urban water usage through February 28, 2016; directing the California Department of Water Resources (DWR) to lead a statewide initiative, in partnership with local agencies, to collectively replace 50 million square feet of lawns and ornamental turf with drought tolerant landscapes, and directing the California Energy Commission to implement a statewide appliance rebate program to provide monetary incentives for the replacement of inefficient household devices.
- Executive Order B-28-14, December 22, 2014: The order cited paragraph 9 of the January 17, 2014 Proclamation and paragraph 19 of the April 25, 2014 Proclamation (both are linked below) and extended the operation of the provisions in these paragraphs through May 31, 2016.
- Executive Order B-27-14, October 6, 2014: The order directed State agencies to assist local governments in their response to wildfires during California's drought conditions.
- Executive Order B-26-14, September 18, 2014: The order facilitated efforts to provide water to families in dire need as extreme drought continued throughout California.

- Proclamation of a Continued State of Emergency, April 25, 2014: The order strengthened the State's ability to manage water and habitat effectively in drought conditions and called on all Californians to redouble their efforts to conserve water.
- Drought State of Emergency, January 17, 2014: The Governor proclaimed a State of Emergency and directed State officials to take all necessary actions to make water immediately available. Key measures in the proclamation included:
  - ✓ Asking all Californians to reduce water consumption by 20 percent and referring residents and water agencies to the Save Our Water campaign – www.saveourwater.com – for practical advice on how to do so;
  - ✓ Directing local water suppliers to immediately implement local water shortage contingency plans;
  - ✓ Ordering the Board to consider petitions for consolidation of places of use for the State Water Project and Central Valley Project, which could streamline water transfers and exchanges between water users;
  - ✓ Directing DWR and the Board to accelerate funding for projects that could break ground in 2014 and enhance water supplies;
  - ✓ Ordering the Board to put water rights holders across the state on notice that they may be directed to cease or reduce water diversions based on water shortages;
  - ✓ Asking the Board to consider modifying requirements for releases of water from reservoirs or diversion limitations so that water may be conserved in reservoirs to protect cold water supplies for salmon, maintain water supplies and improve water quality.

NCDC Events

There have been 33 NCDC drought events in Nevada County. All of these were for the 2014-2016 drought, but no damages, injuries, or losses were reported in the NCDC database.

HMPC Events

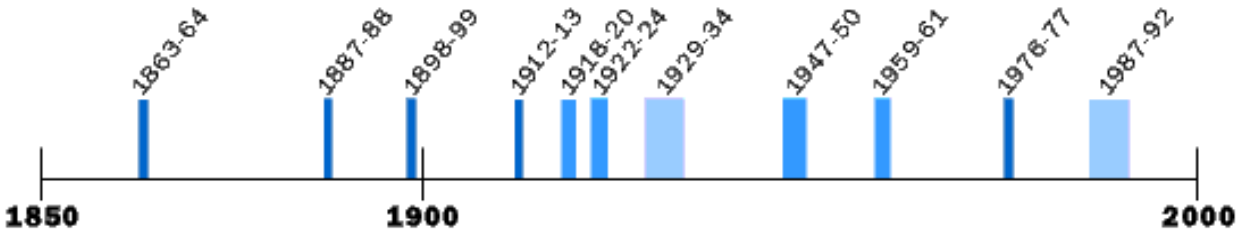
Historically, California has experienced multiple severe droughts. According to the California DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Table 4-22 compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77, 1987-92, and 2007-09 droughts. Figure 4-28 depicts California's Multi-Year Historical Dry Periods, 1850-2000.

Table 4-22 Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

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

Source: California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources. Available at: http://www.water.ca.gov/drought/docs/DroughtReport2010.pdf
*maf=million acre feet

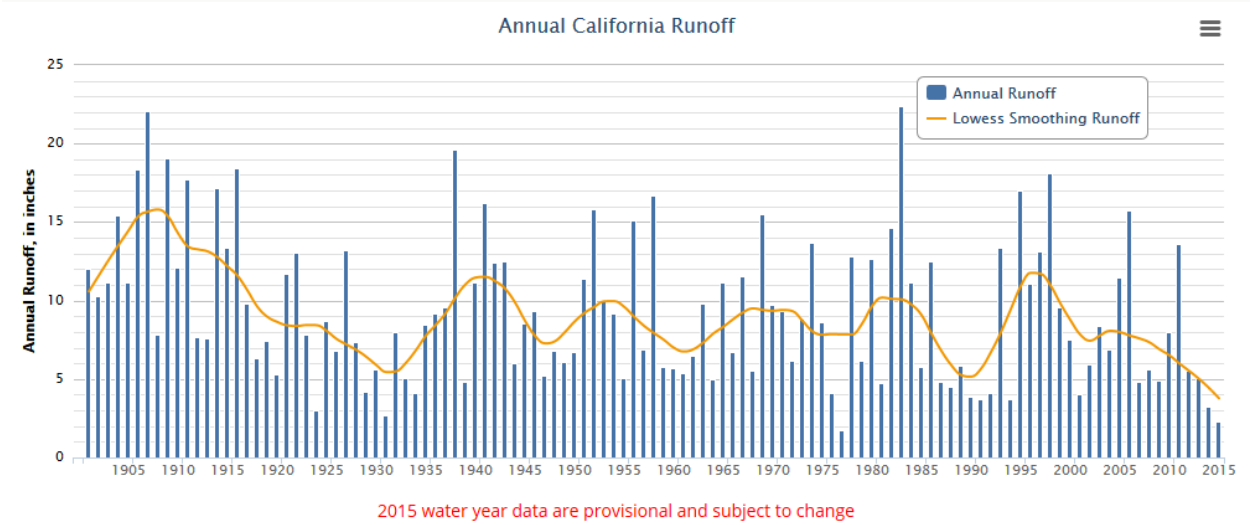
Figure 4-28 California's Multi-Year Historical Dry Periods, 1850-2000



Source: California Department of Water Resources, www.water.ca.gov/
Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

Figure 4-29 depicts runoff for the State from 1900 to 2015. This gives a historical context for the 2014-2015 drought to past droughts

Figure 4-29 Annual California Runoff –1900 to 2015



Source: California DWR

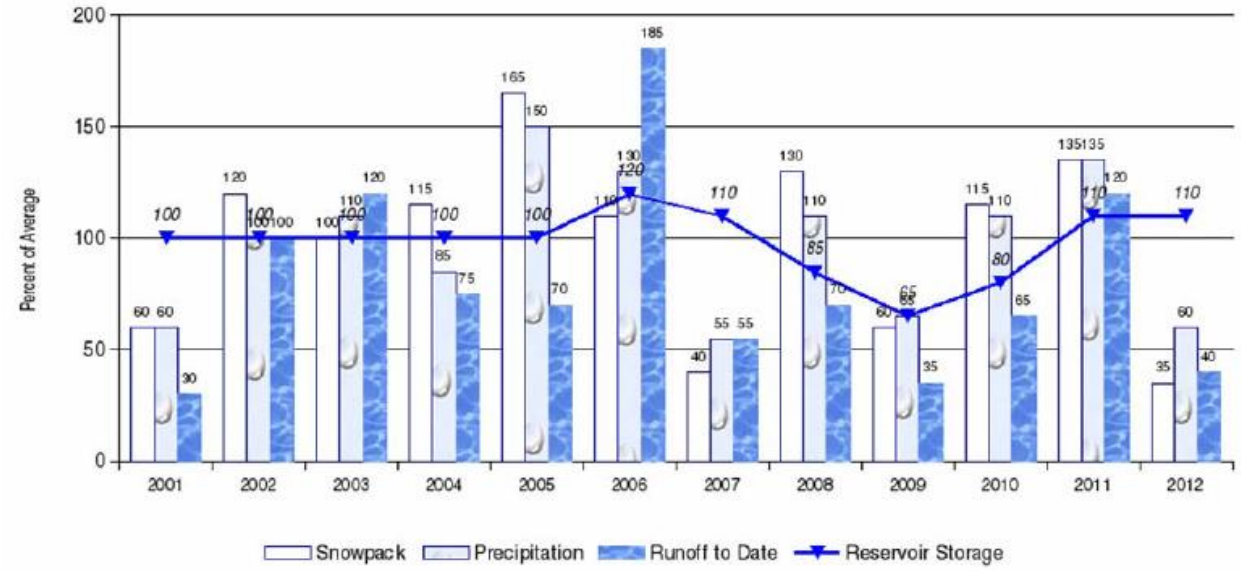
The HMPC noted that during the 2014 drought that was just declared over by the California Governor in April 2017, the County experienced significant economic impacts, many associated with the Skiing and

recreational industry as well as the agricultural industry. In addition, the recent drought increased tree mortality in the County associated with both dying trees due to lack of moisture and those infected with Bark Beetle. Drought (combined with tree mortality issues) also compounded the wildfire risk throughout the County.

Water Shortage

Figure 4-30 illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 2001 and 2012. The chart illustrates the cyclical nature of weather patterns in California. Snow pack and precipitation increased between 2005 and 2006, began decreasing in late 2006, and began to show signs of recovery in 2009.

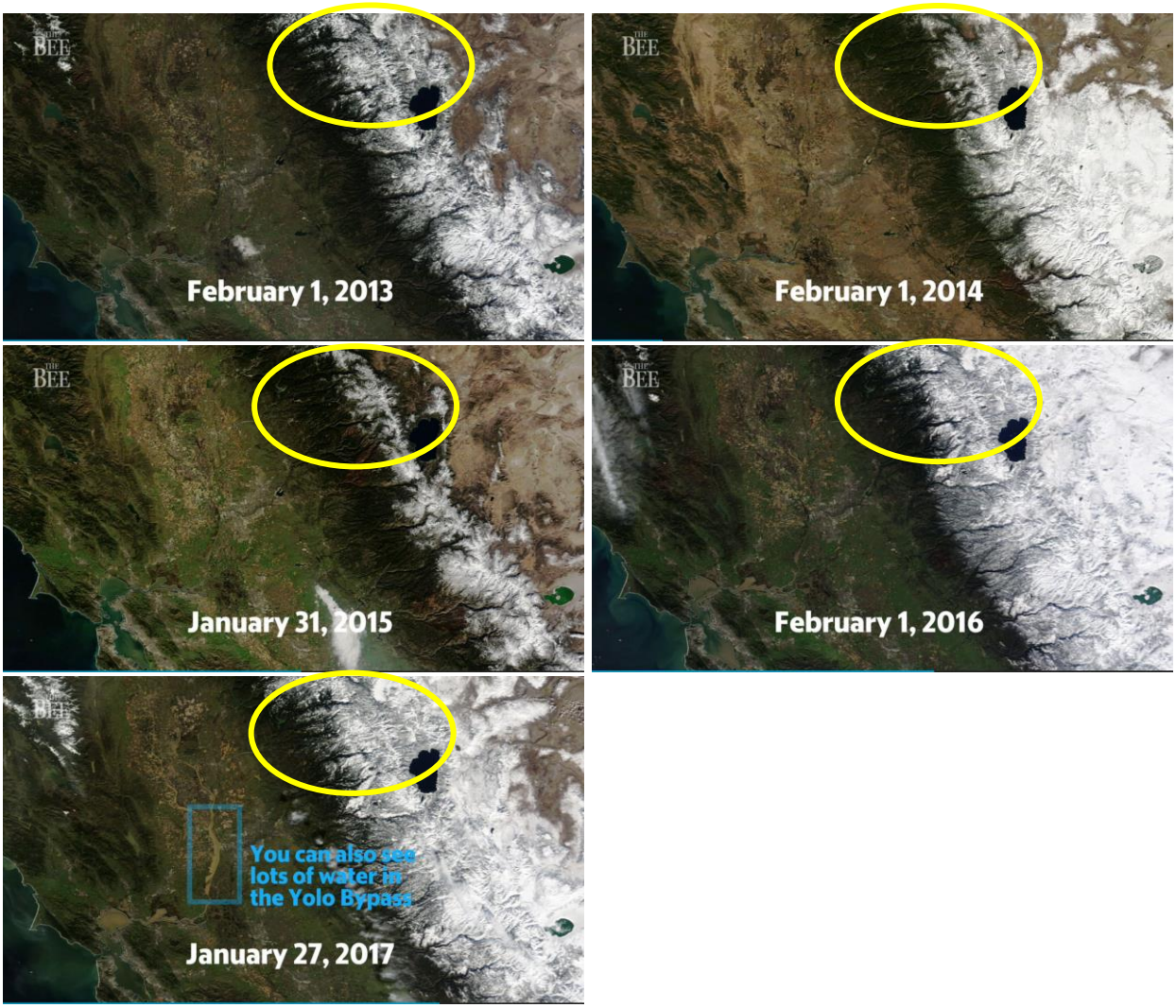
Figure 4-30 Water Supply Conditions, 2001 to 2012



Source: 2013 State of California Hazard Mitigation Plan

Beginning in 2012, snowpack levels in California dropped dramatically. 2015 estimates placed snowpack as 5 percent of normal levels. Snowpack measurements have been kept in California since 1950 and nothing in the historic record comes close to 2015's severely depleted level. The previous record for the lowest snowpack level in California, 25 percent of normal, was set both in 1976-77 and 2013-2014. In "normal" years, the snowpack supplies about 30 percent of California's water needs, according to the California Department of Water Resources. Snowpack levels began to increase in 2016, and in 2017 snowpack increased to the largest in 22 years, according to State DWR. This can be seen in Figure 4-31.

Figure 4-31 Snowpack Levels 2013-2017



Source: Sacramento Bee, NASA

With a reduction in water, water supply issues based on water rights becomes more evident. Some agricultural uses and crops, such as grapes and walnuts, are severely impacted through limited water supply. Drought and water supply issues will continue to be a concern to the Planning Area, including irrigation of agricultural lands. Also noted by the HMPC, several areas within the County had ground water wells go dry affecting water supply to County residents. Much of this was attributed to dewatering activities conducted by active mining operations which further depleted the already reduced ground water table in areas due to drought conditions.

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for the Nevada County Planning Area and region indicate there have been 5 significant droughts in the last 84 years. This equates to a drought every 16.8 years on average or a 6

percent chance of a drought in any given year. However, based on this data and given the multi-year length of droughts, the HMPC determined that future drought occurrence in the Planning Area are likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that Nevada County may at some time be at risk to both short and prolonged periods of water shortage. Based on this it is possible that water shortages will affect the County in the future during extreme drought conditions. However, to date, Nevada County has continued to have good, consistent water supply.

Climate Change and Drought and Water Shortage

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The Climate Adaptation Strategy (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.*

The regional implications of declining water supplies as a long-term public policy issue are recognized in a Southern California Association of Governments July 2009 publication of essays examining climate change topics. In one essay, Dan Cayan observes:

> *In one form or another, many of Southern California's climate concerns radiate from efforts to secure an adequate fresh water supply…Of all the areas of North America, Southern California's annual receipt of precipitation is the most volatile – we only occasionally see a "normal" year, and in the last few we have swung from very wet in 2005 to very dry in 2007 and 2008….Southern California has special challenges because it is the most urban of the California water user regions and, regionwide, we import more than two-thirds of the water that we consume.*

Further, a report published in Science magazine in 2015 that stated:

> *Given current greenhouse gas emissions, the chances of a 35+ year "megadrought" striking the Southwest by 2100 are above 80 percent.*

A report from the Public Policy Institute of California also 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.

4.2.10. Earthquake

Hazard/Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Table 4-23). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-23 Modified Mercalli Intensity (MMI) Scale

MMI	Felt Intensity
I	Not felt except by a very few people under special conditions. Detected mostly by instruments.
II	Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
III	Felt noticeably indoors. Standing automobiles may rock slightly.
IV	Felt by many people indoors; by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.
V	Felt by nearly everyone. Many people are awakened. Some dishes and windows are broken. Unstable objects are overturned.
VI	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.
VII	Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction.
VIII	Damage is slight in specially designed structures, considerable in ordinary buildings, and great in poorly built structures. Heavy furniture is overturned.
IX	Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.
X	Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Considerable landslides occur on steep slopes.
XI	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.
XII	Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.

Source: Multi-Hazard Identification and Risk Assessment, FEMA 1997

California is seismically active because it sits on the boundary between two of the earth's tectonic plates. Most of the state - everything east of the San Andreas Fault - is on the North American Plate. The cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about two inches per year. The

San Andreas Fault is considered the boundary between the two plates, although some of the motion is taken up on faults as far away as central Utah.

Faults

A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another." For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant. This does not mean, however, that faults having no evidence of surface displacement within the last 11,000 years are necessarily inactive. For example, the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active. Potentially active faults are those that have shown displacement within the last 1.6 million years (Quaternary). An inactive fault shows no evidence of movement in historic (last 200 years) or geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible ground shaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

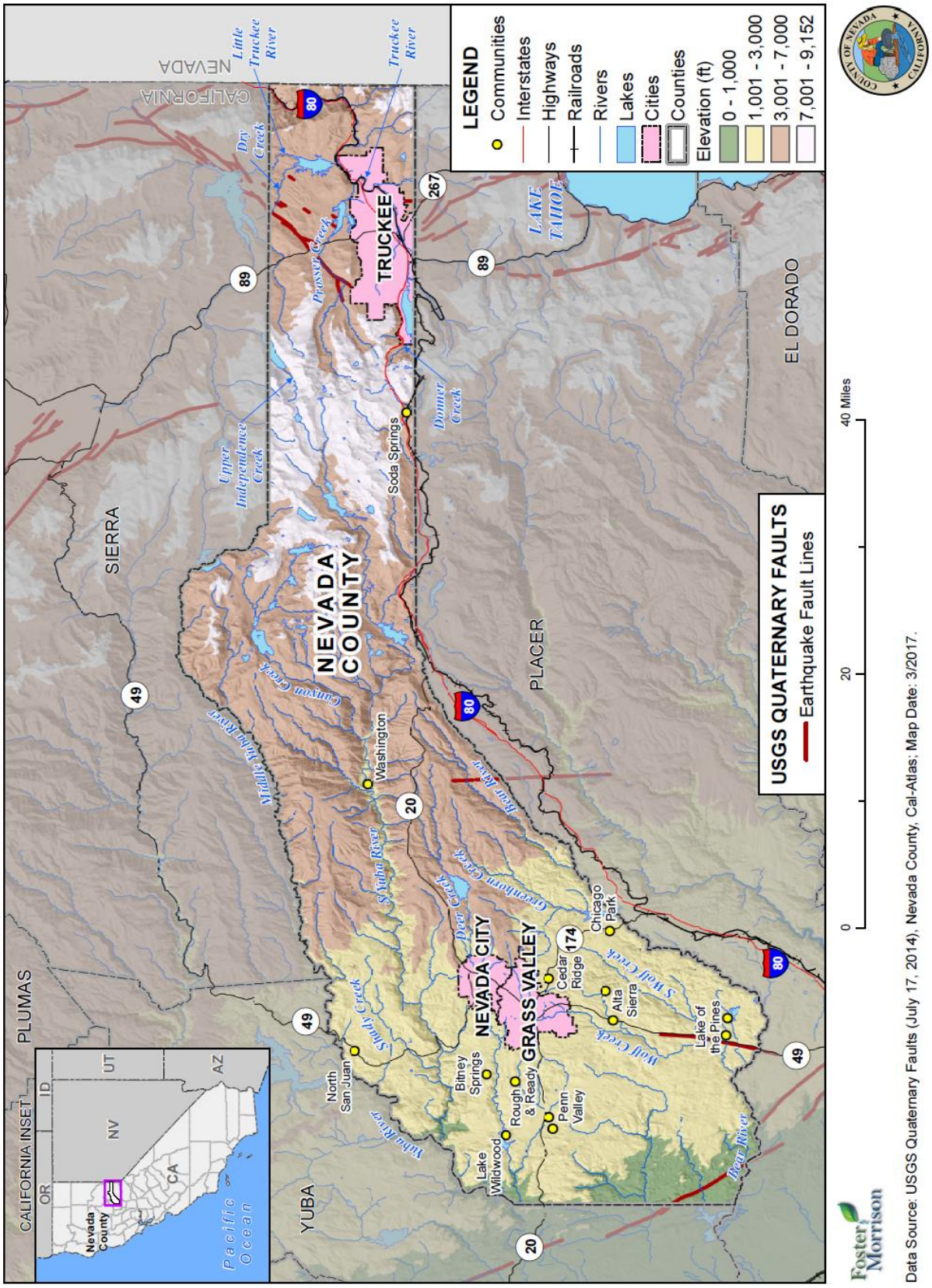
Nevada County lies between two seismically active regions in the western United States. Tectonic stresses associated with the North American-Pacific Plate boundary can generate damaging earthquakes along faults 30 to 100 miles to the west of the County. Extreme eastern Nevada County borders the Basin and Range province that entails most of Nevada and western Utah. This area is riddled with active faults that are responsible for and form the boundary between each basin or valley and the neighboring mountain range.

Prequaternary faults can be found in the County's western half, running generally in a north-south direction. Although the western half of the County contains relatively inactive faults, it should be pointed out that a very high percentage of building construction within the high-density areas of Grass Valley and Nevada City is quite old. Therefore, damage in these areas might be considerable if a major earthquake occurs, despite the fact that most of the buildings are only one or two stories. Quaternary and historic faults can be found in the eastern portion of the County near Truckee. Of particular note is the Dog Valley or Truckee fault which runs through Truckee from Prosser Reservoir past Boca Reservoir to Stampede Reservoir in Sierra County.

Faults within the State of California are divided into three categories: prequaternary (older than two million years); quaternary (younger than two million years); and historic (less than 200 years). Prequaternary faults can be found in the County's western half, running generally in a north-south direction. Quaternary and historic active faults can be found in the eastern portion of the County near the Town of Truckee.

Figure 4-32 shows fault locations in and near Nevada County.

Figure 4-32 Active Faults in and near Nevada County



Earthquake Hazards

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. This section briefly discusses issues related to types of seismic hazards.

Ground Shaking

Ground shaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by ground shaking is among the most serious seismic hazards. Damage to structures from this vibration, or ground shaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion.

Actual ground breakage generally affects only those buildings directly over or nearby the fault. Ground shaking generally has a much greater impact over a greater geographical area than ground breakage. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater. In the Sierra Nevada Range, the common occurrence of relatively shallow weathered material underlain by dense bedrock lessens the seismic risk. This is consistent with the fact that many authorities list igneous and metamorphic bedrock (found extensively throughout Nevada County) as providing the least amount of seismic hazard due to ground shaking. Hazard due to ground breakage is considerably less dependent upon the kind of bedrock.

Seismic Structural Safety

Older buildings constructed before building codes were established, and even newer buildings constructed before earthquake-resistance provisions were included in the codes, are the most likely to be damaged during an earthquake. Buildings one or two stories high of wood-frame construction are considered to be the most structurally resistant to earthquake damage. Older masonry buildings without seismic reinforcement (unreinforced masonry) are the most susceptible to the type of structural failure that causes injury or death.

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions which affect low-rise buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium can cushion low-rise buildings, but it can also accentuate the motion in tall buildings. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include, but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Liquefaction Potential

Liquefaction is a process whereby soil is temporarily transformed to a fluid form during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated (e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are loose to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction.

Liquefaction during major earthquakes has caused severe damage to structures on level ground as a result of settling, titling, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation. Also of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted.

Settlement

Settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to ground shaking is not available.

Other Hazards

Earthquakes can also cause landslides and dam failures. Earthquakes may cause landslides (discussed in Section 4.2.12), particularly during the wet season, in areas of high water or saturated soils. Finally, earthquakes can cause dams to fail (see Section 4.2.7 Dam Failure).

Earthquakes in Nevada County

According to the United States Geological Survey (USGS), Nevada County falls within all three "Maximum Expectable Earthquake Intensity" severity zones. The western half of the County is in the low intensity zone, the middle quarter is in the moderate zone and the eastern quarter is in the highest intensity zone.

Table 4-24 Maximum Expectable Earthquake Intensity Zones

Zone	Probable Damage	Probably Maximum Intensity	Richter Magnitude Scale
I – Low	Minor to Moderate	VI or VII	5
II – Moderate	Moderate	VII or VIII	5 to 6

Zone	Probable Damage	Probably Maximum Intensity	Richter Magnitude Scale
III – High	Major	IX or X	7

Source: Nevada County Master Environmental Inventory (December 1991).

Additionally, western Nevada County may experience ground shaking from distant major to great earthquakes on faults to the west and east. For example, to the west, both the San Andreas Fault (source of the 8.0 estimated Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906, including the State Capitol, the full extent of which was not discovered until the mid-1970s) and the closer Hayward fault have the potential for experiencing major to great events. The USGS recently (February 2004) estimated that there is a 62 percent probability of at least one 6.7 or greater magnitude earthquake occurring that could cause widespread damage in the greater San Francisco Bay Area before 2032.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations in the County.

NCDC Events

Earthquake events are not tracked by the NCDC database.

USGS Events

The USGS National Earthquake Information Center database contains data on earthquakes in the Nevada County area. Table 4-25 shows the approximate distances earthquakes can be felt away from the epicenter. According to the table, a magnitude 5.0 earthquake could be felt up to 90 miles away. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Nevada City in Nevada County. These results are detailed in Table 4-26.

Table 4-25 Approximate Relationships between Earthquake Magnitude and Intensity

Richter Scale Magnitude	Maximum Expected Intensity (MM)*	Distance Felt (miles)
2.0 - 2.9	I – II	0
3.0 - 3.9	II – III	10
4.0 - 4.9	IV – V	50
5.0 - 5.9	VI – VII	90
6.0 - 6.9	VII – VIII	135
7.0 - 7.9	IX – X	240
8.0 - 8.9	XI – XII	365

*Modified Mercalli Intensity Scale.

Source: United State Geologic Survey, Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

*Table 4-26 Magnitude 5.0 Earthquakes within 90 Miles of Nevada County**

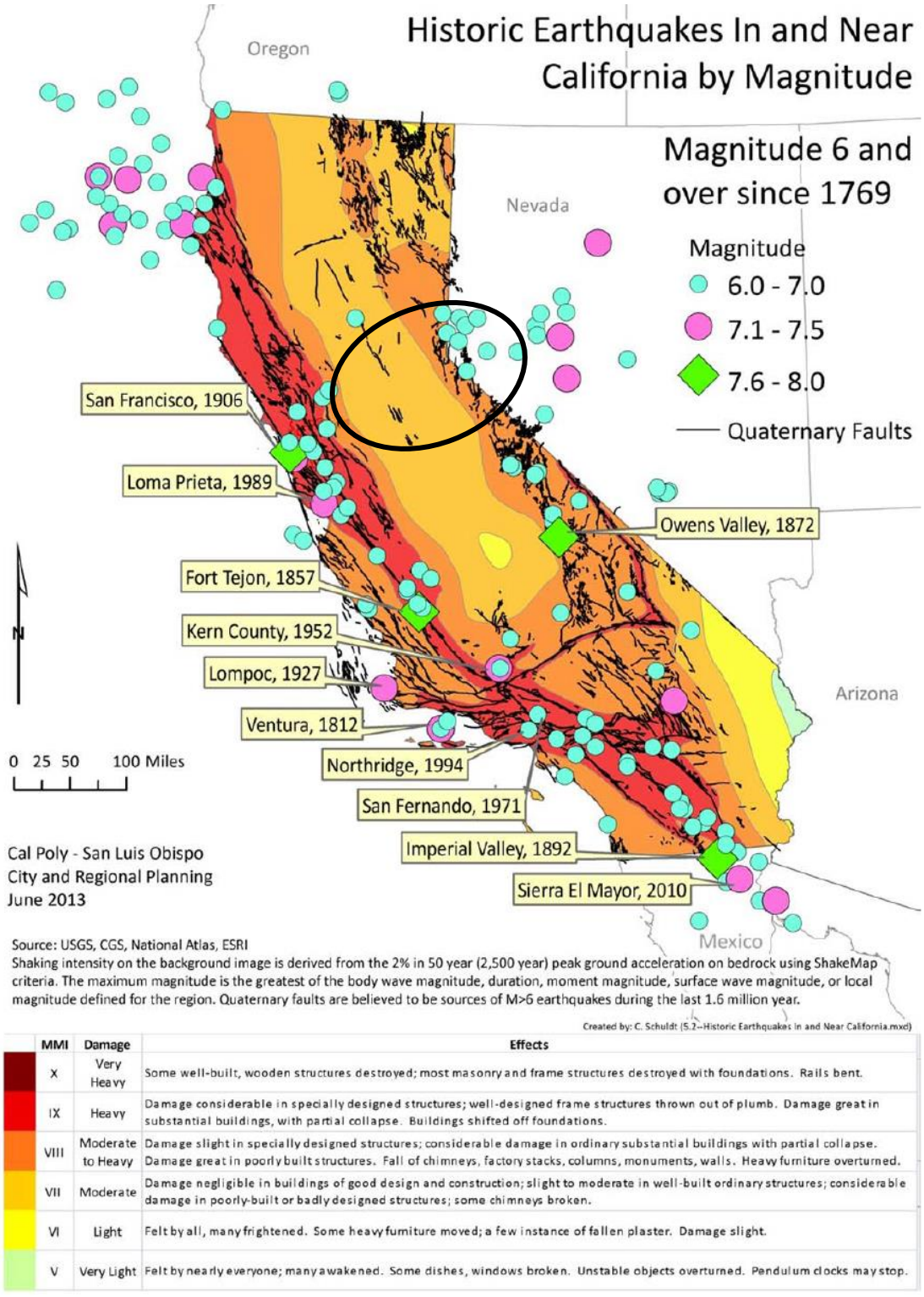
Date	Richter Magnitude	Location
2016-08-10	5.09	20km NNE of Upper Lake, California
2013-05-24	5.69	10km WNW of Greenville, California
2008-04-26	5.1	1km NW of Mogul, Nevada
2001-08-10	5.2	Northern California
2001-08-10	5.2	Northern California
1994-09-12	5.1	Northern California
1994-09-12	5.7	11km SE of Gardnerville Ranchos, Nevada
1994-09-12	5.9	Nevada
1980-11-28	5.1	Northern California
1979-02-22	5.3	Northern California
1975-08-02	5.2	Northern California
1975-08-02	5.2	Northern California
1975-08-02	5.1	Northern California
1975-08-01	5.8	Northern California
1975-08-01	5.7	Northern California
1966-09-12	5.9	Northern California

Source: USGS

*Search dates 1950 – March 1, 2017

Figure 4-33 shows major historical earthquakes in California from 1769 to 2010.

Figure 4-33 Historic Earthquakes in California and Nevada County



MMI	Damage	Effects
X	Very Heavy	Some well-built, wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
IX	Heavy	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
VIII	Moderate to Heavy	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
VII	Moderate	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly-built or badly designed structures; some chimneys broken.
VI	Light	Felt by all, many frightened. Some heavy furniture moved; a few instance of fallen plaster. Damage slight.
V	Very Light	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

Source: 2013 State of California Multi-Hazard Mitigation Plan

HMPC Events

Historically, major earthquakes have not been an issue for Nevada County. However, minor earthquakes have occurred in the County in the past. The HMPC has identified several earthquakes that were felt by area residents and/or caused damaging shaking in Nevada County. Details on some of these events follow.

- **1892** – The Midland Fault Zone, the source of an 1892 earthquake centered between the cities of Vacaville and Winters, though no reports of damages were known.
- **1908** – An estimated 4.0+ Richter magnitude earthquake occurred between Auburn and Folsom in nearby Placer County with an epicenter possibly associated with the Bear Mountain fault.
- **1966 –** The Boca or Truckee earthquake had a Richter magnitude of 5.4 and an MMI of VII. Twenty-one aftershocks at a magnitude of four or greater were felt in the area, with Russell Valley generally believed to be the location of the earthquake's epicenter. Although damage was extensive in the area, it was minor in scale, occurring almost entirely in unconsolidated natural fill. Relatively slight damage occurred to bridges along Highway 80 and both Prosser and Boca earthfill dams. The earthquake was also noticeably felt in western Nevada County.
- The **1975** Oroville Earthquake (5.7) and the Loma Prieta earthquake of **1989** were felt in Nevada County but resulted in no reported damage.
- **2003/2004** – Volcanic magma (molten rock) migrating about 20 miles below the surface of the Sierra Nevada mountains caused a swarm of about 1,600 small earthquakes in late 2003 and early 2004. The 20 mile depth is about twice as deep as earthquakes caused by normal faulting in the region measured during the last 30 years. Nevada County did not report any damages associated with these small earthquakes.
- **2008, 2013, 2014** – There were earthquakes in the Nevada County vicinity in these years. No significant issues were reported in the County. Ground shaking was the primary concern.

Likelihood of Future Occurrence

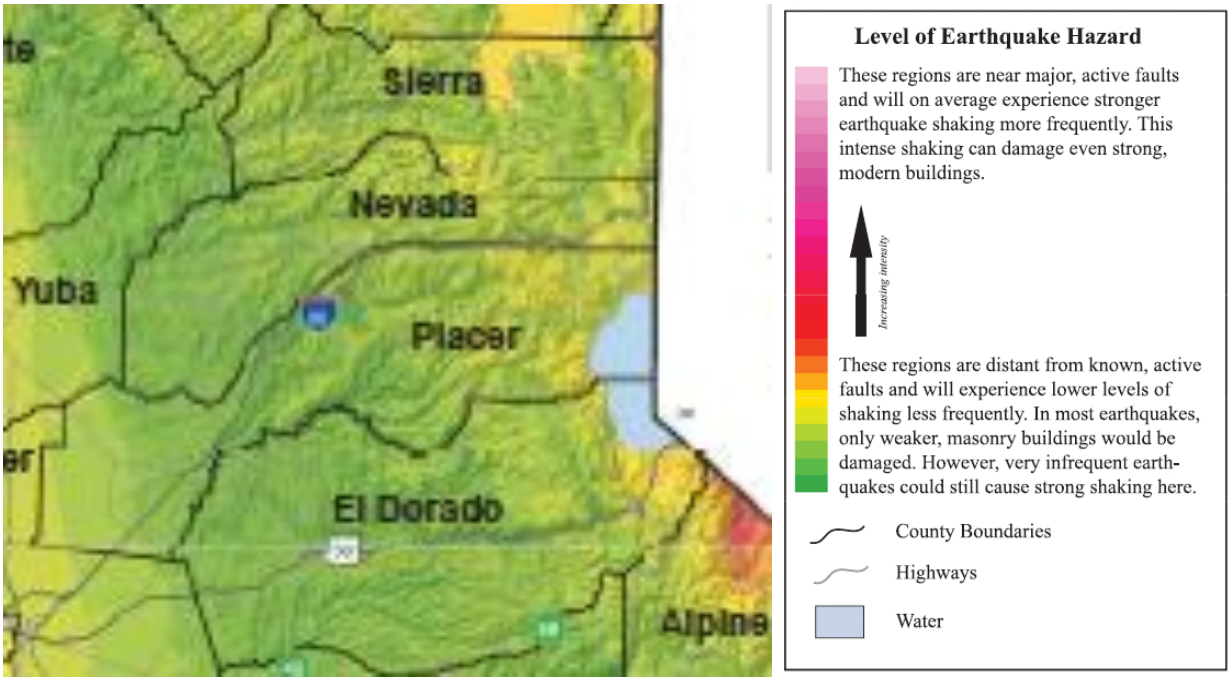
Occasional (major earthquake); Likely (minor earthquake)— The western half of Nevada County is in the lowest Earthquake Shaking Potential for California. It is likely that the region will be impacted by future seismic activity and with the exception of the far eastern edge of the County, the magnitude of the incident is not likely to be severe. Possible earthquakes in the eastern portion of the County could reach a 7.0 magnitude, according to the General Plan Environmental Impact Report. No major earthquakes have been recorded within the County; although the County has felt ground shaking from earthquakes with epicenters located elsewhere. Based on historical data and the location of the Nevada County Planning Area relative to active and potentially active faults, the Planning Area may experience a significantly damaging earthquake occasionally, while small earthquakes are considered likely.

Mapping of Future Occurrences

Maps indicating the maximum expectable intensity of ground shaking for the County are available through several sources. Figure 4-34, prepared by the California Division of Mines and Geology, shows the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground shaking with about a 2,500 year average repeat time.

Although the greatest hazard is in areas of highest intensity as shown on the map, no region is immune from potential earthquake damage.

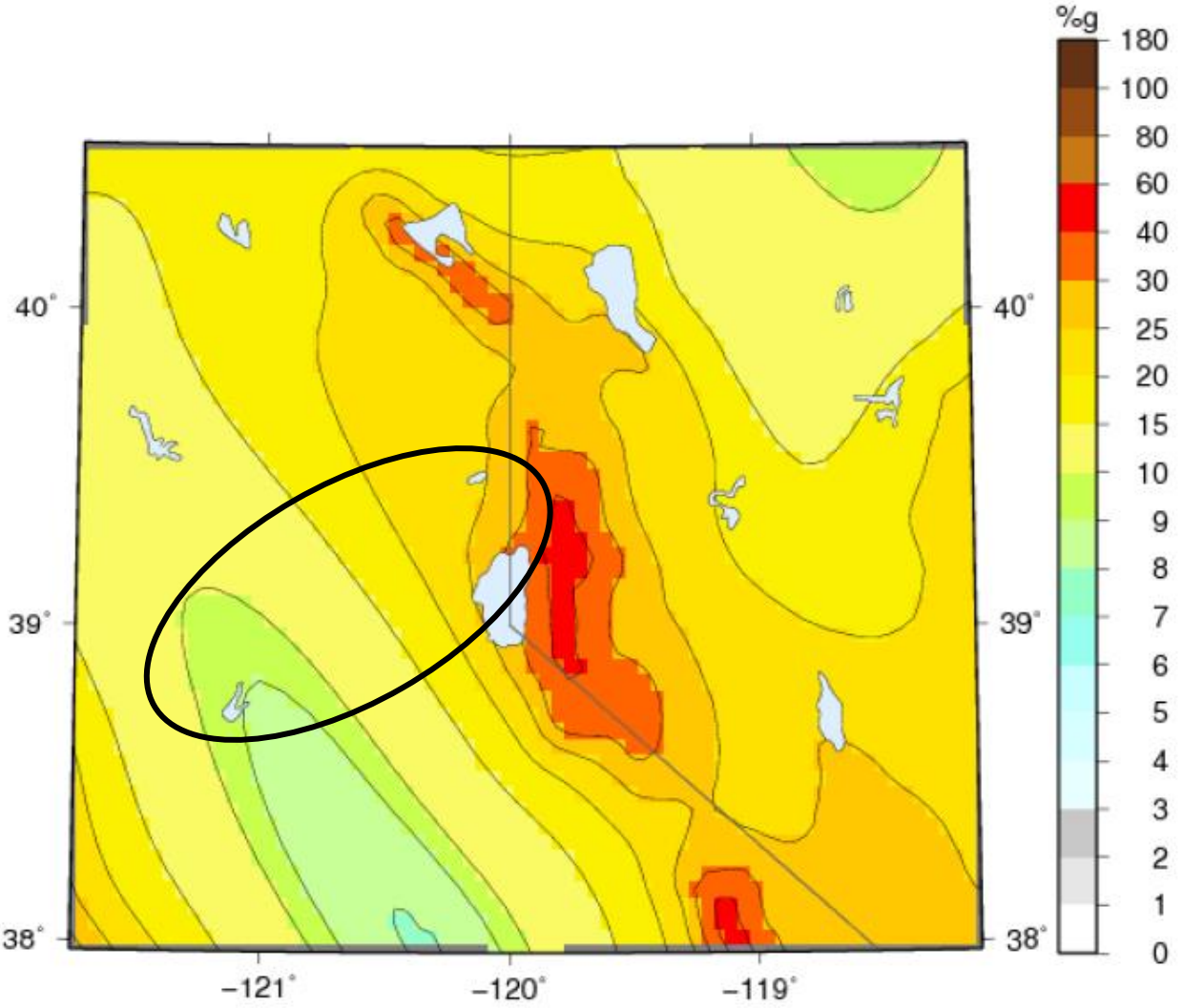
Figure 4-34 Maximum Expectable Earthquake Intensity



Source: California Division of Mines and Geology

The USGS issues National Seismic Hazard Maps as reports every few years. These maps provide various acceleration and probabilities for time periods. Figure 4-35 depicts the peak horizontal acceleration (%g) with 10% probability of exceedance in 50 years (a 500-year event) for the planning region. The figure demonstrates that the County falls in the 9%g (light green) in the west, 20%g (darker yellow) in the central, and in the 25%g area (tan) in the extreme eastern portion of the County. This data indicates that the expected severity of earthquakes in the region is somewhat limited, as damage from earthquakes typically occurs at peak accelerations of 30%g or greater.

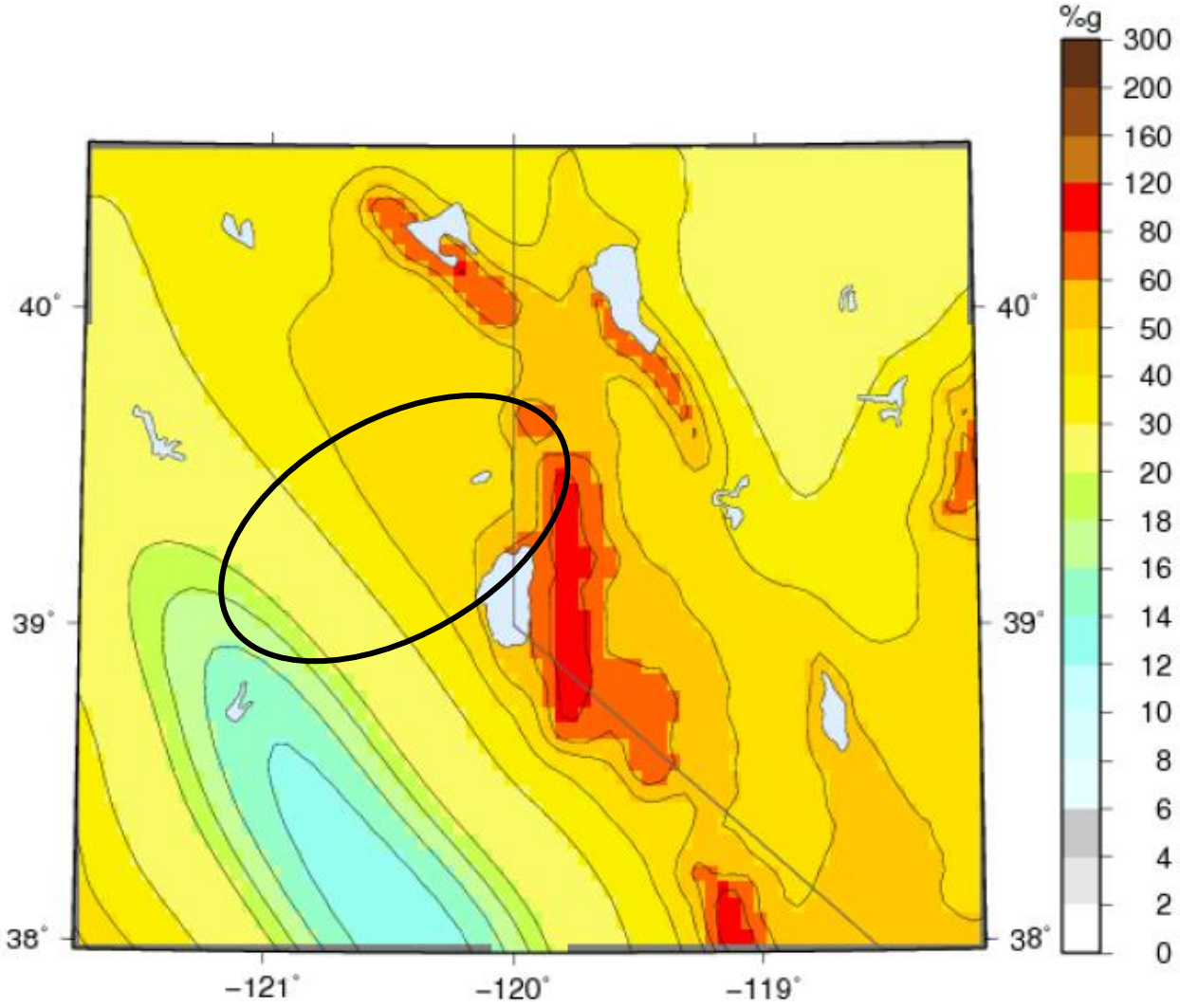
Figure 4-35 Peak Horizontal Acceleration with 10% Probability of Occurrence in 50 Years



Source: USGS National Seismic Hazard Maps

Figure 4-36 depicts the peak horizontal acceleration (%g) with 2% probability of exceedance in 50 years (a 2,500-year event) for the County. The figure demonstrates that the County falls in the 20%g (lighter yellow) in the west, 30%g (darker yellow) in the central, and in the 40%g area (tan) in the extreme eastern portion of the County. This data indicates that the expected severity of earthquakes in the region is moderate, as damage from earthquakes typically occurs at peak accelerations of 30%g or greater.

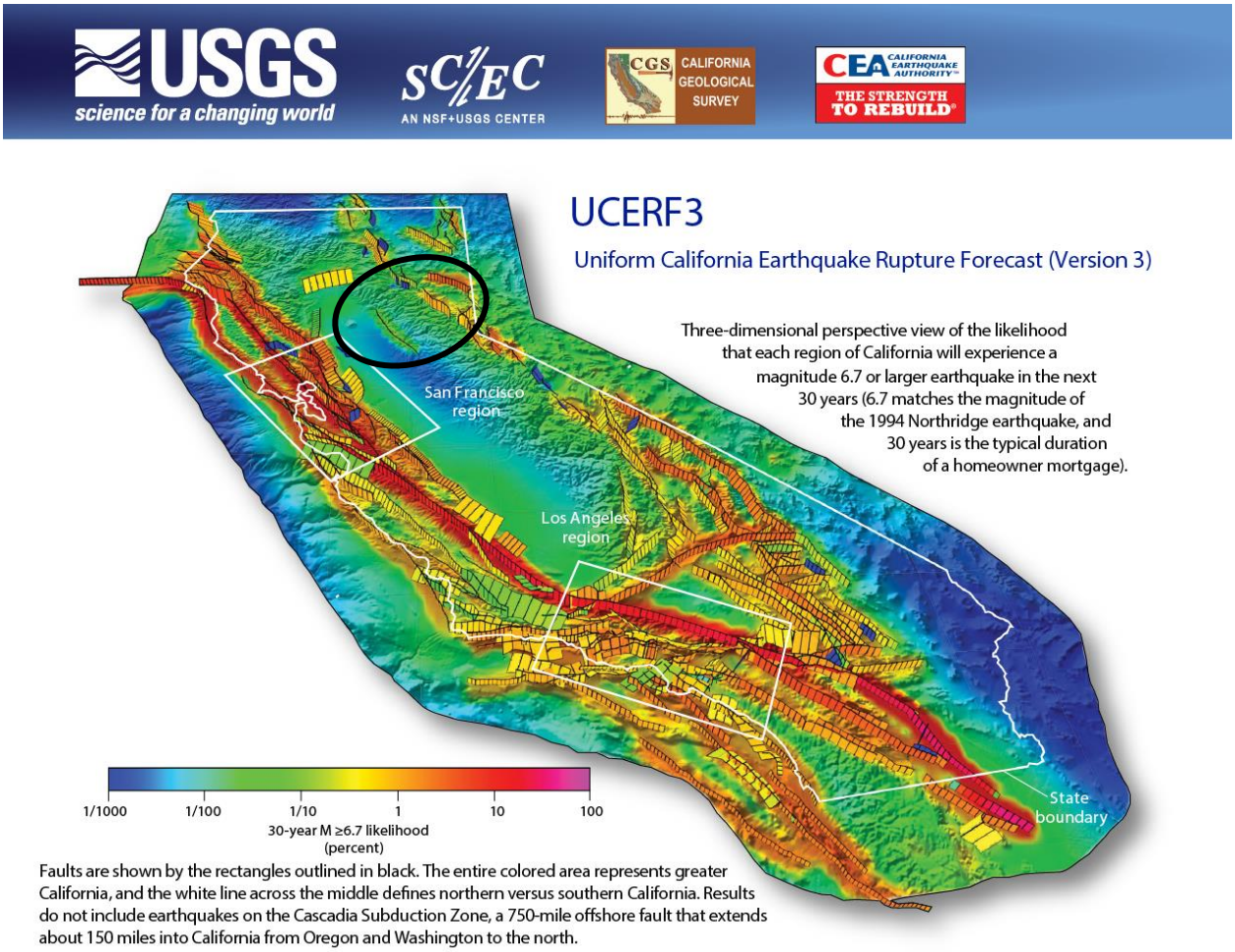
Figure 4-36 Peak Horizontal Acceleration with 2% Probability of Occurrence in 50 Years



Source: USGS National Seismic Hazard Maps

In 2014, the USGS and the California Geological Survey (CGS) released the time-dependent version of the Uniform California Earthquake Rupture Forecast (UCERF III) model. The UCERF III results have helped to reduce the uncertainty in estimated 30-year probabilities of strong ground motions in California. The UCERF map is shown in Figure 4-37 and indicates that Nevada County has a low to moderate risk of earthquake occurrence, which coincides with the likelihood of future occurrence rating of occasional.

Figure 4-37 Probability of Earthquake Magnitudes Occurring in 30 Year Time Frame



Source: United States Geological Survey Open File Report 2015-3009

Climate Change and Earthquake

Climate changes is unlikely to increase earthquake frequency or strength.

4.2.11. Flood: 1%/0.2% Annual Chance (100/500 year)

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. History clearly highlights floods as one of the most frequent natural hazards impacting Nevada County. Floods are among the most costly natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can

transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Health Hazards from Flooding

Certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where cattle and hogs are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease-causing agents.

The second type of health problem arises after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a city or county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Warning and Evacuation Procedures

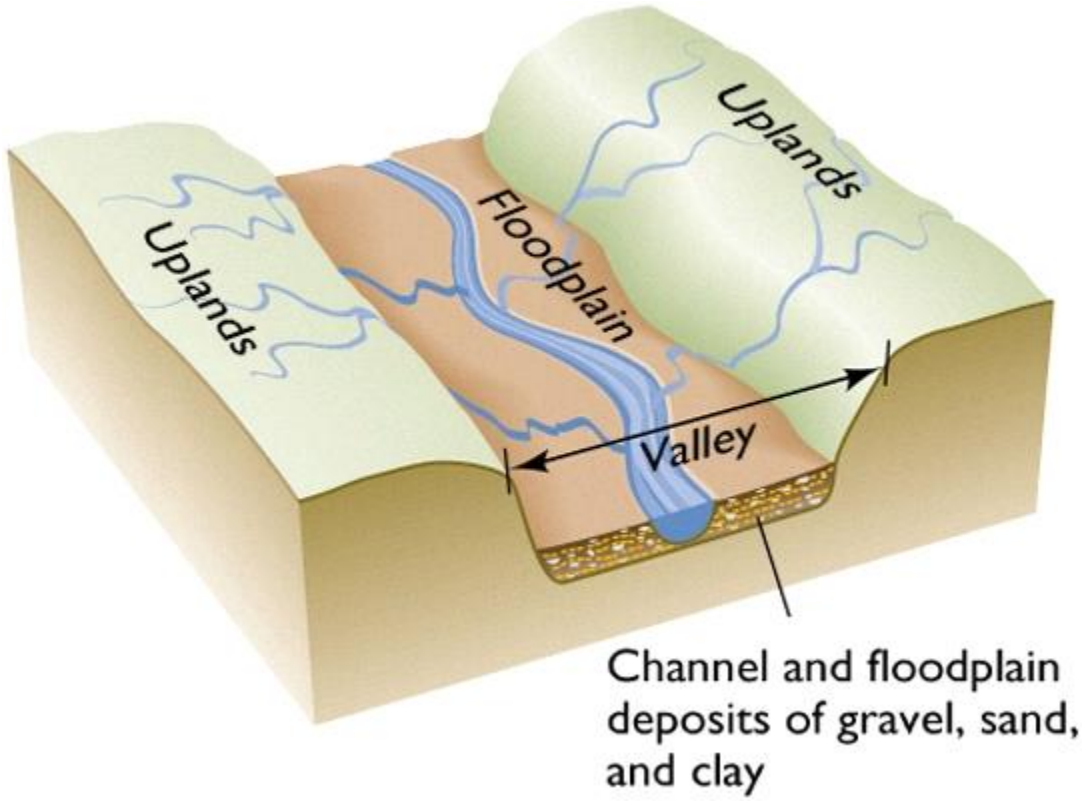
Nevada County and its incorporated communities have a variety of systems and procedures established to protect its residents and visitors to plan for, avoid, and respond to a hazard event including those associated with floods and wildfires. This includes Pre-Disaster Public Awareness and Education information which is major component in successfully reducing loss of life and property in a community when faced with a potentially catastrophic incident. Much of this information is not specific to a given hazard event and is

always accessible to the public on local County and City websites. Specific warning and evacuation systems and procedures include information relative to: CodeRed Emergency Mass Notification System which can send out telephone, email, and text alerts to registered phones. The County is updating its evacuation language to mirror evacuation language use in the FireScope FOG Manual. Additional information on these warning and evacuation procedures as well as post-disaster mitigation policies and procedures can be found in Section 4.4, Capabilities, of this Risk Assessment.

Floodplains

The area adjacent to a channel is the floodplain (see Figure 4-38). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 1% annual chance (100-year) flood, the flood that has a 1% chance in any given year of being equaled or exceeded. The 1% annual chance flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 4-38 Floodplain Schematic



Source: FEMA

The Nevada County Planning Area is susceptible to various types of flood events as described below.

- **Riverine flooding** – Riverine flooding, defined as when a watercourse exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In the Nevada County Planning Area, riverine flooding is largely caused by heavy and continued rains, often combined with snowmelt, increased outflows from upstream dams, and heavy flow from tributary streams. These intense storms can overwhelm the local waterways as well as the integrity of flood control structures. The warning time associated with slow rise floods assists in life and property protection.
- **Flash flooding** – Flash flooding describes localized floods of great volume and short duration. This type of flood usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour and thus early threat identification and warning is critical for saving lives
- **Localized/Stormwater flooding** – Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems. More on localized flooding can be found in Section 4.2.12.
- **Dam failure flooding** – Flooding from failure of one or more upstream dams is also a concern to the Nevada County Planning Area. A catastrophic dam failure could easily overwhelm local response capabilities and require mass evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result, and there could be associated health concerns as well as problems with the identification and burial of the deceased. Dam failure is further addressed in Section 4.2.7 Dam Failure.

Nevada County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Damaging floods in Nevada County occur primarily in the developed areas of the County. Flood flows generally follow defined stream channels, drainages, and watersheds. Various flood protection measures are either in place or planned to protect Nevada County from future flood events. Existing flood protection measures include a system of dams, pumping plants, channel improvements, floodway bypasses, detention and retention structures, and other improvements.

Major Sources of Flooding

California has 10 hydrologic regions. Nevada County sits in the Sacramento and North Lahontan hydrologic region.

- The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of Alpine and Amador counties are also within the region.

Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains. The Sacramento metropolitan area and surrounding communities form the major population center of the region. With the exception of Redding, cities and towns to the north, while steadily increasing in size, are more rural than urban in nature, being based in major agricultural areas.

- The North Lahonton hydrologic region covers approximately 3.91 million acres (6,110 square miles) and includes portions of Modoc, Lassen, Sierra, Nevada, Placer, El Dorado, Alpine, Mono, and Tuolumne counties. Reaching south from the Oregon border almost to Mono Lake on the east side of the Sierra, this region encompasses portions of two geomorphic provinces. The northern portion of the region is rural and sparsely populated. Cattle ranching and associated hay cropping are the predominant land uses in addition to some pasture irrigation. Less than 4 percent of the entire region is irrigated. About 75 percent of the irrigated lands are in Modoc and Lassen counties, and most of the remainder is in Alpine and Mono counties. Much of the southern portion of the region is federally owned and managed as national forest lands where tourism and recreation constitute much of the economic base.

A map of the California's hydrological regions is provided in Figure 4-39.

Figure 4-39 California Hydrologic Regions

Source: California Department of Water Resources

The Nevada County Waterway System

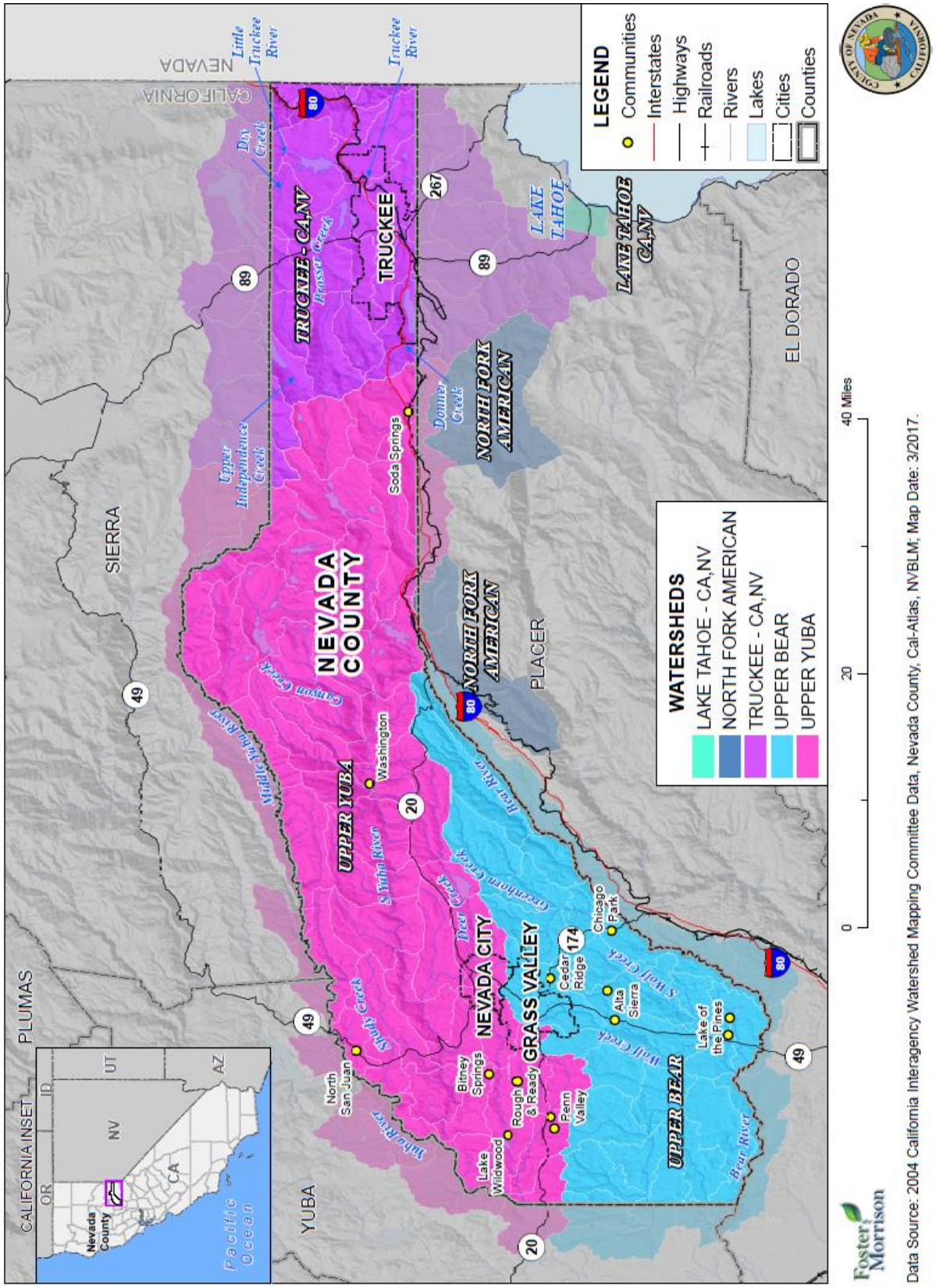
Nevada County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Damaging floods in Nevada County occur primarily in the developed areas of the county. Flood flows generally follow defined stream channels, drainages, and watersheds.

Nevada County crosses 4 watersheds. These include the following watersheds as further described in the following paragraphs:

- North Fork American Watershed
- Truckee River Watershed
- Upper Bear Watershed
- Upper Yuba Watershed

Figure 4-40 illustrates the primary watersheds of Nevada County, as well as the primary waterways in the County.

Figure 4-40 Primary Watersheds and Waterways of Nevada County



North Fork American River Watershed – According to the Sacramento River Watershed Program, the North Fork of the American River is 85 miles long and its watershed encompasses 287 square miles. It begins at an elevation of over 7,000 feet in eastern Placer County in the Tahoe National Forest, and flows westward through remote wilderness areas. The North Fork features scenic multi-use trails along forested ridge tops and riparian corridors. It flows freely as a federally eligible National Wild and Scenic Rivers System river until being impounded by a small debris dam, Clementine (North Fork Reservoir), immediately north of the Foresthill Bridge. Four miles downstream from the dam, it is joined by the Middle Fork and meanders past the site of the abandoned Auburn Dam before reaching Folsom Reservoir.

Truckee River Watershed – The Truckee River is the sole outlet of Lake Tahoe, is 140 mi long in northern California and Nevada, and drains 3,120 square miles of land. It is also filled by many creeks as part of the high Sierra Nevada as it moves through Truckee, Reno, Sparks, and out into the desert, finally emptying into Pyramid Lake.

Upper Bear River Watershed – The Bear River originates about 20 miles west of the crest of the Sierra Nevada in northern Placer County within the boundaries of the Tahoe National Forest. The Bear River is fed by the Drum Canal from Spaulding Lake (located on the South Yuba River) which enters the river at the Drum Afterbay, a few miles downstream of the headwaters. The small reach above the Drum Afterbay is termed the Upper Bear River. Flowing out of the Drum Afterbay is the Middle Bear, which enters Dutch Flat Reservoir where the waters of the Boardman Canal enter after running through Alta Powerhouse. The Bear River continues to roughly parallel I-80. Just before the Bear River flows into Rollins Reservoir, it merges with Steephollow Creek, the largest tributary in the upper watershed. The Bear River discharges from Rollins Reservoir and flows southwest into Lake Combie near the community of Meadow Vista and near an area with heavy development pressure. The Bear River turns west and is fed by Wolf Creek and then enters into Camp Far West Reservoir, the largest water body in the Bear River Watershed. The Bear joins the Feather River south of Yuba City/ Marysville. The Bear River contains a large volume of mining sediment stored in its main channel that is subject to continual erosion. The high volume of mining sediment, in combination with restricting levees, has caused the Lower Bear channel to become deeply incised.

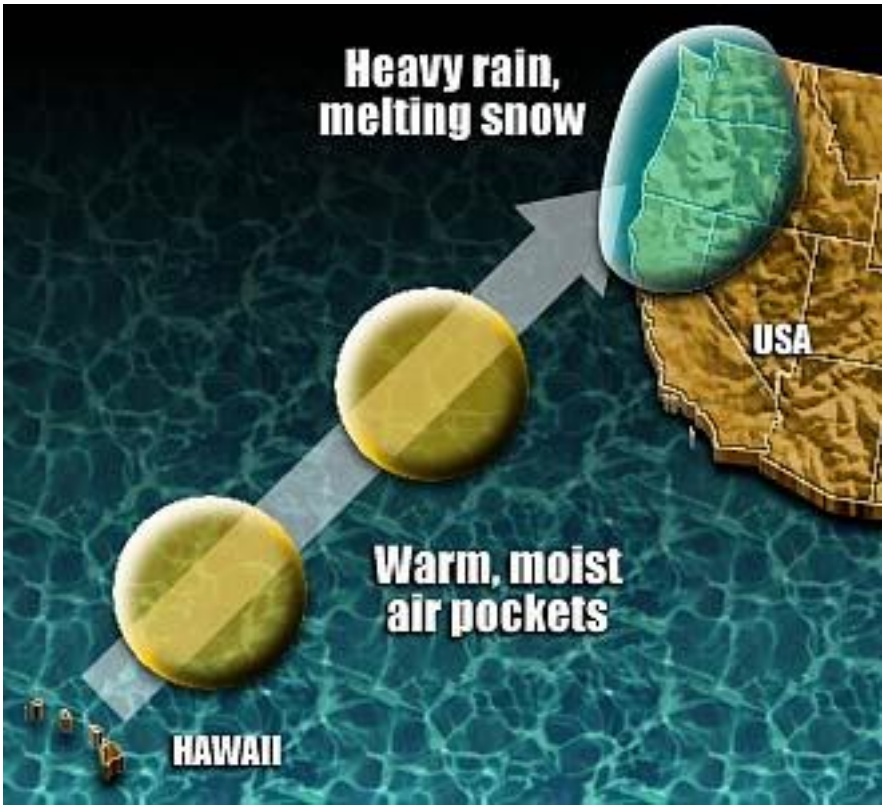
In highest rainfall years, winter flows average 3,400 to 5,600 cfs. In normal years, winter flows are 600–800 cfs. In the driest years, flows average only 20–65 cfs in winter months, down to 0 cfs in all other months. Bear River flow patterns are typical of foothill streams with high winter and spring flows and very low summer and fall flows. Bear River flows are regulated almost entirely by several storage reservoirs and numerous diversions

Upper Yuba River Watershed – The Upper Yuba River rises near the eastern border of the Tahoe National Forest, on a mountainside along California State Route 49. It flows southwest then west through a 3,000-foot-deep canyon past the small villages of Downieville, where it receives the Downie River, and Goodyears Bar. It then incorporates the flow of Canyon Creek and Slate Creek, two of its main tributaries, and very soon after widens into New Bullards Bar Reservoir, which is impounded by the 645-foot New Bullards Bar Dam. Very soon after leaving the dam it joins with the Middle Yuba to form the Yuba River

Other Sources of Flooding

A weather pattern called the "Pineapple Express", a type of atmospheric river meteorologic condition, contributes to the flooding potential of the area. A pineapple express brings warm air and rain to West. A relatively common weather pattern brings southwest winds to the Pacific Northwest or California, along with warm, moist air. The moisture sometimes produces many days of heavy rain, which can cause extensive flooding. The warm air also can melt the snow pack in the mountains, which further aggravates the flooding potential. In the colder parts of the year, the warm air can be cooled enough to produce heavy, upslope snow as it rises into the higher elevations of the Sierra Nevada or Cascades. Forecasters and others on the West Coast often refer to this warm, moist air as the "Pineapple Express" because it comes from around Hawaii where pineapples are grown. This is shown in Figure 4-41.

Figure 4-41 Pineapple Express Weather Pattern



Source: USA TODAY research by Chad Palmer http://www.usatoday.com/weatherwpinappl.htm

Nevada County Flood Mapping

As part of the County's ongoing efforts to identify and manage their flood prone areas, Nevada County relies on a variety of different mapping efforts. What follows is a brief description of FEMA and California DWR mapping efforts covering the Nevada County Planning Area.

FEMA Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. A general overview of floodplain mapping is provided in the following paragraphs. Details on the NFIP and mapping specific to the County and participating jurisdictions are in Section 4.3 Vulnerability Assessment and in the jurisdictional annexes.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The current Nevada County FIS is dated February 3, 2010. This study covers both the unincorporated and incorporated areas of the County.

Flood Insurance Rate Map (FIRM)

The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. For floodplain management, the FIRM delineates 1% and 0.2% annual chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analysis and local floodplain regulation. The County FIRMs have been replaced by digital flood insurance rate maps (DFIRMs) as part of FEMA's Map Modernization program, which is discussed further below.

Letter of Map Revision (LOMR) and Map Amendment (LOMA)

LOMRs and LOMAs represent separate floodplain studies dealing with individual properties or limited stream segments that update the FIS and FIRM data between periodic FEMA publications of the FIS and FIRM.

Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA is converting paper FIRMS to digital FIRMs, DFIRMS. These digital maps:

- Incorporate the latest updates (LOMRs and LOMAs);
- Utilize community supplied data;
- Verify the currency of the floodplains and refit them to community supplied basemaps;
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable support for GIS analyses and other digital applications; and
- Solicit community participation.

DFIRMs for Nevada County have been developed, are dated February 3, 2010, and are being used for the flood analysis for this LHMP Update.

California Department of Water Resources Best Available Maps (BAM)

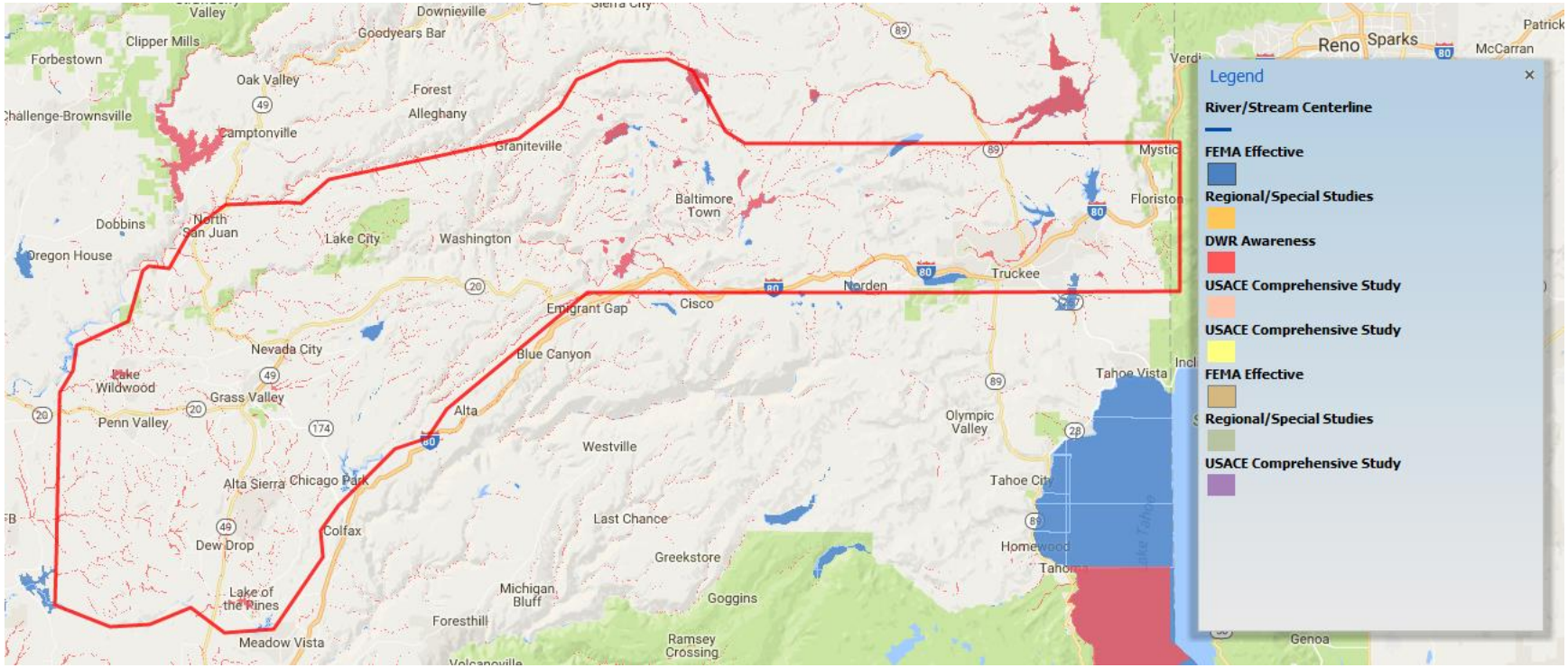
Also to be considered when evaluating the flood risks in Nevada County are various floodplain maps developed by the California Department of Water Resources (DWR) for various areas throughout California, and in the Sacramento-San Joaquin Valley cities and counties. The FEMA regulatory maps provide just one perspective on flood risks in Nevada County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 1$ annual chance flood risk, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance floodplain, it also supports identification of the need and requirement for flood insurance.

Figure 4-42 shows the BAM for the Nevada County Planning Area. BAM maps for each jurisdiction are included in their respective annexes.

Figure 4-42 Nevada County Planning Area – Flood Awareness (Best Available) Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 100-Year (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chacne flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study).

Past Occurrences

Disaster Declaration History

State disaster declarations occurred in 1950, 1955, 1958 (twice), 1963, 1982, 1986, 1990, 1995, 1997, and 2008. Federal disaster declarations occurred in 1955, 1958, 1963, 1964, 1983, 1986, 1995, 1997, twice 2006, and twice in 2017.

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Table 4-27 shows events in Nevada County since 1993. Information on specific events from this table that affected Nevada County are described below the table.

Table 4-27 NCDC Flood Events in Nevada County 1993 to 12/31/2016

Date	Event	Deaths (direct)	Injuries (direct)	Property Damage	Crop Damage	Injuries (indirect)	Deaths (indirect)
7/18/2002	Flash Flood	0	0	$0	$0	0	0
12/12/1996	Flood	0	0	$0	$0	0	0
12/31/1996	Flood	0	0	$0	$0	0	0
1/1/1997	Flood	0	1	$0	$0	0	0
1/1/1997	Flood	0	0	$0	$0	0	0
1/1/1997	Flood	0	0	$0	$0	0	0
1/1/1997	Flood	0	0	$0	$0	0	0
2/2/1998	Flood	0	0	$0	$0	0	0
2/2/1998	Flood	0	0	$0	$0	0	0
2/2/1998	Flood	0	0	$0	$0	0	0
2/3/1998	Flood	2	0	$0	$0	0	0
3/1/1998	Flood	0	0	$0	$0	0	0
1/23/2000	Flood	0	0	$0	$0	0	0
2/11/2000	Flood	0	0	$0	$0	0	0
2/11/2000	Flood	0	0	$0	$0	0	0
2/11/2000	Flood	0	0	$45,000	$0	0	0
2/11/2000	Flood	0	0	$0	$0	0	0
3/5/2000	Flood	0	0	$0	$0	0	0
1/10/2001	Flood	0	0	$0	$0	0	0
7/18/2002	Flood	0	0	$0	$0	0	0
12/31/2005	Flood	0	0	$1,000,000	$0	0	0
1/30/2016	Flood	0	0	$20,000	$0	0	0
3/13/2016	Flood	0	0	$0	$0	0	0

Date	Event	Deaths (direct)	Injuries (direct)	Property Damage	Crop Damage	Injuries (indirect)	Deaths (indirect)
Totals		**2**	**1**	**$1,065,000**	**$0**	**0**	**0**

Source: NCDC

- **January 1, 1997** – Several periods of rain (with snow to unusually low elevations in the mountains) beginning December 20, 1996, set up saturated conditions that finally gave way on the 1st as subtropical air moved in and melted snow up to the 8000-foot level. The moist airmass also left huge amounts of additional rain in the valley, foothills, and mountains with its nearly ideal orographic enhancement conditions. Some of the higher amounts from December 26 to January 3 follow: Shasta Lake inflow area: Stouts Meadow 36.39 inches; Shasta Dam 23.70; Feather River basin: Four Trees 41.32; Bucks Lake 42.16; Yuba River basin: Strawberry Vly 32.80; American River basin: Blue Canyon 29.73; Stanislaus River basin: Gianelli 18.66; Sacramento River valley: Redding 5.29; and Sacramento 3.71. At most locations, the highest rates occurred on the 1st and 2nd. A dry spell from the 3rd to the 11th allowed the flooding to subside in the Shasta-Cascades and the Sierra Nevada mountains, but flooding worsened in the valley below. As the runoff moved downstream and flood control dams operated at near maximum releases, stress on the Sacramento River and San Joaquin River levees resulted in numerous levee breaks, especially from the 4th to the 10th. The result was considerable inundation of the areas near the break. The major breaks for which separate damage figures were available are broken out below. Heavy rains returned at the end of the month, beginning on the 22nd and lasting through the 27th. These storms were colder in nature, with flooding problems mainly in the foothills and valley floor. Levees continued to break in the Sacramento-San Joaquin River delta as the floodwaters headed out to San Francisco Bay. Preliminary data indicated record peak stages were set at nine river gages in the Sacramento-San Joaquin river system. The particular rivers include the Sacramento, San Joaquin, San Joaquin Eastside Bypass, Feather, and especially the Cosumnes and Tuolumne Rivers. The variety and magnitude of the damage were huge. Besides 5 deaths (all accounted for in the entries which follow) in interior northern California, at least 120,000 total people were evacuated. The flooding damaged or destroyed 20,000 homes and 1,500 businesses, at a minimum, in the estimated 250 square miles that were inundated. The toll in dollars will be measured in the billions; early estimates put the total bill for the state at $1.6 billion, much of it in interior northern California. Infrastructure took the hardest hit, conservatively estimated at $400 million for roads and $300 million for flood control facilities. Agricultural damage estimates of $250 million is expected to increase. Hardest hit included the artichoke and winter wheat crops, and the dairy industry, losing thousands of livestock drowned. The flooding also virtually destroyed two large fish hatcheries, the Feather River fish hatchery and the San Joaquin fish hatchery. The American Red Cross labeled the flooding a level 5 disaster--their highest rating.
- **July 18, 2002** – Severe thunderstorms moving through Nevada Co., CA cause flash flooding with 3 to 4 inches of water running down the roads in Hirschdale, CA. and flooding along Trout Creek. Spotter reports of 1 inch hail also accompanied these storms.
- **December 31, 2005** – Interstate 80 was closed because of a large mudslide approximately 5 miles east of Truckee. The mudslide occurred at around 3 am on December 31st, blocking both directions on the Interstate. California Highway 89 was also closed due to a mudslide. Donner Creek caused flooding of some buildings in Truckee. This was the second largest flood of record on Donner Creek. California Highway 89 was closed across Nevada County from Truckee to the Sierra County line.
- **January 30, 2016** – Several storms fueled with moisture by an atmospheric river brought heavy rain and mountain snow, along with gusty winds. Some minor urban and small stream flooding occurred,

mainly over the northern Sacramento Valley. Snow levels were initially high, above pass levels, then dropped to as low as 3000 feet by the end of the event. Ice jamming under Soda Springs Rd. caused the road to be flooded for several hours. The Serene Lakes community was inaccessible until road crews cleared the ice jam.

- **March 13, 2016** – A series of strong winter storms moved across northern California Friday through Monday. Storms just a few days earlier had area small creeks and streams running high. Moisture from these storms resulted in numerous areas of low land flooding, small creek and stream flooding and main stem rivers getting high enough to flow over weirs, that are part of the flood control system in the Northern Valley. This made local news as it was the first time in 4 years that the Weirs flowed since CA drought began back in 2012. There were also breezy to gusty winds with this system that resulted in power outages from downed trees and power lines. Wet slushy snow over the Sierra Nevada passes resulted in numerous slowdowns and delays from slide offs and other accidents. A CHP officer was fatally injured when he was struck by a vehicle that lost control on the slick roads. Four people were rescued Sunday morning after their vehicles were swept away in Greenhorn Creek in Nevada County when they attempted to cross a flooded roadway (Lower Greenhorn Road) that crosses over Greenhorn Creek. Early Sunday morning, the Nevada County Sheriff's Office Search and Rescue team was called to the creek. Two teams were dispatched to the river where they found four people located on the left bank of the river awaiting rescue.

HMPC Events

Historically, portions of Nevada County have always been at risk to flooding because of its high annual percentage of rainfall, heavy snowfall in the winter, and the number of watercourses that traverse the County. Flooding events have caused severe damage in the very eastern and very western portions of the County, but are less of a threat within the center of the County. However, western Nevada County is more likely to experience severe flooding than in other areas, due to urbanization. Existing watershed reports confirm that under existing conditions, flooding will continue to occur. As discussed further in Section 4.2.12, localized stormwater flooding also continues to be a problem throughout the Planning Area.

The HMPC provided additional information on the following historical flood events in the County.

- In the early history (**prior to 1885**) of the County it was not uncommon for bridges and structures to be damaged or destroyed on the Yuba and its tributaries. On the morning of June 18, 1883, the English Damon the Middle Fork of the Yuba River broke and released 650 million cubic feet of water. Water stored in the reservoir behind the dam served 80 miles of ditches to hydraulic mine operations in the area. Eight or nine men were drowned.
- An event in **December of 1955**. Heavy rain occurred, with river, creeks and ravine runoff, area roads damaged, and bank erosion happening in many areas of Nevada County. Northern California mountain and foothills. The peak of the flooding was Dec. 23, 1955.
- An event occurred between **December 22 and 26, 1964.** Heavy rain and water flow occurred in the County. Stream Bank erosion occurred in many locations. The road surface of the steel bridge over the South Yuba River was destroyed; this bridge was replaced with a reinforced concrete bridge around 1971. Damage to local roads (Washington Rd., Maybert Rd.) also occurred.
- An event occurred on **Feb. 15-20, 1986**. High river and stream flows occurred after heavy rains. Damages were reported near Washington, CA. Both campgrounds in town had damage, damage to some places on Old Washington Rd. river and stream bank erosion. There was also debris and water

damage to local roads that limited access to town. A landslide also occurred due to this. More information on it may be found in Section 4.2.14.

- **12/25/96 to 01/02/97** – Very high river, stream, and ravine flows and runoff near Washington, CA. Major damage all along South Yuba River, Canyon Creek, Washington Creek, and other streams in the area. Structure damage and structure loss along South Yuba River and Washington Creek. Loss of water district dam and intake system on Canyon Creek. Major mud slides, debris, and water damage to Washington Road, with ditch erosion, culvert damage, trees down, etc. Maybert Rd major damage with wash outs, ditch, and culvert damages etc. Relief Hill and Gaston Roads had erosion, slides, and wash outs. The approach on the town side of the South Yuba River bridge was washed out. The bridge over Washington Creek on Old Washington Rd. was damaged and had to be replaced. Damage to both campgrounds in town. Structure damage and losses on Godfrey Lane on the north side of the river. A loss of fish and wildlife was reported as well.
- Nevada City has information from the **1986, 1995, and 1997** floods that provides indications of likely future flood damages. Deer Creek and Little Deer creek converge at the foot of the commercial district on Broad Street. The below grade level of a commercial building at the south- west corner of Broad Street has historically had approximately 3 feet of water intrusion during severe flood events. In 1995 and again in 2004 an underground culvert that connects Deer Creek and Little Deer Creek in a parking lot at the intersection of Sacramento Street and Broad Street has failed resulting in failure of the parking lot surface. In 1995 and 2005, Little Deer Creek overflowed its banks in Pioneer Park, a city owned park, with resulting damage to the tennis courts, baseball diamond and horse shoe pits.
- Truckee in the eastern portion of Nevada County experienced flooding along West River Street during the flood of 1997. Of more concern in terms of mitigation however, has been the recurrent flooding (**1995, 1997, and 2005**) along Gregory Creek, Trout Creek, along Donner Lake Road and South Shore Road.
- By the end of the **20th century**, the floodplains of the Yuba, Truckee and Bear were better understood and flooding was much less common. What flooding that occurs now is related to the smaller streams and creeks of the watershed where these channels are dry or nearly dry much of the year and to clogged channels of the larger creeks. Unusually heavy rainfall for several days can cause some of these smaller sources to overflow their normal channels with the effects being localized to particular parcels or areas.
- **January 8, 2017** – Heavy storms slammed Nevada County, toppling trees and power lines as rivers and creeks swelled to near dangerous levels. Authorities said that no significant flooding occurred. Almost 5 inches of rain fell in Grass Valley from Thursday afternoon to Sunday afternoon. A vast majority — 4.2 inches — fell between Saturday and Sunday afternoons, said Idamis Del Valle, a meteorologist with the National Weather Service.

Figure 4-43 January 8 Storms

January-March 2017. Flooding occurred near Washington. Maybert Road had one washed out area plus water flowing over it in several places. The washed-out area was repaired then suffered more damage during the 2nd flood event. Washington Road had a mud slide, debris and water flowing over it, ditch damage, culvert plug ups, and several areas where the road berm is slipping away and could result in landslides. Several trees down on local roads. There was some damage to screen and intake pipe of the town water system on Canyon Creek. Delayed the construction of the new bridge over Canyon Creek by 1-2 months. There was also reports of river and stream bank erosion, and some damage to the two local camp grounds. The Serene Lakes area was also affected. Soda Springs road was closed due to flooding (see Figure 4-44).

Figure 4-44 Soda Springs Road Flooding

Source: Nevada County OES

Likelihood of Future Occurrence

1% Annual Chance Flood

Occasional—The flood that has a 1- percent chance of being equaled or exceeded in any given year. Thus, the 100-year flood could occur more than once in a relatively short period of time. Given that, the likelihood of future development is unlikely

0.2% Annual Chance Flood

Unlikely—The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. Given that, the likelihood of future development is unlikely.

Climate Change and Flood

According to the CAS, climate change may affect flooding in Nevada County. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events.

4.2.12. Flood: Localized Flooding

Hazard/Problem Description

Localized, stormwater flooding also occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated ground conditions. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

In addition to flooding, damage to these areas during heavy storms can include pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff. These areas and the types of damage are presented in Table 4-28.

Table 4-28 Unincorporated Nevada County Localized Flooding Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris
Maybert Road	X		X			X
Grizzly Hill Road		X	X		X	X
Murphy's Road	X	X	X			x
Washington Road		X	X		X	
Scotts Flat Road			X			
Taylor Crossing	X		X	X		
Eagle Lakes Road	X		X	X		
Dog Valley Road	X		X			
Tyler Foote Crossing	X					X
Sherritt Lane	X		X			X
Greenhorn Road						X
Meadow Lake Road	X		X			X
Brunswick Road		X	X			

Source: Nevada County

Past Occurrences

Disaster Declarations

There are no state or federal disaster declarations for localized flooding.

NCDC Events

The past occurrences of localized flooding are included in the 1%/0.2% annual chance flood hazard profile in Section 4.2.11.

HMPC Events

The HMPC noted the following past occurrences of localized flooding:

- In **2004/2005 and in 2017** there was localized flooding in Truckee. Town-wide localized flooding occurred due to rain on snow events. Some localized impact to properties near drainages and small creeks occurred. Roads and storm sewer infrastructure had some damage due to these events. Road closures, including I-80, inhibited traffic into Town which may have affected businesses (both events). This was in addition to school closures (10 + days) that occurred in both events. CAL OES and FEMA funding received ('04/'05); CAL OES and FEMA funding applied ('17).
- **12/30/05 to 01/02/06**. Localized storm water runoff of medium magnitude occurred near the community of Washington. High water from rains affected the local river, streams, & ravines. Bank erosion on river and streams, one of the local campgrounds had frontage damage along the river. Some wash outs occurred on Maybert Road, Debris and water damage on Maybert, Washington, and Relief Hill Roads. Downed trees on several roads caused transportation problems.

Gregory Creek travels south through Negro Canyon, under Interstate 80 and into the west end of Donner Lake. After the creek crosses under Interstate 80 the banks of the creek become less defined and intermittently clogged with debris. When the creek jumps its banks, the water course fans out and multiple homes and businesses are flooded.

Trout Creek originates near the crest of the Sierra Nevada and flows southeast for approximately 5.5 miles to its confluence with the Truckee River. A 6,600' stretch of Trout Creek has been severely diverted and hardened to support logging and railroad development over the past 140 years, such that, the current alignment experiences flooding and has damaged the floodplain and riparian habitat.

During heavy rain or rain on snow events, drainage ditches along South Shore Drive become plugged with debris and cause water to overtop South Shore Drive and cause flooding to adjacent and downstream homes (24) with erosion from this runoff going directly into Donner Lake. Multiple utility lines, including high-pressure gas lines, have been exposed due to uncontrolled drainage. Drainage crosses Interstate 80 and under Donner Lake Road in under-defined drainage channels. During high water discharge events drainage exceeds the channel capacity and causes flooding to approximately 20 homes up to 18 inches in depth and then floods across Donner Pass Road.

In addition, the HMPC noted that the County has certain areas that face more localized flooding: Cascade Shores, Greenhorn, Lake of the Pines, Wildwood, Pioneer Trail, and the Tahoe Donner/Truckee areas.

Likelihood of Future Occurrence

Highly Likely—With respect to the localized, stormwater flood issues, the potential for flooding may increase as storm water is channelized due to land development. Such changes can create localized flooding

problems in and outside of natural floodplains by altering or confining natural drainage channels. Urban storm drainage systems have a finite capacity. When rainfall exceeds this capacity or systems clog, water accumulates in the street until it reaches a level of overland release. With increasing urbanization of Nevada County, combined with older infrastructure, this type of flooding will continue to occur on an annual basis during heavy rains.

Climate Change and Localized Flood

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

4.2.13. Hazardous Materials Transport

Hazard/Problem Description

According to the EPA, a hazardous material is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained.

The U.S. Occupational Safety and Health Administration's (OSHA) definition of hazardous material includes any substance or chemical which is a "health hazard" or "physical hazard," including: chemicals which are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents which act on the hematopoietic system; agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, oxidizers, pyrophorics, unstable-reactive or water-reactive; and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapors, mists or smoke which may have any of the previously mentioned characteristics.

The Environmental Protection Agency (EPA) incorporates the OSHA definition, and adds any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping or disposing into the environment. The EPA maintains a list of 366 chemicals that are considered extremely hazardous substances (EHS). This list was developed under the Superfund Amendments and Reauthorization Act. The presence of EHSs in amounts in excess of a threshold planning quantity requires that certain emergency planning activities be conducted.

A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of water, people, and property. The effects may involve a local site or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual, such as the development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Accidents involving the transportation of hazardous materials could be just as catastrophic as accidents involving stored chemicals, possibly more so, since the location of a transportation accident is not

predictable. The U.S. Department of Transportation divides hazardous materials into nine major hazard classes. A hazard class is a group of materials that share a common major hazardous property, i.e., radioactivity, flammability, etc. These hazard classes include:

- Class 1—Explosives
- Class 2—Compressed Gases
- Class 3—Flammable Liquids
- Class 4—Flammable Solids; Spontaneously Combustible Materials; Dangers When Wet Materials/Water-Reactive Substances
- Class 5—Oxidizing Substances and Organic Peroxides
- Class 6—Toxic Substances and Infectious Substances
- Class 7—Radioactive Materials
- Class 8—Corrosives
- Class 9—Miscellaneous Hazardous Materials/Products, Substances, or Organisms

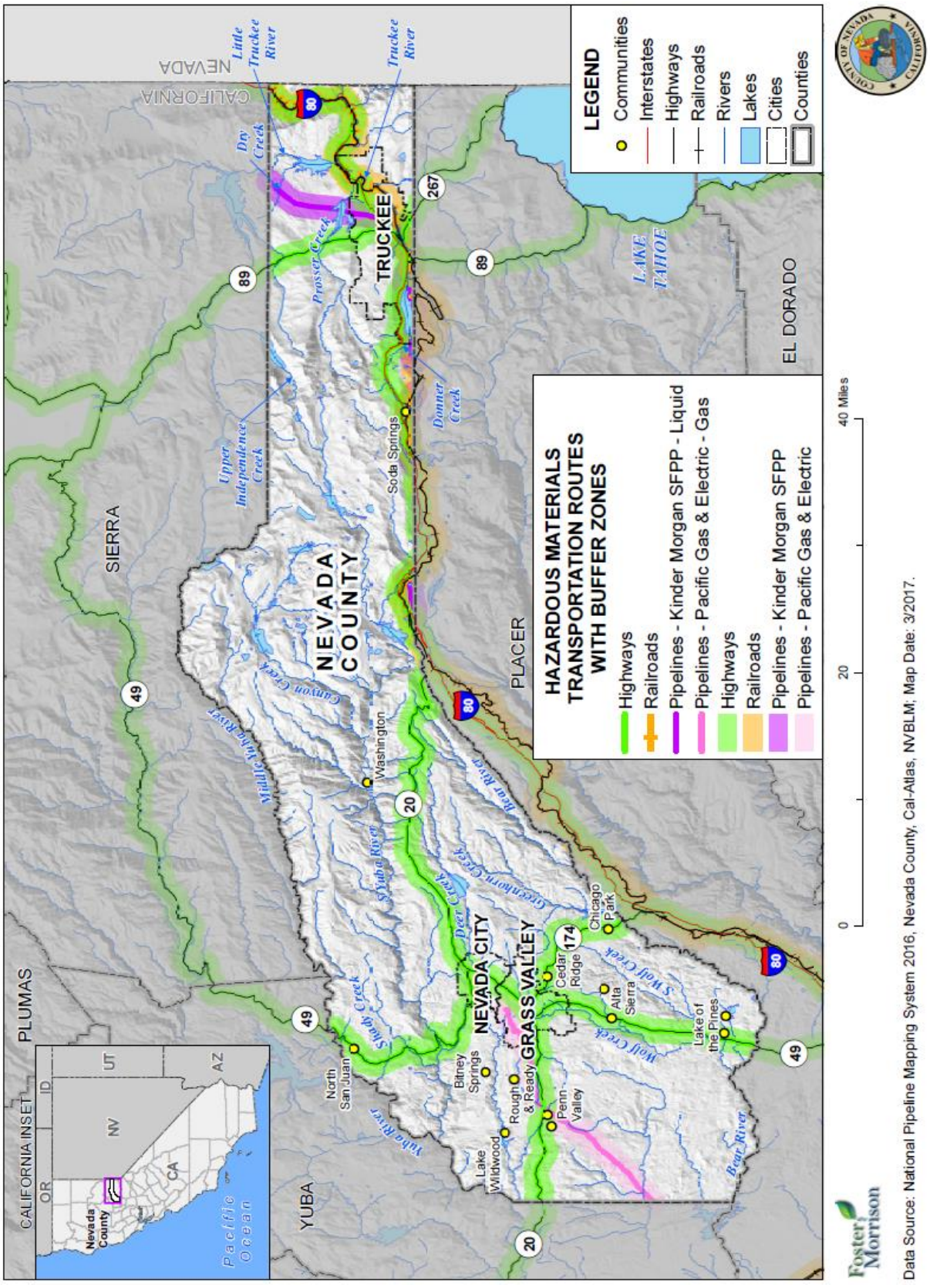
Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. Much of the hazardous materials transported through Nevada County are carried by truck on the State Highway, railway systems, and underground pipelines. Figure 4-45 shows the roadways, railroads and pipelines that are involved in the transportation of hazardous materials through the County. Interstate 80 and State Routes 49 and 20 are considered primary roadway routes and State Routes, 89, 174, and 267 are considered secondary routes for the transportation of hazardous materials. The Union Pacific railroad tracks, which roughly parallel I-80 and the Kinder Morgan petroleum pipeline are the other two areas of primary concern for a transportation-related release of hazardous materials. Crude oil is currently being transported into Nevada County through the Town of Truckee via rail. Other underground pipelines of lesser concern include those which provide natural gas to various parts of Nevada County and the underground hydrocarbon pipeline which runs adjacent to the Union Pacific railway tracks.

Specifically, the Nevada County General Plan addresses the transportation of hazardous materials as follows:

> *Interstate 80, the Union Pacific Railroad, and the Kinder Morgan petroleum pipeline are the three major transportation routes by which tons of hazardous materials are transported through the County. Interstate 80 weaves in and out of the County from the State Route 20 interchange to the Nevada state line. It is within this corridor that the incident of an accidental release of hazardous material is most likely to occur. Traffic volumes, the winding character of the Interstate, and snow and ice make this corridor especially dangerous during the winter months. In addition to the character of the interstate, the remoteness of the County from outside help creates even a greater potential for a major incident. Assistance from areas outside the County would be unavailable for a period of one to four hours in the event of a hazardous materials spill.*

Some of the hazardous materials transported through the County may bypass identified hazardous materials routes. Chemicals supporting local industries, such as agriculture operations and agriculture support operations, may transport hazardous materials to and from the facilities and fields on other area roads. that are not shown on Figure 4-45. In addition, while most routes are known, the County has not quantified the amount of hazardous materials that are transported through it en route to adjoining counties or states.

Figure 4-45 Hazardous Materials Routes in Nevada County



The HMPC also noted that Nevada County has a transfer station in Grass Valley. The waste is hauled via trailer up Hwy 20 to Lockwood, Nevada. During peak season, approximately 60 trailers per week are hauled. Each trailer holds approximately 20 tons of either municipal solid waste or construction/demolition waste. Alternate transport would be Hwy 20 west, to Ostrom Road Landfill in Yuba County. In the past 20 years, the HMPC recalled that there has been one trailer fire while en route on Hwy 20, east. So, they could present a rolling fire source. There have been occasional fires in the trailers while still at the transfer station.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations for hazardous materials in Nevada County.

NCDC Events

The NCDC does not track hazardous materials events.

PHMSA Events

The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety performs a range of functions to support the safe transport of hazardous material. One of these functions is the tracking of hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in Nevada County. A summary of rail and highway incidents since 1970 in the Nevada County Planning Area are shown in Table 4-29. 27 separate events were contained in the database. Incidents where damages or spill amounts were large are discussed after the table.

Table 4-29 Nevada County Hazardous Materials Incidents by Jurisdiction and Date

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
10/12/1973	Truckee	N/A	Highway	N/A	Gasoline	0 Gallons	$0
1/1/1976	Truckee	N/A	Highway	N/A	Gasoline	260 Gallons	$0
11/28/1978	Truckee	N/A	Highway	N/A	Gasoline	2,730 Gallons	$0
7/21/1980	Truckee	N/A	Rail	N/A	Phosphoric Acid Solution	1 Gallons	$0
5/21/1986	Truckee	N/A	Rail	N/A	Benzoyl Chloride	0.12 Gallons	$0
4/15/1987	Truckee	N/A	Highway	N/A	Toluene	1 Gallon	$0
9/30/1990	Grass Valley	720 S Auburn St	Highway	Unloading	Fuel Oil	30 Gallons	$695

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
1/4/1991	Nevada City	Bittney Spring Rd Off Rough Rd	Highway	In Transit	Nitric Acid (Over 40%)	0.0625 Gallons	$1,200
1/29/1992	Grass Valley	12025 Charles Drive	Highway	In Transit	Compounds - Cleaning Liquids	0.25 Gallons	$175
2/13/1992	Grass Valley	12025 Charles Drive	Highway	Unloading	Potassium Hydroxide Solution	1.5 Gallons	$201
2/26/1992	Grass Valley	12025 Charles Drive	Highway	Unloading	Ammonia Solution	0.015625 Gallons	$52
7/1/1992	Truckee	I-80 Eastbound	Highway	In Transit	Nitrogen – Refrigerated	6,000 Gallons	$1,800
12/1/1992	Alta Sierra	Hwy 49	Highway	In Transit	Gasoline	3,000 Gallons	$520,000
6/19/1997	Donner	I-80 West of Reno	Highway	In Transit	Corrosive Liquids N.O.S.	0	$0
7/15/1998	Truckee	Westbound I-80	Highway	In Transit	Xylenes	5 Gallons	$100
5/6/2000	Nevada City	364 Lower Grass Valley Rd	Highway	Loading	Petroleum Gases Liquefied	800 Gallons	$400
5/24/2001	Truckee	East of Yuba Gap I-80	Highway	In Transit	Hypochlorite Solutions W	1 Gallon	$1,864
6/19/2003	Truckee	12800 I-80	Highway	In Transit	Hydrochloric Acid	1 Gallon	$10,245
3/29/2005	Truckee	Truckee Agricultural Station	Highway	In Transit	Heptanes	350 Gallons	$1,000
12/18/2006	Grass Valley	15421 Gary Way	Highway	Unloading	Liquefied Petroleum Gas	0.26736 cubic feet	$0
10/3/2007	Grass Valley	12025 Charles Road	Highway	Unloading	N/A	0.25 lbs	$0
3/11/2008	Grass Valley	12025 Charles Road	Highway	Unloading	Flammable Liquids N.O.S.	0.5 Gallons	$0
12/6/2012	Grass Valley	13045 Grass Valley Ave.	Highway	Unloading	Liquefied Petroleum Gas	1 Gallons	$0
1/14/2013	Grass Valley	12025 Charles Road	Highway	Unloading	Carbon Dioxide	0	$0
11/12/2014	Truckee	I-80 Milepost 183	Highway	In Transit	Flammable Liquids N.O.S.	10 Gallons	$5,000

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
6/17/2015	Grass Valley	109 Spring Hill Drive	Air	Unloading	Fire Extinguishers Container	2.204623 lbs	$0
9/29/2015	Grass Valley	12025 Charles Road	Highway	Unloading	Flammable Liquids N.O.S.	0.03125 Gallons	$0
Totals							**$542,732**

Source: PHMSA Database – Search dates 01/01/1970 – 03/01/2017

July 1, 1992 – Truck driver was eastbound on I-80, 7 miles east of Truckee, and allowed unit to wander off highway. While in the process of bringing unit back on highway unit rolled on its right side. The rear head weld hit on the edge of the shoulder and pulled rear outer head back. This broke the vacuum immediately and caused a complete loss of vacuum. The inner tank did not rupture but due to pressure, product was lost through the vent system. Emergency response personnel decided to vent the entire load to the atmosphere. The nitrogen mixed back to the atmosphere causing no environmental damage. This was a single vehicle rollover accident.

December 1, 1992 – Driver was north bound on Hwy 49 at Little Valley Rd. Driver swerved to avoid hitting an animal. Driver pulled the truck to the right dropping left causing the truck to rollover to the right. Spill was caused when the truck tank hit a black top curb causing the tank to puncture. 3,000 gallons spilled.

June 19, 2003 – A spill occurred from a load consisting of 10 totes of hydrochloric acid. According to the hazmat team during transit the combination of loose caps, temperature, and latitudinal changes caused off gassing of acid vapors. The vapors condensed on the cold metal surfaces (roof and walls) and then ran and dripped back onto the totes and trailer floor. The truck was stopped at the Truckee scales where material was noted on the outside of the trailer. H2o environmental was called in to test the material which had a ph of 1-2. They then completed a clean-up and decontamination. The hydrochloric acid was neutralized and disposed of as industrial non-hazardous waste.

March 29, 2005 – Driver was en route From Sacramento to Reno. While in Truckee, driver was removing chains from unit. While removing chains, driver noticed fumes and leakage from back of trailer. CHP was immediately notified. Other emergency agencies were also notified and I-80 was shut down. FedEx sent representatives from Reno to incident. Highway was closed for 8 hours while cleanup was taking place. Package was determined to be leaking from valve on the bottom of container. Valve was in the open position releasing fluid material. Cargo was transloaded to another trailer after leak was stopped.

HMPC Events

The HMPC noted the following events:

- In April of 2005, a 300-gallon spill from a Kinder Morgan pipeline affected Summit Creek and the Donner Lake Watershed. Kinder Morgan was subject to a court settlement for restoration efforts around Donner Lake.

- In May of 2010, a tanker truck on Interstate 80 spilled 2,500 to 3,000 gallons of diesel. This occurred close to Memorial Day. Fortunately, cleanup efforts occurred and no closures around Donner Lake occurred. Impacts to creek, lake, and aquatic species were reported. I-80 was closed for about 6 hours.
- In the fall of 2013. An underground gas leak caused by old pipes resulted in the evacuation of Nevada Union High School. School was cancelled while the leak was fixed. No deaths or injuries were reported, and no damages were reported.

Likelihood of Future Occurrence

Highly Likely – Given that 27 hazardous materials incidents have happened in transport through the County in the past 47 years (and many small releases go unreported to national databases), it is highly likely a hazardous materials incident will occur in Nevada County every 1.7 years. However, according to Caltrans, most incidences are related to releases during loading and unloading of cargo, and during transport of fluids from the transporting vehicles themselves and not the cargo. Thus, the likelihood of a significant hazardous materials release within the County may be more limited and is difficult to predict.

Climate Change and Hazardous Materials

Climate change is unlikely to affect hazardous materials transportation incidents.

4.2.14. Landslides and Debris Flows

Hazard/Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas.

Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

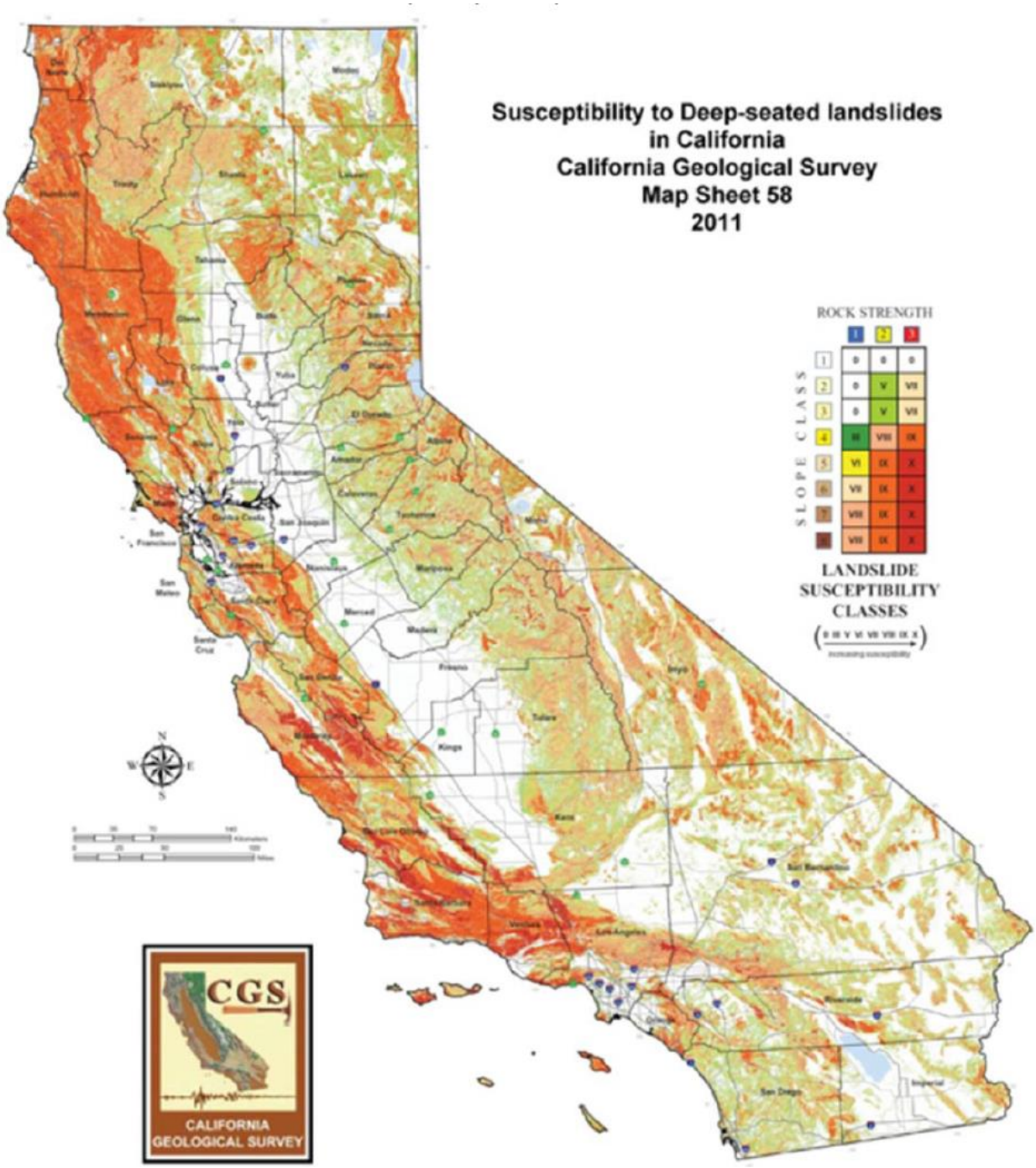
The General Plan Safety Element noted that although slope movements can occur in any type of rock material, certain bedrock formations exhibit a high susceptibility to such movement. This type of rock/soils is generally found in the central portion of the County. However, most of the County's soils are underlain with dense bedrock formations and lack the characteristics contributing to landslide susceptibility.

Triggers such as an earthquake, heavy rainfall and human activities can set a landslide in motion. Mining is a human activity that can greatly increase the potential of a landslide. Nevada County contains many

historic hydraulic mining sites, one of which, located northeast of Nevada City, is an area of over 20,000 acres. Because of the extreme methods used in hydraulic mining to "wash away" hillsides in the mid to late nineteenth century, these areas are extremely prone to slope failure resulting in landslides.

Figure 4-46 was developed for the 2013 State of California Multi-Hazard Mitigation Plan. It indicates that most areas throughout Nevada County are at low to moderate risk for landslides and an area in the central and eastern portions of the County is at high risk for landslides.

Figure 4-46 Landslide Risk Zones



Source: 2013 State of California Multi-Hazard Mitigation Plan

The HMPC identified the following areas at risk to landslides from topography:

- I-80, east of Hershdale to county line
- Highway 49, 4 miles north of Nevada City to county line
- Area south of Grass Valley to Combie Road

- Areas along Washington Road
- Cascade Shores Area

The HMPC noted that past hydraulic mining areas subject to large amounts of precipitation (as in 1997, 2004, 2005, and 2017) create the potential for landslide activity. According to the United States Soil Conservation Service, any area adjacent to a hydraulically mined area is subject to landslide activity. The mining removes the toe of the slope resulting in slope instability uphill or upstream. Triggering devices such as an earthquake or heavy rainfall would set a slide in motion. Many hydraulic mining sites are located within Nevada County. Located east of Nevada City is an area of over 20,000 acres containing the majority of these sites. Some of the largest mining sites in Nevada County are listed below:

- Malakoff Diggins, North Bloomfield area;
- Montezuma Hill, Nevada City;
- Empire Mines, Grass Valley
- Chalk Bluff, You Bet/Red Dog area;
- North San Juan; and
- French Corral.

Reactivation of Inactive Slides

Nevada County's General Plan Environmental Impact Report noted that after movement, most landslides attain a degree of stability, but a landslide reacts with remarkable sensitivity to changes brought on by nature and human-related activities. Equilibrium can be upset by increasing the driving force (i.e. overloading the head of the slide) or by decreasing the resisting force (i.e. removing support from in front of the slide, in the area called the toe). This is apparent every winter to road maintenance crews who remove the toe of a fresh slide from the highway only to leave the slide in a poised and precarious state for the next triggering rain. The same is true where new roads are constructed across the toe of an old inactive slide; or where grading on a residential tract is completed with satisfactory precautions, only to have grading during utility, sidewalk, house or yard construction remove toe support from a creep or slide area.

Triggering devices such as water, ground shaking, and grading activities are not the basic causes that create the unstable condition and determine the dimension of the slide. Rather, it is the effect of these triggering devices on the basic environmental conditions; the relationship of rock type and geologic structure to, most importantly, slope height and slope angle.

The HMPC noted there are landslide problem areas in the County: Pleasant Valley: Brittney Springs Looney Flats; Hwy 49 -north of Nevada City; Hwy 49 to Middle Fork/Sierra County Line; Cascade Shores, Washington Rd; and Hwy 174 Bear River Canyon.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated with landslides in Nevada County.

NCDC Events

The NCDC contains one record for landslide. Due to the regional nature of the NCDC reporting, this event did not occur in Nevada County, but in El Dorado County. No damages or effects were noted for Nevada County.

HMPC Events

In **1982**, Nevada County experienced 100 inches of precipitation and in the following year, received 90 inches. The Soil Conservation Service also noted that every landslide that occurred during those periods was adjacent to a hydraulic mine site. Mapping of these areas was unavailable for analysis.

Around **02/18/1986,** due to heavy rains in Feb. 1986, about ¾ mile south west of town at what is known as Brandy Flats a major landslide occurred. It was estimated that 1,000,000 Cubic Yards and 10,000,000 Board/feet of timber slid off the mountain. There was damage to the old Fairview Mine road at the foot of the slide. The picture below shows the slide area today.

In the heavy rain season of the winter of **2004-2005**, Cascade Shores, a community northeast of Nevada City, was the site of a landslide. A hillside above the community's sewer treatment plant, owned by Nevada County Sanitation District #1, slid to within a couple of feet of the treatment plant facilities rendering the

plant unusable for a period of one week. Directly destroyed was an above ground sewer collection main. 178,000 gallons of partially treated sewage were released into Gas Canyon Creek which is a minor tributary of the Bear River and Rollins Lake. The landslide site was approximately 400 feet long and 300 feet high. The total hillside runs for about a mile but does not endanger any other facilities. The mitigation measures installed after this event consisted of a debris wall and wire screen contour on the face of the slide material.

The Spring (March and April) of **2006** saw limited landslides and damage to roadways (Allison Ranch Road, Pleasant Valley Road and I-80/SR49) caused by ground saturation from unusually heavy and prolonged rainfall. Ground slippage has also occurred in the Cascade Shores area.

In the **spring of 201**7, multiple landslide events occurred in Nevada County. Nevada County Public Works tracked issues by street. Issues from January and February are shown in Table 4-30 and Table 4-31.

Table 4-30 Unincorporated Nevada County – January 2017 Damages

Route	Damage	Route	Damage
Maybert Road	$75,000	Green Horn Access	$5,000
Brunswick Road slide	$15,000	Green Horn Rd	$5,000
Brunswick Road - sink hole	$85,000	Lime Kiln Road	$10,000
Pleasant Valley Road	$15,000	Allison Ranch Road	$15,000
Murphys	$10,000	Rock Creek Rd-washout	$25,000
Washington Rd- culvert	$10,000	Banner Lava Cap	$15,000
Washington Rd - slide	$10,000	Cooper Road	$20,000
Tyler Foot Crossing	$15,000	Scotts Valley - pavement	$7,500
Donner Pass Rd	$200,000	Scotts Valley -slides	$7,500
Hobart Mills Road	$75,000	N. Bloomfield bridge deposits	$20,000
Purdon Road	$15,000	Valley Dr. bridge deposits	$20,000
Scotts Flat Rd washout	$25,000	Augustine	$25,000
Taylor Crossing	$10,000	WetHill Road	$22,000
Old Downieville Hwy	$10,000	Various Roads*	$150,000
Pasqualie Rd	$20,000	Various Roads*	$150,000

Source: Nevada County Public Works

Table 4-31 Unincorporated Nevada County – February 2017 Damages

Location	Description of Damage and Scope of Work	Cost Estimate
Coyote Street	various cut bank failures debris into road way and road shoulder	$10,000.00
Washington Road edge slip	fill slope on Washington road failing	$75,000.00
Mooney Flat Road	Road cut bank slip into road, and road surface damage	$10,000.00
Maybert Road	Gravel Road surface damaged by Yuba River, after just rebuilding it	$10,000.00

Location	Description of Damage and Scope of Work	Cost Estimate
Mountain View Dr	Road cut bank slip into roadway and road surface damage	$5,000.00
Willow Valley Rd	cut bank slip into road and damage to road	$12,000.00
Washington road -settlement	Road surface settlement - cracking	$10,000.00
Red Dog at Buckeye	Pavement Failure - road heave	$20,000.00
Jackson Meadows Road	Road slide west of Dam	$20,000.00

Source: Nevada County Public Works

Likelihood of Future Occurrence

Likely—Based on data provided by the HMPC, minor landslides have occurred in the past, probably over the last several hundred years, as evidenced both by past deposits exposed in erosion gullies and recent landslide events. With significant rainfall, additional failures are likely to occur within landslide hazard areas. Given the nature of rock/soils and sloped areas located throughout the County, landslides will likely continue to impact the area when heavy precipitation occurs, as they have in the past.

Climate Change and Landslide and Debris Flows

According to the CAS, climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.2.4. 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 and landslides.

4.2.15. Levee Failure

Hazard/Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower steam channel, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the stream bank, raising the level of the land around the stream. To construct a man-made levee, workers place dirt or concrete along the stream banks, creating an embankment. This embankment is flat at the top, and slopes at an angle down to the water. For added strength, sandbags are sometimes placed over dirt embankments.

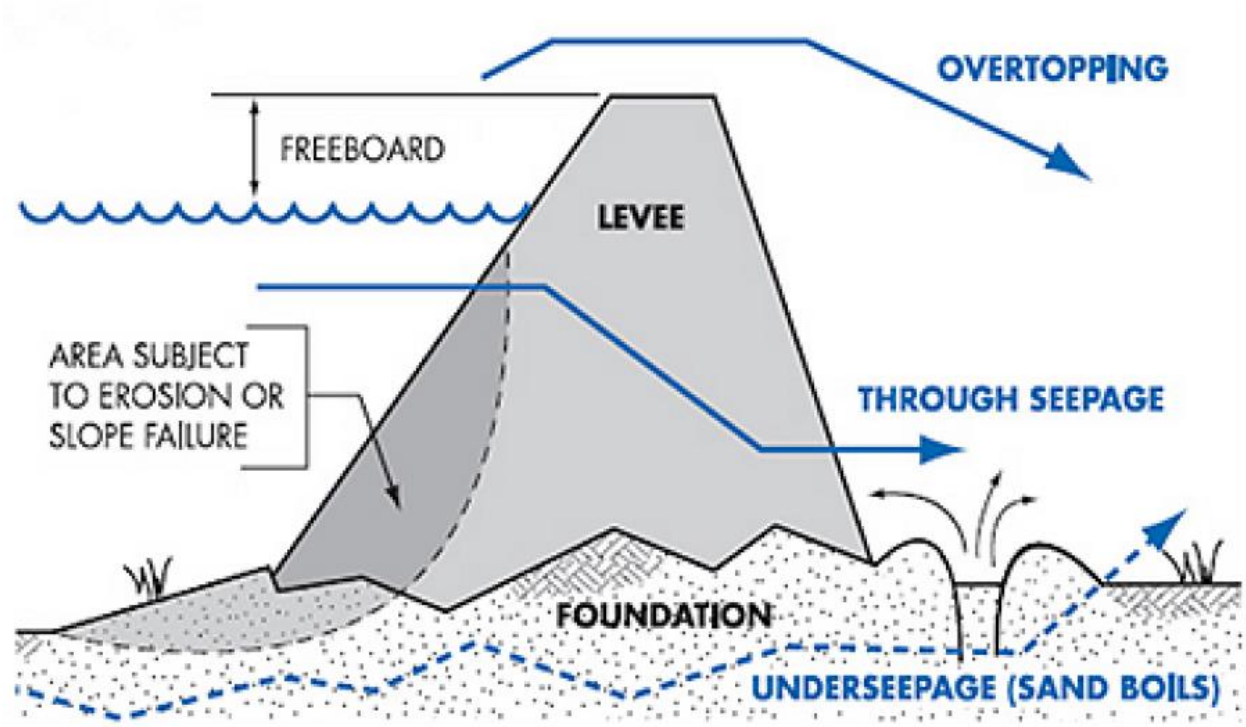
Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. Levees reduce, not eliminate, the risk to individuals and structures located behind them.

A levee system failure or overtopping can create severe flooding and high water velocities. It's important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

Under-seepage refers to water flowing under the levee through the levee foundation materials, often emanating from the bottom of the landside slope and ground surface and extending landward from the landside toe of the levee. Through-seepage refers to water flowing through the levee prism directly, often emanating from the landside slope of the levee. Both conditions can lead to failure by several mechanisms, including excessive water pressures causing foundation heave and slope instabilities, slow progressing internal erosion, and piping leading to levee slumping.

Rodents burrowing into and compromising the levee system is a significant issue in the Planning Area. Erosion can also lead to levee failure. Figure 4-47 depicts the causes of levee failure.

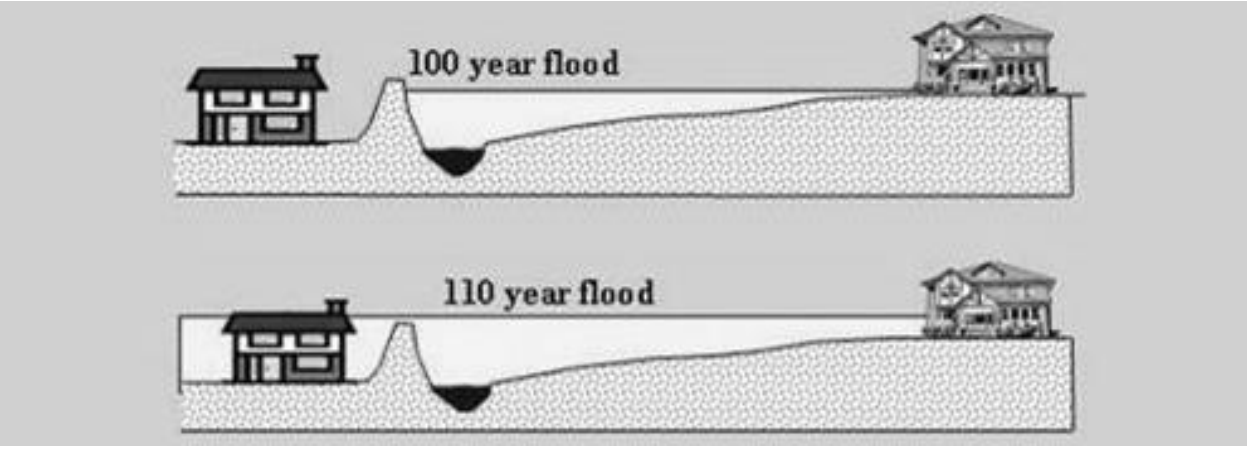
Figure 4-47 Potential Causes of Levee Failure



Source: USACE

Overtopping failure occurs when the flood water level rises above the crest of a levee. As shown in Figure 4-48, overtopping of levees can cause greater damage than a traditional flood due to the often lower topography behind the levee.

Figure 4-48 Flooding from Levee Overtopping



Source: Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.

Nevada County Levees

The 2010 FIS noted that it was determined that no levees exist within Nevada County. A search of the National Levee Database, Cal DWR Levee Flood Protection Zone maps, and Cal DWR BAM found no levees in the County. The HMPC confirmed that there are no levees within the Nevada County Planning Area.

Past Occurrences

With no levees present in Nevada County, there have been no past occurrences of levee failure.

Likelihood of Future Occurrence

Unlikely – Due to the lack of levees in Nevada County, future levee failures are unlikely.

Climate Change and Levee Failure

In general, increased flood frequency in California is a predicted consequence of climate change. Mechanisms whereby climate change leads to an elevated flood risk include more extreme precipitation events and shifts in the seasonal timing of river flows. This threat may be particularly significant because recent estimates indicate the additional force exerted upon the levees is equivalent to the square of the water level rise. These extremes are most likely to occur during storm events, leading to more severe damage from waves and floods. However, due to the lack of levees in the County, climate change will not affect levee failure in Nevada County.

4.2.16. Subsidence

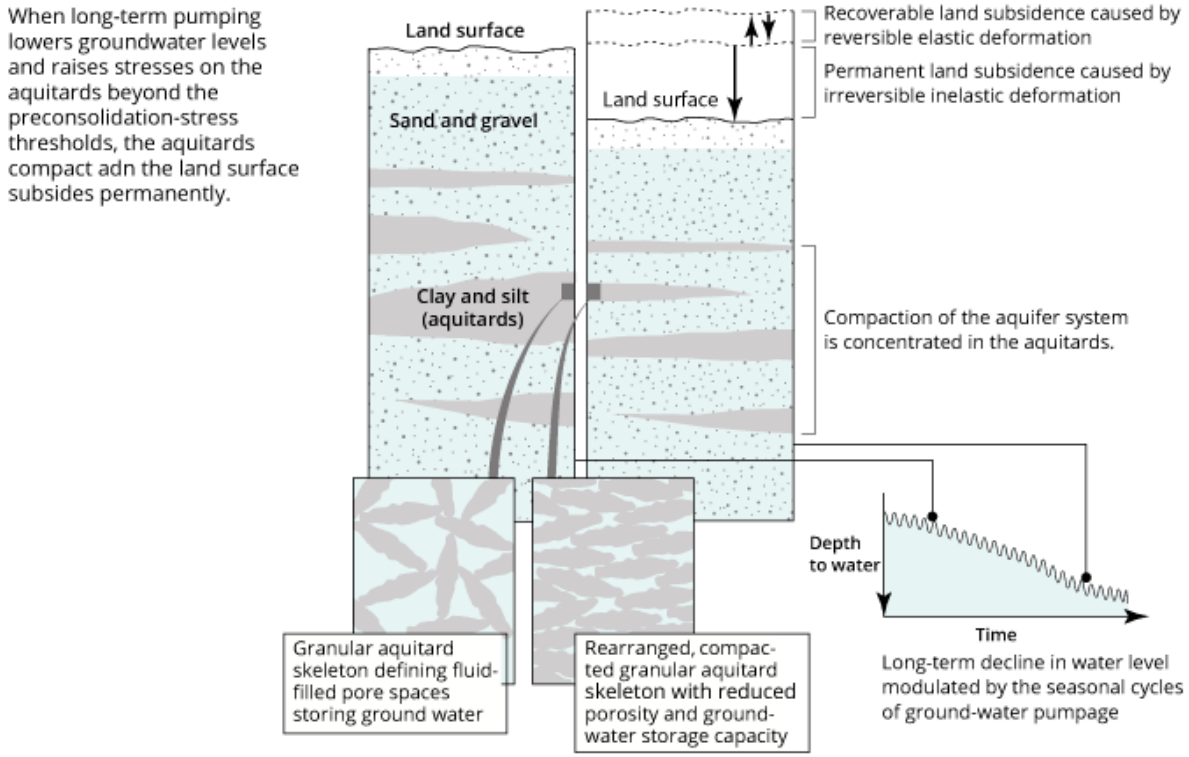
Hazard/Problem Description

Land subsidence is defined as the sinking of the land over man-made or natural underground voids. Subsidence can result in serious structural damage to buildings, roads, irrigation ditches, underground utilities, and pipelines. It can disrupt and alter the flow of surface or underground water. Weight, including surface developments such as roads, reservoirs, and buildings and manmade vibrations from such activities as blasting or heavy truck or train traffic can accelerate the natural processes of subsidence. Fluctuations in the level of underground water caused by pumping or by injecting fluids into the earth can initiate sinking to fill the empty space previously occupied by water or soluble minerals. The consequences of improper use of land subject to ground subsidence can be excessive economic losses, including the high costs of repair and maintenance for buildings, irrigation works, highways, utilities, and other structures. This results in direct economic losses to citizens as well as indirect economic losses through increased taxes and decreased property values. Nevada County is susceptible to subsidence from a variety of causes, such as evidenced by the massive sinkhole that occurred during heavy winter rains in 2017. The main causes are water drawdown, mining related subsidence, and karst.

Water Drawdown

Although land subsidence caused by groundwater pumping has caused many negative effects on human civil works for centuries, the relation between subsidence and groundwater pumpage was not understood or recognized for a long time. Fine-grained sediments (clays and silts) within an aquifer system are the main culprits in land subsidence due to groundwater pumping. When fine-grained sediments are originally deposited, they tend to be deposited in random orientations. These randomly oriented sediment grains have a lot of room between them to store water. However, when groundwater levels decline to historically low levels, those randomly oriented sediments are rearranged into stacks. These stacks occupy less space and also have less space between them to store water. This is shown on Figure 4-49.

Figure 4-49 Subsidence from Water Drawdown



Source: USGS

Mining-related Subsidence

Given the extensive mining history in Nevada County, subsidence due to past mining operations (i.e., the settling of ground over abandoned mine workings) is a primary concern in the Planning Area. Past mining activities have created surface subsidence in some areas and have created the potential for subsidence in other areas. Nevada County is home to many abandoned mines.

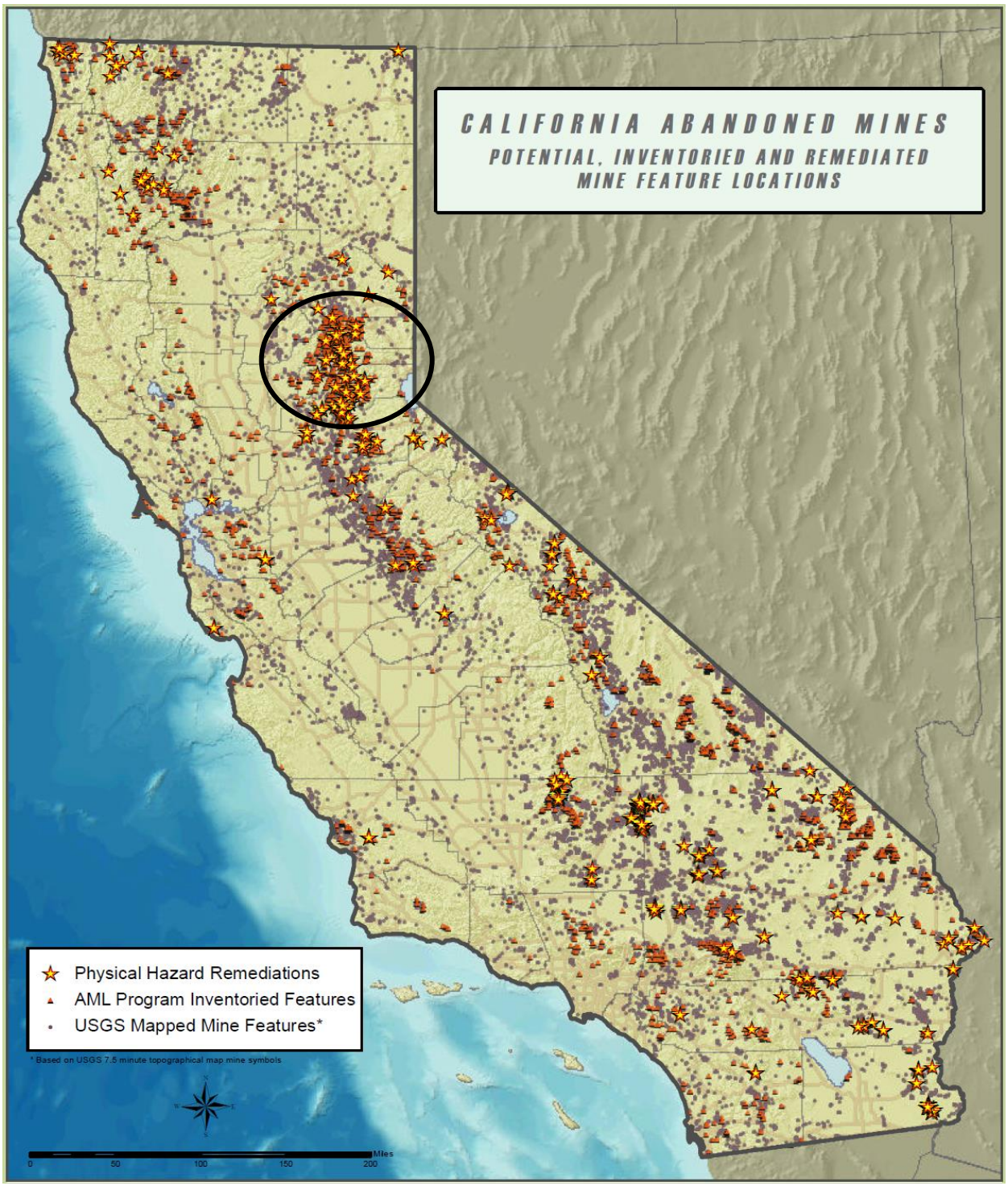
A substantial portion of the Grass Valley and Nevada City area is underlain by a deep, extensive labyrinth of abandoned mine tunnels. The Empire Mine tunnels alone extend some 365 miles beneath the City of Grass Valley. Dozens of mining claims were worked in the Grass Valley and Nevada City area during the heyday of gold mining. Some were large, mechanized operations. Most were small and more labor-intensive.

Hard-rock mining, as historically practiced in western Nevada County, was also characterized by 1) one or more angular shafts from surface to underground tunnels for transporting miners, equipment, and ore and 2) vertical air shafts from tunnels up to the surface, whose functions were to admit fresh air to the otherwise depleted atmosphere below. Tailings piles (ore storage) and tailings ponds (used in ore processing) were also typical surface features of deep mines.

Mines and mining, always dangerous while in operation, posed new dangers when abandoned. Airshafts were left exposed or covered by a few boards. They are typically holes of 4 to 10 feet in diameter on the surface, extending hundreds of feet down to the mine tunnels below. Access shafts were often covered hurriedly by closing off the mine mouth (entrance) with logs, then backfilling with rock and earth. In time, the forgotten but reclaimed site sprouted vegetation, hiding a large hole lurking perhaps as little as 8 to 10 feet below the surface.

Figure 4-50 shows abandoned mines in and around Nevada County. More specific information for the County can be seen in Section 4.3.14.

Figure 4-50 Abandoned Mines in Nevada County

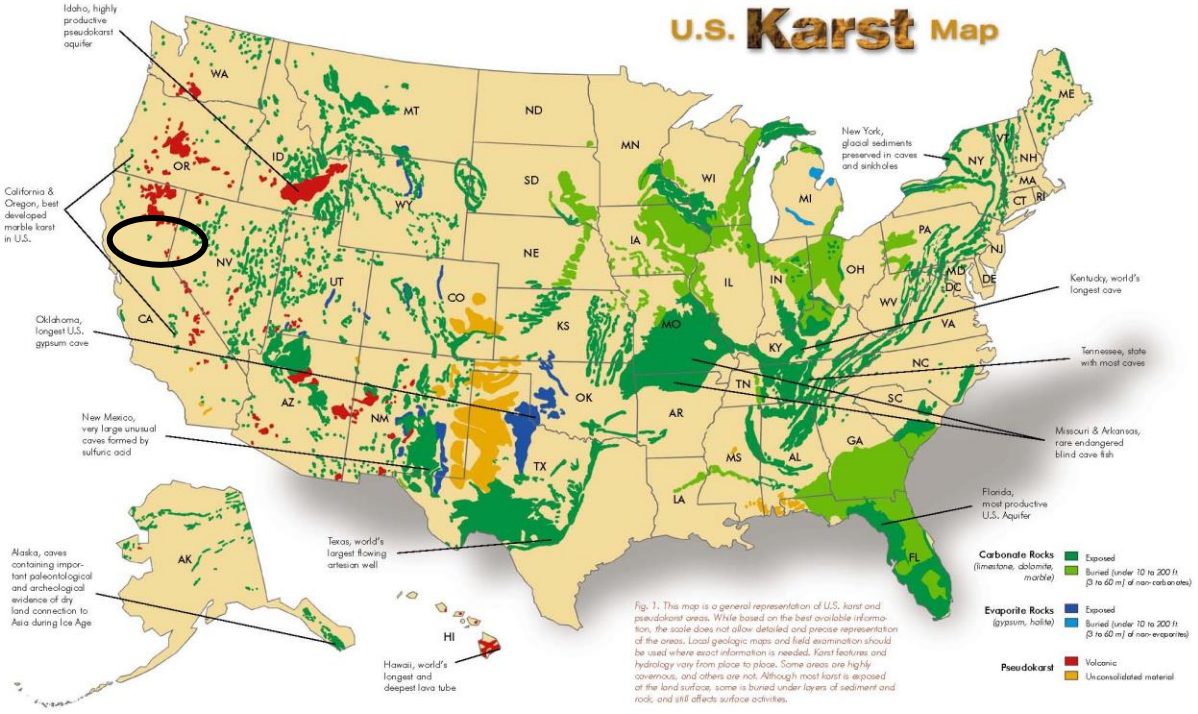


Source: California Department of Conservation, Office of Mine Reclamation

Karst-related Subsidence

In addition to mines, the Planning Area is at risk to subsidence from karst. Distinctive surficial and subterranean features developed by solution of carbonate and other rocks and characterized by closed depressions, sinking streams, and cavern openings are commonly referred to as karst. Originally the term defined surface features derived by solution of carbonate rocks, but subsequent use has broadened the definition to include sulfates, halides, and other soluble rocks. The term has been expanded also to cover interrelated forms derived by solution on the surface in the subsurface. Most of the problems created by karst pertain to subterranean karst and pseudokarst features that affect foundations, tunnels, reservoir tightness, and diversion of surface drainage. A map of karst in the United States and the Planning Area is provided in Figure 4-51. Areas in the eastern portion of the County show a risk to karst.

Figure 4-51 US Karst Map



Source: USGS

Subsidence Surveys in Nevada County

Land subsidence in Nevada County has not been quantified as no subsidence extensometers (which help detect subsidence) are present in Nevada County. However, the California Department of Conservation GIS data there are 366 Toms symbols in Nevada County. From field surveys, each symbol represents approximately 3.5 mining features. Therefore, 1281 mining features of some kind are located in the County. However, these features may or may not be significant. The HMPC also noted that in the Motherlode many

of the historic mine records were never mapped. In sum, there are a minimum of 366 potential mine sites in Nevada County.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations related to subsidence in Nevada County.

NCDC Events

The NCDC database shows no past occurrences of subsidence.

HMPC Events

In **1986,** there was a subsidence ground collapse on County owned property immediately adjacent to Wet Hill Road. This collapse was due to an air vent that had been capped over in prior decades but which had eroded away due to wet soil conditions. This hole was filled with more than 60 yards of rock and soil and has not been the source of further issues.

The collapse of the Old Brunswick shaft of the Idaho-Maryland Mine Complex near Grass Valley during the **1998** storm season dramatized the danger to persons and property presented by abandoned mines. In that May 1998 incident, the sudden subsidence of land above along-hidden mine entrance claimed property and undercut the foundation of a new home near Grass Valley.

The HMPC noted an event that occurred in **January of 2017**. A storm in January caused a sinkhole to open in Grass Valley. Grass Valley Public Works Director Tim Kiser stated the ground opened up next to the parking lot of Liberty Motors, just off of Freeman Lane. The large sinkhole, described as being seven stories deep and 80 feet in diameter when it first formed, occurred when a 7.5 foot-diameter underground culvert for Little Wolf Creek failed along the 600 block of Freeman Lane. Pictures from this event are shown in Figure 4-52.

Figure 4-52 January 2017 Sinkhole

Source: Nevada County OES

Likelihood of Future Occurrence

Likely—Soil subsidence (or sinkholes) due to mining activity has historically been seen as an outcome of the extensive mining activity that was the mainstay of the early economy of western Nevada County. Given the number of mines in the County, there does exist the possibility of future subsidence. Subsidence due to water drawdown and karst are likely as well.

Climate Change and Subsidence

Climate change is unlikely to change the effects of subsidence from abandoned mines and karst in the County. However, data is showing that the groundwater table is lowering causing subsidence in California which can be caused by the changes in precipitation and periods of drought.

4.2.17. Volcano

Hazard/Problem Description

The California State Hazard Mitigation Plan identifies volcanoes as one of the hazards that can adversely impact the State. However, there have been few losses in California from volcanic eruptions. Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Long Valley Caldera and Lassen Peak are the closest to Nevada County. The Long Valley area is considered to be an active volcanic region of California and includes features such as the Mono-Inyo Craters, Long Valley Caldera, and numerous active and potential faults. The Lassen Peak volcano is considered to be active, with its last eruption in 1915. Lassen Peak is the largest of a group of more than 30 volcanic domes erupted over the past 300,000 years in Lassen Volcanic National Park. Figure 4-53 shows volcanoes in or near California and the location of the Lassen Peak and the Long Valley area relative to the Nevada County Planning Area.

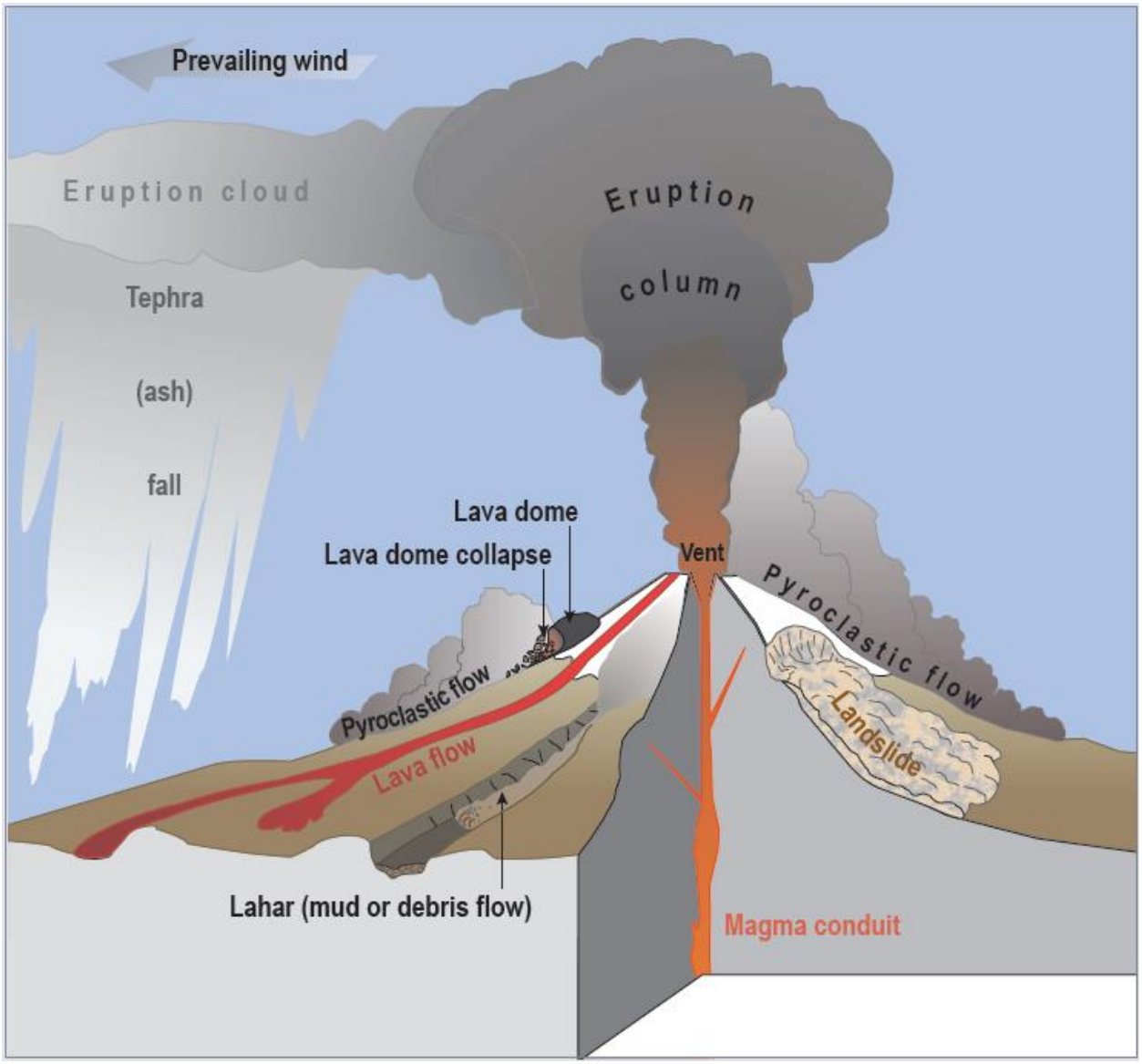
Figure 4-53 Active Volcanoes in California and in the Nevada County Area

Source: 2013 State of California Hazard Mitigation Plan

As shown in Figure 4-54, active volcanoes pose a variety of natural hazards. Explosive eruptions blast lava fragments and gas into the air with tremendous force. The finest particles (ash) billow upward, forming an eruption column that can attain stratospheric heights in minutes. Simultaneously, searing volcanic gas laden with ash and coarse chunks of lava may sweep down the flanks of the volcano as a pyroclastic flow. Ash in the eruption cloud, carried by the prevailing winds, is an aviation hazard and may remain suspended for

hundreds of miles before settling to the ground as ash fall. During less energetic effusive eruptions, hot, fluid lava may issue from the volcano as lava flows that can cover many miles in a single day. Alternatively, a sluggish plug of cooler, partially solidified lava may push up at the vent during an effusive eruption, creating a lava dome. A growing lava dome may become so steep that it collapses, violently releasing pyroclastic flows potentially as hazardous as those produced during explosive eruptions.

Figure 4-54 Volcanoes and Associated Hazards

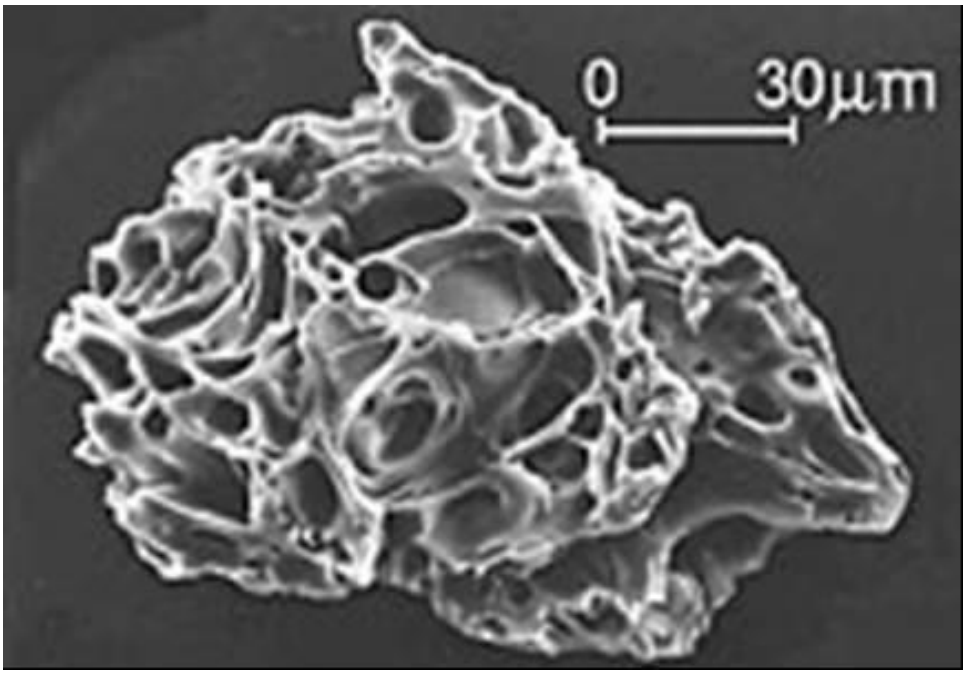


Source: USGS Publication 2014-3120

During and after an explosive or effusive eruption, loose volcanic debris on the flanks of the volcano can be mobilized by heavy rainfall or melting snow and ice, forming powerful floods of mud and rock (lahars) resembling rivers of wet concrete. These can rush down valleys and stream channels as one of the most destructive types of volcano hazards.

Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away and cause problems for aviation. The USGS notes specific characteristics of volcanic ash. Volcanic ash is composed of small jagged pieces of rocks, minerals, and volcanic glass the size of sand and silt, as shown in Figure 4-55. Very small ash particles can be less than 0.001 millimeters across. Volcanic ash is not the product of combustion, like the soft fluffy material created by burning wood, leaves, or paper. Volcanic ash is hard, does not dissolve in water, is extremely abrasive and mildly corrosive, and conducts electricity when wet.

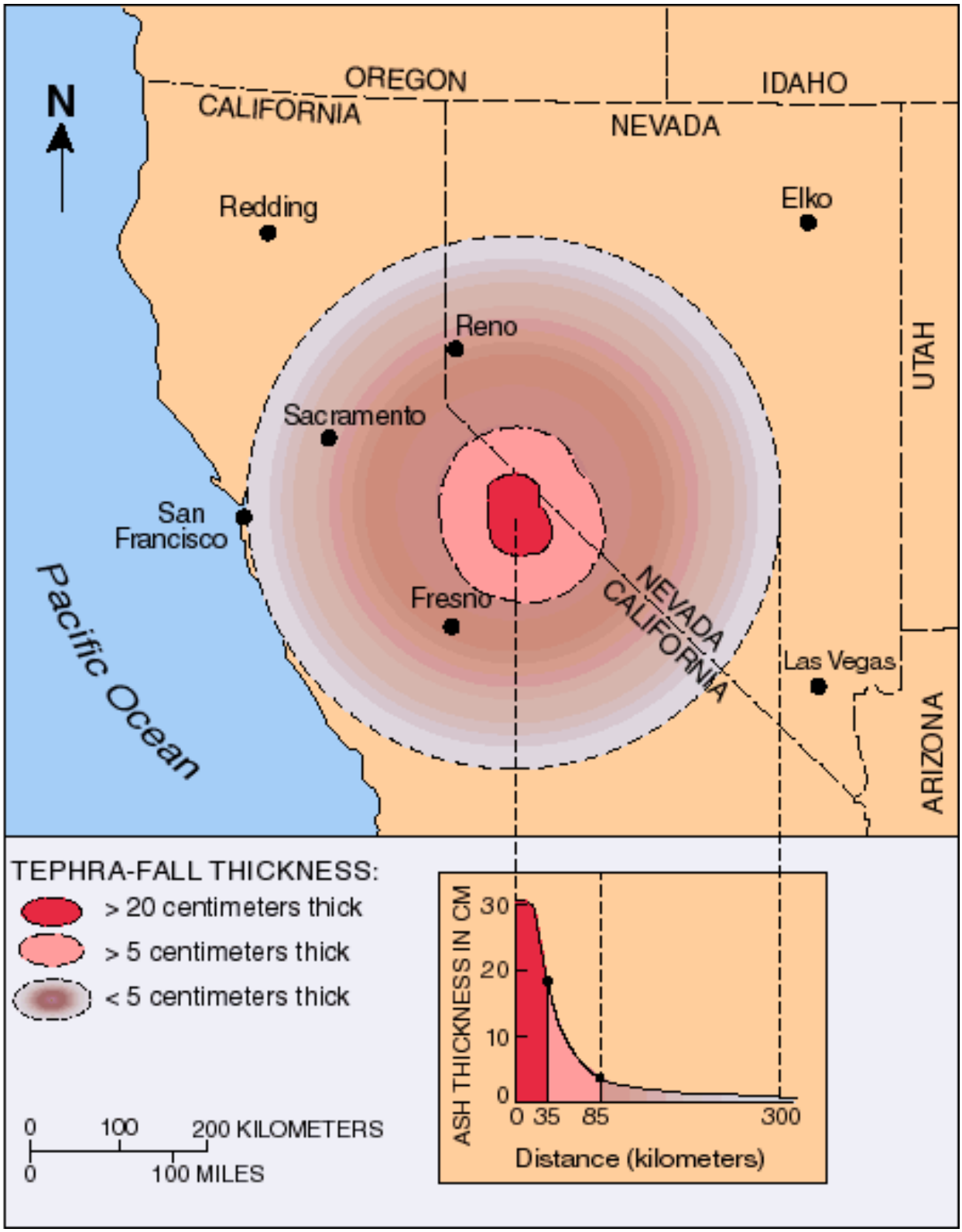
Figure 4-55 Ash Particle from 1980 Mt. St Helens Eruption Magnified 200 Times



Source: US Geological Survey: Volcanic Ash: Effect & Mitigation Strategies. http://volcanoes.usgs.gov/ash/properties.html.

Volcanic ash is formed during explosive volcanic eruptions. Explosive eruptions occur when gases dissolved in molten rock (magma) expand and escape violently into the air, and also when water is heated by magma and abruptly flashes into steam. The force of the escaping gas violently shatters solid rocks. Expanding gas also shreds magma and blasts it into the air, where it solidifies into fragments of volcanic rock and glass. Once in the air, wind can blow the tiny ash particles tens to thousands of miles away from the volcano. Figure 4-56 is a volcanic hazard's ash dispersion map for the Long Valley Caldera, which could possibly affect Nevada County.

Figure 4-56 Volcanic Hazards Ash Dispersion Map for the Long Valley Caldera



Source: US Geological Survey

The average grain-size of rock fragments and volcanic ash erupted from an exploding volcanic vent varies greatly among different eruptions and during a single explosive eruption that lasts hours to days. Heavier, large-sized rock fragments typically fall back to the ground on or close to the volcano and progressively smaller and lighter fragments are blown farther from the volcano by wind. Volcanic ash, the smallest particles (2 mm in diameter or smaller), can travel hundreds to thousands of kilometers downwind from a volcano depending on wind speed, volume of ash erupted, and height of the eruption column.

The size of ash particles that fall to the ground generally decreases exponentially with increasing distance from a volcano. Also, the range in grain size of volcanic ash typically diminishes downwind from a volcano (becoming progressively smaller). At specific locations, however, the distribution of ash particle sizes can vary widely. Based on Figure 4-56, the USGS estimated that ash of up to 2" could fall in areas of Nevada County.

Past Occurrences

Disaster Declarations

There have been no disaster declarations related to volcano.

NCDC Events

The NCDC does not track volcanic activity.

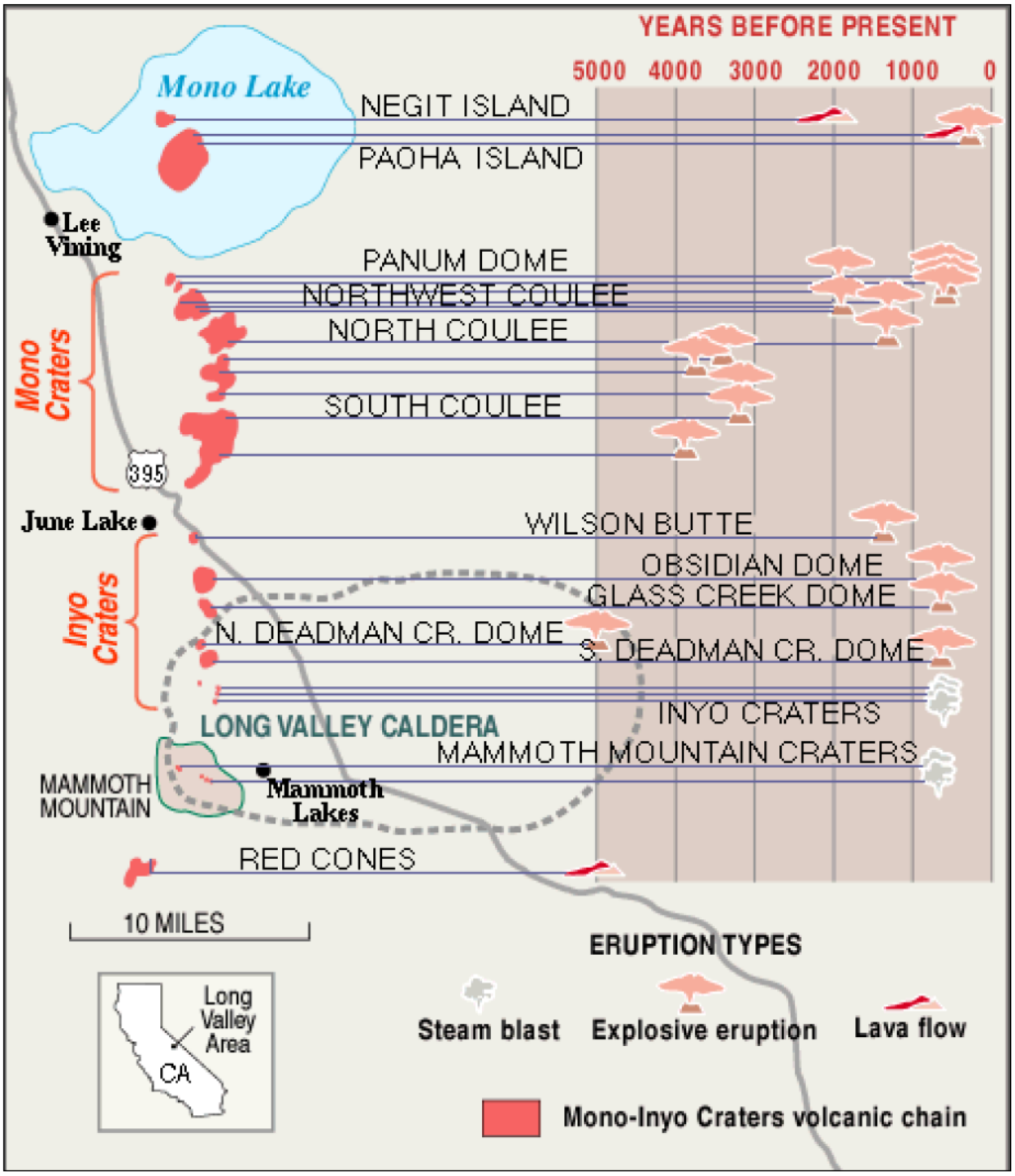
HMPC Events

The HMPC noted no volcanic events.

USGS Events

During the past 1,000 years, there have been at least 12 volcanic eruptions in the Long Valley area. This activity is likely to continue long into the future. The Long Valley Caldera and Mono-Inyo Craters volcanic chain has a long history of geologic activity that includes both earthquakes and volcanic eruptions. Volcanoes in the Mono-Inyo Craters volcanic chain have erupted often over the past 40,000 years. As shown in Figure 4-57. over the past 5,000 years, small to moderate eruptions have occurred at various sites along the Mono-Inyo Craters volcanic chain at intervals ranging from 250 to 700 years.

Figure 4-57 Volcanic Activity in the Mono-Inyo Craters Volcano Chain in the Past 5,000 Years



Source: U.S. Geological Survey

As recently as 1980 four large earthquakes (greater than magnitude 6 on the Richter Scale) and numerous relatively shallow earthquakes occurred in the area. Since then, earthquakes and associated uplift and deformation in the Mammoth Lakes Caldera have continued. Because such activities are common

precursors of volcanic eruptions, the USGS closely monitors the unrest in the region. There are no records of past impacts from volcanic eruptions to the Nevada County Planning Area.

On May 22, 1915, an explosive eruption at Lassen Peak, the southernmost active volcano in the Cascade Range, devastated nearby areas and rained volcanic ash as far away as 200 miles to the east. This explosion was the most powerful in a 1914-17 series of eruptions that were the last to occur in the Cascades before the 1980 eruption of Mt. St. Helens.

Figure 4-58 Eruption of Lassen Peak – May 22, 1915

Source: National Park Service

Likelihood of Future Occurrences

Unlikely—According to the USGS, the pattern of volcanic activity over the past 5,000 years suggests that the next eruption in the Long Valley area will most likely happen somewhere along the Mono-Inyo volcanic chain. However, the probability of such an eruption occurring in any given year is less than 1 percent. The next eruption will most likely be small and similar to previous eruptions along the Mono-Inyo volcanic chain during the past 5,000 years (see Figure 4-57 above). According to the State Multi-Hazard Mitigation Plan, only Medicine Lake, Mount Shasta, Lassen Peak, and the Long Valley Caldera are considered active and pose a threat of future activity. However, due to the location of the Planning Area relative to the active volcanoes, the State Plan does not consider Nevada County to be vulnerable to eruption and more likely ash from these volcanoes.

4.2.18. Wildfire

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for the Nevada County Planning Area. Generally, the fire

season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Significant economic losses can also result. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Wildland Urban Interface

Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. The WUI defines the community development into the foothills and mountainous areas of California. The WUI describes those communities that are mixed in with grass, brush and timbered covered lands (wildland). These are areas where wildland fire once burned only vegetation but now burns homes as well. The WUI for Nevada County is shown in Figure 4-59. The WUI for Nevada County consists of communities at risk (shown in Table 4-83 in Section 4.2.17) as well as the area around the communities that pose a fire threat.

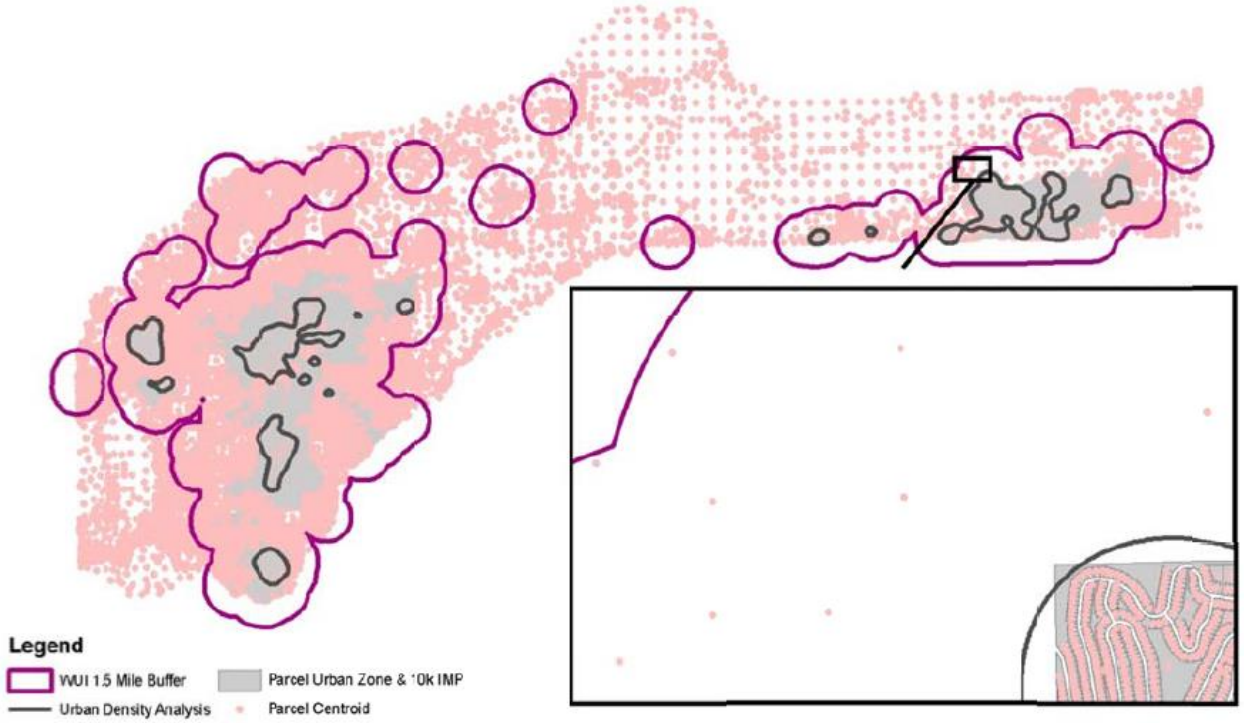
There are two types of WUI environments. The first is the true urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low density communities where homes are intermixed in wildland areas. Wildland urban intermix communities are difficult to defend because they are sprawling communities over a large geographical area with wild fuels throughout. This profile makes access, structure protection, and fire control difficult as fire can freely run through the community.

WUI fires are the most damaging. WUI fires occur where the natural and urban development intersect. Even relatively small acreage fires may result in disastrous damages. WUI fires occur where the natural forested landscape and urban-built environment meet or intermix. The damages are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

The pattern of increased damages is directly related to increased urban spread into historical forested areas that have wildfire as part of the natural ecosystem. Many WUI fire areas have long histories of wildland fires that burned only vegetation in the past. However, with new development, a wildland fire following a historical pattern now burns developed areas. WUI fires can occur where there is a distinct boundary between the built and natural areas or where development or infrastructure has encroached or is intermixed in the natural area. WUI fires may include fires that occur in remote areas that have critical infrastructure easements through them, including electrical transmission towers, railroads, water reservoirs, communications relay sites or other infrastructure assets. Human impact on wildland areas has made it

much more difficult to protect life and property during a wildland fire. This home construction has created a new fuel load within the wildland and shifted firefighting tactics to life safety and structure protection.

Figure 4-59 Nevada County Planning Area –Wildland Urban Interface



Source: Nevada County Community Wilfire Protection Plan

Nevada County Wildfires

Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas, such as the Sierra Nevada and foothills areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. The HMPC noted that almost the entire county is foothill area within mass vegetation. Almost all of it is wildland areas. Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. As a result of effective fire suppression since the 1930s, vegetation throughout the county has continued to grow and accumulate, and hazardous fuels have increased. As such, certain areas in and surrounding Nevada County are extremely vulnerable to fires as a result of dense vegetation combined with a growing number of structures being built near and within open lands. These high fuel hazards, coupled with a greater potential for ignitions, increases the susceptibility of the County to a catastrophic wildfire.

- **Topography** – An area's terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes. Nevada County's topography increases its risk to wildfire.
- **Weather –** Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is one of the most treacherous weather factor. The greater a wind, the faster a fire will spread and the more intense it will be. Winds can be significant at times in Nevada County. North winds in Nevada County are especially conducive to hot, dry conditions, which can lead to "red flag" days indicating extreme fire danger. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, often in difficult to reach terrain for firefighters.
- **Human Actions** – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

Factors contributing to the wildfire risk in Nevada County include:

- Overstocked forests, severely overgrown vegetation, and lack of defensible space around structures;
- Excessive vegetation along roadsides and hanging over roads, fire engine access, and evacuation routes;
- Drought and overstocked forests with increased beetle infestation or kill in weakened and stressed trees;
- Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response as well as the many subdivisions that have only one means of ingress/egress;
- Inadequate or missing street signs on private roads and house address signs;
- Nature and frequency of lightning ignitions; and
- Increasing population density leading to more ignitions.

Historically, Nevada County's ecosystems have been kept healthy and in balance by a variety of natural disturbances, including fire, insects, pathogens, wind throw, floods, weather variations, landslides, avalanches and earthquakes. Over the last few centuries, this balance has been affected by human introduced disturbances of fire exclusion/suppression, livestock grazing, roads and development, logging, and introduced plants, animals and pathogens. Lightning and human-caused fire ignitions occur frequently in the area.

Due to changes in ecosystem disturbance patterns, fire behavior may now deviate considerably from the historic fire conditions. These changes may benefit some species, but they put others at risk. More importantly, altered fire regimes potentially destabilize ecosystems and landscapes, thus creating conditions that may promote unprecedented catastrophic disturbance events. In turn, they may seriously reduce ecosystem resiliency, the ability to return to prior levels of productivity.

Consequently, wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may actually be beneficial to the landscape. Century old policies of fire exclusion and

aggressive suppression have given way to better understanding of the importance fire plays in the natural cycle of certain forest types.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. State disaster declarations occurred in 1961, 1987, and 1988 (49er Fire). Federal disaster declarations occurred in 1998 (twice for 49er Fire), and 2009 (Yuba Fire).

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. The 24 events in Nevada County are shown in Table 4-32.

Table 4-32 NCDC Wildfire Events in Nevada County 1993 to 12/31/2016

Date	Event	Injuries (direct)	Deaths (direct)	Property Damage	Crop Damage	Injuries (direct)	Deaths (direct)
6/24/2007	Wildfire	0	3	$500,000,000	$0	0	0
4/18/2008	Wildfire	0	0	$0	$0	0	0
4/18/2008	Wildfire	0	1	$0	$0	0	0
5/12/2008	Wildfire	0	0	$0	$0	0	0
6/21/2008	Wildfire	0	0	$0	$0	0	0
6/21/2008	Wildfire	0	0	$0	$0	12	0
7/1/2008	Wildfire	0	1	$0	$0	0	0
7/1/2008	Wildfire	0	0	$0	$0	0	0
8/3/2008	Wildfire	0	0	$0	$0	0	0
8/6/2008	Wildfire	0	0	$0	$0	0	0
7/26/2009	Wildfire	0	0	$0	$0	0	0
8/1/2009	Wildfire	0	0	$0	$0	0	0
9/13/2009	Wildfire	0	0	$0	$0	0	0
8/17/2013	Wildfire	0	5	$0	$0	0	0
9/1/2013	Wildfire	0	5	$0	$0	0	0
10/1/2013	Wildfire	0	0	$0	$0	0	0
7/25/2014	Wildfire	0	2	$0	$0	0	0
9/13/2014	Wildfire	0	10	$0	$0	0	0
7/23/2015	Wildfire	0	1	$25,000	$0	0	0
7/25/2015	Wildfire	0	6	$0	$0	0	0
8/1/2015	Wildfire	0	0	$0	$0	0	0
9/9/2015	Wildfire	2	1	$0	$0	0	0
6/28/2016	Wildfire	0	0	$0	$0	0	0

Date	Event	Injuries (direct)	Deaths (direct)	Property Damage	Crop Damage	Injuries (direct)	Deaths (direct)
7/1/2016	Wildfire	0	0	$0	$0	0	0
Totals		**0**	**27**	**$500,000,000**	**$0**	**12**	**0**

Source: NCDC

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

CAL FIRE Events

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Nevada County were extracted and are listed in summary in Table 4-33, and in detail in Appendix E. There are 203 fires recorded in this database for Nevada County. Each of them was tracked by CAL FIRE. Appendix E lists each fire's date, cause, name, total acreage burned, and acreage burned in Nevada County.

Figure 4-60 shows fire history for the County, colored by the size of the acreage burned. This map contains fires from 1950 to 2015, while the detailed tables of wildfire shown in Appendix E contain fires from 1950 to 2015.

Figure 4-60 Nevada County Wildfire History

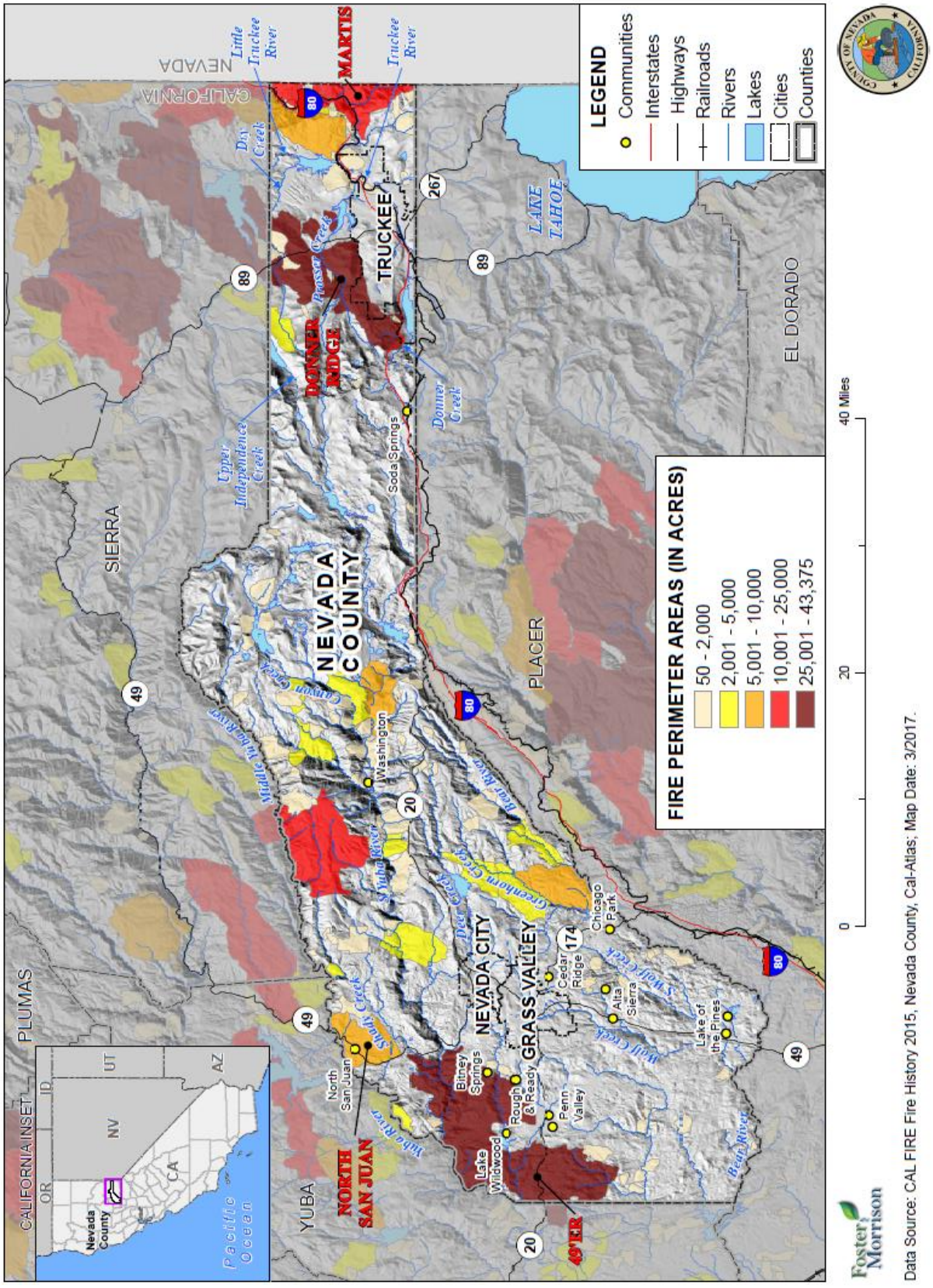


Table 4-33 Nevada County – Wildfire History Summary 1950-2015

Jurisdiction / Cause of Fire	Fire Count	Fire Area (in Acres)
Unincorporated Nevada County		
Arson	6	635
Campfire	5	16,697
Debris	11	38,889
Equipment Use	3	1,235
Escaped Prescribed Burn	1	17
Lightning	18	11,568
Miscellaneous	29	47,581
Playing with fire	1	43
Powerline	4	4,400
Railroad	1	328
Smoking	6	5,105
Unknown	1	2,316
Unknown / Unidentified	102	82,314
Vehicle	1	110
Nevada County Total	**189**	**211,238**
Unincorporated Nevada County and Truckee		
Debris	1	43,374
Equipment Use	1	78
Miscellaneous	6	11,848
Nevada County and Truckee Total	**8**	**55,300**
Unincorporated Nevada County and Sierra County		
Lightning	1	1,312
Sierra County Total	**1**	**1,312**
Truckee		
Arson	2	417
Miscellaneous	2	547
Railroad	1	90
Truckee Total	**5**	**1,054**
Grand Total	**203**	**268,904**

Source: CAL FIRE

HMPC/CWPP Events

The HMPC and Nevada County CWPP noted that fire has played a significant historical role in defining the current vegetative strata in Nevada County. Between 1965 and 2015, the County saw 14 fires that exceeded 500 acres. This can be seen in Table 4-34.

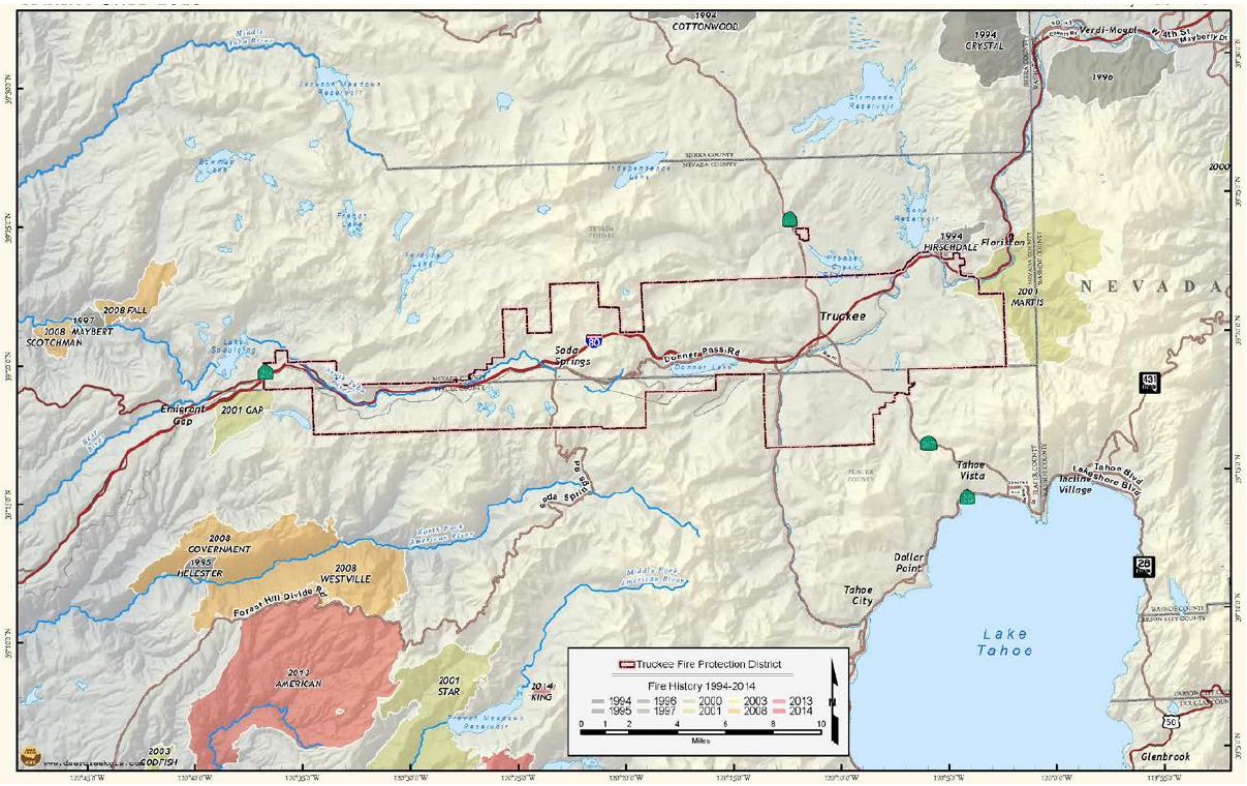
Table 4-34 Nevada County Planning Area – Major Fires (500+ Acres) 1965-2015

Year	Fire Name	Cause	Acres
1976	OAKTREE	Unknown/Unidentified	885
1976	KEYSTONE	Unknown/Unidentified	897
1977	FREEWAY	Misc	1,305
1987	PALMER	Lightning	1,972
1988	49'ER	Debris	36,343
1994	TRAUNER	Powerline	536
1994	HIRSCHDALE	Equipment Use	1,069
1996	COLUMBIA HILL	Debris	1,517
2001	GAP	Campfire	2,447
2001	MARTIS	Campfire	14,127
2008	SCOTCHMAN	Lightning	1,165
2008	FALL	Lightning	2,417
2009	YUBA	Powerline	3,829
2015	Lowell	Unknown/Unidentified	2,316

Source: Nevada County CWPP

The Truckee CWPP noted the fires that have affected the Town of Truckee and the eastern portion of the County. These can be seen in Figure 4-61.

Figure 4-61 Truckee CWPP – Fire History 1994 to 2014



The HMPC also provided the following information on notable, historic fires in the County.

Donner Ridge Fire, 1960. The Donner Ridge Fire affected the town of Truckee. It was the middle of August 1960, and construction workers were blazing the new Interstate 80 across Donner Summit. Road crews burned slash and debris as they went, and a few embers settled into the furrows of cracked granite alongside the road. Then the winds picked up, carrying the sparks up the wooded slope north of the interstate, below what is now the Tahoe Donner housing development. Fire crews were spread thin across the state with wildfires already blazing in Southern California, then split in half locally by the Volcano Fire just over the crest near Foresthill. Firefighters were able to stop the fire in one place – bulldozing a line to protect the historic Donner Party camp at Alder Creek. In the end it was about 20 miles long and five miles wide at its widest. The Sierra Sun reported a perimeter stretching 70 miles, with flames "within a few feet of several Donner Lake homes and businesses," missing Truckee (what they called downtown Truckee at the time) by 2.5 miles, "skirting" Hobart Mills and destroying the buildings at the E. E. Prayen Ranch. The fire left 27 injured – and thankfully, none dead. The 44,800-acre blaze scorched $3.5 million in trees, according to the Sun, amounting to 150 million board-feet of lumber. The cost of the firefighting efforts was reported at $650,000.

Trauner Fire, August 7, 1994 – The Traurner fire started near Rough & Ready and burned 536 acres. The fire caused a loss of power due to damaged poles and lines. Most roads in Rough & Ready were closed for several days. The fire burned a historic schoolhouse, 12 homes, and 21 other structures.

Maybert Fire, May 21 to 23, 1997. The Maybert Fire was human caused and was of medium to high magnitude to the County due to tourism losses near Memorial weekend. The fire struck at the confluence of Canyon Creek and South Yuba River. This fire caused loss of revenue for camp grounds and local businesses.

49er Fire, September 11, 1998 – The 49er fire burned 33,500 acres. There were: 148 Homes, 358 Other structures, 89 vehicles, and 17 boats destroyed in the fire. There were approximately 4,000-4,500 homes in the fire perimeter. Of the148 homes destroyed, 80% were not in compliance with the Pub. Res. Code concerning clearance around homes. During the height of the battle there were: 285 engines, 65 dozers, 76 handcrews, 12 airtankers, 8 helicopters, and 3200 people directly involved, plus an unknown number of locals which assisted indirectly. Aircraft dropped approx. 300,000 gallons of fire retardant at a price of $0.58 cents per gallon. Suppression costs were estimated at $7.5 million. Total dollar lost was estimated at $22.7 million.

Martis Fire, June 17, 2001 – Martis Fire burned 14,126 acres in Nevada County. The fire started near Truckee and burned into Nevada County. One Cabin, one mobile home, and three vehicles were destroyed. There was an extended closure of Interstate 80 in both directions.

Yuba River Complex Fire, June 21 to July 15, 2008. –Started by lightning, the Yuba River Complex fire consisted of 13 fires; 6 were within 5 miles of the community of Washington: Alpha ¼ acre 1 mile, Omega 1- 3 acres 2 ½ miles, Omega 2- 2 ½ acres 2 ¼ miles, Scotchman 1,165.4 acres, Gaston 5 acres 2 miles, Fall 2416.8 acres 5 miles. These fires occurred 1 to 5 miles from Washington. Over 3,590 acres of private and Tahoe National Forest timber burnt. There was a revenue loss to the businesses in town over July 4th Holiday and Washington Road was closed, with access given to local traffic only. There were health issues reported due to very heavy smoke; several people had to leave town.

Lowell Fire, July 25, 2018 – The Lowell Fire burned 2,304 acres in Nevada County. It occurred on Lowell Hill Road/Steep Hollow Canyon. Three firefighters were injured on the fireline. In addition, one Cabin, two motorhomes, and an outbuilding were lost. Two firefighting utility vehicles and one fire engine were also damaged. The area suffured a loss of power due to damaged poles and lines. Resident evacuations in the Chalk Bluff and Greenhorn areas in Nevada County and several communities in Placer County took place.

Tree Mortality, 2013 to 2017. Tree mortality has occurred near Washington California and throughout Sierra Nevada Mountains. This has occurred on both private lands and Public Forest lands. This is due in part to bark beetle infestation of the trees throughout the area. The HMPC is concerned about potential damage to power grid from falling trees, increased soil erosion during heavy rains, increased lighting strikes potential. Increased Wildfire potential due to both increased aerial and ground fuel loading. Potential negative effects on the water system from increased soil erosion.

Likelihood of Future Occurrence

Highly Likely — From May to October of each year, Nevada County faces a serious wildland fire threat. Fires will continue to occur on an annual basis in the Nevada County Planning Area. The threat of wildfire and potential losses are constantly increasing as human development and population increase and the

wildland urban interface areas expand. Due to its high fuel load and long, dry summers, most of Nevada County continues to be at risk from wildfire. When fire does return to the dense, dry forests of Nevada County, they are more likely to burn uncharacteristically, at moderate and high intensity, rather than the historic low intensity level. The increased fuel accumulation results in greater flame lengths, more crown fires and greater resistance to control. Tree mortality is often high, even for the fire-resistant ponderosa pine and large Douglas firs. Soils, understory vegetation, and wildlife populations, which evolved with low intensity fires, are at risk of long-term damage from uncharacteristic fire intensity.

Climate Change and Wildfire

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 2085, as compared to current (2010) conditions. Based on this model, Cal-Adapt predicts that wildfire risk in Nevada County will increase slightly in the near term, and subside during mid-to late-century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in Nevada County, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

4.2.19. Hazards Summary

Table 4-35 summarizes the results of the hazard identification and hazard profile for the Nevada County Planning Area based on the hazard identification data and input from the HMPC. For each hazard profiled in Section 4.2, this table includes the likelihood of future occurrence and whether the hazard is considered a priority hazard for the Nevada County Planning Area, based on the initial hazard prioritization by the HMPC.

Table 4-35 Hazard Identification/Profile Summary and Initial Determination of Priority Hazard: Nevada County Planning Area

Hazard	Likelihood of Future Occurrence	Priority Hazard
Ag Hazards: Severe Weather/Insect Pests	Highly Likely	Y
Avalanche	Highly likely	N
Climate Change	Likely	Y
Dam Failure	Occasional	Y
Drought and Water Shortage	Likely/ Occasional	Y
Earthquake	Unlikely	Y
Flood: 100/500–year	Occasional/Unlikely	Y
Flood: Localized/Stormwater	Highly Likely	Y
Hazardous Materials Transportation (interstates, railroads, pipelines)	Likely	Y
Landslide, Debris & Mud Flows	Likely	Y

Hazard	Likelihood of Future Occurrence	Priority Hazard
Levee Failure	Unlikely	N
Severe Weather: Extreme Heat	Likely	Y
Severe Weather: Extreme Cold, Snow, and Freeze	Highly Likely	Y
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Highly Likely	Y
Subsidence	Likely	Y
Volcano	Unlikely	N
Wildfire (smoke, tree mortality, conflagration)	Highly Likely	Y

4.3 Vulnerability Assessment

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

With Nevada County's hazards identified and profiled, the HMPC conducted a vulnerability assessment to describe the impact that each hazard would have on the Nevada County Planning Area. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to natural hazards and estimates potential losses. This section focuses on the risks and vulnerabilities to the County as a whole. Data from the individual participating jurisdictions was also evaluated and is integrated here and in the jurisdictional annexes, and noted where the risk differs for a particular jurisdiction and across the Planning Area.

This vulnerability assessment followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses*. This vulnerability assessment first describes the total vulnerability and assets at risk for the Nevada County Planning Area and for the unincorporated County and then discusses vulnerability for these areas by hazard.

Data Sources

Data used to support this vulnerability assessment included the following:

- CAL FIRE GIS datasets
- USFS GIS datasets
- County staff
- ArkStorm at Tahoe - Stakeholder Perspectives on Vulnerabilities and Preparedness for an Extreme Storm Event in the Greater Lake Tahoe, Reno and Carson City Region. 2014.
- California Adaptation Planning Guide
- Cal-Adapt
- CAL FIRE GIS datasets
- CalTrans, Truck Networks on California State Highways. 2015.
- California Department of Finance, E-1 Report

- California Department of Finance, E-4 Report
- California Department of Finance, P-1 Report
- California Department of Fish and Wildlife's Natural Diversity Database
- California Department of Food and Agriculture
- California Department of Water Resources Best Available Maps
- California Department of Water Resources Division of Safety of Dams
- California Native Plant Society
- California Natural Diversity Database
- California Office of Historic Preservation
- Existing plans and studies
- FEMA's HAZUS-MH 2.2 GIS-based inventory data
- FEMA Digital Flood Insurance Rate Map. February 3, 2010.
- FEMA Nevada County Flood Insurance Study. February 3, 2010.
- Kenward, Alyson PhD, Adams-Smith, Dennis, and Raja, Urooj. Wildfires and Air Pollution – The Hidden Health Hazards of Climate Change. Climate Central. 2013.
- Liu, J.C., Mickley, L.J., Sulprizio, M.P. et al. Climatic Change. 138: 655. doi:10.1007/s10584-016-1762-6. 2016.
- National Drought Mitigation Center – Drought Impact Reporter
- National Park Service – Historic American Buildings Survey and Historic American Engineering Record
- Nevada County Building Department
- Nevada County GIS data
- Nevada County General Plan
- Nevada County General Plan Environmental Impact Report
- Personal interviews with planning team members and staff from the County and participating jurisdictions
- Public Health Alliance of Southern California
- Statewide GIS datasets from other agencies such as Cal OES, FEMA, USGS, CGS, Cal Atlas, and others
- Topographically Occurring Mine Symbols dataset
- US Census Bureau 2010 Household Population Estimates
- US Fish and Wildlife Service
- US Fish and Wildlife Service's National Wetlands Inventory maps
- Written descriptions of inventory and risks provided by Nevada County
- Personal interviews and discussions with planning team members and staff from the County and participating jurisdictions

4.3.1. Nevada County Vulnerability and Assets at Risk

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

- Total values at risk;
- Critical facility inventory;

- Cultural, historical, and natural resources; and
- Growth and development trends.

Total Values at Risk

Parcel Inventory and Assessed Values

This analysis captures the values associated with assessed assets located within the County. The 2016/2017 GIS parcel layer and the Nevada County Assessor data, obtained from the Nevada County was used for as the basis of this analysis. This data provided by the County represents best available data.

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

Methodology

Nevada County's 2016/2017 Assessor Data and the County's GIS parcel data obtained from the County were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the County Planning Area. This data provides the land and improved values assessed for each parcel, along with key information such as property use. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Nevada County to support countywide mapping and analysis of assets at risk. City and County boundary limits from Nevada County were used to identify and attribute those parcels located within jurisdictional boundaries. The Nevada County GIS parcel data contained 63,427 parcels, including the areas of the City of Grass Valley, City of Nevada City, Town of Truckee, and the unincorporated areas of Nevada County.

Data Limitations & Notations

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

The 2016/2017 GIS and Assessor data was obtained to perform the spatial analysis. The initial GIS parcel data contained 67,624 records. The data contained 1,108 duplicated records, which were therefore excluded from the analysis dataset. The duplicate parcels largely consisted of split-parcel/timeshare ownership properties that were bundled under a common assessor parcel number (APN). The primary APN record in each bundle remained in the analysis dataset, and although the duplicate parcels were excluded, it should

be noted that these records did not contain assessor values. Of the remaining 66,516 records, it was determined that 2,926 records were right-of-way parcels, with no assessed values nor unique APNs, and were also excluded from the dataset. During further review of the data, it was determined that an additional 163 duplicated records were discovered and excluded from the dataset. In total, 63,427 records were utilized for the analysis.

Property Use Categories

Nevada County Assessor Use Codes provide detailed descriptive information about how each property is generally used, such as residential, commercial, or industrial. For analysis purposes, the Use Codes were categorized into the following property use categories found within the Nevada County Assessor data:

- Agricultural
- Commercial
- Government
- Industrial
- Institutional
- Miscellaneous
- Residential

Once Use Codes were grouped into categories, the number of total and improved parcels and land and improved values were inventoried for the County and jurisdictions by property use.

Estimated Content Replacement Values

Nevada County's assigned property use categories were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards. FEMA's standard CRV factors were utilized to develop more accurate loss estimates for all mapped hazard analyses. FEMA's CRV factors estimate value as a percent of improved structure value by property use. Table 4-36 shows the breakdown of the different property uses in Nevada and their estimated CRV factors.

Table 4-36 Nevada County Planning Area – Content Replacement Factors by Property Use

Nevada County Property Use Categories	Hazus Property Use Categories	Hazus Content Replacement Values
Agricultural	Agricultural	100%
Commercial	Commercial	100%
Government	Government	100%
Industrial	Industrial	150%
Institutional	Institutional	100%
Miscellaneous	Miscellaneous	100%
Residential	Residential	50%

Source: Hazus

Nevada County Values at Risk Results

Values at Risk without Contents

Values associated with land, and improved structure values were identified and summed to determine total assessed values at risk in the Nevada County Planning Area. Together, the land value and improved structure value make up the majority of assessed values associated with each identified parcel or asset. Improved parcel counts were based on the assumption that a parcel was improved if a structure value was present. Information on other values such as personal property values were not readily available for inclusion in this effort.

Table 4-37 shows the total values or exposure for the entire Nevada County Planning Area, by jurisdiction. Table 4-38 shows the total values for the Planning Area by property use. The values for unincorporated Nevada County are broken out by property use type and are provided in Table 4-39. More information on values at risk for each jurisdiction can be found in their respective annexes.

Table 4-37 Nevada County Planning Area – Total Values at Risk by Jurisdiction

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Grass Valley	7,460	6,311	$658,630,489	$1,389,116,078	$2,047,746,567
Nevada City	3,378	2,852	$337,779,199	$648,132,005	$985,911,204
Truckee	16,118	12,432	$1,625,532,697	$4,269,152,444	$5,894,685,141
Unincorporated Nevada County	36,471	26,991	$3,076,138,037	$5,475,572,560	$8,551,710,597
Total	**63,427**	**48,586**	**$5,698,080,422**	**$11,781,973,087**	**$17,480,053,509**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Table 4-38 Nevada County Planning Area – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Agricultural	1,578	621	$121,169,963	$45,488,153	$166,658,116
Commercial	1,624	1,153	$393,408,051	$688,148,383	$1,081,556,434
Government	1,754	10	$13,656,736	$9,873,701	$23,530,437
Industrial	217	192	$62,073,107	$145,055,516	$207,128,623
Institutional	115	79	$10,524,550	$98,688,432	$109,212,982
Miscellaneous	630	14	$11,896,380	$239,817	$12,136,197
Residential	57,509	46,517	$5,085,351,635	$10,794,479,085	$15,879,830,720
Total	**63,427**	**48,586**	**$5,698,080,422**	**$11,781,973,087**	**$17,480,053,509**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Table 4-39 Unincorporated Nevada County – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Agricultural	1,517	614	$117,329,068	$44,316,608	$161,645,676
Commercial	201	142	$40,901,445	$67,924,911	$108,826,356
Government	1,382	5	$4,405,895	$3,905,051	$8,310,946
Industrial	25	23	$6,791,568	$18,911,915	$25,703,483
Institutional	55	34	$5,009,152	$23,954,107	$28,963,259
Miscellaneous	495	12	$9,756,950	$131,979	$9,888,929
Residential	32,796	26,161	$2,891,943,959	$5,316,427,989	$8,208,371,948
Total	**36,471**	**26,991**	**$3,076,138,037**	**$5,475,572,560**	**$8,551,710,597**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Values at Risk with Contents

Table 4-40 shows the total values of the Nevada County Planning Area as shown in Table 4-38, but with estimated content replacement values (CRVs) included (using CRV multipliers from Table 4-36). This table is important as potential losses to the County include structure contents. In addition, loss estimates contained in the hazard vulnerability sections of this Chapter will use calculations based on the total values, including content replacement values.

Table 4-40 Nevada County Planning Area – Total Values at Risk by Property Use with Content Replacement Values

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	1,578	621	$121,169,963	$45,488,153	$45,488,153	$212,146,269
Commercial	1,624	1,153	$393,408,051	$688,148,383	$688,148,383	$1,769,704,817
Government	1,754	10	$13,656,736	$9,873,701	$9,873,701	$33,404,138
Industrial	217	192	$62,073,107	$145,055,516	$217,583,274	$424,711,897
Institutional	115	79	$10,524,550	$98,688,432	$98,688,432	$207,901,414
Miscellaneous	630	14	$11,896,380	$239,817	$239,817	$12,376,014
Residential	57,509	46,517	$5,085,351,635	$10,794,479,085	$5,397,239,543	$21,277,070,263
Total	**63,427**	**48,586**	**$5,698,080,422**	**$11,781,973,087**	**$6,457,261,303**	**$23,937,314,812**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Table 4-41 shows the total values of the unincorporated County as shown in Table 4-39, also with estimated content included.

Table 4-41 Unincorporated Nevada County – Total Values at Risk by Property Use with Content Replacement Values

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	1,578	621	$121,169,963	$45,488,153	$45,488,153	$212,146,269
Commercial	1,624	1,153	$393,408,051	$688,148,383	$688,148,383	$1,769,704,817
Government	1,754	10	$13,656,736	$9,873,701	$9,873,701	$33,404,138
Industrial	217	192	$62,073,107	$145,055,516	$217,583,274	$424,711,897
Institutional	115	79	$10,524,550	$98,688,432	$98,688,432	$207,901,414
Miscellaneous	630	14	$11,896,380	$239,817	$239,817	$12,376,014
Residential	57,509	46,517	$5,085,351,635	$10,794,479,085	$5,397,239,543	$21,277,070,263
Total	**63,427**	**48,586**	**$5,698,080,422**	**$11,781,973,087**	**$6,457,261,303**	**$23,937,314,812**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Critical Facility Inventory

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

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

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

- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
  - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers
  - ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
  - ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.
  - ✓ Designated Emergency Shelters.
  - ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio and other emergency warning systems.
  - ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power and gas).
  - ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.
  - ✓ Transportation Lifeline Systems - Airports, helipads, and critical highways, roads, bridges and other transportation infrastructure (Note: Critical highways, roads, etc. will be determined during any hazard-specific evacuation planning and are not identified in this plan).

- **At Risk Population Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release of hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property.

A fully detailed list of all critical facilities in the planning are can be found in Appendix F. A summary of critical facilities in the County can be found in Figure 4-62 and Table 4-42. Note that only Category 1, Essential Services, and Category 2, At-risk Populations were available in mapped form and are thus included on Figure 4-62 and Table 4-42. Category 3, Hazardous Materials Facilities, was only available in table format. Due to the large number of these facilities, they are included in Table F-2 in Appendix F. Also to note, the mapped layer is based on best available data and may not reflect a comprehensive inventory of critical facilities in the County based on the current definition; updated critical facility mapping is a work in progress.

Figure 4-62 Nevada County Planning Area – Critical Facilities Inventory

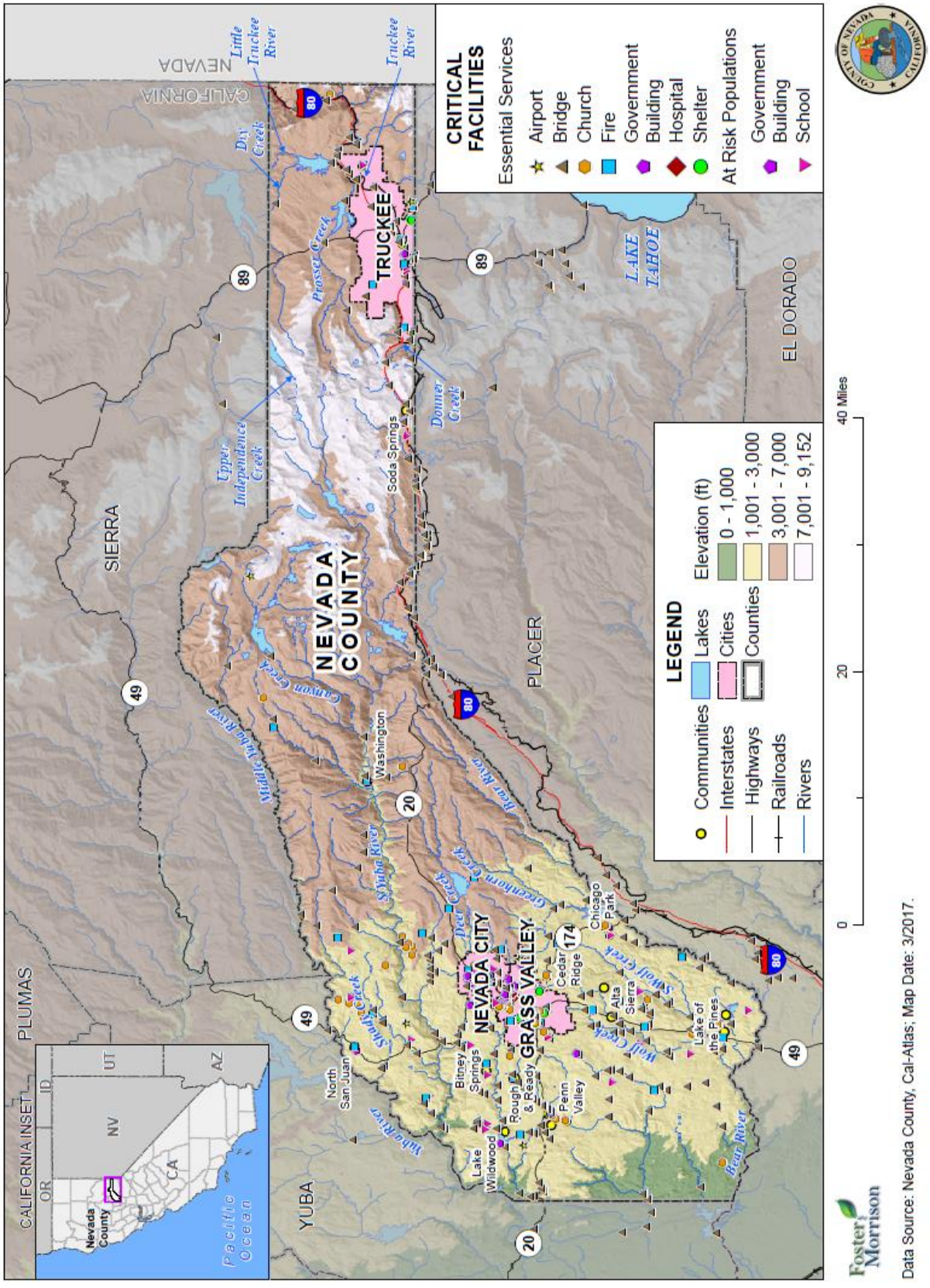


Table 4-42 Nevada County Planning Area – Critical Facilities Inventory

Critical Facility Category	Critical Facility Type	Grass Valley	Nevada City	Truckee	Unincorporated Nevada County	Nevada County Planning Area Total
Category 1						
Essential Services	Airport	3	0	1	5	9
	Bridge	23	15	31	205	274
	Church	15	9	0	37	61
	Fire	4	3	5	27	39
	Government Building	28	15	4	5	52
	Hospital	5	0	1	0	6
	School	0	0	0	0	0
	Shelter	8	2	7	11	28
Total		**86**	**44**	**49**	**290**	**469**
Category 2						
At Risk Populations	Airport	0	0	0	0	0
	Bridge	0	0	0	0	0
	Church	0	0	0	0	0
	Fire	0	0	0	0	0
	Government Building	1	4	0	1	6
	Hospital	0	0	0	0	0
	School	15	11	5	24	55
	Shelter	0	0	0	0	0
	Total	**16**	**15**	**5**	**25**	**61**
Grand Total		**102**	**59**	**54**	**315**	**530**

Cultural, Historical, and Natural Resources

Assessing Nevada County's vulnerability to disaster also involves inventorying the cultural, historical, and natural resource assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- In the event of a disaster, an accurate inventory of cultural, historical and natural resources allows for more prudent care in the disaster's immediate aftermath when the potential for additional impacts is higher.

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

Cultural and Historical Resources

Nevada County has a large stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements.

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

Historical resources included in the programs above are identified in Table 4-43.

Table 4-43 Nevada County Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
A. A. Sargent Residence, Sargent-Freeman Residence (P305)			X	7/13/1973	Nevada City
Aaron Baruh House (P382)			X	3/20/1975	Nevada City
Alpha Hydraulic Diggings (628)		X		1/29/1958	Washington
American Hill Diggins (P273)			X	11/1/1972	Nevada City
Boca Dam (N947)	X			3/25/1981	Truckee
Boca Ice Harvest Site (P610)			X	3/2/1983	Truckee
BR #17C-24 / Purdon Bridge (P839)			X	9/13/2000	Nevada City
Bridgeport (Nyes Crossing) Covered Bridge (390)		X		8/26/1947	French Corral
Bridgeport Covered Bridge (N100)	X			7/14/1971	French Corral
Caldwell's Upper Store Site (P304)			X	7/13/1973	Nevada City
Caroline Hansen House (P402)			X	5/9/1975	Grass Valley
Columbia Hill School (P194)			X	5/19/1971	Nevada City
Donner Monument (Or) Pioneer Monument (134)		X		1/31/1934	Truckee
Donner Summit Bridge (P709)			X	11/22/1988	Donner Lake
DR. W.C. Jones Home (P547)			X	3/31/1980	Grass Valley
Emmanuel Episcopal Church (P246)			X	4/25/1972	Grass Valley
Empire Mine (298)	X	X		2/23/1939	Grass Valley
Englebright House (P326)			X	3/15/1974	Nevada City
First Manufacturing Site Of The Pelton Wheel (1012)		X		5/27/1993	Nevada City
First Transcontinental Railroad-Truckee (780)		X		11/20/1962	Truckee
Foote's Crossing (P401)			X	5/9/1975	North San Juan
Gilmore Air Field (P242)			X	1/19/1972	Grass Valley
Grass Valley Public Library (N1755)	X			3/26/1992	Grass Valley
Holbrooke Hotel (914)		X		12/30/1977	Grass Valley
Home Of Lola Montez (292)		X		7/20/1938	Grass Valley
Home Of Lotta Crabtree (293)		X		8/15/1938	Grass Valley
Idaho-Maryland Mine Site (P640)			X	11/16/1984	Grass Valley
Kruger House (N1115)	X			6/17/1982	Truckee
Little Town Of Rough And Ready (294)		X		9/19/1938	Rough and Ready
Lone Grave, The (P8)			X	12/16/1966	Nevada City

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Malakoff Diggins-North Bloomfield Historic District (N224)	X			4/11/1973	North Bloomfield
Marsh, Martin Luther, House (N225)	X			4/11/1973	Nevada City
Martin Luther Marsh House (P241)			X	1/19/1972	Nevada City
Meadow Lake Petroglyphs (N84)	X			5/6/1971	French Lake
Mount Saint Mary's Convent And Academy (855)		X		4/24/1972	Grass Valley
Mount St. Mary's Academy And Convent (N285)	X			5/3/1974	Grass Valley
National Hotel (899)	X	X		6/16/1976	Nevada City
Nevada Brewery (N1380)	X			9/12/1985	Nevada City
Nevada City Downtown Historic District (N1382)	X			9/23/1985	Nevada City
Nevada City Firehouse No. 2 (N286)	X			5/3/1974	Nevada City
Nevada City Free Public Library (N1659)	X			12/10/1990	Nevada City
Nevada Theatre (863)	X	X		9/13/1973	Nevada City
North Bloomfield Mining And Gravel Company (852)		X		1/20/1972	Nevada City
North San Juan Methodist Episcopal Church (P248)			X	4/25/1972	North San Juan
North Star Mine Powerhouse (843)		X		9/24/1970	Grass Valley
Old Bear River Bridge (P802)			X	8/23/1994	Grass Valley
Old North San Juan School Site (P710)			X	11/22/1988	North San Juan
Omega Hydraulic Diggings And Townsite (629)		X		1/29/1958	Washington
Ott's Assay Office (N346)	X			4/14/1975	Nevada City
Overland Emigrant Trail (799)		X		9/16/1964	Grass Valley
Pioneer Cemetery (P324)			X	3/15/1974	Nevada City
Plaza Grocery (P325)			X	3/15/1974	Nevada City
Red Castle, The (P191)			X	5/19/1971	Nevada City
Red Dog Townsite (N2143)	X		X	9/14/2001	Nevada City
Root Cellar On Mexican War Land Grant (P603)			X	12/31/1982	Grass Valley
Sargent, Aaron A., House (N884)	X			6/20/1980	Nevada City
Searls Historical Library (P257)			X	6/22/1972	Nevada City
Site of One of the First Discoveries of Quartz Gold in California (297)		X		2/23/1939	Grass Valley
South Yuba Canal Office (832)		X		8/29/1969	Nevada City
The Union - Grass Valley Newspaper (P247)			X	4/25/1972	Grass Valley

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Town Of Washington (P604)			X	12/31/1982	Washington
Truckee Jail (P193)			X	5/19/1971	Truckee
Western Skisport Museum (P192)			X	5/19/1971	Truckee
William Morris Stewart House (P272)			X	11/1/1972	Nevada City
World's First Long-Distance Telephone Line (247)		X		3/25/1937	French Corral
You Bet Townsite (P400)			X	5/9/1975	Nevada City

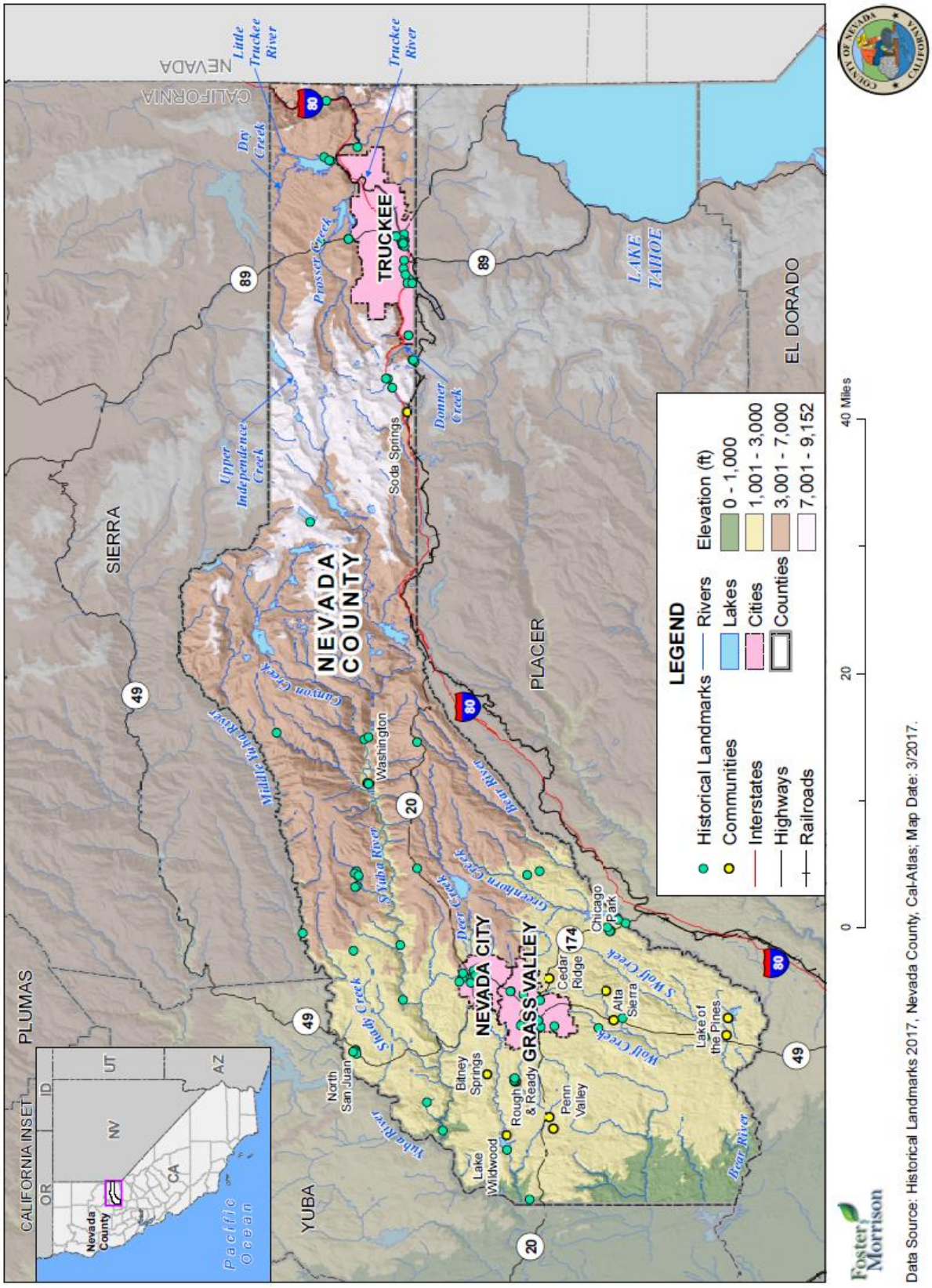
Source: California Department of Parks and Recreation Office of Historic Preservation, http://ohp.parks.ca.gov/

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

Nevada County Historic Landmarks

Nevada County keeps records of their own historical landmarks. These are shown on Figure 4-63. Due to the length of the table, that is shown in Appendix G.

Figure 4-63 Nevada County – Historic Landmarks



Natural Resources

Natural resources are an important and valuable asset to any community. When evaluating hazard impacts, it is important to inventory and consider the natural resources unique to each jurisdiction. Identification of natural resources is also important in the development of cost/benefit analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as reducing the force of and storing floodwaters.

The geographic extent of Nevada County spans from the Sacramento Valley to the crest of the Sierra Nevada Range eastward to the Nevada state line. The State of California Department of Fish and Game recognizes five primary wildlife habitat types in California: tree dominated; shrub dominated; herbaceous dominated; aquatic; and developed. These habitats occur in continuous stretches, as well as isolated "pockets" depending on the overall topography, elevation, climate and pattern of development of a particular area. Animals may move between various habitat types to satisfy their life requirements. Animals will utilize riparian corridors, low lying or "saddle" areas of ridges, established trails, and other corridors for this inter-habitat movement. In addition, many species including deer move seasonally throughout the county in response to their seasonal habitat requirements.

Habitats throughout the County have been modified by human activity. The western portions of the county have experienced rapid residential growth in recent years and the resultant parcelization, fencing, alteration of vegetation, introduction of cats and dogs, roadways, noise and night lighting have served to reduce the habitat values throughout the area. In the mid to high elevations, logging, mining, and development of second homes and rural subdivisions have also served to alter habitats. Habitat values can be reduced by both direct (construction of housing) and indirect (increased density in wide movement corridors) activities. Although the overall trend in the county is toward a decline in habitat values as identified by the Department of Fish and Game, there is a wide localized variation in habitats, tolerances of species and degrees of human disturbance. In some cases, disruption of predator-prey balances occur; in others, food sources are affected; while in others, breeding or birthing areas are disturbed. While some species may benefit, the larger percentage of species are adversely affected.

Nevada County supports a variety of wildlife habitats which are important or unique. These habitats consist of movement corridors, wetlands and riparian areas, and residence/breeding/foraging areas. Movement corridors serve two primary purposes: first, to enable migratory animals, especially deer, to move seasonally from and between winter and summer habitats, and second, to allow animals to move within their home range or residence areas. Wetlands and riparian areas both serve as important habitats in their own right, as well as critical components in animal movement and migration and as supporting habitat for special status species. Oak woodlands and savannas provide an important habitat which serves as a significant grazing resource for area ranchers, a wildlife habitat of diverse values, and as a source of hardwood. Additionally, oak woodlands and savannas contribute to the overall protection of watersheds by stabilizing soils on even the steepest slopes.

Special Status Species

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

The California Natural Diversity Database, a program that inventories the status and locations of rare plants and animals in California, was queried to create an inventory of special status species in Nevada County. Table 4-44 lists the name, federal status, state status, California Department of Fish and Wildlife status, and the California Rare Plant rank of species in Nevada County.

Table 4-44 Special Status Species in Nevada County

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals – Amphibians					
Ambystoma macrodactylum sigillatum	southern long–toed salamander	None	None	SSC	–
Rana boylii	foothill yellow–legged frog	None	None	SSC	–
Rana draytonii	California red–legged frog	Threatened	None	SSC	–
Rana sierrae	Sierra Nevada yellow–legged frog	Endangered	Threatened	WL	–
Taricha torosa	Coast Range newt	None	None	SSC	–
Animals – Birds					
Accipiter cooperii	Cooper's hawk	None	None	WL	–
Accipiter gentilis	northern goshawk	None	None	SSC	–
Aquila chrysaetos	golden eagle	None	None	FP ; WL	–
Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP	–
Pandion haliaetus	osprey	None	None	WL	–
Cypseloides niger	black swift	None	None	SSC	–
Ardea herodias	great blue heron	None	None	–	–
Spizella breweri	Brewer's sparrow	None	None	–	–
Falco mexicanus	prairie falcon	None	None	WL	–
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP	–
Grus canadensis tabida	greater sandhill crane	None	Threatened	FP	–
Progne subis	purple martin	None	None	SSC	–
Icteria virens	yellow–breasted chat	None	None	SSC	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Setophaga petechia	yellow warbler	None	None	SSC	–
Picoides albolarvatus	White–headed woodpecker	None	None	–	–
Picoides arcticus	black–backed woodpecker	None	None	–	–
Sphyrapicus ruber	red–breasted sapsucker	None	None	–	–
Laterallus jamaicensis coturniculus	California black rail	None	Threatened	FP	–
Asio otus	long–eared owl	None	None	SSC	–
Strix nebulosa	great gray owl	None	Endangered	–	–
Strix occidentalis occidentalis	California spotted owl	None	None	SSC	–
Empidonax traillii	willow flycatcher	None	Endangered	–	–
Animals – Crustaceans					
Stygobromus sheldoni	Sheldon's amphipod	None	None	–	–
Animals – Fish					
Catostomus platyrhynchus	mountain sucker	None	None	SSC	–
Siphateles bicolor pectinifer	Lahontan Lake tui chub	None	None	SSC	–
Oncorhynchus clarkii henshawi	Lahontan cutthroat trout	Threatened	None	–	–
Oncorhynchus mykiss irideus	steelhead – Central Valley DPS	Threatened	None	–	–
Oncorhynchus tshawytscha	chinook salmon – Central Valley spring–run ESU	Threatened	Threatened	–	–
Prosopium williamsoni	mountain whitefish	None	None	SSC	–
Animals – Insects					
Bombus morrisoni	Morrison bumble bee	None	None	–	–
Bombus occidentalis	western bumble bee	None	None	–	–
Goeracea oregona	Sagehen Creek goeracean caddisfly	None	None	–	–
Lepidostoma ermanae	Cold Spring caddisfly	None	None	–	–
Cryptochia excella	Kings Canyon cryptochian caddisfly	None	None	–	–
Desmona bethula	amphibious caddisfly	None	None	–	–
Ecclisomyia bilera	Kings Creek ecclysomyian caddisfly	None	None	–	–
Animals – Mammals					
Aplodontia rufa californica	Sierra Nevada mountain beaver	None	None	SSC	–
Vulpes vulpes necator	Sierra Nevada red fox	Candidate	Threatened	–	–
Lepus americanus tahoensis	Sierra Nevada snowshoe hare	None	None	SSC	–
Gulo gulo	California wolverine	Proposed Threatened	Threatened	FP	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Martes caurina sierrae	Sierra marten	None	None	–	–
Pekania pennanti	fisher – West Coast DPS	Proposed Threatened	Candidate Threatened	SSC	–
Taxidea taxus	American badger	None	None	SSC	–
Ochotona princeps schisticeps	gray–headed pika	None	None	–	–
Antrozous pallidus	pallid bat	None	None	SSC	–
Corynorhinus townsendii	Townsend's big–eared bat	None	None	SSC	–
Euderma maculatum	spotted bat	None	None	SSC	–
Lasionycteris noctivagans	silver–haired bat	None	None	–	–
Lasiurus cinereus	hoary bat	None	None	–	–
Myotis evotis	long–eared myotis	None	None	–	–
Myotis lucifugus	little brown bat	None	None	–	–
Myotis thysanodes	fringed myotis	None	None	–	–
Myotis volans	long–legged myotis	None	None	–	–
Myotis yumanensis	Yuma myotis	None	None	–	–
Animals – Mollusks					
Monadenia mormonum buttoni	Button's Sierra sideband	None	None	–	–
Margaritifera falcata	western pearlshell	None	None	–	–
Anodonta californiensis	California floater	None	None	–	–
Animals – Reptiles					
Emys marmorata	western pond turtle	None	None	SSC	–
Phrynosoma blainvillii	coast horned lizard	None	None	SSC	–
Sceloporus graciosus graciosus	northern sagebrush lizard	None	None	–	–
Community – Aquatic					
–	Great Basin Cutthroat Trout/Paiute Sculpin Stream	None	None	–	–
–	Great Basin Sucker/Dace/Redside Stream With Cutthroat Trout	None	None	–	–
Community – Terrestrial					
–	Darlingtonia Seep	None	None	–	–
–	Fen	None	None	–	–
Plants – Bryophytes					
Bruchia bolanderi	Bolander's bruchia	None	None	–	4.2
Nardia hiroshii	Hiroshi's flapwort	None	None	–	2B.3
Meesia triquetra	three–ranked hump moss	None	None	–	4.2
Meesia uliginosa	broad–nerved hump moss	None	None	–	2B.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Mielichhoferia elongata	elongate copper moss	None	None	–	4.3
Plants – Vascular					
Allium sanbornii var. congdonii	Congdon's onion	None	None	–	4.3
Allium sanbornii var. sanbornii	Sanborn's onion	None	None	–	4.2
Perideridia bacigalupii	Bacigalupi's yampah	None	None	–	4.2
Artemisia tripartita ssp. tripartita	threetip sagebrush	None	None	–	2B.3
Erigeron miser	starved daisy	None	None	–	1B.3
Erigeron petrophilus var. sierrensis	northern Sierra daisy	None	None	–	4.3
Jensia yosemitana	Yosemite tarplant	None	None	–	3.2
Azolla microphylla	Mexican mosquito fern	None	None	–	4.2
Cryptantha glomeriflora	clustered–flower cryptantha	None	None	–	4.3
Rorippa subumbellata	Tahoe yellow cress	None	Endangered	–	1B.1
Streptanthus longisiliquus	long–fruit jewelflower	None	None	–	4.3
Streptanthus tortuosus ssp. truei	True's mountain jewelflower	None	None	–	1B.1
Pseudostellaria sierrae	Sierra starwort	None	None	–	4.2
Stellaria obtusa	obtuse starwort	None	None	–	4.3
Calystegia stebbinsii	Stebbins' morning–glory	Endangered	Endangered	–	1B.1
Bulbostylis capillaris	thread–leaved beakseed	None	None	–	4.2
Carex davyi	Davy's sedge	None	None	–	1B.3
Carex lasiocarpa	woolly–fruited sedge	None	None	–	2B.3
Carex limosa	mud sedge	None	None	–	2B.2
Carex xerophila	chaparral sedge	None	None	–	1B.2
Eriophorum gracile	slender cottongrass	None	None	–	4.3
Rhynchospora alba	white beaked–rush	None	None	–	2B.2
Rhynchospora capitellata	brownish beaked–rush	None	None	–	2B.2
Schoenoplectus subterminalis	water bulrush	None	None	–	2B.3
Drosera anglica	English sundew	None	None	–	2B.3
Arctostaphylos mewukka ssp. truei	True's manzanita	None	None	–	4.2
Astragalus austiniae	Austin's astragalus	None	None	–	1B.3
Astragalus whitneyi var. lenophyllus	woolly–leaved milk–vetch	None	None	–	4.3
Lathyrus sulphureus var. argillaceus	dubious pea	None	None	–	3
Phacelia stebbinsii	Stebbins' phacelia	None	None	–	1B.2
Juncus digitatus	finger rush	None	None	–	1B.1

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Juncus hemiendytus var. abjectus	Center Basin rush	None	None	–	4.3
Juncus luciensis	Santa Lucia dwarf rush	None	None	–	1B.2
Lycopus uniflorus	northern bugleweed	None	None	–	4.3
Scutellaria galericulata	marsh skullcap	None	None	–	2B.2
Fritillaria eastwoodiae	Butte County fritillary	None	None	–	3.2
Lilium humboldtii ssp. humboldtii	Humboldt lily	None	None	–	4.2
Lycopodiella inundata	inundated bog–clubmoss	None	None	–	2B.2
Fremontodendron decumbens	Pine Hill flannelbush	Endangered	Rare	–	1B.2
Sidalcea stipularis	Scadden Flat checkerbloom	None	Endangered	–	1B.1
Claytonia megarhiza	fell–fields claytonia	None	None	–	2B.3
Lewisia cantelovii	Cantelow's lewisia	None	None	–	1B.2
Lewisia longipetala	long–petaled lewisia	None	None	–	1B.3
Clarkia biloba ssp. brandegeeae	Brandegee's clarkia	None	None	–	4.2
Epilobium howellii	subalpine fireweed	None	None	–	4.3
Botrychium ascendens	upswept moonwort	None	None	–	2B.3
Botrychium crenulatum	scalloped moonwort	None	None	–	2B.2
Botrychium lunaria	common moonwort	None	None	–	2B.3
Botrychium minganense	Mingan moonwort	None	None	–	2B.2
Corallorhiza trifida	northern coralroot	None	None	–	2B.1
Cypripedium californicum	California lady's–slipper	None	None	–	4.2
Cypripedium fasciculatum	clustered lady's–slipper	None	None	–	4.2
Penstemon personatus	closed–throated beardtongue	None	None	–	1B.2
Poa sierrae	Sierra blue grass	None	None	–	1B.3
Eriogonum tripodum	tripod buckwheat	None	None	–	4.2
Eriogonum umbellatum var. torreyanum	Donner Pass buckwheat	None	None	–	1B.2
Potamogeton praelongus	white–stemmed pondweed	None	None	–	2B.3
Potamogeton robbinsii	Robbins' pondweed	None	None	–	2B.3
Primula pauciflora	beautiful shootingstar	None	None	–	4.2
Ceanothus fresnensis	Fresno ceanothus	None	None	–	4.3
Rhamnus alnifolia	alder buckthorn	None	None	–	2B.2
Ivesia sericoleuca	Plumas ivesia	None	None	–	1B.2
Darlingtonia californica	California pitcherplant	None	None	–	4.2
Brodiaea sierrae	Sierra foothills brodiaea	None	None	–	4.3
Viola tomentosa	felt–leaved violet	None	None	–	4.2

Sources: California Natural Diversity Database BIOS Viewer Tool

Federal Status

Endangered: The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.
Threatened: The classification provided to an animal or plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
Proposed Endangered: The classification provided to an animal or plant that is proposed for federal listing as Endangered in the Federal Register under Section 4 of the Endangered Species Act.
Proposed Threatened: The classification provided to an animal or plant that is proposed for federal listing as Threatened in the Federal Register under Section 4 of the Endangered Species Act.
Candidate: The classification provided to an animal or plant that has been studied by the United States Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.
None: The plant or animal has no federal status.
Delisted: The plant or animal was previously listed as Endangered or Threatened, but is no longer listed on the Federal Endangered and Threatened species list.

CDFW Status

FP: Fully Protected: This classification was the State of California's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction.
SSC: Species of Special Concern: To this end, the Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability.
WL: Watch List: Species that were previously designated as "Species of Special Concern" but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

CA Rare Plant Rank

1A: Plants presumed extinct in California and rare/extinct elsewhere
1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California
1B.2: Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California
1B.3: Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California
2A: Plants presumed extirpated in California, but more common elsewhere
2B.1: Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
2B.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
2B.3: Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California
3.1: Plants about which we need more information; seriously threatened in California
3.2: Plants about which we need more information; fairly threatened in California
3.3: Plants about which we need more information; not very threatened in California
4.1: Plants of limited distribution; seriously threatened in California
4.2: Plants of limited distribution; fairly threatened in California
4.3: Plants of limited distribution; not very threatened in California

Wetlands

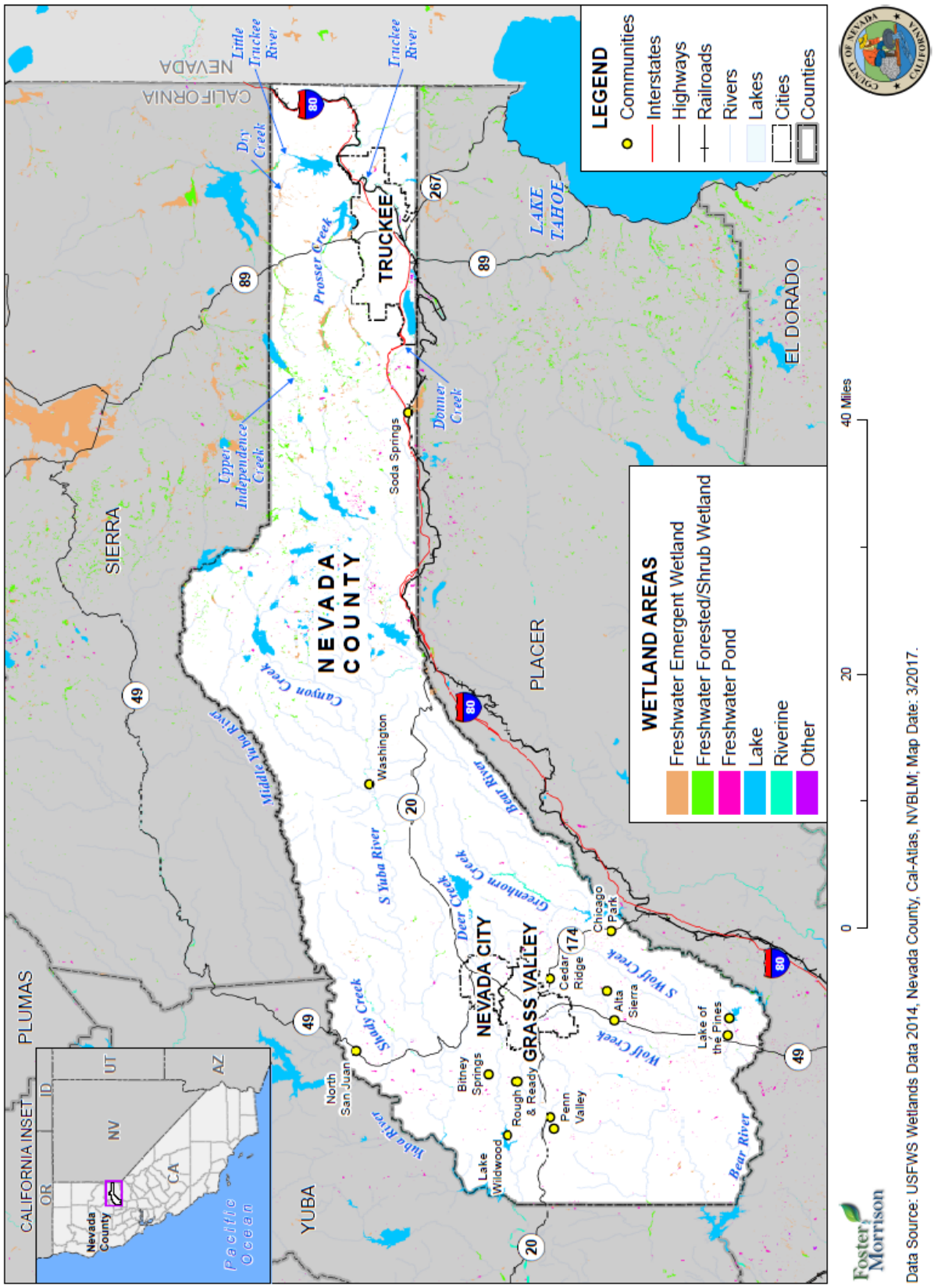
Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and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

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

reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands in Nevada County are generally small, isolated features dependent on riparian water, NID ditch leaks or overflows, diversions by agricultural operations or natural seeps or springs. Man-made or naturally occurring wetlands provide an important biological resource both through provision of localized habitat and habitat for migratory species and as a natural water filtration system. The primary issues related to wetlands are loss due to filling as a result of land development; degradation or loss due to interruption of water supply from natural and man-made drainage systems; and degradation due to degraded water quality, resulting from increased pollution from urban runoff, sedimentation, pesticides and herbicides. Wetlands in the County are shown in Figure 4-64.

Figure 4-64 Nevada County Planning Area – Wetlands



Natural and Beneficial Functions

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

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream. Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater and flood waters. Trees, root mats, and other wetland vegetation also slow the speed of floodwaters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion. Wetlands within and downstream of urban areas are particularly valuable, counteracting the greatly increased rate and volume of surface- water runoff from pavement and buildings.

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

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

Farmlands

Williamson Act

The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. The County has designated areas as agricultural preserves within which the county will enter into contracts for the preservation of the land in agriculture. The County has 7,532 acres under Williamson Act Contract as of 2013.

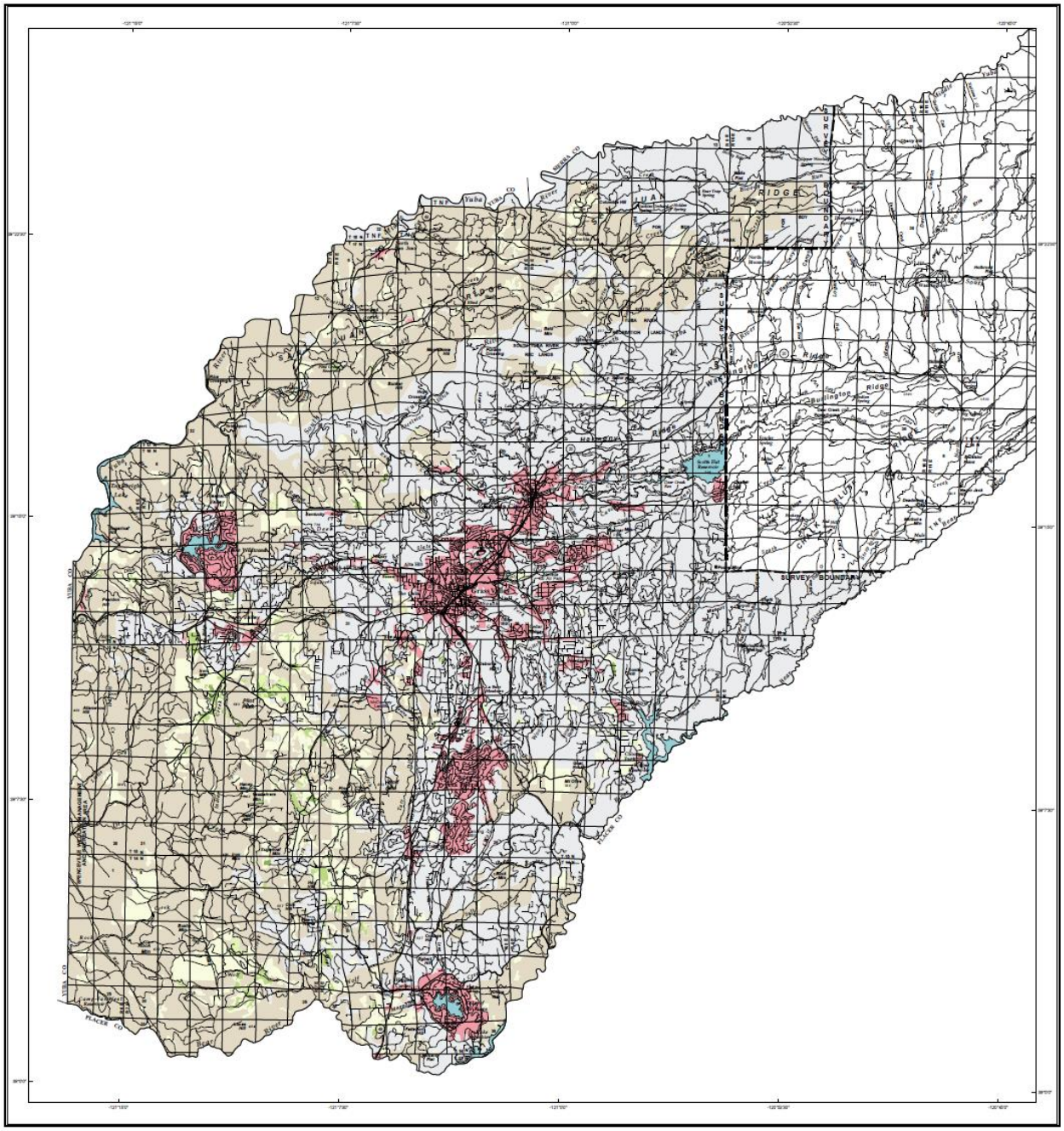
State Inventory of Important Farmland

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

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

The 2014 maps were the most recent versions. These lands are shown in Figure 4-65.

Figure 4-65 Nevada County – Map of Important Farmlands 2014



Source: State of California Department of Conservation

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability. Information from the Nevada County General Plan Housing Element, the California Department of Finance, and the US Census Bureau form the basis of this discussion.

More specific information on growth and development for each participating jurisdiction can be found in the jurisdictional annexes.

Current Status and Past Development

The estimated population of Nevada County for January 1, 2016 was 98,095, representing an almost five-fold increase from just over 19,000 people in 1940. Table 4-45 and Table 4-46 illustrate the pace of population growth in Nevada County dating back to 1940 along with more recent population trends for each jurisdiction. The data on population and housing growth shows that Nevada County saw tremendous growth during the end of the 20th century. That growth has slowed between 2000 and 2010, and the County has seen small population losses since 2010.

Table 4-45 Nevada County Population Growth 1940-2016

Year	Population	Change	Percent Increase
1940	19,283	–	–
1950	19,888	605	3.1%
1960	20,911	1,023	5.1%
1970	26,346	5,435	26.0%
1980	51,465	25,119	96.0%
1990	77,500	26,035	52.0%
2000	92,033	14,533	17.2%
2010	98,764	6,731	7.3%
2016	98,095	-669	-0.7%

Sources: Nevada County Housing Element Background Report, California Department of Finance, US Census Bureau

Table 4-46 Population Growth for Jurisdictions in Nevada County, 2000-2016

Area	2000	2010	2016	% Change 2000 to 2016
Grass Valley	10,922	12,860	12,955	19.0%
Nevada City	2,996	3,068	3,260	8.8%
Truckee	13,864	16,180	15,370	10.9%
Unincorporated	64,251	66,656	66,510	3.5%

Sources: Nevada County Housing Element Background Report, California Department of Finance E-1

Development since 2011 Plan

As shown in Table 4-45, the Nevada County Planning Area has shrunk by approximately 0.7% between 2010 and January 1, 2016.

The Nevada County Building Department and Planning Department tracked total building permits issued since 2011 for unincorporated Nevada County. A summary of all development is shown in Table 4-47. These are tracked by hazard area and by property use type, and area shown in Table 4-48. All development in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas, were completed in accordance with all current and applicable development codes and standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the Nevada County Planning Area to identified priority hazards.

Table 4-47 Unincorporated Nevada County Development since 2011 Summary

Property Use	2011	2012	2013	2014	2015	2016
Residential	12	30	78	65	84	30
Commercial	8	8	7	1	9	3
Total	**20**	**38**	**85**	**66**	**73**	**33**

Source: Nevada County Building Department

Table 4-48 Unincorporated Nevada County Development in Hazard Zones since 2011

Property Use	1 % Annual Chance Flood	Wildfire Very High	Wildfire High
Residential	9	118	134
Commercial	0	14	10
Total	**9**	**132**	**144**

Source: Nevada County Building Department

Special Populations

The Climate Change and Health Profile Report reported on special populations in the County:

- In 2010, approximately 6% of adults aged 25 years and older had less than a high school education (statewide average was 19%). In 2010, 9% of the population had incomes below the poverty level (the statewide average was 14%). Twenty percent of households paid 50% or more of their annual income on rent or a home mortgage (statewide average was 22%).
- In 2012, approximately 5,000 (27%) low-income residents reported they did not have reliable access to a sufficient amount of affordable, nutritious food (called food insecurity; statewide average was 42%). In 2010, Nevada County had approximately 4,203 outdoor workers whose occupation increased their risk of heat illness. In 2010, roughly four percent of households did not own a vehicle that could be used for evacuation (statewide average was 8%).
- In 2009, approximately 35% of households were estimated to lack air conditioning, a strategy to counter adverse effects of heat (statewide average was 36%). In 2011, tree canopy, which provides shade and

other environmental benefits, was present on 48% of the county's land area (statewide average was 8%).

In addition, members of the HMPC noted that tourism is one special population that can affect the County during times of disaster. Also, those with second homes in the County can make it more difficult in contributing to mitigation as absent homeowners. There is also have a transient work population that travels in and out of the County during harvest and ski seasons.

Future Development

As indicated in the previous section, Nevada County had been steadily growing from 1940 to 2010, with a small downturn recently. Long term forecasts by the California Department of Finance project population growth in Nevada County continuing through the 2060. Table 4-49 shows the population projections for the County as a whole through 2060.

Table 4-49 Population Projections for Nevada County Planning Area, 2020-2060

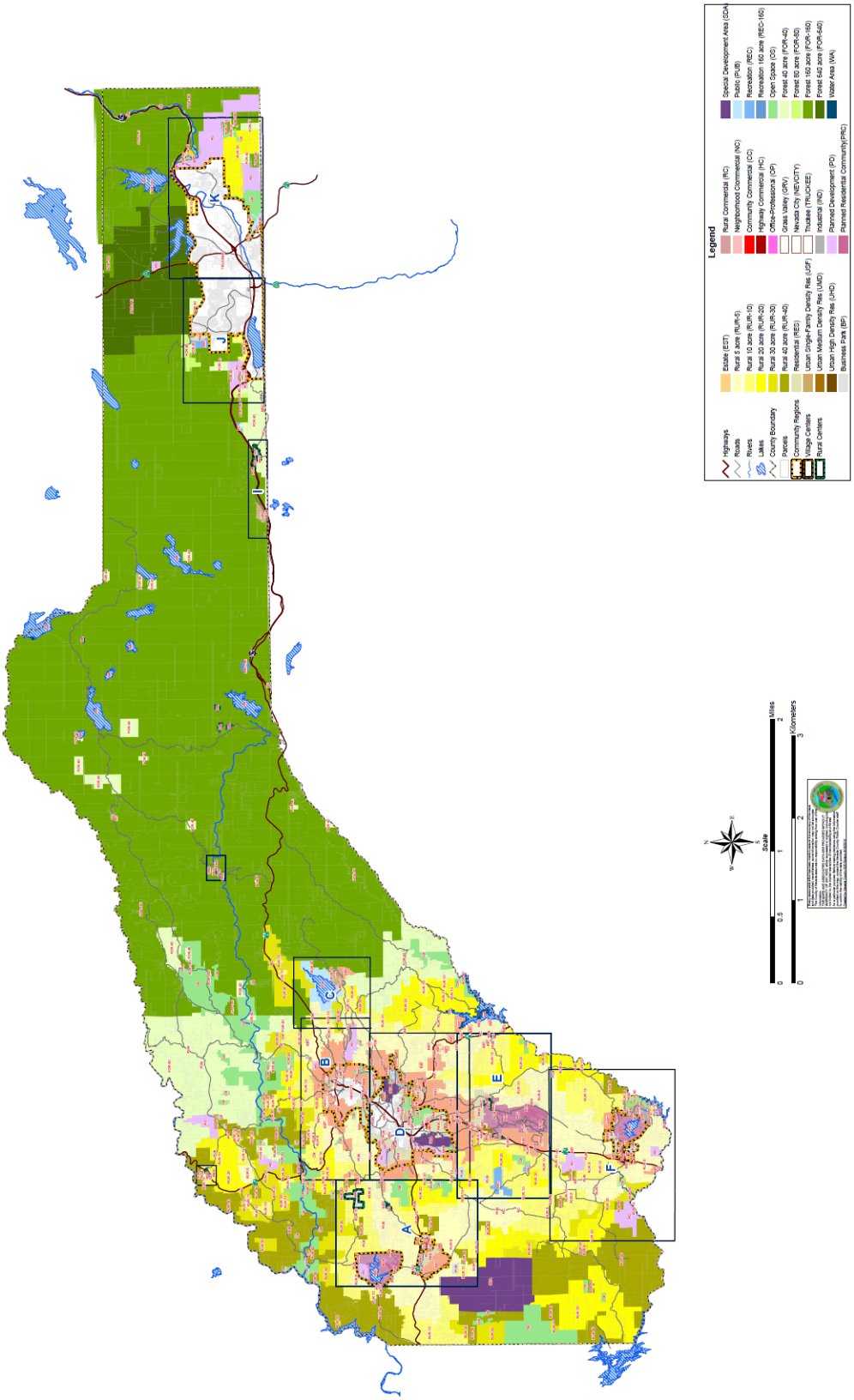
	2020	2025	2030	2035	2040	2045	2050	2055	2060
Nevada	101,767	105,389	108,111	110,224	111,885	113,469	115,350	118,071	121,517

Source: California Department of Finance, P-1 Report

Land Use/Zoning

The future use of land in the County is fundamental to attaining the vision of a balanced, self-sustaining community. A land use pattern which balances growth between rural and urban areas, as well as providing a balance between housing, employment, natural resources, and services in the County is a key element in maintaining the quality of life and unique character of the County. Descriptions of allowed uses for each classification are detailed in the Nevada County General Plan Land Use Element. Figure 4-66 is sourced from this section.

Figure 4-66 Nevada County General Plan Land Use



Source: Nevada County General Plan Land Use Element

The residential developments in the western portion of Nevada County are situated in areas of great natural beauty. The predominant type of residential development has been single-family dwelling units, with multiple-family development occurring mainly in the Grass Valley and Nevada City areas. In the unincorporated area of the County, the greatest residential density occurs in the Alta Sierra area to the south of Grass Valley/Nevada City, Lake Wildwood to the west of Grass Valley/Nevada City, and Lake of the Pines to the south of Alta Sierra along the most southerly County boundary.

While residences are found along many of the highways and roadways in the rural areas of the County, residential development is also found in a dozen or so smaller rural communities. These small Rural Places vary in size but may have up to a hundred residences or more. They include Cascade Shores, Cedar Ridge, Chicago Park, Deer Creek Park, Peardale, Red Dog/You Bet, Rough and Ready, North San Juan, Washington, Soda Springs and Hirschdale.

Residential land uses in eastern Nevada County are concentrated around Donner Lake, in the large Tahoe-Donner development, in the Glenshire area to the east, and the Prosser subdivisions to the north on Highway 89. Soda Springs, Kingvale and Floriston are small Rural Places of less than 100 residences in eastern County. There are relatively few residential uses outside of these established areas.

Most of the commercial and industrial development in western Nevada County is located in or around the City of Grass Valley and Nevada City. Commercial uses are concentrated in the downtown areas of each City, the Brunswick/Glenbrook Basin area, and the Pine Creek Shopping Center on Highway 49 south of Grass Valley. Within the Grass Valley Community Region, the Loma Rica Industrial Park is a major location for industrial development and also includes commercial land uses adjacent to the Nevada County Airport. Within the last decade, the Higgins Corner-Lake of the Pines Village Center in South County has experienced increased commercial development. Based on recent development proposals, such as the Higgins Marketplace shopping center, this commercial development pattern is expected to continue. Within the Penn Valley Village Center, there is a mixture of primarily commercial and some industrial developments. In eastern County, commercial development is concentrated in the Town of Truckee and industrial development is located adjacent to the Tahoe-Truckee Airport and to the north along Highway 89.

The General Plan is to direct urban growth into Community Regions that can effectively and economically provide urban types of services. Eventually, urban and suburban residents demand such amenities as paved streets, water and sewer services, and related facilities - urban services that cannot be extended to widely scattered homes and subdivisions.

All portions of the County not included within a Community Region shall be considered to be within the Rural Regions of the County. Within these Rural Regions, growth is provided for only those types and densities of development which are consistent with the open, rural lifestyle, pastoral character, and natural setting which exists in these areas. Rural Places are established within the Rural Regions to recognize the existence of defined places as centers of activity for the surrounding rural areas, each containing some combination of residential or commercial uses.

Rural Centers are intended to provide various supporting commercial uses for the Rural Regions. Minimum parcel sizes range from five acres to 10, 20, 30, 40 and 160 acres. The Community Regions contain higher

residential densities and provide for a broad range of residential, commercial, cultural, public, and quasi-public uses, located for convenience, efficiency, and affordability. These Community Regions should be compact, self-sustaining areas of more intensive development where such development can be served most efficiently and effectively with a full range of urban services and facilities, such as public sewer and water.

GIS Analysis

Nevada County provided these Community Regions in GIS. Shapefiles were provided for the following locations:

- Ananda
- Deer Creek Park 2
- Harmony Ridge
- Kenny Ranch
- Milhouse Ranch
- Northstar
- Pleasant Valley Commercial
- Quail Lake Estates
- Rincon del Rio
- Teel Property
- Wildwood Ridge Estates

With the exception of Kenny Ranch and Northstar (Grass Valley), and Teel Property (Truckee), all of these lie in the unincorporated County. The locations of each are shown on Figure 4-67. The numbers in the first column of Table 4-50 align with those on the map, and Table 4-50 shows the current parcel count and improved parcel count within each future development area.

Figure 4-67 Nevada County – Future Development Areas

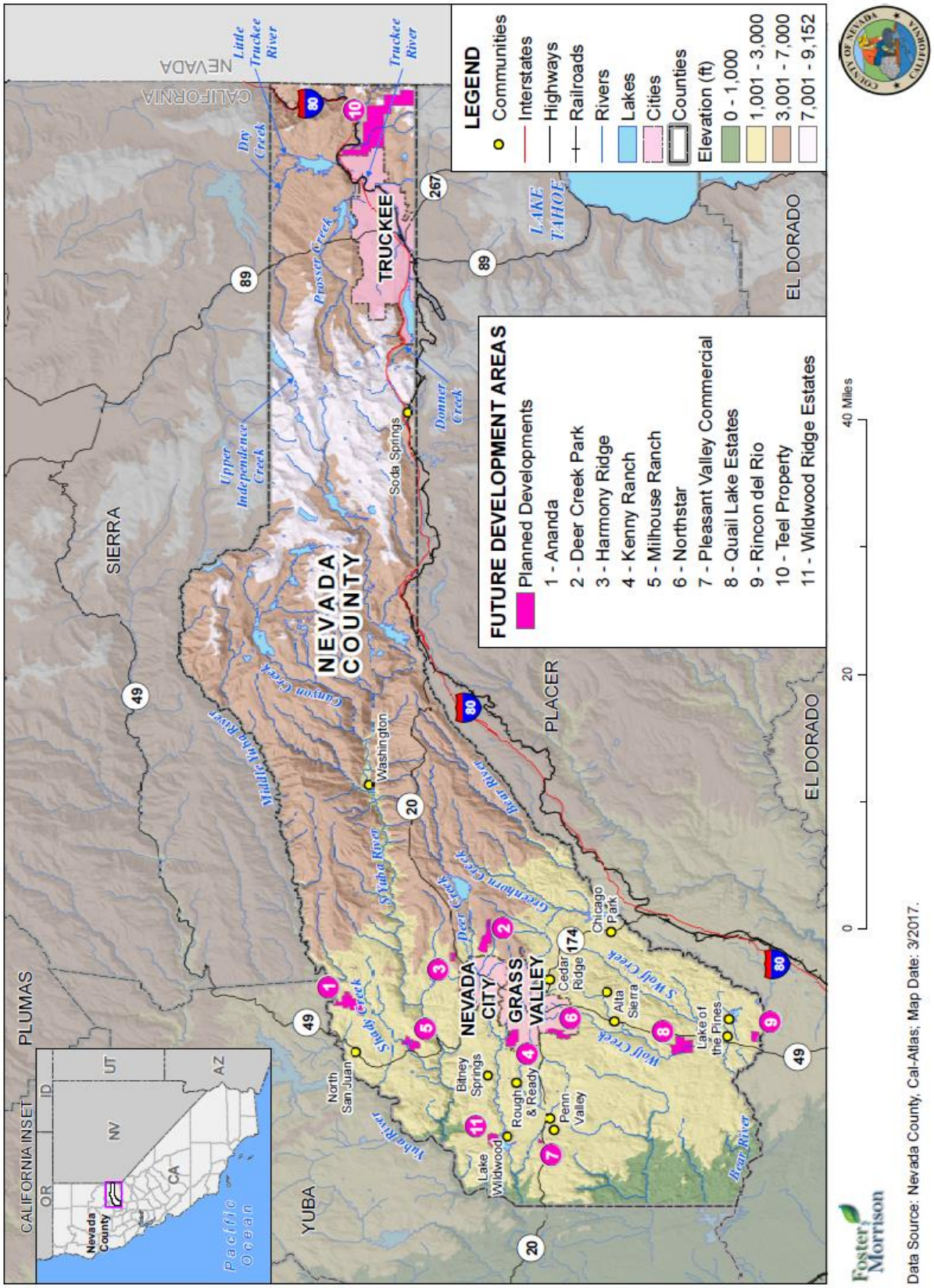


Table 4-50 Nevada County – Future Development Areas

Future Development Areas	Total Parcel Count	Improved Parcel Count
1 - Ananda	19	11
2 - Deer Creek Park 2	18	2
3 - Harmony Ridge	1	1
4 - Kenny Ranch	11	2
5 - Milhouse Ranch	13	13
6 - Northstar	17	2
7 - Pleasant Valley Commercial	2	0
8 - Quail Lake Estates	10	2
9 - Rincon del Rio	5	1
10 - Teel Property	22	0
11 - Wildwood Ridge Estates	121	98
Grand Total	**239**	**132**

Source: Nevada County GIS

4.3.2. Nevada County Vulnerability to Specific Hazards

The Disaster Mitigation Act regulations require that the HMPC evaluate the risks associated with each of the hazards identified in the planning process. This section summarizes the possible impacts and quantifies, where data permits, the Nevada County Planning Area's vulnerability to each of the hazards identified as a priority hazard in Section 4.2.19 Hazards Summary. Where specific hazards vary across the Nevada County Planning Area, additional information can be found in the jurisdictional annexes. Based on information developed for the hazard profiles, the priority hazards evaluated further as part of this vulnerability assessment include:

- Ag Hazards: Severe Weather/Insect Pests
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: 100/500–year
- Flood: Localized/Stormwater
- Hazardous Materials Transportation (interstates, railroads, pipelines)
- Landslide, Debris & Mud Flows
- Severe Weather: Extreme Heat
- Severe Weather: Extreme Cold, Snow, and Freeze
- Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)
- Subsidence
- Wildfire (smoke, tree mortality, conflagration)

Avalanche, levee failure, and volcano were determined not to be priority hazards during the initial prioritization process based on information obtained during development of the hazard profiles.

An estimate of the vulnerability of the Nevada County Planning Area and unincorporated Nevada County to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

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

The HMPC identified six hazards in the Planning Area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These six hazards are earthquake, flood, hazardous materials, landslide, subsidence (abandoned mines), and wildfire. Because these hazards have discrete hazard risk areas, their risk varies by jurisdiction and across the Planning Area. The vulnerability of the flood (100/500-year), landslide, hazardous materials transportation, subsidence, and wildfire hazards were analyzed using GIS and County parcel and assessor data. The HMPC used FEMA's loss estimation software, HAZUS-MH, to analyze the County's vulnerability to earthquakes.

For flood (100/500 year), landslide, subsidence, and wildfire, the HMPC inventoried the following for each community, to the extent possible, to quantify vulnerability in identified hazard areas:

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

For hazardous materials, the HMPC identified:

- General hazard-related impacts, including impacts to life, safety, and health and overall community impacts
- Population at risk
- Critical facilities at risk

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

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

- Agricultural Hazards
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Flood: Localized/Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: Extreme Cold, Snow, and Freeze
- Severe Weather: Heavy Rain and Storms

The vulnerability sections below are presented alphabetically.

4.3.3. Agricultural Hazards Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

Given the importance of agriculture to Nevada County, agricultural hazards continue to be an ongoing concern. The primary causes of agricultural losses are severe weather events, such as drought, freeze, and insect infestations. According to the HMPC, agricultural losses occur on an annual basis throughout the County and are usually associated with these severe weather events.

According to the US Department of Agriculture (USDA), every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include: contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. Specific impacts by hazard are listed below:

- Drought's most severe effects on agriculture include water quality and quantity issues. Other impacts include decreased crop yields, impact to feed and forage, and altered plant populations.
- Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on agricultural production and the environment. These impacts could

include loss of harvest or livestock and destruction of irrigation systems and other agricultural infrastructure.

- Extreme cold may result in loss of livestock, increased deicing, downed power lines, and increased use of generators. Deicing can impact agriculture by damaging local ecosystems and contaminating water bodies. Downed power lines cause people to run generators more often, which can release harmful air pollutants.
- Hot weather and extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock.
- Wildfires can spread quickly and devastate thousands of acres of land, which may include agricultural lands. This devastation could lead to large losses in crops, forestry, livestock, and agricultural infrastructure.
- Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.
- Landslides and debris flow occur in all 50 states and commonly occur in connection with other major natural disasters such as earthquakes, volcanoes, wildfires, and floods. Some of the threats from landslides and debris flows include rapidly moving water and debris that can cause trauma; broken electrical, water, gas, and sewage lines; and disrupted roadways and railways. This can lead to agricultural impacts including contamination of water, change in vegetation, and harvest and livestock losses.
- Tornadoes can appear without much warning and have the potential to devastate an area very quickly. This devastation can impact agriculture by contaminating water and destroying crops, livestock, and other farm property.

In addition to threats to agriculture from weather events, agriculture in the County is at risk from invasive species. Establishment of an invasive species would be detrimental to the agricultural industry of Nevada County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem. In addition, invasive plants:

- Increase wildfire potential
- Reduce water resources
- Accelerate erosion and flooding
- Threaten wildlife
- Degrade rangeland, cropland, and timberland
- Diminish outdoor recreation opportunities.

Invasive plants cost California $82 million every year (2008 Cal-IPC). Estimates on yearly losses in Nevada County varies and was not available for the County. Due to the economic value of crops in the County, invasive species have the ability to cause immense financial harm.

Future Development

Future development in the County is not likely to have an impact on agricultural hazards in Nevada County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing.

4.3.4. Climate Change Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

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

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

Nevada County Climate Change Impacts

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Nevada County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

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

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

Continued changes in hydrologic flow regimes and increased temperatures will further stress these systems regional habitats supporting many special-status species.

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

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

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

Future Development

Nevada County in general 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. For example, sea level rise may disrupt economic activity and housing in coastal communities, resulting in migration to inland urban areas. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact the Nevada County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

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

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

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

Climate change will affect transportation. The transportation network is vital to the county and the region's economy, safety, and quality of life. While it is widely recognized that emissions from transportation have impacts on climate change, climate will also likely have significant impacts on transportation infrastructure and operations Examples of specific types of impacts include softening of asphalt roads and warping of railroad rails; damage to roads; flooding of roadways, rail routes, and airports from extreme events; and interruptions to flight plans due to severe weather. Climate change impacts considered in the plan include: extreme temperatures; increased precipitation, runoff and flooding; increased wildfires; and landslides. Although landslides are not a direct result of climate change, these events are expected to increase in frequency due to increased rainfall, runoff, and wildfire. These events have the potential to cause injuries or fatalities, environmental damage, property damage, infrastructure damage, and interruption of operations. During flood events, these trails serve as secondary transportation facilities when roadways are blocked or otherwise impassible. During Hurricane Sandy, bicycles were one of the primary modes used to deliver food and water to residents stranded in their homes due to flood. Including dual or multi-purpose facilities and amenities as part of all new development provides not just desirable community amenities but critical infrastructure for climate resiliency.

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

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

Addressing Urban Heat Islands and Heat Events. New development will contribute to urban heat island (UHI) impacts and will need to incorporate urban greening methods into all aspects of development; interior and exterior of buildings, surrounding environment and beyond. New development will need to reduce its impacts to the overall UHI impacts affecting the county and surrounding region. On-going and expanding heat wave awareness and assistance will also affect new development. During heat waves in Nevada County, a heat alert is issued and news organizations are provided with tips on how vulnerable people can protect themselves. Programs used by health departments to engage with thousands of block captains to check on elderly and other vulnerable residents, along with public cooling places extending their hours, or local businesses welcoming residents into their businesses for purposes of staying cool are examples of programs and services that will be necessary. Other programs to consider that could further involve hospitals and clinics are operating a “heatline” with nurses or other healthcare professionals ready to assist callers with heat-related health problems. In addition, continued funding for weatherization, reduced utility rates and similar programs that offers assistance to elderly, low-income residents to install roof insulation, solar, trees and cool surfaces to save energy and lower indoor temperatures.

4.3.5. Dam Failure Vulnerability Assessment

Likelihood of Future Occurrence—Unlikely
Vulnerability—High

Dam failure flooding can occur as the result of partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam.

A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas subject to inundation downstream of the facility. Secondary losses would

include loss of the multi-use functions of the facility and associated revenues that accompany those functions.

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

Flooding as a result of dam failure can occur as a result of manmade or natural causes. Such causes include improper sitting, structural design flaws, erosion of the face or foundation, earthquakes, massive landslides, and rapidly rising flood waters. Inundation as a result of dam failure would most likely be the result of an earthquake. There are populated areas within the inundation zone of several of these dams; others have public property (such as roads) located down creek. However, the area of Nevada County in which these dams exist is not located within an historical seismic zone. In fact, the western half of Nevada County is within the lowest earthquake intensity zone in California.

The General Plan Safety element noted that within the eastern portion of Nevada County, classified in a higher earthquake intensity zone, are three major dams: Prosser Creek Reservoir Dam, Stampede Reservoir Dam (located with Sierra County) and Boca Reservoir Dam. One of the two major faults believed to be potential seismic sources appears to be relatively active and of special significance due to its close proximity to the three dams noted above. However, the Truckee earthquake of 1966 had a magnitude of 5.4 but only relatively slight damage occurred to both Prosser and Boca earth fill dams. Martis Creek Dam, found near the town of Truckee has been the subject of recent concern receiving national attention. The dam is managed by the Army Corp of Engineers and has been listed by the Corp as one of nation's six dams most at risk of failure. Three key risks of failure sited by the Corp are: seepage under the dam leading to foundation failure, a too small spillway leading to overflowing events in heavy rains, and an earthquake fault-line located within 200 yards of the dam. The dam is on an active monitoring program, not in use for water storage and has extensive remediation work underway.

In the western portion of the County, flooding in the event of failure of the Upper and Lower Scotts Flat Dams would inundate a wide area from east of Nevada City, through Nevada City and west to Lake Wildwood. The failure of such a dam would most likely be the result of a significant earthquake. Also in western Nevada County is the Rollins Reservoir on the Bear River, which flows into Combie Lake. The Nevada Irrigation District owns both. Inundation plans are in place for both bodies of water. It is predicted that a collapse of the Rollins Reservoir may impact Camp Far West reservoir in Yuba County. Three dams are owned by PG&E in the Spaulding Lake complex. Collapse of the three dams would cause significant flooding at the 2,700-foot level in the Town of Washington.

Inundation maps and Emergency Action Plans (EAP) prepared by dam owners are on file with the County, and for security purposes, can only be accessed through the Nevada County OES. Nevada County OES receives printed copies of Emergency Action Plans from FERC regulated dams as well as non-FERC dams such as NID and PGE. The County receives annual updates for the EAPs as well as participates in their scheduled annual drills and exercises. The EAPs contain warning levels, protocols/procedures for making

notifications & evacuations, and mapping of affects areas downstream. In an event triggering the activation of the EAP and notification, Nevada County OES normally receives direct phone calls from the originating source/agency or from County Dispatch and or Cal OES. The County in turn, follows the procedures in the EAPs and local EOPs to make required notifications. For warning to the public & evacuation procedures, County protocols are to use the local radio stations, TV news, as well as using the reverse 911 system. Nevada County OES can also request the NWS to issue an EAS. The Nevada County OES has also developed an evacuation plan that specifies emergency procedures for evacuation, control, and re-entry of areas at risk for possible dam inundation.

The EAPs for available significant and high hazard dams were searched. Information related to dam failure vulnerability for each dam is shown on Table 4-51.

Table 4-51 Nevada County – Significant and High Hazard Dams: EAP Vulnerability Assessment

Dam	Creek	Potential Downstream Impacts	Time to Impact of Wave
Martis Creek Dam (USACE)	Martis Creek; converges with the Truckee River	In and around Reno Nevada	unknown
Englebright Dam (USACE)	Yuba River	Inundate entire City of Marysville and surrounding communities	unknown
Combie Dam (NID)	Bear River	Downstream land use is predominantly agricultural. The primary impact would be to the vicinity of Highway 49 crossing.	The time to impact of wave is within 25 minutes of failure.
Lake Spaulding Dam	South Fork Yuba River	Lang Crossing Bridge, Holbrook Flat, Residences and bridge along Maybert Road, Town of Washington, Washington Road Bridge, Edwards Crossing Bridge, Purdon Crossing Bridge, 2 Hoyt Corssing Bridges, Jones Bar, Town of Bridgeport, Pleasant Valley Road Bridge, Marina – Englebright Lake, Englebright Dam	Unknown
Scotts Flat Dam (NID)	Deer Creek	The City of Nevada City and the residential development around Lake Wildwood. Once downstream of Lake Wildwood, Deer Creek joins the Yuba River where the primary impact in this area would be to the City of Marysville	45 minutes to Nevada City; 3:07 to upstream of Marysville
Dutch Flat #2 Forbay Dam (NID) Yuba-Bear Project	Off-stream from Bear River, Bear River Watershed	No areas of concern between the Dutch Flat Forbay and Dutch Flat Afterbay	N/A
Dutch Flat Afterbay Dam (NID) Yuba-Bear Project	Bear River, Bear River Watershed	No areas of concern between the Dutch Flat Afterbay and Rollins Reservoir. The only structure below the Afterbay is the Chicago Park Powerhouse, a project facility.	N/A

Dam	Creek	Potential Downstream Impacts	Time to Impact of Wave
Rollins Dam (NID) Yuba-Bear Project	Bear River, Bear River Watershed	Primary area of concern are two residences approximately 300 yards downstream. Next is the State Highway 174 Bridge approximately 1 mile downstream of dam.	1 minute to the Bridge much less for the residences.
Jackson Lake Dam (NID) Yuba-Bear Project	Jackson Creek South Yuba River Watershed	Area of primary concern is the Jackson Creek Campground approximately 2.5 miles downstream. USFS Campgrounds, Bowman Lake Road, Town of Washington, Englebright, Bullards Bar, Narrows	12 minutes for initial wave; 50 minutes for the peak flood wave.
French Lake Dam (NID) Yuba-Bear Project	Canyon Creek French Lake Dam South Yuba River Watershed	Primary area of concern is Canyon Creek Campground below Faucherie Dam and 5 miles downstream of French Lake Dam. USFS Campgrounds, Bowman Lake Road, Town of Washington, Englebright, Bullards Bar, Narrows	9 minutes.
Faucherie Dam (NID) Yuba-Bear Project	Canyon Creek South Yuba River Watershed	Primary area of concern is Canyon Creek Campground approximately 1 mile downstream. USFS Campgrounds, Bowman Lake Road, Town of Washington, Englebright, Bullards Bar, Narrows	4 minutes.
Bowman Dam (NID) Yuba-Bear Project	Canyon Creek South Yuba River Watershed	Town of Washington is 13.9 miles below the dam. USFS Campgrounds, Bowman Lake Road, Town of Washington, Englebright, Bullards Bar, Narrows	25 minutes.
Jackson Meadows Dam (NID) Yuba-Bear Project	Middle Yuba River Middle Yuba River Watershed	Area of primary concern is the USFS campground at Milton Reservoir. USFS Campgrounds, Bowman Lake Road, Town of Washington, Englebright, Bullards Bar, Narrows	3 minutes.

Source: Nevada County OES

Future Development

Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation areas will continue to occur.

4.3.6. Drought and Water Shortage Vulnerability Assessment

Likelihood of Future Occurrence—Drought - Likely; Water Shortage - Occasional
Vulnerability—Medium

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

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

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Table 4-52 show drought impacts for the Nevada County Planning Area from 1850 to April 2017. The data represented is skewed, with the majority of these impacts from records within the past ten years.

Table 4-52 Nevada County Drought Impacts

Category	Number of Impacts
Agriculture	21
Business and Industry	10
Energy	4
Fire	12
Plants & Wildlife	25
Relief, Response, and Restrictions	43
Society and Public Health	32
Tourism and Recreation	14
Water Supply and Quality	39
Total	**200**

Source: National Drought Mitigation Center

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

It is difficult to quantitatively assess drought impacts to Nevada County because not many county-specific studies have been conducted. Some factors to consider include: the impacts of fallowed agricultural land, habitat loss and associated effects on wildlife, and the drawdown of the groundwater table. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in Nevada County. It can be assumed, however, that the loss of production in one sector of the economy

would affect other sectors. This is especially true of agriculture in Nevada County, which is highly vulnerable to drought conditions.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Land subsidence can also occur when the groundwater table is depleted.

Tree Mortality (Drought and Bark Beetles)

One of the specific vulnerabilities of drought in Nevada County is the increased risk to trees from beetle kill. Bark beetles mine the inner bark (the phloem-cambial region) on twigs, branches, or trunks of trees and shrubs. This activity often starts a flow of tree sap in conifers, but sometimes even in hardwoods like elm and walnut. The sap flow (pitch tube) is accompanied by the sawdustlike frass created by the beetles. Frass accumulates in bark crevices or may drop and be visible on the ground or in spider webs. Small emergence holes in the bark are a good indication that bark beetles were present. Removal of the bark with the emergence holes often reveals dead and degraded inner bark and sometimes new adult beetles that have not yet emerged. Bark beetles frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. Bark beetles can contribute to the decline and eventual death of trees; however only a few aggressive beetle species are known to be the sole cause of tree mortality (see Figure 4-68).

Figure 4-68 Monterey Pine Killed by Engraver Beetles

Source: University of California

In addition to attacking larger limbs, some species such as cedar and cypress bark beetles feed by mining twigs up to 6 inches back from the end of the branch, resulting in dead tips. These discolored shoots hanging

on the tree are often referred to as “flagging” or “flags.” (see Figure 4-69) Adult elm bark beetles feed on the inner bark of twigs before laying eggs. If an adult has emerged from cut logs or a portion of a tree that is infected by Dutch elm disease, the beetle’s body will be contaminated with fungal spores. When the adult beetle feeds on twigs, the beetle infects healthy elms with the fungi that cause Dutch elm disease. Elms showing yellowing or wilting branches in spring may be infected with Dutch elm disease.

Figure 4-69 Flag Tips from Cypress Bark Beetle Feeding

Source: University of California

More information regarding beetle kill is discussed in the wildfire vulnerability in Section 4.3.14.

Future Development

According to the HMPC, Nevada County has access to large quantities of water through surface water as well as groundwater. However, population growth in the County will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth.

4.3.7. Earthquake Vulnerability Assessment

Likelihood of Future Occurrence—Occasional (major earthquake); Likely (minor earthquake)
Vulnerability—High

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable.

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

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

Common impacts from earthquakes include damage to infrastructure and buildings (e.g., crumbling of unreinforced masonry, failure of architectural facades, rupturing of underground utilities, and road closures). Earthquakes also frequently trigger secondary hazards, such as dam failures, landslides and rock falls, explosions, and fires that can become disasters themselves.

According to the U.S. Geological Service, Nevada County falls within five earthquake ground movement intensity zones. The western half of the County is in the lower intensity zones (5-20% gravity), the middle portion is in the moderate zone (21-30% gravity) and the eastern edge is in the 31-40% gravity zone. No part of Nevada County is exposed to an earthquake probability of gravity 40 or more.

According to the Nevada County General Plan Safety Element, Lake of the Pines is the primary community developed in the 8-10% peak ground acceleration zone of Nevada County. Developed primarily since the 1960's, Lake of the Pines would not be expected to suffer significant damage during a normal earthquake event for this area. Grass Valley, Nevada City, Penn Valley, Cedar Ridge, Lake Wildwood, Rough and Ready, and North San Juan are the communities primarily in the 10-15% peak ground acceleration zone. Of these communities, Grass Valley, North San Juan, Rough and Ready and Nevada City are those, which have structures of un-reinforced masonry buildings in their older neighborhoods and commercial districts. While possible, it is not expected that normal seismic activity in this area would result in significant damage. Truckee is the major community of Nevada County located in the 30-40% peak ground acceleration zone. Truckee is similar to Nevada City and Grass Valley in terms of the location of un-reinforced masonry

buildings being located in the historic portions of town and the commercial district. Previous local earthquake history has not shown these structures to be at significant risk during normal events.

Estimating Potential Losses

Earthquake losses will vary across the Nevada County Planning Area depending on the source and magnitude of the event. To further evaluate potential losses associated with earthquake activity in the Planning Area, a HAZUS-MH probabilistic earthquake scenario was run for the 2017 LHMP Update.

2017 Earthquake Scenario

HAZUS-MH 2.2 was utilized to model earthquake losses for the County. Specifically, the probable magnitude used for Nevada County utilized a 7.0 magnitude earthquake, based on data from the Nevada County General Plan. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis.

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

The results of the probabilistic scenario are captured in Table 4-53. Key losses included the following:

- Total economic loss estimated for the earthquake was $1.747 billion, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled $1.614 billion.
- Over 24 percent of the buildings in the County were at least moderately damaged. 774 buildings were completely destroyed.
- Over 60 percent of the building- and income-related losses were residential structures.
- 16 percent of the estimated losses were related to business interruptions.
- The mid-day earthquake caused the most casualties: 34
- 27 percent of the households experienced a loss of potable water the first day after the earthquake.

Table 4-53 HAZUS-MH Earthquake Loss Estimation 2,500-Year Scenario Results

Type of Impact	Impacts to County
Total Buildings Damaged (based on 51,000 buildings)	Slight: 17,495 Moderate: 9,560 Extensive: 2,156 Complete: 774
Building and Income Related Losses	$1.614 billion 60 percent of damage related to residential structures

Type of Impact	Impacts to County	
	16 percent of loss due to business interruption	
Total Economic Losses (Includes building, income and lifeline losses)	$1.747 billion	
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 152 Requiring hospitalization: 27 Life threatening: 2 Fatalities: 4	
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 422 Requiring hospitalization: 111 Life threatening: 18 Fatalities: 34	
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 280 Requiring hospitalization: 76 Life threatening: 22 Fatalities: 22	
Damage to Transportation Systems	17 highway bridges, moderate damage 1 bus facility, moderate damage 1 railway facility, moderate damage 1 airport facility, moderate damage	
Damage to Essential Facilities	No facilities with at least moderate damage	
Damage to Utility Systems	5 Wastewater facilities with moderate damage: 4 communication facilities with at least moderate damage 989 potable water line breaks 709 waste water line breaks 203 natural gas line breaks	
Households without Power/Water Service (Based on 41,527 total households)	Power loss, Day 1: 11,327 Power loss, Day 3: 7,597 Power loss, Day 7: 1,125 Power loss, Day 30: 489 Power loss, Day 90: 0	Water loss, Day 1: 6,892 Water loss, Day 3: 4,674 Water loss, Day 7: 2,200 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	539	
Shelter Requirements	302 people	
Debris Generation	0.32 million tons	

Source: HAZUS-MH 2.2

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

4.3.8. Flood: 1%/0.2% Annual Chance Vulnerability Assessment

Likelihood of Future Occurrence—1% – Occasional; 0.2% – Unlikely
Vulnerability—High

Flooding is a significant problem in Nevada County. Historically, the Nevada County Planning Area has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas.

Historically, much of the growth in the County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Primarily due to the significant east to west elevation change in the western part of the county, most of the heavy storm rainfall moves quickly out of the watershed. In the eastern part of the County, higher elevation causes most precipitation to fall as snow during the winter season. Flooding affecting Nevada County normally occurs when heavy rainfall combines with unseasonably warm temperatures that begin a pre - mature melt of the snow pack. This phenomenon is most dramatically seen on the Yuba River with its steep canyon walls and the Truckee River with its smaller river channel. The Bear River because of its lower elevations and shallow riverbed tends to be impacted more by heavy rain over an extended period.

Flood Hazard Assessment

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

Values at Risk

Unincorporated Nevada County and its incorporated jurisdictions have mapped FEMA flood hazard areas. GIS was used to determine the possible impacts of flooding within the County and how the risk varies

across the Planning Area. The following methodology was followed in determining improved parcel counts and assets at risk to the 1% annual chance flood event and 0.2% annual chance flood events. Analysis on values at risk to floods in the County is provided for two different areas in this base plan:

- Nevada County Planning Area
- Unincorporated Nevada County

The Nevada County Planning Area includes both the unincorporated County and each incorporated jurisdiction, essentially the entire geographical area of Nevada County. Summary tables for the Planning Area are presented below. For the unincorporated County, both summary and detail tables are shown and discussed below. Detail tables for the participating jurisdictions are included in their respective annexes to this plan.

Methodology

Nevada County's 2016/2017 Assessor Data and the County's GIS parcel data, obtained from Nevada County, were used as the basis for the county inventory of parcels, values, and acres. Nevada County has a FEMA effective DFIRM dated February 3, 2010, with digital LOMR updates dated May 19, 2014, which was obtained from the National Flood Hazard Layer to perform the flood analysis.

In some cases there are parcels in multiple flood zones, such as Zone A, Shaded X, or Zone X. GIS was used to create a centroid, or point representing the center of the parcel polygon. DFIRM flood data was then overlaid on the parcel layer. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned the flood zone for the entire parcel. The parcels were segregated and analyzed in this fashion for the Nevada County Planning Area. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and the GIS parcel layer.

Each of the DFIRM flood zones that begins with the letter 'A' depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-54 explains the difference between DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the Planning Area, and shows which flood zones are present in each jurisdiction. The effective DFIRM maps for the Nevada County Planning Area are shown on Figure 4-70.

Table 4-54 Nevada County Planning Area – DFIRM Flood Hazard Zones

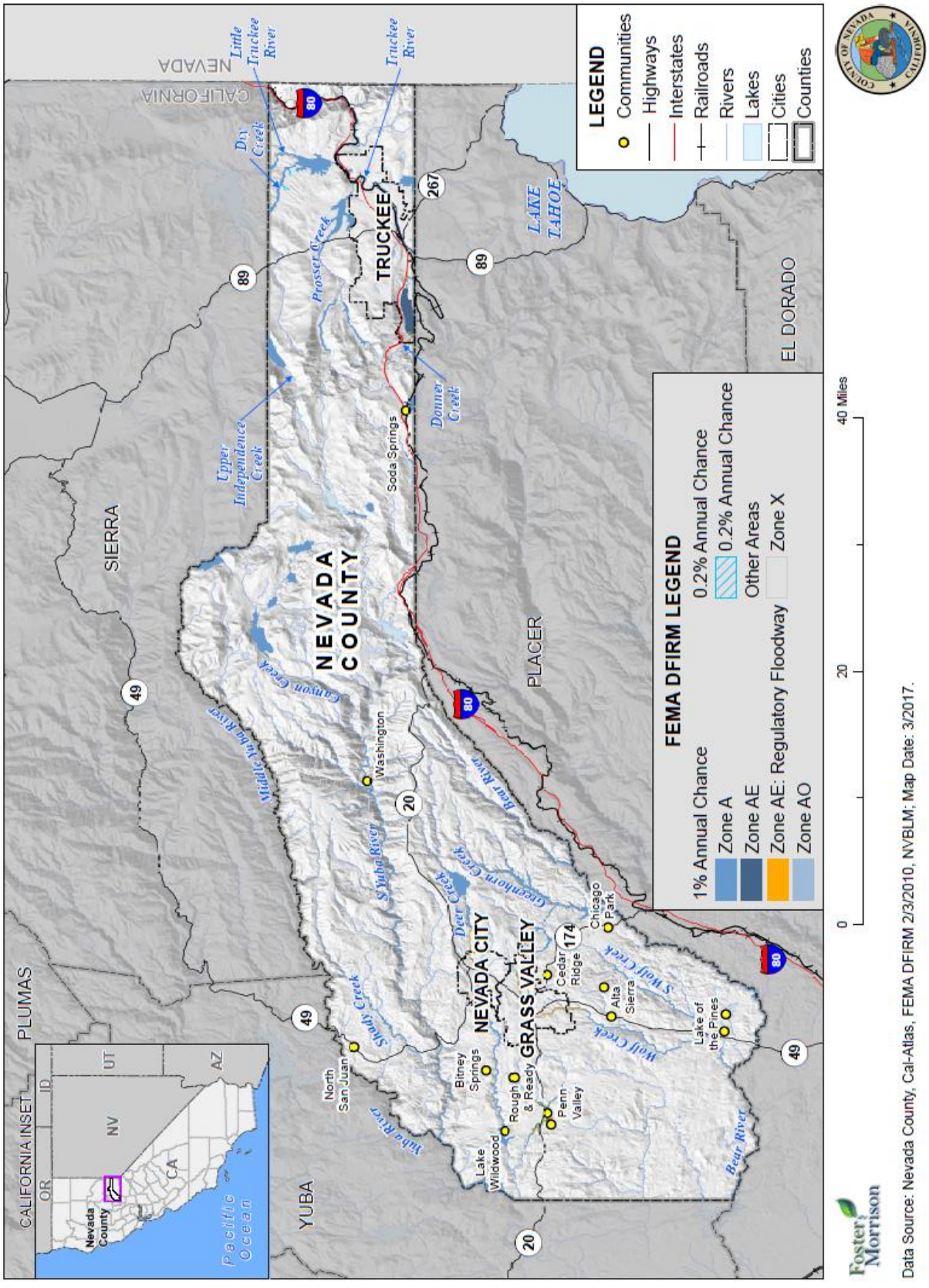
Flood Zone	Description	Present in Grass Valley	Present in Nevada City	Present in Truckee	Present in Nevada County
A	1% (100-year Flood): No base flood elevations provided	X	X	X	X
AE	1% (100-year Flood): Base flood elevations provided	X	X	X	X
AE Floodway*	1% (100-year Flood): Regulatory floodway; Base flood elevations provided	X	X	X	X

Flood Zone	Description	Present in Grass Valley	Present in Nevada City	Present in Truckee	Present in Nevada County
Shaded X	0.2% (500-year Flood): The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X	X	X	X
X (unshaded)	No flood hazard	X	X	X	X
D	Unmapped Areas			X	X

Source: FEMA

*In Nevada County, the floodway is defined as the channel of any water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation more than one foot.

Figure 4-70 Nevada County Planning Area – DFIRM Flood Zones



Flood Loss Estimate

The loss estimate for flood is based on the total of improved and contents value. Improved parcels include those with improved structure values identified in the Assessor's database. Only improved parcels and the value of their structure improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of improvements and structure contents. The land value is represented in the detailed flood tables, but are only present to show the value of the land associated with each flood zone.

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

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total loss of an area or building. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percent of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an assumed average flood depth of 2 feet.

The end result of the flood hazard analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard. Results are presented here first for the Nevada County Planning Area and secondly for unincorporated Nevada County. Results for the incorporated jurisdictions are presented in their annexes to the plan.

Flooded Acres

In addition to the centroid analysis used to obtain numbers of parcels and assets at risk to flood hazards, parcel boundary analysis was performed to obtain total acres and flooded acres by flood zone for each parcel. The parcel layer was intersected with the FEMA DFIRM data to obtain the acres flooded. The flooded acres analysis methodology and results are presented at the end of this section.

Nevada County Planning Area

Table 4-55 and Table 4-56 contain flood analysis results for the entire Nevada County Planning Area. This includes unincorporated Nevada County and the incorporated jurisdictions. These tables show the number of parcels and values at risk to the 1% and 0.2% annual chance event for the entire Nevada County Planning Area. Table 4-55 shows the value of improved parcels by jurisdiction. Table 4-56 shows the improved parcels by property use category in each flood zone for the entire Planning Area.

Table 4-55 Nevada County Planning Area – Count and Improved Value of Parcels in 1% and 0.2% Annual Chance Flood Zones by Jurisdiction

Jurisdiction	1 % Annual Chance Flood Zone			0.2% Annual Chance Flood Zone**		
	Total Parcel Count	Improved Parcel Count*	Total Improved Value	Total Parcel Count	Improved Parcel Count*	Total Improved Value
Grass Valley	98	71	$8,205,360	87	78	$11,656,540
Nevada City	37	23	$4,449,305	2	2	$331,655
Truckee	225	165	$57,940,781	87	70	$18,321,645
Unincorporated	471	190	$28,144,917	7	5	$1,090,935
Total	**831**	**449**	**$98,740,363**	**183**	**155**	**$31,400,775**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table 4-56 Nevada County Planning Area – Count and Improved Value by Property Use and Detailed DFIRM Flood Zones, with Content Replacement Values

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone A (1% Annual Chance Flood)						
Agricultural	25	6	$4,118,041	$650,456	$650,456	$1,300,912
Commercial	10	6	$971,662	$1,470,765	$1,470,765	$2,941,530
Government	107	0	$360,057	$0	$0	$0
Industrial	1	1	$30,943	$166,162	$249,243	$415,405
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	21	0	$86,069	$0	$0	$0
Residential	301	162	$16,954,815	$23,270,082	$11,635,041	$34,905,123
Total	**465**	**175**	**$22,521,587**	**$25,557,465**	**$14,005,505**	**$39,562,970**
Zone AE (1% Annual Chance Flood)						
Agricultural	3	1	$262,886	$4,064	$4,064	$8,128
Commercial	14	8	$7,888,601	$2,785,989	$2,785,989	$5,571,978
Government	7	0	$0	$0	$0	$0
Industrial	6	6	$1,225,863	$460,859	$691,289	$1,152,148
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	4	0	$21,789	$0	$0	$0
Residential	238	197	$39,408,003	$61,268,258	$30,634,129	$91,902,387
Total	**272**	**212**	**$48,807,142**	**$64,519,170**	**$34,115,471**	**$98,634,641**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone AE Floodway (1% Annual Chance Flood)						
Agricultural	1	0	$27,056	$0	$0	$0
Commercial	17	9	$2,440,505	$2,460,537	$2,460,537	$4,921,074
Government	4	0	$0	$0	$0	$0
Industrial	1	1	$23,676	$40,982	$61,473	$102,455
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	71	52	$3,461,417	$6,162,209	$3,081,105	$9,243,314
Total	**94**	**62**	**$5,952,654**	**$8,663,728**	**$5,603,115**	**$14,266,843**
1 % Annual Chance Grand Total	**831**	**449**	**$77,281,383**	**$98,740,363**	**$53,724,090**	**$152,464,453**
Shaded X (0.2% Annual Chance **)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	43	36	$5,065,666	$10,520,614	$10,520,614	$21,041,228
Government	9	0	$0	$0	$0	$0
Industrial	1	1	$55,154	$98,924	$148,386	$247,310
Institutional	2	2	$48,419	$135,634	$135,634	$271,268
Miscellaneous	1	0	$0	$0	$0	$0
Residential	127	116	$7,249,549	$20,645,603	$10,322,802	$30,968,405
Total	**183**	**155**	**$12,418,788**	**$31,400,775**	**$21,127,436**	**$52,528,211**
Zone D (Unmapped)						
Agricultural	537	110	$28,536,519	$7,691,730	$7,691,730	$15,383,460
Commercial	31	17	$3,819,084	$3,290,015	$3,290,015	$6,580,030
Government	706	1	$1,572,940	$735	$735	$1,470
Industrial	1	1	$66,040	$208,378	$312,567	$520,945
Institutional	6	4	$513,935	$1,121,164	$1,121,164	$2,242,328
Miscellaneous	93	3	$3,003,823	$60,004	$60,004	$120,008
Residential	2,386	1,192	$160,005,975	$219,552,442	$109,776,221	$329,328,663
Total	**3,760**	**1,328**	**$197,518,316**	**$231,924,468**	**$122,252,436**	**$354,176,904**
Zone X – Unshaded (No Mapped Flood Hazard)						
Agricultural	1,012	504	$88,225,461	$37,141,903	$37,141,903	$74,283,806
Commercial	1,509	1,077	$373,222,533	$667,620,463	$667,620,463	$1,335,240,926
Government	921	9	$11,723,739	$9,872,966	$9,872,966	$19,745,932
Industrial	207	182	$60,671,431	$144,080,211	$216,120,317	$360,200,528

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Institutional	107	73	$9,962,196	$97,431,634	$97,431,634	$194,863,268
Miscellaneous	511	11	$8,784,699	$179,813	$179,813	$359,626
Residential	54,386	44,798	$4,858,271,876	$10,463,580,491	$5,231,790,246	$15,695,370,737
Total	**58,653**	**46,654**	**$5,410,861,935**	**$11,419,907,481**	**$6,260,157,341**	**$17,680,064,822**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table 4-57 shows potential losses summarized by the 1% and 0.2% annual chance flood event with loss estimate and loss ratios for the Planning Area. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located in the Planning Area) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator that a community may have more difficulties recovering from a flood. The County should keep in mind that the loss ratio could increase with additional development in the 1% and 0.2% annual chance floodplain, unless development is elevated in accordance with the local floodplain management ordinance.

Table 4-57 Nevada County Planning Area – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	831	449	$98,740,363	$53,724,090	$152,464,453	$30,492,891	0.17%
0.2% Annual Chance**	183	155	$31,400,775	$21,127,436	$52,528,211	$10,505,642	0.06%
Grand Total	**1,014**	**604**	**$130,141,138**	**$74,851,526**	**$204,992,664**	**$40,998,533**	**0.23%**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

According to the information in Table 4-55 through Table 4-57, the Nevada County Planning Area has 449 improved parcels and roughly $152 million of structure and contents value in the 1% annual chance floodplain. There are 155 improved parcels and roughly $52 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 0.23% indicates that while the County does have assets at risk, those asset values do not indicate a disproportionate number of assets in the FEMA regulated floodplains.

Unincorporated Nevada County

Table 4-58 and Table 4-59 contain information for unincorporated Nevada County only. Table 4-58 shows the number of improved parcels and associated structure and other improved assets at risk to the each of

the FEMA flood zones using the DFIRM data in the unincorporated areas and Table 4-59 shows potential losses summarized by 1% and 0.2% annual chance flood events with loss estimates and loss ratios.

Table 4-58 Unincorporated Nevada County– Count and Improved Value by Property Use and Detailed Flood Zone with Contents Replacement Values

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone A (1% Annual Chance Flood)						
Agricultural	25	6	$4,118,041	$650,456	$650,456	$1,300,912
Commercial	4	1	$32,310	$156,566	$156,566	$313,132
Government	91	0	$360,057	$0	$0	$0
Industrial	1	1	$30,943	$166,162	$249,243	$415,405
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	20	0	$58,315	$0	$0	$0
Residential	257	126	$13,834,940	$17,934,183	$8,967,092	$26,901,275
Total	**398**	**134**	**$18,434,606**	**$18,907,367**	**$10,023,357**	**$28,930,724**
Zone AE (1% Annual Chance Flood)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	1	1	$1,861,620	$864,750	$864,750	$1,729,500
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	56	45	$3,749,521	$7,087,291	$3,543,646	$10,630,937
Total	**57**	**46**	**$5,611,141**	**$7,952,041**	**$4,408,396**	**$12,360,437**
Zone AE Floodway (1% Annual Chance Flood)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	2	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	14	10	$886,936	$1,285,509	$642,755	$1,928,264
Total	**16**	**10**	**$886,936**	**$1,285,509**	**$642,755**	**$1,928,264**
1 % Annual Chance Grand Total	**471**	**190**	**$24,932,683**	**$28,144,917**	**$15,074,507**	**$43,219,424**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Shaded X (0.2% Annual Chance **)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	6	5	$429,110	$1,090,935	$545,468	$1,636,403
Total	**7**	**5**	**$429,110**	**$1,090,935**	**$545,468**	**$1,636,403**
Zone D (Unmapped)						
Agricultural	537	110	$28,536,519	$7,691,730	$7,691,730	$15,383,460
Commercial	31	17	$3,819,084	$3,290,015	$3,290,015	$6,580,030
Government	706	1	$1,572,940	$735	$735	$1,470
Industrial	1	1	$66,040	$208,378	$312,567	$520,945
Institutional	6	4	$513,935	$1,121,164	$1,121,164	$2,242,328
Miscellaneous	93	3	$3,003,823	$60,004	$60,004	$120,008
Residential	2,380	1,190	$159,634,613	$218,694,249	$109,347,125	$328,041,374
Total	**3,754**	**1,326**	**$197,146,954**	**$231,066,275**	**$121,823,340**	**$352,889,615**
Zone X – Unshaded (No Mapped Flood Hazard)						
Agricultural	955	498	$84,674,508	$35,974,422	$35,974,422	$71,948,844
Commercial	165	123	$35,188,431	$63,613,580	$63,613,580	$127,227,160
Government	582	4	$2,472,898	$3,904,316	$3,904,316	$7,808,632
Industrial	23	21	$6,694,585	$18,537,375	$27,806,063	$46,343,438
Institutional	49	30	$4,495,217	$22,832,943	$22,832,943	$45,665,886
Miscellaneous	382	9	$6,694,812	$71,975	$71,975	$143,950
Residential	30,083	24,785	$2,713,408,839	$5,070,335,822	$2,535,167,911	$7,605,503,733
Total	**32,239**	**25,470**	**$2,853,629,290**	**$5,215,270,433**	**$2,689,371,210**	**$7,904,641,643**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table 4-59 Unincorporated Nevada County – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count*	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	471	190	$28,144,917	$15,074,507	$43,219,424	$8,643,885	0.10%
0.2% Annual Chance**	7	5	$1,090,935	$545,468	$1,636,403	$327,281	0.00%
Grand Total	**478**	**195**	**$29,235,852**	**$15,619,974**	**$44,855,826**	**$8,971,165**	**0.10%**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

According to Table 4-58 and Table 4-59, unincorporated Nevada County has 190 improved parcels and roughly $43 million of structure and contents value in the 1% annual chance floodplain. The unincorporated County has 5 improved parcels and roughly $1.6 million in structure and contents values in the 0.2% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described, there is a 1% chance in any given year of a flood event causing roughly $8.6 million in damage in the unincorporated areas of Nevada County. Applying the same factor, there is a 0.2% chance of a flood event causing $0.3 million in damage to the unincorporated County. A loss ratio of 0.10% indicates that while the unincorporated County has assets at risk in the floodplain, flood losses would be limited compared to the total built environment and the community would likely be able to recover adequately.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the County in comparison to total area within the Nevada County Planning Area, the nincorporated Nevada County, and the incorporated communities.

Methodology

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

Limitations

One limitation created by this type of analysis is that improvements are uniformly found throughout the parcel, while in reality, only portions of the parcel are improved, and improvements may or may not fall

within the flood zone portion of a parcel; thus, areas of improvements flooded calculated through this method may be higher or lower than those actually seen in a similar real world event.

The following tables represent a detailed and summary analysis of total acres for each FEMA DFIRM flood zone. Table 4-60 gives summary information for the Planning Area by jurisdiction. Table 4-61 gives a summary for the entire Planning Area by 1% and 0.2% annual chance, and shows what percentage of the County Planning Area falls in each flood zone.

Table 4-60 Nevada County Planning Area – Flooded Acres by Jurisdiction

Jurisdiction	Flood Zone	Total Flooded Acres	Improved Flooded Acres
Grass Valley	1% Annual Chance Flood Hazard	190	76
	0.2% Annual Chance Flood Hazard	63	32
	Other Areas	14,880	6,378
	Total	**15,133**	**6,486**
Nevada City	1% Annual Chance Flood Hazard	106	41
	0.2% Annual Chance Flood Hazard	4	2
	Other Areas	7,128	4,661
	Total	**7,238**	**4,704**
Truckee	1% Annual Chance Flood Hazard	707	172
	0.2% Annual Chance Flood Hazard	75	21
	Other Areas	29,542	11,680
	Total	**30,324**	**11,874**
Unincorporated Nevada County	1% Annual Chance Flood Hazard	19,729	2,593
	0.2% Annual Chance Flood Hazard	199	61
	Other Areas	942,637	249,137
	Total	**962,566**	**251,791**
Grand Total		**1,015,260**	**274,855**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

Table 4-61 Nevada County Planning Area – Flooded Acres Summary

Flood Zone	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
1% Annual Chance Flood Hazard	20,732	2,882	1.05%
0.2% Annual Chance Flood Hazard	340	117	0.04%
Other Areas	994,188	271,856	98.91%
Total	**1,015,260**	**274,855**	**100.00%**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

Table 4-62 gives detailed information by property use for the unincorporated County. This information is available for each jurisdiction in their respective annexes. Table 4-63 gives a summary for the entire Planning Area by 1% and 0.2% annual chance, and shows what percentage of the unincorporated County falls in each flood zone

Table 4-62 Unincorporated Nevada County – Flooded Acres by Property Use and Detailed Flood Zone

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
1% Annual Chance Flood Hazard		
Zone AE Floodway		
Agricultural	0	0
Commercial	2	1
Government	19	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	125	83
Zone AE Floodway Total	**147**	**84**
Zone AE		
Agricultural	0	0
Commercial	3	2
Government	1	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	173	118
Zone AE Total	**176**	**120**
Zone AO		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Zone AO Total	**0**	**0**
Zone A		
Agricultural	1,746	453
Commercial	28	10
Government	11,031	47

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Industrial	20	20
Institutional	0	0
Miscellaneous	1,666	0
Residential	4,914	1,859
Zone A Total	**19,406**	**2,389**
1% Annual Chance Flood Hazard Total	**19,729**	**2,593**
0.2% Annual Chance Flood Hazard		
Agricultural	33	0
Commercial	2	2
Government	58	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	107	60
0.2% Annual Chance Flood Hazard Total	**199**	**61**
Other Areas		
Zone X -Unshaded (no mapped floodplain		
Agricultural	66,563	25,363
Commercial	1,544	884
Government	57,010	210
Industrial	600	593
Institutional	2,373	1,432
Miscellaneous	11,706	388
Residential	328,538	195,750
Zone X - Unshaded Total	**468,334**	**224,621**
Zone D (unmapped)		
Agricultural	129,122	7,830
Commercial	384	79
Government	255,339	793
Industrial	1	1
Institutional	732	731
Miscellaneous	16,333	189
Residential	72,392	14,893
Zone D (unmapped) Total	**474,303**	**24,516**
Other Areas Total	**942,637**	**249,137**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

Table 4-63 Unincorporated Nevada County – Flooded Acres Summary

Flood Zone	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
1% Annual Chance Flood Hazard	19,729	2,593	1.03%
0.2% Annual Chance Flood Hazard	199	61	0.02%
Other Areas	942,637	249,137	98.95%
Total	**962,566**	**251,791**	**100.00%**

Source: FEMA 2/3/2010 DFIRM, Nevada County 2016 Parcel/Assessor's Data

Insurance Coverage, Claims Paid, and Repetitive Losses

Unincorporated Nevada County joined the NFIP on January 19, 1983. The County does not participate in the CRS program, but may consider joining. NFIP insurance data indicates that as of September 19, 2016, there were 127 policies in force in unincorporated Nevada County, resulting in $34,044,400 of insurance in force and $112,575 in annual premiums paid. Of these, 122 are for residential properties and 5 are nonresidential. 33 of these are in A zones; 4 are in D zones, and 90 policies are for parcels in the B, C, & X zones.

There have been 15 closed paid losses totaling $345,057; 14 of these were for residential properties and 1 was for nonresidential. Of these 15 paid losses, 10 were parcels in A zones and 6 parcels were in B, C, & X zones. Of the 15 claims, 14 claims were associated with pre-FIRM structures and 1 with post-FIRM structures. There has been one substantial damage claim since 1978. There has also been one repetitive loss (RL) property in the unincorporated County. The losses occurred per-FIRM in a B, C, or X zone, with payments totaling $53,877.90. There are no severe repetitive loss (SRL) properties in the unincorporated County.

Based on this analysis of insurance coverage, unincorporated Nevada County has exposure to the 100-year and greater floods. Of the 449 improved parcels within the 100-year floodplain, only 66 (or 14.7 percent) of those parcels maintain flood insurance. This can be seen, along with details for the rest of the Planning Area) on Table 4-64.

Table 4-64 Nevada County Planning Area – Percentages of Policy Holders to Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Grass Valley	71	14	19.7%
City of Nevada City	23	1	4.3%
Town of Truckee	165	18	10.9%
Unincorporated County	190	33	17.4%
Total	**449**	**66**	**14.7%**

Source: FEMA 2/3/2010 DFIRM; 8/19/2016 NFIP Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

Population at Risk

A separate analysis was performed to determine population in flood zones. Using GIS, the DFIRM Flood dataset was overlayed on the improved residential parcel data. Those parcel centroids that intersect a flood zone were counted and multiplied by the Census Bureau average household size for each jurisdiction; results were tabulated by jurisdiction and flood zone (see Table 4-65). According to this analysis, there is a population of 974 in the 1% annual chance flood event, and 268 in the 0.2% annual chance flood event.

Table 4-65 Nevada County Planning Area – Population at Risk to Flooding

	1% Annual Chance		0.2% Annual Chance	
Jurisdiction	Improved Residential Parcels*	Population**	Improved Residential Parcels*	Population**
Grass Valley	55	112	50	102
Nevada City	18	38	2	4
Truckee	157	399	59	150
Unincorporated	181	425	5	12
Total	**411**	**974**	**116**	**268**

Source: FEMA 2/3/2010 DFIRM, US Census Bureau 2010 Estimates, Nevada County 2016 Assessor/Parcel Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

** Census Bureau 2010 average household sizes are: Grass Valley – 2.04, Nevada City – 2.09; Truckee – 2.54, Unincorporated – 2.35

Historical, Cultural, and Natural Resources at Risk

The Nevada County Planning Area has significant historical, cultural, and natural resources located throughout the County as previously described. GIS analysis of these resources was not possible due to data limitations. However, it can be assumed that those historical, cultural and natural resources located within the 1% and 0.2% floodplains are at risk to flooding. It should also be noted here, that natural areas, such as wetlands and riparian areas within the floodplain, often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and

infiltration of floodwaters. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the Nevada County Planning Area.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the Nevada County Planning Area to determine critical facilities in the 1% and 0.2 annual chance floodplains. Using GIS, the DFIRM flood zones were overlayed on the critical facility GIS layer. Figure 4-71 shows critical facilities, as well as the DFIRM flood zones. Table 4-66 details critical facilities by facility type and count. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the County, there are likely some that are present within identified floodplains.

Figure 4-71 Nevada County Planning Area – Critical Facilities in DFIRM Flood Zones

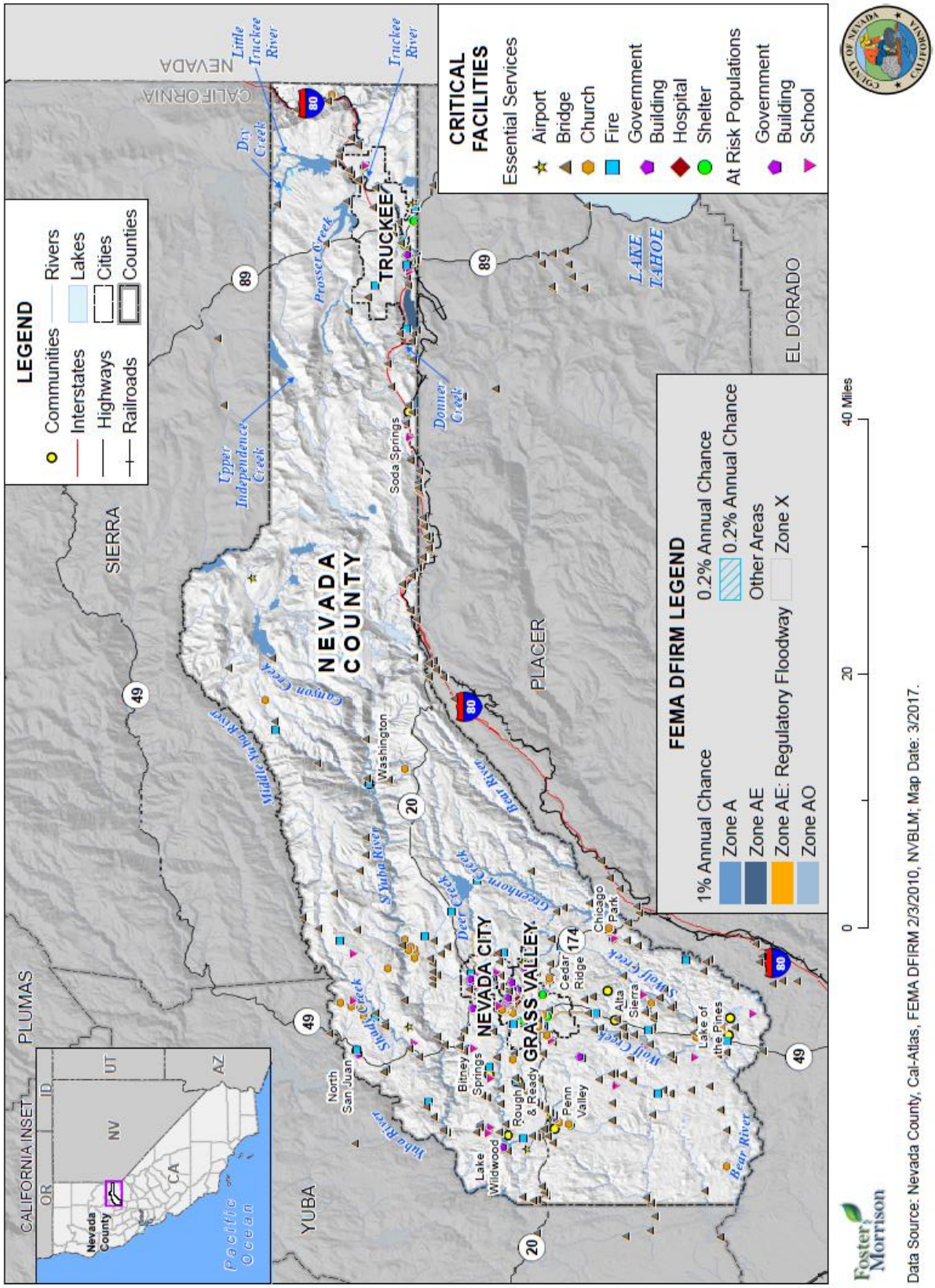


Table 4-66 Nevada County Planning Area – Critical Facilities by Detailed DFIRM Flood Zones

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
1% Annual Chance Flood		
Zone AE		
Essential Services	Airport	0
	Bridge	13
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**13**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**0**
	ZONE AE Total	**13**
Zone A		
Essential Services	Airport	0
	Bridge	56
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**56**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**0**
	ZONE A Total	**56**
1% Annual Chance Flood Total		**69**
Shaded X – 0.2% Annual Chance Flood		
Essential Services	Airport	0
	Bridge	1
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	1
	Total	**2**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	1
	Shelter	0
	Total	**1**
0.2% Annual Chance Flood Total		**3**
Zone D – Unmapped		
Essential Services	Airport	2
	Bridge	36
	Church	2
	Fire	4
	Government Building	1
	Hospital	0
	School	0
	Shelter	0
	Total	**45**

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	2
	Shelter	0
	Total	**2**
Zone D (Unmapped) Total		**47**
Zone X Unshaded (No mapped flood area)		
Essential Services	Airport	7
	Bridge	168
	Church	59
	Fire	35
	Government Building	51
	Hospital	6
	School	0
	Shelter	27
	Total	**353**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	6
	Hospital	0
	School	52
	Shelter	0
	Total	**58**
ZONE X (UNSHADED) Total		**411**

Source: FEMA 2/3/2010 DFIRM, Nevada County GIS

Overall Community Impact

Floods and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that floods can have potentially devastating economic impacts to certain areas of the County. However, many of the floods in the County are minor, localized flood events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

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

Future Development and Future Flood Conditions

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

Future Development: General Considerations

Communities that participate in the NFIP adopt regulations and codes that govern development in special flood hazard areas, and enforce those requirements through their local floodplain management ordinances through the issuance of permits. Nevada County's floodplain management ordinance provides standards for development, subdivision of land, construction of buildings, and improvements and repairs to buildings that meet the minimum requirements of the NFIP.

The International Residential Code (IRC) and International Building Code (IBC), by reference to ASCE 24, include requirements that govern the design and construction of buildings and structures in flood hazard areas. FEMA has determined that the flood provisions of the I-Codes are consistent with the requirements of the NFIP (the I-Code requirements shown either meet or exceed NFIP requirements). ASCE 24, a design standard developed by the American Society of Civil Engineers, expands on the minimum NFIP requirements with more specificity, additional requirements, and some limitations.

With the adoption of the 2015 International Code, communities will be moving towards a more stringent approach to regulatory floodplain management, beyond the minimum requirements of the NFIP. The adoption and enforcement of disaster-resistant building codes is a core community action to promote effective mitigation. When communities ensure that new buildings and infrastructure are designed and constructed in accordance with national building codes and construction standards, they significantly increase local resilience now and in the future. With continued advancements in building codes, local ordinances should be reviewed and updated to meet and exceed standards as practicable to protect new development from future flood events and to further promote disaster resiliency.

One of the most effective ways to reduce vulnerability to potential flood damage is through careful land use planning that fully considers applicable flood management information and practices. Master planning will also be necessary to assure that open channel flood flow conveyances serving the smaller internal streams and drainage areas are adequately prepared to accommodate the flows. Preservation and maintenance of natural and riparian areas should also be an ongoing priority to realize the flood control benefits of the natural and beneficial functions of these areas. Also to be considered in reducing flooding

in areas of existing and future development is to promote implementation of stormwater program elements and erosion and sediment controls, including the clearing of vegetation from natural and man-made drains that are critical to flood protection. Both native and invasive species can clog drains, and reduce flows of floodwaters, which slow that natural drainage process and can exacerbate flooding.

Future Development: DFIRM Analysis

Future development areas for unincorporated Nevada County were made available by County GIS for this plan. An analysis was performed to quantify parcels within these development areas that are also in flood hazard areas. Results can provide information on how and where to grow in the future. GIS was used to determine the number of parcels in the 1% and 0.2% annual chance flood events within the future development areas. GIS was used to create a centroid, or point representing the center of the parcel polygon.

Four parcels centroids are in the flood zones, none of which are currently improved. One is in Quail Lake in Zone A, one in is Rincon Del Rio in Zone A, and two are in the Teel Property in Zone A as well. The future development zones in the DFIRM flood zones are shown on Figure 4-72, and a summary of properties in the flood zone is detailed in Table 4-67.

Figure 4-72 Nevada County – Future Development and DFIRM Areas

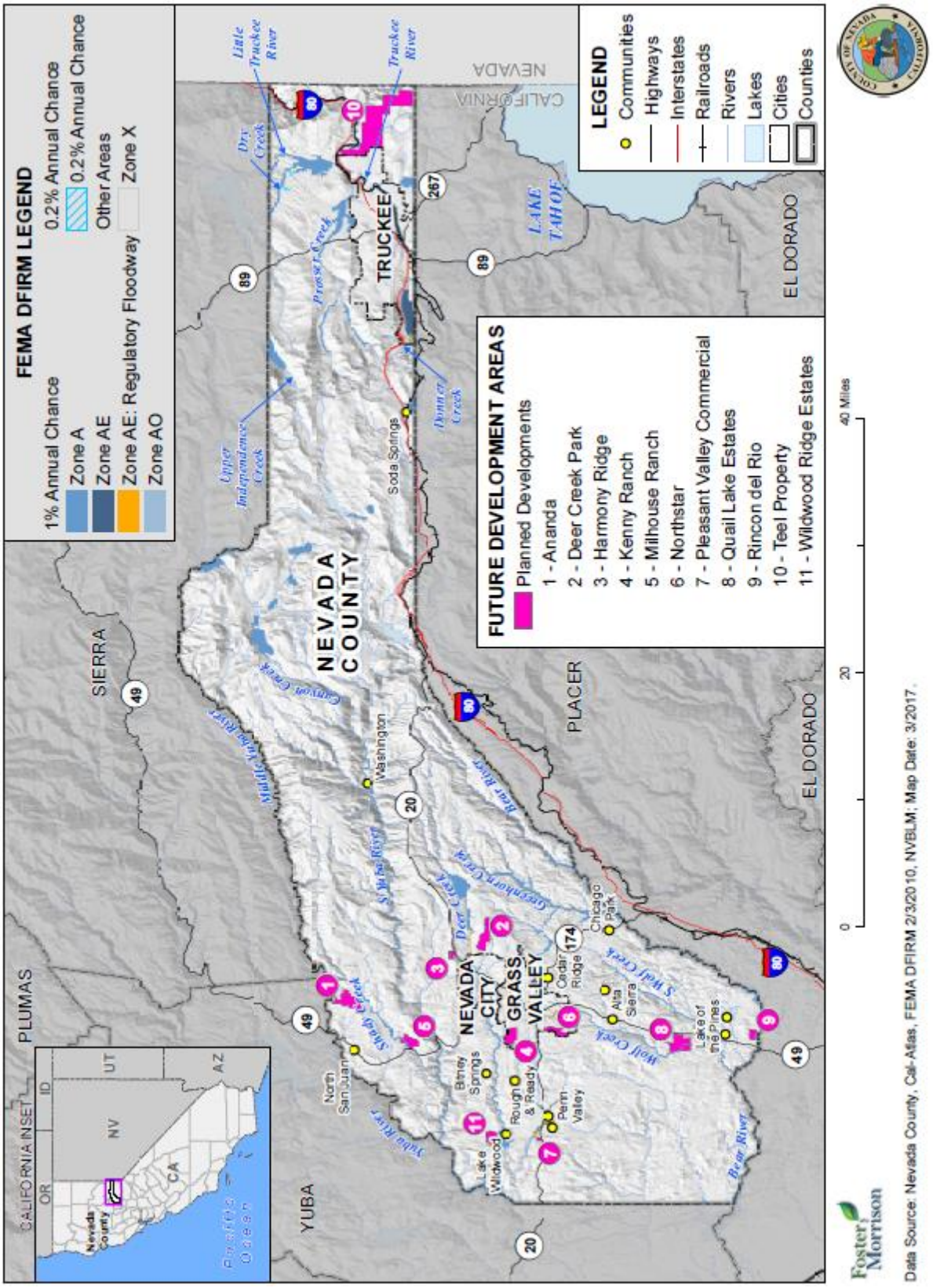


Table 4-67 Nevada County – Future Development in DFIRM Flood Zone Summary

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count
1% Annual Chance Flood		
Zone A	4	0
Zone AE	0	0
Zone AE - Floodway	0	0
Total	**4**	**0**
0.2% Annual Chance Flood		
Zone X - Shaded	0	0
Total	**0**	**0**
Grand Total	**4**	**0**

Source: FEMA 2/3/2010 DFIRM, Nevada County GIS

Future Flood Conditions: The Effects of Climate Change

The effects of climate change on future flood conditions should also be considered. While the risk and associated short and long term impacts of climate change are uncertain, experts in this field tend to agree that among the most significant impacts include those resulting from increased heat and precipitation events that cause increased frequency and magnitude of flooding. Changes associated with climate change and flooding could be significant given the higher elevations in the County where winter snow could turn to more significant rain events. Increases in damaging flood events will cause greater property damage, public health and safety concerns displacement, and loss of life. In addition, an increase in the magnitude and severity of flood events can lead to potential contamination of potable water and contamination of food crops given the agricultural industry in the County. Displacement of residents can include both temporary and long-term displacement, increase in insurance rates or restriction of coverage in vulnerable areas.

Nevada County will continue to study the risk and vulnerability associated with future flood conditions, both in terms of future growth areas and other considerations such as climate change, as they evaluate and implement their flood mitigation and adaptation strategy for the Nevada County Planning Area.

Future Flood Conditions: ARkStorm Scenario

Also to be considered in evaluating potential "worst case" future flood conditions, is the ARkStorm Scenario. Although much attention in California's focuses on the "Big One" as a high magnitude earthquake, there is the risk of another significant event in California – a massive, statewide winter storm. The last such storms occurred in the 19th century, outside the memory of current emergency managers, officials, and communities. However, massive storms are a recurring feature of the state, the source of rare but inevitable disasters. The USGS Multi Hazards Demonstration Project's (MHDP) developed a product called ARkStorm, which addressed massive U.S. West Coast storms analogous to those that devastated California in 1861-1862. Over the last decade, scientists have determined that the largest storms in

California are the product of phenomena called Atmospheric Rivers, and so the MHDP storm scenario is called the ARkStorm, for Atmospheric River 1000 (a measure of the storm's size).

Scientific studies of offshore deposits in northern and southern California indicate that storms of this magnitude and larger have occurred about as often as large earthquakes on the southern San Andreas Fault. Such storms are projected to become more frequent and intense as a result of climate change. This scientific effort resulted in a plausible flood hazard scenario to be used as a planning and preparation tool by hazard mitigation and emergency response agencies.

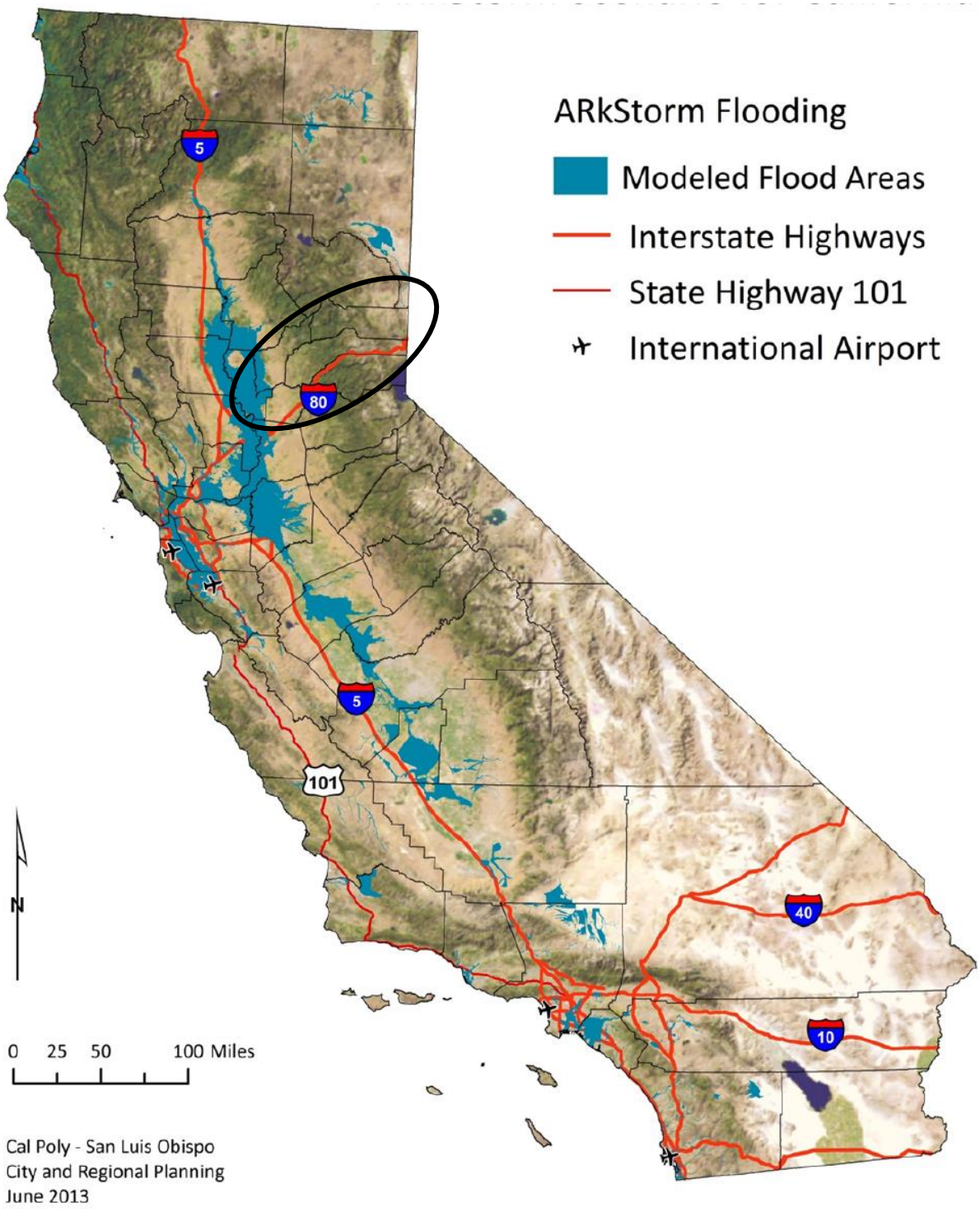
For the ARkStorm Scenario, experts designed a large, scientifically realistic meteorological event followed by an examination of the secondary hazards (e.g., landslides and flooding), physical damages to the intense winter storms of 1861-62 that left California's Central Valley impassible. Storms far larger than the ARkStorm, dubbed megastorms, have also hit California at least six times in the last two millennia.

The ARkStorm produces precipitation in many places exceeding levels experienced on average every 500 to 1,000 years. Extensive flooding in many cases overwhelms the state's flood protection system, which is at best designed to resist 100- to 200-year runoffs (many flood protection systems in the state were designed for smaller runoff events). The Central Valley experiences widespread flooding. Serious flooding also occurs in Orange County, Los Angeles County, San Diego, the San Francisco Bay Area, and other coastal communities. In some places, winds reach hurricane speeds, as high as 125 miles per hour. Hundreds of landslides occur, damaging roads, highways, and homes. Property damage exceeds $300 billion, most of it from flooding. Agricultural losses and other costs to repair lifelines, dewater flooded islands, and repair damage from landslides brings the total direct property loss to nearly $400 billion, of which only $20 to $30 billion would be recoverable through public and commercial insurance. Power, water, sewer, and other lifelines experience damage that takes weeks or months to restore. Flooding evacuation could involve over one million residents in the inland region and Delta counties.

A storm of ARkStorm's magnitude has important implications: 1) it raises serious questions about the ability of existing national, state, and local disaster policy to handle an event of this magnitude; 2) it emphasizes the choice between paying now to mitigate, or paying a lot more later to recover; 3) innovative financing solutions are likely to be needed to avoid fiscal crisis and adequately fund response and recovery costs; 4) responders and government managers at all levels could be encouraged to conduct self-assessments and devise table-top exercises to exercise their ability to address a similar event; 5) the scenario can be a reference point for application of FEMA and Cal OES guidance connecting federal, state, and local natural hazards mapping and mitigation planning under the NFIP and Disaster Mitigation Act of 2000; and 6) common messages to educate the public about the risk of such an extreme event could be developed and consistently communicated to facilitate policy formulation and transformation.

Figure 4-73 depicts an ARkStorm modeled scenario showing the potential for flooding primarily in the Central Valley as the result of a large storm. In Nevada County, the modeled scenario suggests the County would escape inundation.

Figure 4-73 Projected ARkStorm Flooding in California



Source: USGS ArkStorm

4.3.9. Flood: Localized Stormwater Flooding Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

Historically, the Planning Area has been at risk to flooding primarily during the winter and spring months when stream systems in the County swell with heavy rainfall. Localized flooding also occurs throughout the Planning Area at various times throughout the year with several areas of primary concern unique to each City. Unincorporated Nevada County tracks localized flooding areas as shown in Table 4-28 in Section 4.2.11. Localized flooding specific to each participating jurisdiction is detailed in their annexes to this LHMP Update.

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.

Much of the growth in Nevada County is occurring through expansion of the urban areas, causing an increase in peak flow and stormwater runoff. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities.

The potential for flooding may increase as stormwater is channeled due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the floodplain.

4.3.10. Hazardous Materials Transport Vulnerability Assessment

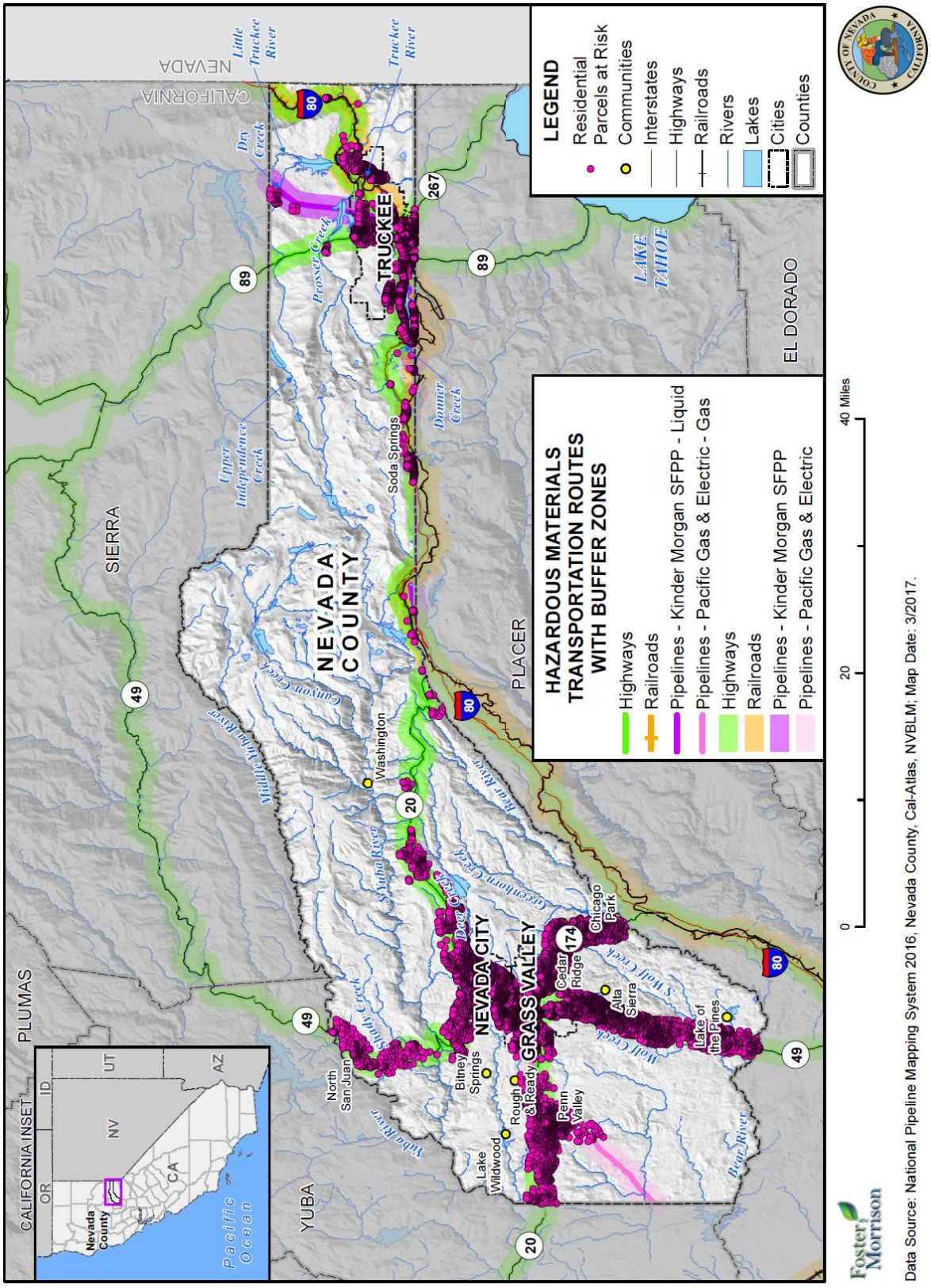
Likelihood of Future Occurrence—Likely
Vulnerability—Medium

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key Planning Area assets relative to the hazardous materials sites and transportation corridors identified above in Section 4.2.13. Figure 4-74 shows the hazardous materials transportation corridors (for roadways, rail, and pipeline) in Nevada County as well as the two mile buffer zone used for this analysis as detailed further in the methodology below.

Methodology: Buffer Zone

An analysis of the potential vulnerability of the Planning Area to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable, a one mile buffer was applied to both sides of Interstate 80 and State Routes 20, 49, 89, 174, and 267; the Union Pacific railroad tracks (which roughly parallel I-80) and the Kinder Morgan petroleum pipeline. The result is a two-mile buffer zone around each transportation corridor that is used for risk-analysis. The buffer distance was based on guidelines in the U.S. Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this plan, a buffer distance of one mile was used on either side of the transportation corridor. Actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions. The buffer zone and residential parcels at risk are shown in Figure 4-74.

Figure 4-74 Nevada County Planning Area – Hazardous Materials Routes, and Residential Parcels Located within Identified Buffer Zones



Values at Risk

During a hazardous materials transportation spill, generally the greatest concern is for the people that are at risk to the effects of the spill. During a spill, buildings, property, and their values are at a lessor risk as most often it is the airborne nature of the released contaminant that is the greatest concern. However, it should be noted, that depending on the nature and extent of any release of hazard materials, the building stock located within the release zone are all potentially at risk. Impacts and vulnerability of the community could be even more significant if fires or explosions occurred as a result of a transportation incident

HMPC Assets at Risk

The HMPC noted no specific assets at risk, but also noted that the location of the spill may affect people and property differently.

Population at Risk

To determine the populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway, railroad, and pipeline corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel data and results tabulated for the Planning Area, unincorporated County, and incorporated jurisdictions as found in Table 4-68. Those parcel centroids that intersect the buffered corridor were counted and multiplied by the 2010 Census Bureau average household factors for Nevada County communities. According to this analysis, there is a total population of 51,118 in the buffered corridor. There are 20,281 people in the buffered corridor in the unincorporated County.

Table 4-68 Nevada County Planning Area – Jurisdictional Populations at Risk in Hazardous Materials Corridors

Jurisdiction	Residential Parcels	Population
Grass Valley	5,375	10,965
Nevada City	2,151	4,496
Truckee	6,081	15,446
Unincorporated	8,630	20,281
Total	**22,237**	**51,188**

Source: Cal Trans, Nevada County GIS, US Census Bureau

* Census Bureau 2010 average household sizes are: Grass Valley – 2.04, Nevada City – 2.09; Truckee – 2.54, Unincorporated – 2.35

Critical Facilities at Risk

To determine the critical facilities at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the facilities located within the two-mile buffer zone of the highway and railroad corridors. Using GIS, the buffered corridor was overlaid on the Nevada County critical facilities layer and results tabulated for the Planning Area, unincorporated Nevada County, and incorporated jurisdictions as shown on Figure 4-75 and detailed in Table 4-89. There are 343 facilities in the buffered corridor in the Planning Area, 138 of which are in the

unincorporated Nevada County. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the County, there are likely some that are present within identified hazardous materials transportation corridors.

Figure 4-75 Nevada County Planning Area – Critical Facilities in the Hazardous Materials Buffer Zones

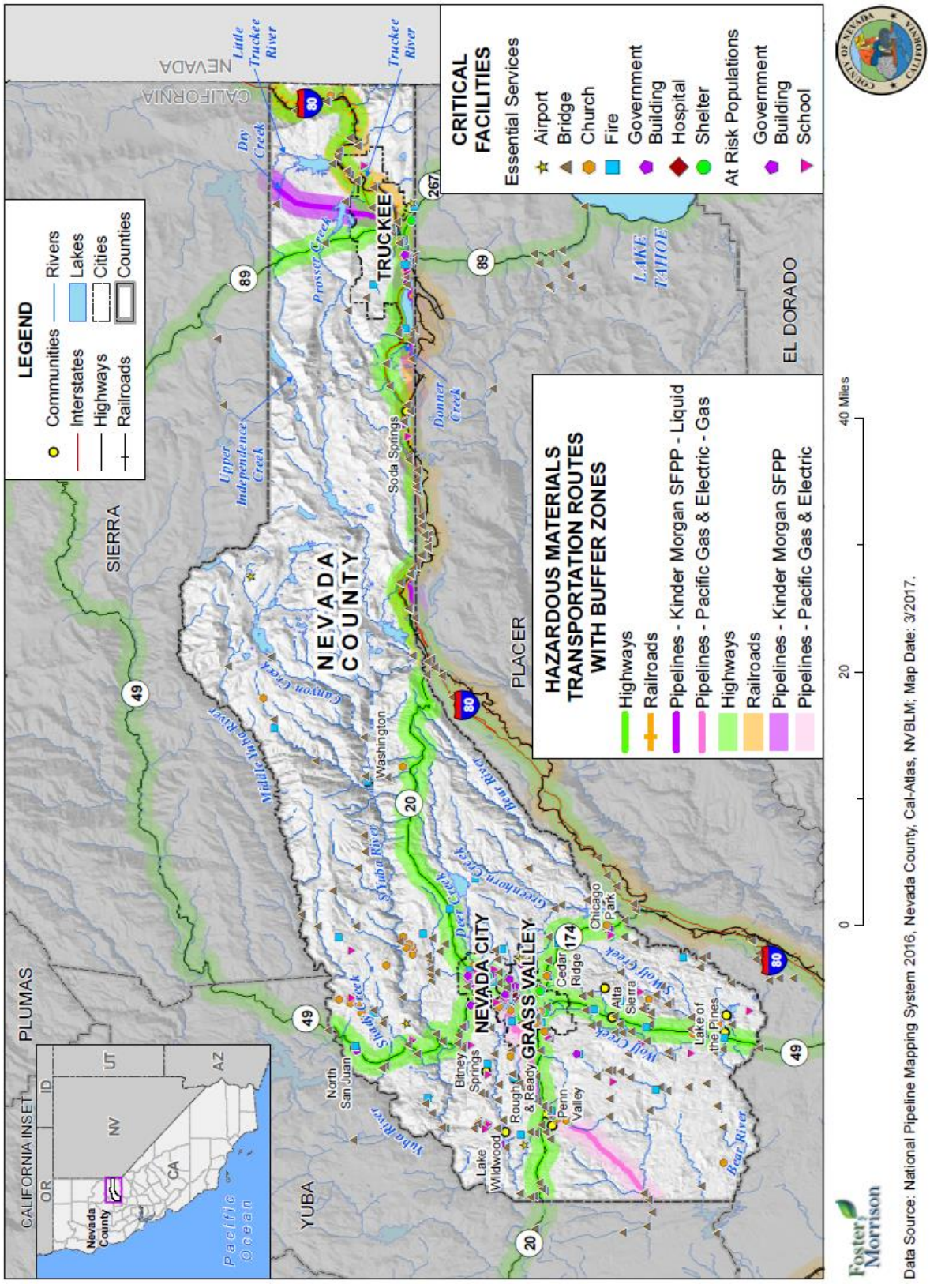


Table 4-69 Nevada County Planning Area – Critical Facilities in the Hazardous Materials Buffer Zones

Critical Facility Type	Nevada County Planning Area					Outside Area of Interest				
	Grass Valley	Nevada City	Truckee	Unincorporated Nevada County	Nevada County Planning Area Total	Placer County	Sierra County	Yuba County	Outside Area of Interest Total	Grand Total
Essential Services										
Airport	2	0	1	1	**4**	0	0	0	0	4
Bridge	22	14	30	93	**159**	46	1	3	50	209
Church	13	9	0	15	**37**	0	0	0	0	37
Fire	4	3	4	11	**22**	0	0	0	0	22
Government Building	26	15	4	3	**48**	0	0	0	0	48
Hospital	5	0	1	0	**6**	0	0	0	0	6
School	0	0	0	0	**0**	0	0	0	0	0
Shelter	8	2	7	5	**22**	0	0	0	0	22
Essential Services Total	**80**	**43**	**47**	**128**	**298**	**46**	**1**	**3**	**50**	**348**
At Risk Populations										
Airport	0	0	0	0	**0**	0	0	0	0	0
Bridge	0	0	0	0	**0**	0	0	0	0	0
Church	0	0	0	0	**0**	0	0	0	0	0
Fire	0	0	0	0	**0**	0	0	0	0	0
Government Building	0	4	0	1	**5**	0	0	0	0	5
Hospital	0	0	0	0	**0**	0	0	0	0	0
School	15	11	5	9	**40**	0	0	0	0	40
Shelter	0	0	0	0	**0**	0	0	0	0	0
At Risk Populations Total	**15**	**15**	**5**	**10**	**45**	**0**	**0**	**0**	**0**	**45**
Grand Total	**95**	**58**	**52**	**138**	**343**	**46**	**1**	**3**	**50**	**393**

Source: Cal Trans, Nevada County GIS

Historical, Cultural, and Natural Resources at Risk

The Nevada County Planning Area has significant cultural and natural resources located throughout the County as previously described. GIS analysis of these resources was not possible due to data limitations. However, it should be noted, that depending on the nature and extent of any release of hazard materials, the historical, cultural and natural resources located within the release zone are all potentially at risk. Impacts

and vulnerability of these valuable community resources could be even more significant if fires or explosions occurred as a result of a transportation incident.

Overall Community Impacts

Impacts from hazardous materials transportation incidents vary by location and severity of any given event and will likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that hazardous materials spills and releases will continue to have potential economic impacts to certain areas of the County. However, many of the historic spills in the County have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

GIS Analysis

Future development areas for unincorporated Nevada County were made available by County GIS for this plan. An analysis was performed to quantify parcels within these development areas that are also in the haz-mat buffer area. Results can provide information on how and where to grow in the future. GIS was used to determine the number of parcels in the hazardous materials buffer zones in future development areas. GIS was used to create a centroid, or point representing the center of the parcel polygon.

With the exception of Ananda, Deer Creek Park 2, and Wildwood Ridge Estates, all of the other future development areas have parcels that fall in the hazardous materials buffer zone. The future development zones in the hazardous materials buffer zones are shown on Figure 4-76, and a summary of properties in the hazardous materials buffer zone is detailed in Table 4-70.

Figure 4-76 Nevada County – Future Development and Hazardous Materials Buffer Zones

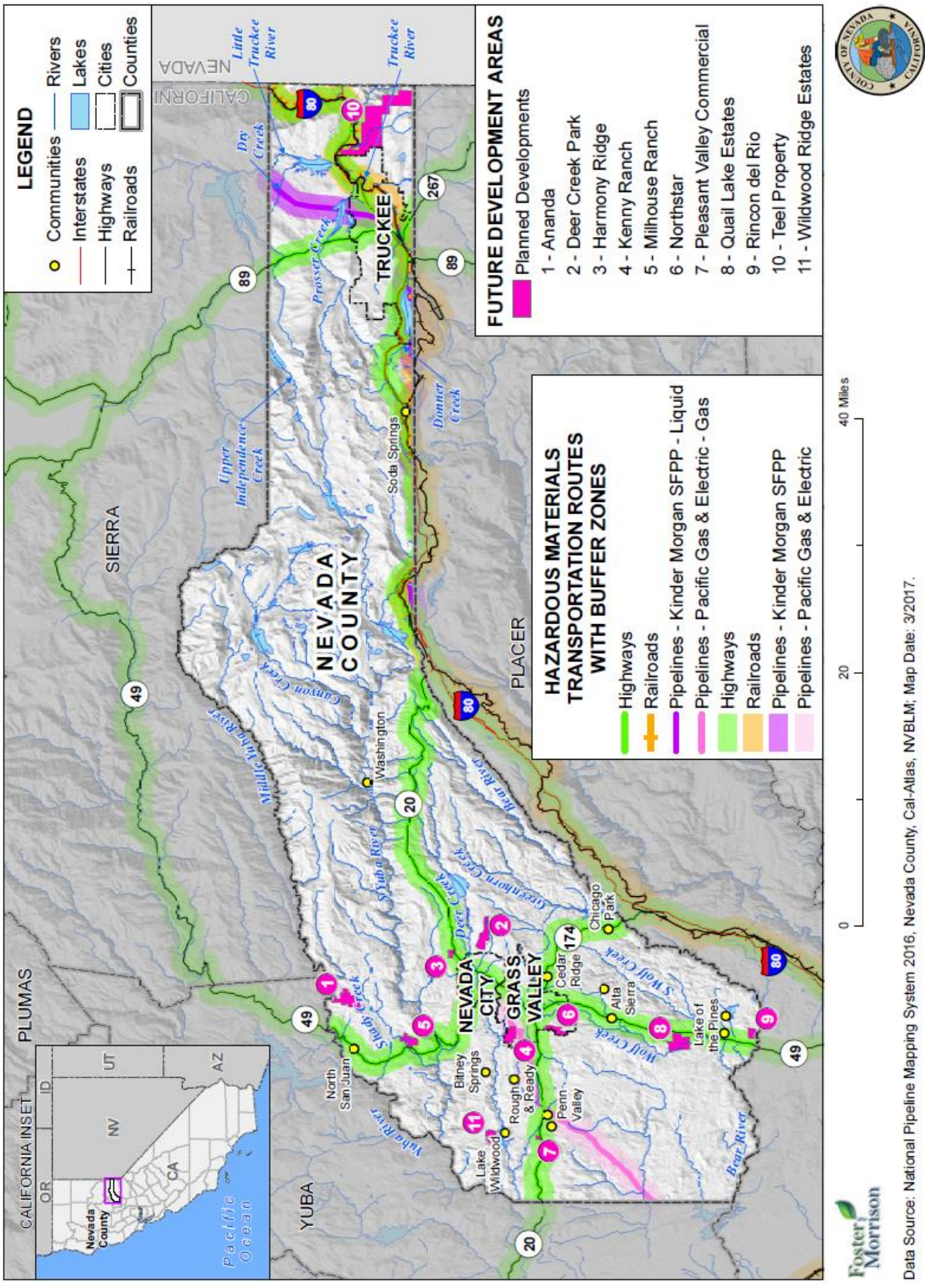


Table 4-70 Nevada County – Future Development in Hazardous Materials Buffer Zone Summary

Jurisdiction / Future Development Areas	Total Parcel Count	Improved Parcel Count
1 - Ananda	0	0
2 - Deer Creek Park 2	0	0
3 - Harmony Ridge	1	1
4 - Kenny Ranch	11	2
5 - Milhouse Ranch	13	13
6 - Northstar	4	1
7 - Pleasant Valley Commercial	2	0
8 - Quail Lake Estates	6	2
9 - Rincon del Rio	3	1
10 - Teel Property	13	0
11 - Wildwood Ridge Estates	0	0
Grand Total	**53**	**20**

Source: Cal Trans, Nevada County GIS

4.3.11. Landslide, Debris, and Mud Flows Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

Landslides in Nevada County include a wide variety of processes resulting in downward and outward movement of soil, rock, and vegetation. Common names for landslide types include slumps, rockslides, debris slides, lateral spreading, debris avalanches, earth flows, and soil creep. Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity. Although this hazard also includes related issues such as mudslides and debris flows, available mapped hazard data was limited to landslides; thus, the remainder of this section is focused on the landslide vulnerability. Additional data and information on mudslides and debris flows are included in the hazard profiles section of this plan. An analysis of landslide is presented below.

GIS Analysis: Methodology

The 2001 Landslide Incidence and Susceptibility data was obtained for the Nevada County Planning Area. According to the landslide layer obtained by the USGS there landslide incidence ranges from low to moderate to high in the Planning Area. Areas of high landslide risk exist in the eastern portion of the County. The County's parcel layer was used as the basis for the inventory of all parcels within Nevada County. GIS was used to overlay the landslide hazard layer onto the parcel layer centroids, and where the landslide zones intersected a parcel centroid, it was assigned with that hazard zone for the entire parcel.

Only improved parcels were included in this analysis. Note that the value of the improved land is also included in the total of values at risk as the land itself is at risk to landslide.

Values at Risk

The USGS landslide layer was overlaid with the Nevada County parcel layer in GIS to obtain results. Areas of landslide incidence in the County Planning Area is shown in Figure 4-77. Table 4-71 illustrates the estimated damages to the Nevada County Planning area from landslides, using FEMA contents replacement values described in Table 4-36 above. Table 4-72 shows the unincorporated County property uses by landslide risk.

Figure 4-77 Nevada County Planning Area – Landslide Incidence and Susceptibility Areas

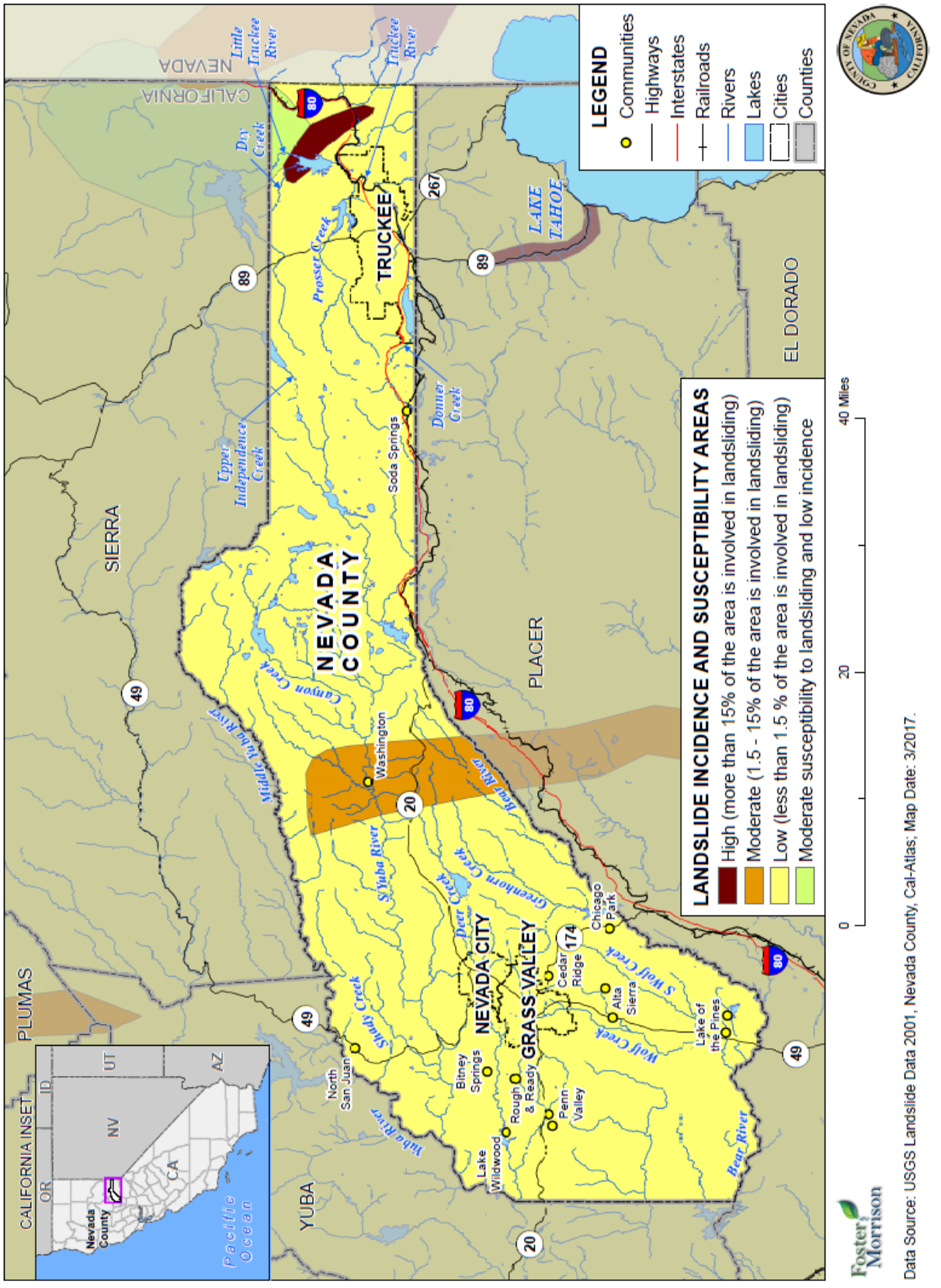


Table 4-71 Nevada County Planning Area – Parcel Count and Values in Landslide Incident and Susceptibility Areas by Jurisdiction with Contents Replacement Values

Landslide Susceptibility and Incidence Area / Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
High						
Grass Valley	0	0	$0	$0	$0	$0
Nevada City	0	0	$0	$0	$0	$0
Truckee	0	0	$0	$0	$0	$0
Unincorporated Nevada County	20	0	$637,699	$0	$0	$637,699
Total	**20**	**0**	**$637,699**	**$0**	**$0**	**$637,699**
Moderate						
Grass Valley	0	0	$0	$0	$0	$0
Nevada City	0	0	$0	$0	$0	$0
Truckee	0	0	$0	$0	$0	$0
Unincorporated Nevada County	484	157	$20,009,912	$12,798,439	$7,270,473	$40,078,824
Total	**484**	**157**	**$20,009,912**	**$12,798,439**	**$7,270,473**	**$40,078,824**
Low						
Grass Valley	7,460	6,311	$658,630,489	$1,389,116,078	$981,606,861	$3,029,353,428
Nevada City	3,378	2,852	$337,779,199	$648,132,005	$383,542,669	$1,369,453,873
Truckee	16,118	12,432	$1,625,532,697	$4,269,152,444	$2,265,297,250	$8,159,982,391
Unincorporated Nevada County	35,933	26,834	$3,055,174,675	$5,462,774,121	$2,819,544,050	$11,337,492,846
Total	**62,889**	**48,429**	**$5,677,117,060**	**$11,769,174,648**	**$6,449,990,830**	**$23,896,282,538**
Moderate Susceptibility with Low Incidence						
Grass Valley	0	0	$0	$0	$0	$0
Nevada City	0	0	$0	$0	$0	$0
Truckee	0	0	$0	$0	$0	$0
Unincorporated Nevada County	34	0	$315,751	$0	$0	$315,751
Total	**34**	**0**	**$315,751**	**$0**	**$0**	**$315,751**

Source: USGS, Nevada County 2016/2017 Assessor's Data

Table 4-72 Unincorporated Nevada County – Parcel Count and Values in Landslide Incident and Susceptibility Areas by Property Use with Contents Replacement Values

Landslide Susceptibility and Incidence Area / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
High						
Agricultural	3	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	16	0	$574,557	$0	$0	$574,557
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	1	0	$63,142	$0	$0	$63,142
Total	**20**	**0**	**$637,699**	**$0**	**$0**	**$637,699**
Moderate						
Agricultural	100	25	$5,001,144	$468,979	$468,979	$5,939,102
Commercial	6	4	$273,083	$513,862	$513,862	$1,300,807
Government	100	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	1	1	$281,874	$759,666	$759,666	$1,801,206
Miscellaneous	16	0	$293,515	$0	$0	$293,515
Residential	261	127	$14,160,296	$11,055,932	$5,527,966	$30,744,194
Total	**484**	**157**	**$20,009,912**	**$12,798,439**	**$7,270,473**	**$40,078,824**
Low						
Agricultural	1,412	589	$112,304,932	$43,847,629	$43,847,629	$200,000,190
Commercial	195	138	$40,628,362	$67,411,049	$67,411,049	$175,450,460
Government	1,241	5	$3,760,874	$3,905,051	$3,905,051	$11,570,976
Industrial	25	23	$6,791,568	$18,911,915	$28,367,873	$54,071,356
Institutional	54	33	$4,727,278	$23,194,441	$23,194,441	$51,116,160
Miscellaneous	475	12	$9,401,465	$131,979	$131,979	$9,665,423
Residential	32,531	26,034	$2,877,560,196	$5,305,372,057	$2,652,686,029	$10,835,618,282
Total	**35,933**	**26,834**	**$3,055,174,675**	**$5,462,774,121**	**$2,819,544,050**	**$11,337,492,846**
Moderate Susceptibility and Low Incidence						
Agricultural	2	0	$22,992	$0	$0	$22,992
Commercial	0	0	$0	$0	$0	$0
Government	25	0	$70,464	$0	$0	$70,464

Landslide Susceptibility and Incidence Area / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	4	0	$61,970	$0	$0	$61,970
Residential	3	0	$160,325	$0	$0	$160,325
Total	**34**	**0**	**$315,751**	**$0**	**$0**	**$315,751**

Source: USGS, Nevada County 2016/2017 Assessor's Data

It should be noted that these maps and analysis represent best available data. There have been past occurrences of landslides in areas not shown to be at risk to landslide. Generally, landslide risk maps detail areas prone to slope failure; the maps rarely include the runout areas where the failed slope will go. By way of example, a landslide on March 22, 2014, killed 43 people when it wiped out a rural neighborhood in Oso, northeast of Seattle. While the failed slope area was mapped as prone to landslides, the runout area was not. It was the runout area that resulted in devastating loss. Thus, mapping of landslide susceptible areas should be considered as one part of the equation. Damages to the area that could be inundated by such slope failure should also be considered by communities.

Populations at Risk

Those residential parcel centroids that intersect the landslide risk areas were counted and multiplied by the 2010 Census Bureau average household factors for each jurisdiction and unincorporated Nevada County. Results were tabulated by jurisdiction. According to this analysis, there is a total population of 367 residents of the Nevada County Planning Area, all within unincorporated Nevada County, at risk to moderate incidence or greater landslide. This is shown in Table 4-73.

Table 4-73 Nevada County Planning Area – Count of Improved Residential Parcels and Population by Landslide Incidence and Susceptibility Areas

Jurisdiction	Grass Valley		Nevada City		Truckee		Unincorporated County	
Landslide Incidence	Imp. Res. Parcels	Population*	Imp. Res. Parcels	Population*	Imp. Res. Parcels	Population*	Imp. Res. Parcels	Population*
High	0	0	0	0	0	0	0	0
Moderate	0	0	0	0	0	0	157	367
Moderate w/low susceptibility	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**157**	**367**

Source: USGS, US Census Bureau 2010 Estimates, Nevada County 2016 Assessor/Parcel Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

** Census Bureau 2010 average household sizes are: Grass Valley – 2.04, Nevada City – 2.09; Truckee – 2.54, Unincorporated – 2.35

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Nevada County and all jurisdictions to determine critical facilities in the landslide incidence and susceptibility areas. Using GIS, landslide incidence and susceptibility areas were overlayed on the critical facility GIS layer. Figure 4-78 shows critical facilities, as well as the landslide incidence and susceptibility areas. There are 7 critical facilities in the medium or high landslide incidence zones, as shown on Table 4-74. Details of critical facility definition, type, name and address and jurisdiction by landslide incidence zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the County, there are likely some that are present within identified landslide incidence and susceptibility areas.

Figure 4-78 Nevada County Planning Area – Critical Facilities in Landslide Incidence and Susceptibility Areas

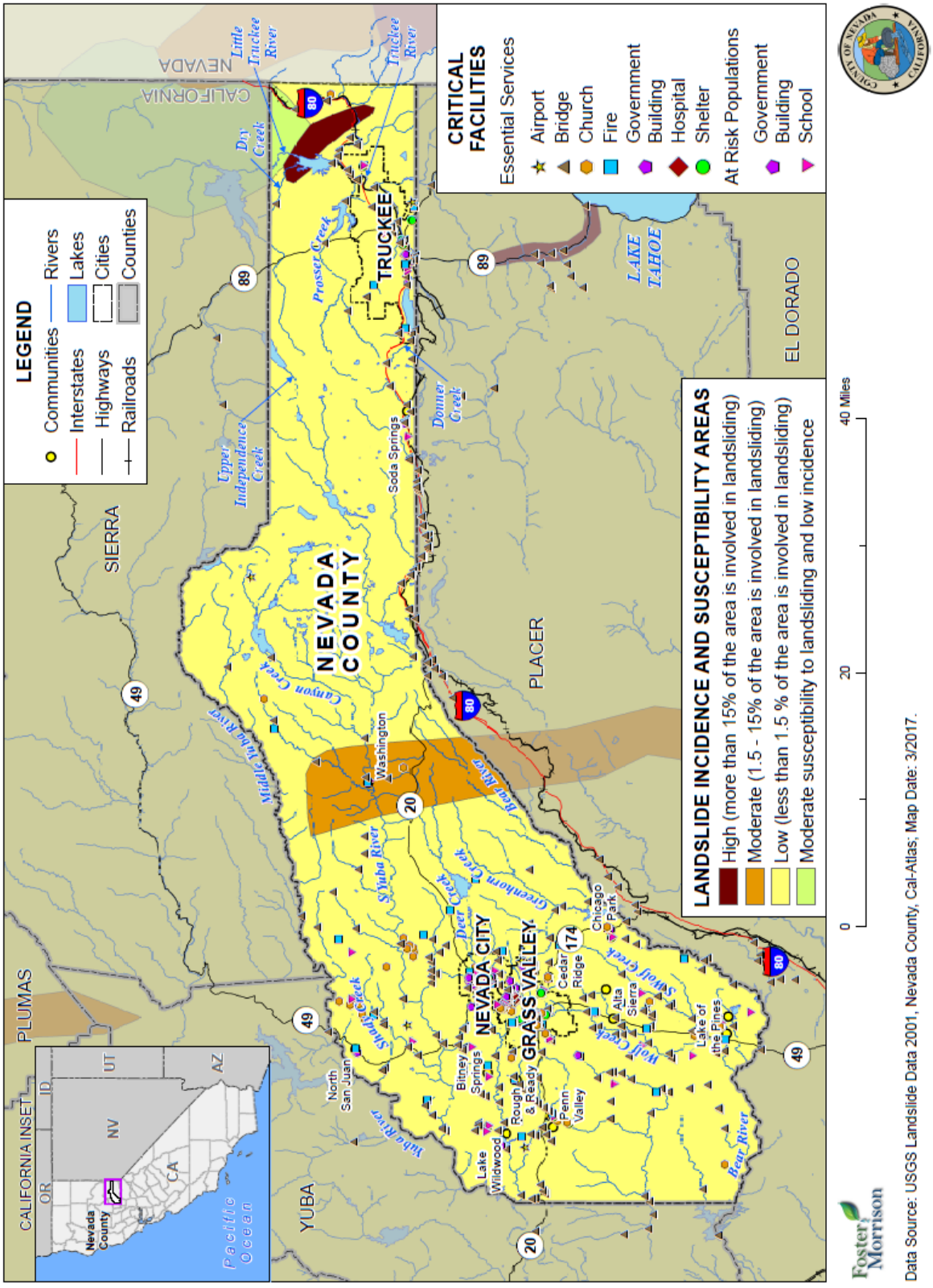


Table 4-74 Nevada County Planning Area – Critical Facilities in Landslide Incidence and Susceptibility Areas

Landslide Incidence and Susceptibility Area / Critical Facility Category	Critical Facility Type	Critical Facility Count
Moderate		
Essential Services	Airport	0
	Bridge	3
	Church	1
	Fire	1
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**5**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	1
	Shelter	0
	Total	**1**
Moderate Total		**6**
Low		
Essential Services	Airport	5
	Bridge	201
	Church	36
	Fire	26
	Government Building	5
	Hospital	0
	School	0
	Shelter	11
	Total	**284**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0

Landslide Incidence and Susceptibility Area / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Government Building	1
	Hospital	0
	School	23
	Shelter	0
	Total	**24**
Low Total		**308**
Moderate Susceptibility – Low Incidence		
Essential Services	Airport	0
	Bridge	1
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**1**
Moderate Susceptibility -Low Incidence Total		**1**
Grand Total		**315**

Source: USGS, Nevada County GIS

Historical, Cultural, and Natural Resources at Risk

The Nevada County Planning Area has significant historical cultural and natural resources located throughout the County as previously described. GIS analysis of these resources was not possible due to data limitations. However, it should be noted, that depending on the location, nature and extent of any landslide event, the historical, cultural and natural resources located within the affected area are all potentially at risk.

Overall Community Impact

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that a significant landslide could have economic impacts to certain areas of the County. However, most all of the landslides in the County are minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but could be anticipated in large landslide events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;

- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

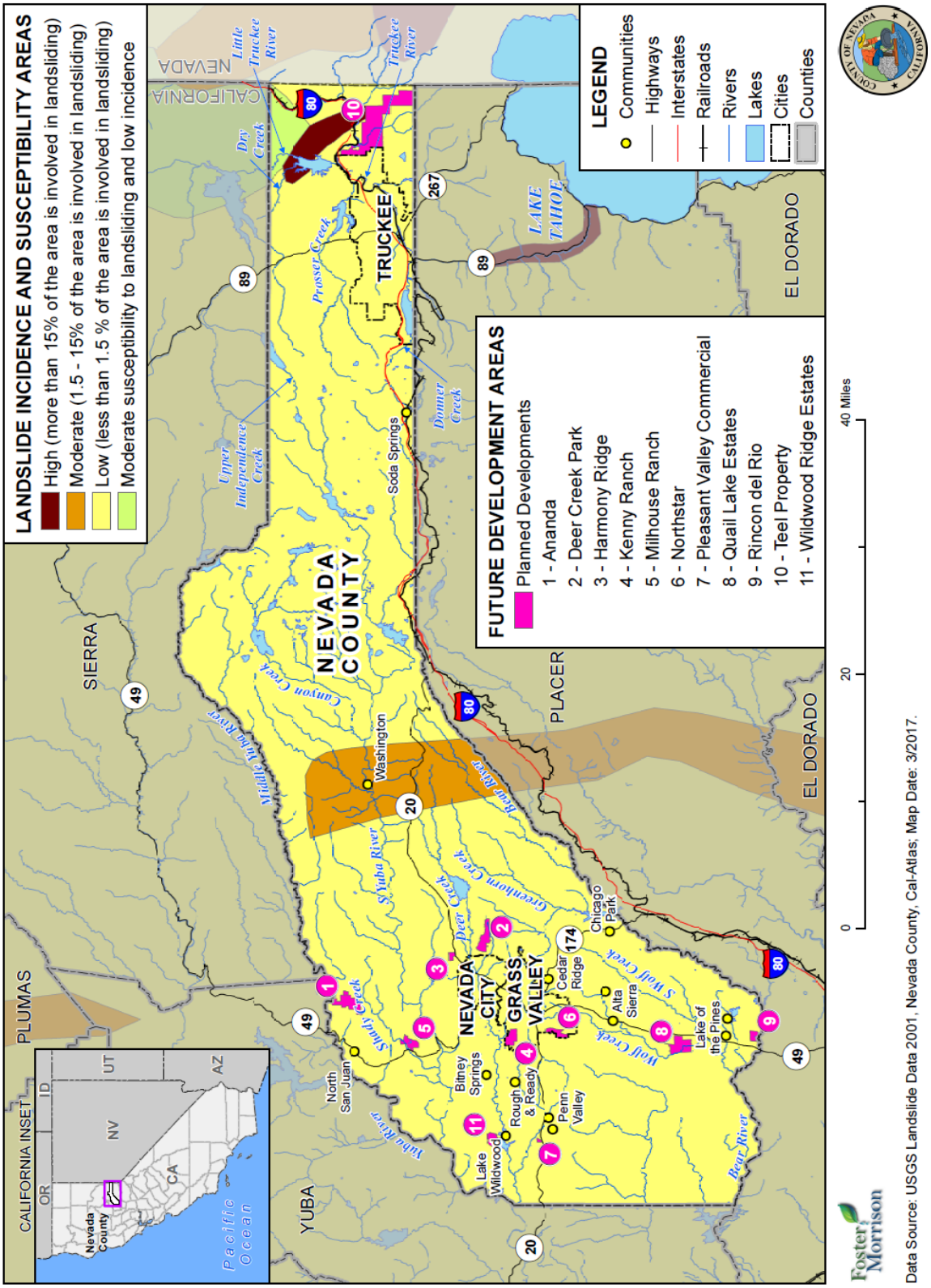
Although new growth and development corridors would fall in the area affected by moderate risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide area will continue to occur.

GIS Analysis

Future development areas for unincorporated Nevada County were made available by County GIS for this plan. An analysis was performed to quantify parcels within these development areas that are also in the landslide incidence areas. Results can provide information on how and where to grow in the future. GIS was used to determine the number of parcels in the landslide zones in future development areas. GIS was used to create a centroid, or point representing the center of the parcel polygon.

None of the future development areas fall in landslide areas. The future development zones in the hazardous materials buffer zones are shown on Figure 4-79.

Figure 4-79 Nevada County – Future Development and Landslide Incidence and Susceptibility Areas



Severe Weather: Extreme Cold, Snow, and Freeze Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

Freeze and snow events happen in Nevada County each year. Winter weather and freeze can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe winter weather in the County. The ability for the County to continue to operate during periods of winter storm and freeze is paramount. Vulnerable populations to winter weather and freeze include:

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

In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. However, many residents of Nevada County are self-sufficient and accustomed to rural living and the climate extremes that are part of the territory. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold and heavy snows.

The varying elevations in the County, in part, determine the extent to which a given area is affected by freeze and snow. The agricultural industry is especially vulnerable to extreme temperatures. Freezing temperatures can cause significant loss to crops, and excessive heat can cause high levels of mortality among livestock as well as damage to crops. Historically, extreme temperatures have caused losses to agricultural crops and have resulted in several USDA disaster declarations.

Other impacts to the County as a result of winter snow storms include damage to infrastructure, frozen pipes, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also of concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow. Although the eastern portion of the county is the most vulnerable to the effects of snow, snowfall occurring in the lower elevations can create significant issues, as residents working and living in those areas may not be as prepared for snowfall.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the County shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the Planning Area as well as

people retiring to the area. However, as previously mentioned, many of the residents of Nevada County are self-sufficient and accustomed to rural living. An updated snow removal plan including an assessment of available snow removal equipment will be important as development occurs in more remote areas of the County.

4.3.12. Severe Weather: Extreme Heat Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

Extreme heat happens in Nevada County each year. Limited data on temperature extreme impacts per County was available during the development of this hazard's profile. Extreme heat normally does not impact structures as there may be a limited number of days where the temperatures stay high which gives the structure periodic relief between hot and cool temperature cycles. Areas prone to excessively high temperatures are identified normally on a nation-wide assessment scale, which doesn't allow detailed results on specific structures.

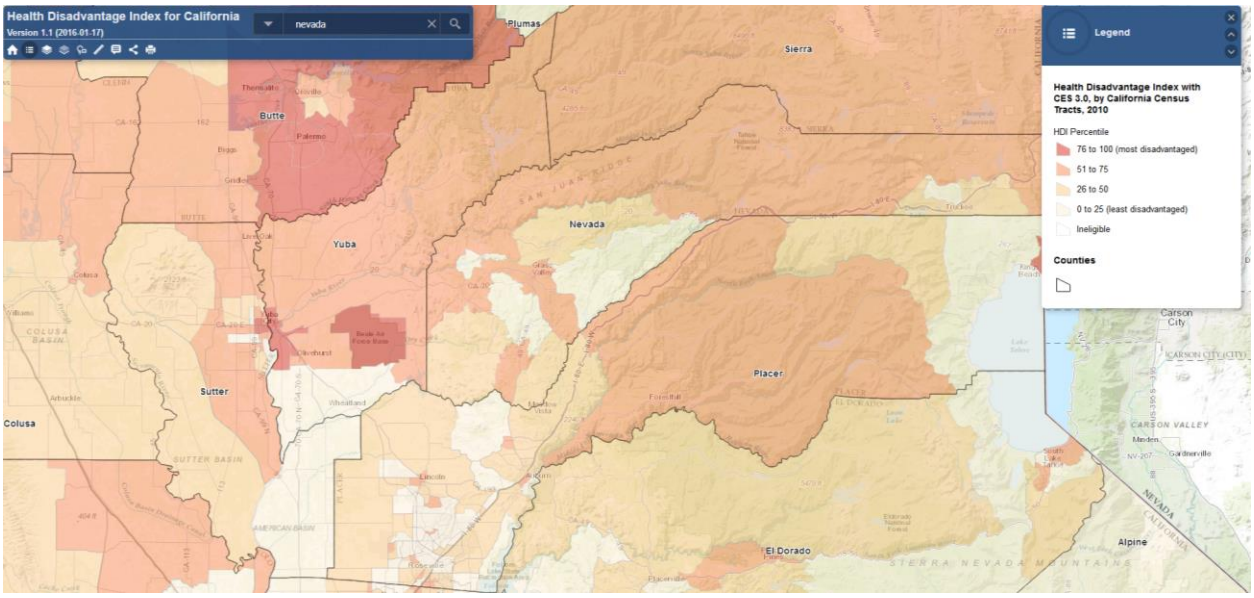
Recent research indicates that the impact of extreme temperatures, particularly on populations, has been historically under-represented. The risks of extreme temperatures are often profiled as part of larger hazards, such as severe winter storms or drought (see Section 4.3.7). However, as temperature variances may occur outside of larger hazards or outside of the expected seasons but still incur large costs, it is important to examine them as stand-alone hazards. Extreme heat may overload demands for electricity to run air conditioners in homes and businesses during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. Extreme heat may also be a secondary effect of droughts, or may cause drought-like conditions in a temporary setting. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist.

Vulnerable populations to extreme heat include:

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

The Public Health Alliance has developed a composite index to identify cumulative health disadvantage in California. Factors such as those bulleted above were combined to show what areas are at greater risk to hazards like extreme heat. This is shown on Figure 4-80.

Figure 4-80 Health Disadvantage Index by California Census Tract



Source: Public Health Alliance of Southern California

In addition to vulnerable populations, pets and livestock are at risk to extreme heat.

Future Development

As the County shifts in demographics, more residents will become senior citizens. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme heat. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations are opened when necessary.

4.3.13. Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind/Tornadoes) Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

According to historical hazard data, severe weather is an annual occurrence in Nevada County. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences in the County. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact on the County. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this plan (Section 4.3.8 Flood: 100/500-year, Section 4.3.9 Flood: Localized Stormwater, and Section 4.3.4 Dam Failure).

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While minimal damages have occurred to critical facilities in the past due to lightning, hail, or high winds and tornadoes, there still remains future risk. With development occurring in the region, future losses to new development may occur.

4.3.14. Subsidence Vulnerability Assessment

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

There are several major sources of subsidence present in Nevada County: water drawdown, abandoned mines, karst and any underground voids caused by a variety of factors including underground utilities and culverts. One of the primary sources for the City, abandoned mines, had data available to conduct additional analysis of possible locations of future mine-related subsidence, and is thus the focus of the remainder of this section. Mine-related hazards include the presence of open holes at ground surface; inadequately covered/shored up shafts and tunnels below ground level; tailings, and other abandoned mining features. Safety and hazard concerns resulting from old mine operations include the risk of falling into open shafts, surface collapse/subsidence into old shafts, and the presence of residual toxic materials generated in mining processes.

A substantial portion of the Grass Valley and Nevada City area is underlain by a deep, extensive labyrinth of abandoned mine tunnels. The Empire Mine tunnels alone extend some 365 miles beneath the City of Grass Valley. Dozens of mining claims were "worked" in the Grass Valley and Nevada City area during the height of gold mining. Some were large, mechanized operations. Most were small and more labor-intensive.

Hard- rock mining, as historically practiced in western Nevada County, was also characterized by: one or more angular shafts from surface to underground tunnels for transporting miners, equipment, and ore; and vertical air shafts from tunnels up to the surface, whose functions were to admit fresh air to the otherwise depleted atmosphere below. Tailings piles (ore storage) and tailings ponds (used in ore processing) were also typical surface features of deep mines.

Mines and mining, always dangerous while in operation, posed new dangers when abandoned. Airshafts were left exposed or covered by a few boards. They are typically holes of 4 to 10 feet in diameter on the surface, extending hundreds of feet down to the mine tunnels below. Access shafts were often covered hurriedly by closing off the mine mouth (entrance) with logs, then backfilling with rock and earth. In time, the forgotten -but- "reclaimed" site sprouted vegetation, hiding a large hole lurking perhaps as little as 8 to 10 feet below the surface.

The susceptibility of mine shafts to subsidence or cave-ins depends on a number of factors, particularly water content of the soil above and the depth and physical condition of the shaft (often due to heavy rains). The Division of Mines and Geology believes that septic systems contribute to subsidence by keeping otherwise dry soil overburden wet and heavy, thus triggering collapses that might otherwise not occur.

The greatest problem regarding mine-related surface hazards is the absence of information about the locations and physical characteristics of abandoned tunnel entrances and shafts. Some are known, cataloged and marked, while others are not. Most are on privately owned property. Without current, comprehensive information, it is difficult to assess the magnitude of the problem or to devise remedial programs.

Recent efforts to map these areas have been underway. Table 4-75 shows the mine quads and their associated known mine count. Areas susceptible to subsidence based on the historic mining operations (a mine inventory) are shown in Figure 4-81 and detailed in Table 4-76 and Table 4-77.

Table 4-75 Nevada County Planning Area – Mine Quads

Mine Quads	Mine Count
Alleghany	35
Blue Canyon	21
Boca	1
Camp Far West	1
Camptonville	2
Chicago Park	54
Cisco Grove	12
Dutch Flat	3
English Mtn.	11
French Corral	5
Graniteville	12
Grass Valley	96
Hobart Mills	2
Lake Combie	2
Martis Peak	4
Nevada City	20
North Bloomfield	24
Pike	6
Rough and Ready	9
Smartville	4
Truckee	5
Washington	19
Webber Peak	3
Wolf	1
Grand Total	**352**

Figure 4-81 Nevada County Planning Area – Subsidence (Known Mine) Inventory

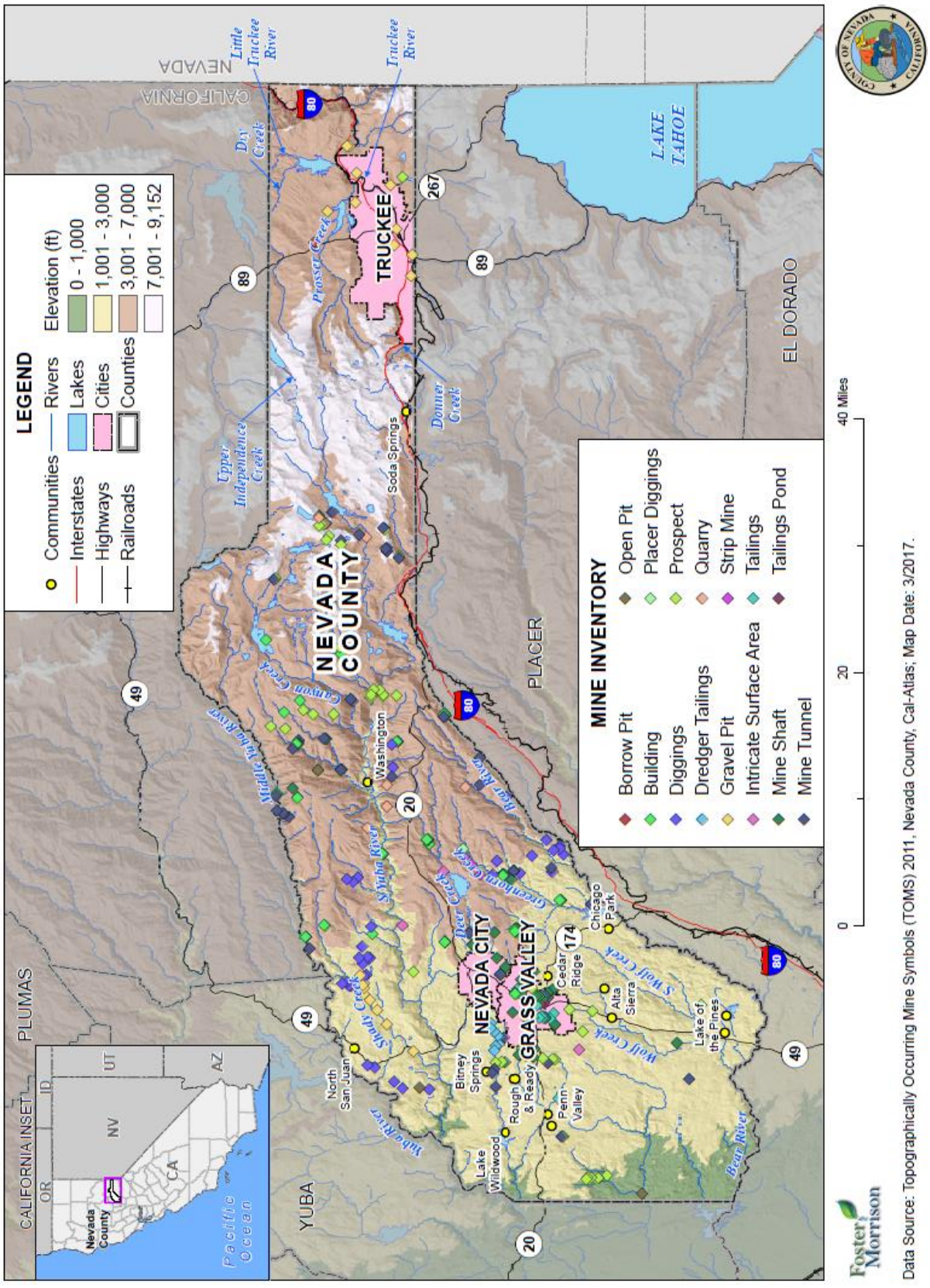


Table 4-76 Nevada County Planning Area – Mine Name and Count by Jurisdiction

Jurisdiction / Mine Name	Mine Count	Mine Name	Mine Count
Grass Valley			
Empire Mine	6	Old Brunswick Mine	1
Idaho Maryland Mine	21	Pennsylvania Mine	1
New Brunswick Mine	1	Scotia Mine	1
North Star Central Shaft	1	Spring Hill Mine	6
North Star Mine	2	Unknown	20
Grass Valley Total			**60**
Nevada City			
Banner Mtn Mine	2	Unknown	4
Gracie Mine	1		
Nevada City Total			**7**
Truckee			
Unknown	7		
Truckee Total	**7**		
Unincorporated Nevada County			
Alpha Diggings	1	Lava Cap Mine	27
Ancho Erie Mine	9	Liberty Hill Diggings	1
Anderson Mine	1	Little York Diggings	3
Arctic Mine	2	Maid of Orleans Mine	1
Arrowhead Mine	4	Malacoff Diggings	2
Azalea Mine	1	Malakoff Diggings	1
Badger Hill Diggings	1	Mammoth Spr Mine	1
Badger Hill Diggins	1	Mt View Mine	1
Baltic Mine	1	Murchie Mine	4
Banner Mine	1	New Hope Mine	1
Barren Mine	1	Niagra Mine	1
Birchville Diggins	1	North Columbia Diggings	5
Birchville Mine	1	Old Allison Ranch Mine	1
Black Bear Mine	1	Omega Diggings	1
Black Sand Mine (site)	2	Pine Hill Mine	1
Blue Lead Mine	1	Poore Mine	1
Buckeye Diggings	1	Red Dog You Bet Diggings	1
Carlisle Mine	1	Rose Mt Mine	1
Cherokee Diggings	2	Sadie D Mine	1
Cherokee Diggins	3	Sadie D Mine (inactive)	1

Jurisdiction / Mine Name	Mine Count	Mine Name	Mine Count
Christmas Hill Diggings	1	Sebastopol Diggins	2
Eagle Bird Mine	1	Sleeping Beauty Mine	1
Excelsior Mine	3	Snowflower Mine	1
French Corral Diggins	1	South Star Mine	1
Gaston Mine (inactive)	4	Spanish Mine (inactive)	7
German Bar Mine (inactive)	5	Spotswood Mine	1
Giant King Mine	1	St Louis Mine	2
Gold Bug Mine	2	Stockton Hill Mine	1
Hoge Mine	5	Swamp Angel Mine	1
Hot Water Mine	1	Sweetland Diggins	1
Howie Mine	1	Unknown	122
Jim Mine	1	Upper Spanish Mine inactive)	2
Kentucky Ride Mine	1	Yellow Metal Mine	1
Last Chance Mine	2	Zeibright Mine	14
Nevada County Total			**278**
Grand Total			**352**

Source: TOMS 2011

Table 4-77 Nevada County Planning Area – Mine Type and Count by Jurisdiction

Jurisdiction / Mine Type	Mine Count
Grass Valley	
Building	26
Mine Shaft	15
Mine Tunnel	1
Prospect	1
Tailings	14
Tailings Pond	3
Grass Valley Total	**60**
Nevada City	
Building	3
Mine Shaft	2
Mine Tunnel	1
Prospect	1
Nevada City Total	**7**
Truckee	
Gravel Pit	7

Jurisdiction / Mine Type	Mine Count
Truckee Total	**7**
Nevada County	
Borrow Pit	1
Building	85
Diggings	35
Dredger Tailings	7
Gravel Pit	12
Intricate Surface Area	3
Mine Shaft	17
Mine Tunnel	61
Open Pit	3
Placer Diggings	1
Prospect	40
Quarry	8
Strip Mine	3
Tailings	2
Nevada County Total	**278**
Grand Total	**352**

Source: TOMS 2011

Values at Risk

Understanding the total assessed value of parcels affected by mines, or potential subsidence areas, in Nevada County is a starting point to understanding the overall value of identified assets at risk in the County to mine-related incidents. When the total assessed values are combined with potential values associated with other community assets such as public and private critical infrastructure, historic and cultural resources, and natural resources, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of mine-related subsidence within the County.

The Nevada County Planning Ares has mapped mining areas as detailed above. The Topographically Occurring Mine Symbols (TOMS) 2011 mine data is collected and maintained by the California Department of Conservation Abandoned Mine Lands Program. The data was used to determine the potential impacts of mining-related land subsidence within the County. Maps and tables detailing the mine inventory and values at risk in the County are provided below and includes a methodology for determining parcels and values at risk to the mapped mine areas.

Methodology

Parcel Analysis and Assessed Values

Nevada County's 2016/2017 parcel layer and Assessor's data, obtained from Nevada County, were used as the basis for the County inventory of parcels and values. The TOMS GIS layers dated 2011 was utilized to perform the mine inventory analysis. The source of this GIS layer is detailed above. The TOMS data was overlaid on the parcel layer. For the purposes of this analysis, the mine data that intersected a parcel was assigned the assessor values associated with the parcel. Once combined, the assessor data, such as property use and assessed values, were attributed to the affected parcels. The parcels were segregated and analyzed in this fashion for the Nevada County Planning Area and by jurisdiction.

Values at Risk Results

Values associated with land, and improved structure values were identified and summed in order to determine total assessed values at risk for parcels affected by mines in the Nevada County Planning area, including unincorporated Nevada County and the jurisdictions of Grass Valley, Nevada City, and Truckee. There are 352 mining-related locations in Nevada County. These mines are located on 212 parcels throughout the County and affect 63 improved parcels. Together, the land value and improved structure value make up the majority of assessed values associated with each identified parcel or asset. Improved parcel counts were based on the assumption that a parcel was improved if a structure value was present. Information on other values such as personal property values were not readily available for inclusion in this effort. Table 4-78 shows the total values or exposure for the entire Nevada County Planning Area, by jurisdiction. The values for the Nevada County Planning Area are also broken out by property use as provided in Table 4-79. The values for unincorporated Nevada County are broken out by property use type and are provided in Table 4-80. Contents values are included in Table 4-79 and Table 4-80, using the methodology shown in Table 4-36 in Section 4.3.1. More information on values at risk for each jurisdiction can be found in their respective annexes.

Table 4-78 Nevada County Planning Area – Parcel Count and Values at Risk from Subsidence (Known Mine Inventory) by Jurisdiction

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Total Value
Grass Valley	38	18	$9,250,156	$9,852,780	$19,102,936
Nevada City	4	4	$754,953	$1,048,683	$1,803,636
Truckee	7	4	$6,329,997	$851,452	$7,181,449
Unincorporated Nevada County	163	37	$18,550,670	$7,634,552	$26,185,222
Total	**212**	**63**	**$34,885,776**	**$19,387,467**	**$54,273,243**

Source: TOMS 2011, Nevada County 2016/2017 Assessor's Data

Table 4-79 Nevada County Planning Area – Parcel Count and Values at Risk from Subsidence (Known Mine Inventory) by Property Use with Contents Replacement Values

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	19	6	$7,292,995	$441,961	$441,961	$8,176,917
Commercial	8	3	$1,533,897	$2,908,262	$2,908,262	$7,350,421
Government	60	0	$0	$0	$0	$0
Industrial	15	14	$6,447,913	$6,800,580	$10,200,870	$23,449,363
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	3	0	$0	$0	$0	$0
Residential	107	40	$19,610,971	$9,236,664	$4,618,332	$33,465,967
Total	**212**	**63**	**$34,885,776**	**$19,387,467**	**$18,169,425**	**$72,442,668**

Source: TOMS 2011, Nevada County 2016/2017 Assessor's Data

Table 4-80 Unincorporated Nevada County – Parcel Count and Values at Risk from Subsidence (Known Mine Inventory) by Property Use with Contents Replacement Values

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	19	6	$7,292,995	$441,961	$441,961	$8,176,917
Commercial	1	1	$16,542	$156,566	$156,566	$329,674
Government	52	0	$0	$0	$0	$0
Industrial	1	1	$20,597	$11,116	$16,674	$48,387
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	3	0	$0	$0	$0	$0
Residential	87	29	$11,220,536	$7,024,909	$3,512,455	$21,757,900
Total	**163**	**37**	**$18,550,670**	**$7,634,552**	**$4,127,656**	**$30,312,878**

Source: TOMS 2011, Nevada County 2016/2017 Assessor's Data

According to Table 4-78 through Table 4-80, the Nevada County Planning Area has 63 improved parcels and roughly $72,442,668 of structure and contents value in the mine-affected areas. The unincorporated County has 37 improved parcels and roughly $30 million in structure and contents values in the mine-affected areas.

Population at Risk

A separate analysis was performed to determine population in subsidence (known mine) areas. Using GIS, the mine location dataset was overlayed on the improved residential parcel data. Those parcels that intersect a known mine were counted and multiplied by the Census Bureau average household size for each

jurisdiction; results were tabulated by jurisdiction (see Table 4-81). According to this analysis, there is a population of 142 at risk to known subsidence (known mine) areas.

Table 4-81 Nevada County Planning Area – Population at Risk to Subsidence (Known Mines) Areas

Jurisdiction	Improved Residential Parcels*	Population**
Grass Valley	18	37
Nevada City	4	8
Truckee	4	10
Unincorporated	37	87
Total	**63**	**142**

Source: TOMS 2011, US Census Bureau 2010 Estimates, Nevada County 2016/2017 Assessor/Parcel Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

** Census Bureau 2010 average household sizes are: Grass Valley – 2.04, Nevada City – 2.09; Truckee – 2.54, Unincorporated – 2.35

Historical, Cultural, and Natural Resources at Risk

The Nevada County Planning Area has significant historical, cultural, and natural resources located throughout the County as previously described. Risk analysis of these resources was not possible due to data limitations. However, any resources in abandoned mine areas are at risk.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory for the Nevada County Planning Area including all jurisdictions to determine critical facilities in known mine areas. Using GIS, the mine inventory data were overlayed on the critical facility GIS layer. Figure 4-82 shows critical facilities relative to the area mines. There are 6 critical facilities in known mine areas, as shown on Table 4-82. All of these facilities are in the unincorporated County, none are in any of the incorporated communities. Details of critical facility definition, type, name and address and jurisdiction affected by known mine areas are listed in Appendix F.

Figure 4-82 Nevada County – Critical Facilities in Subsidence (Known Mine) Areas

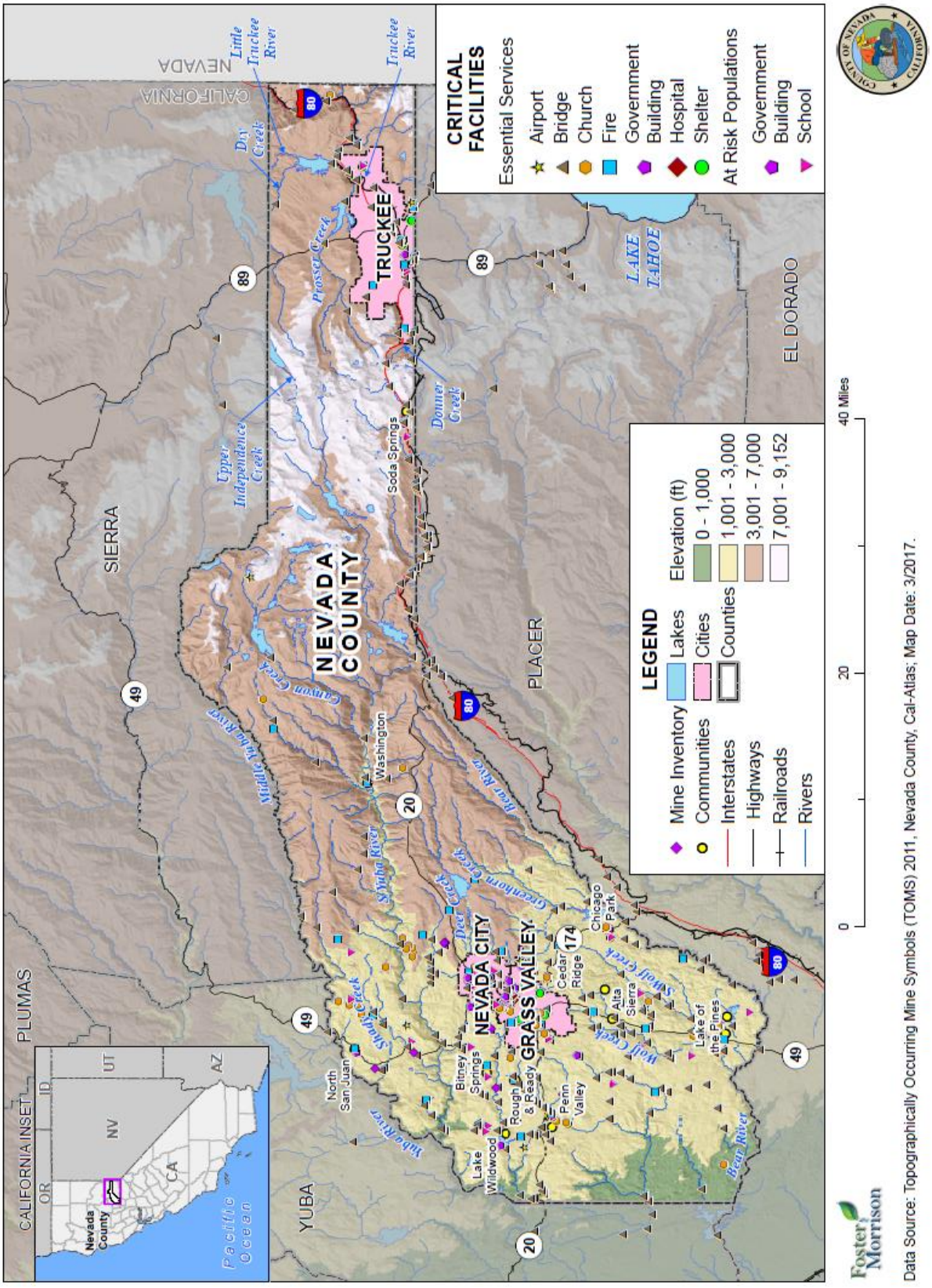


Table 4-82 Unincorporated Nevada County – Critical Facilities in Subsidence (Known Mine) Areas

Critical Facility Category	Critical Facility Type	Critical Facility Count
Essential Services	Bridge	6
	Total	**6**
Grand Total		**6**

Source: TOMS 2011, Nevada County GIS

Overall Community Impact

Subsidence impacts vary by location and severity of any given event and will likely only affect certain areas of the County during specific times. Based on the risk assessment, it is evident that subsidence may have potential economic impacts to certain areas of the County, regardless of the cause. However, many of the subsidence areas in the County may only experience minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

Many of the subsidence and mine areas in the County are known, but many still remain unknown and untracked. The risk of subsidence to future development can be minimized by accurate recordkeeping and tracking of previously unknown abandoned mines. Knowing these locations and choosing not to develop in those areas or mitigating against future issues will reduce future risks of losses due to subsidence.

4.3.15. Wildfire Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Extremely High

Risk and vulnerability to the Nevada County Planning Area from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. High fuel loads in the Planning Area, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. Even the more urbanized area of western Nevada County is not immune from fire. During the May to October fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to

quickly become a large, out-of-control fire. As development continues throughout the Planning Area, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

The wildfire hazard is the highest priority hazard in the County, and is the hazard with the greatest potential for catastrophic loss. Wildfires can cause short-term and long-term disruption to the County. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities.

Nevada County Communities at Risk to Wildfire

The National Fire Plan is a cooperative, long-term effort between various government agency partners with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. For purposes of the National Fire Plan, the California Department of Forestry and Fire Protection (CAL FIRE) generated a list of California communities at risk for wildfire. The intent of this assessment was to evaluate the risk to a given area from fire escaping off federal lands. Three main factors were used to determine the wildfire threat in the wildland-urban interface areas of California: fuel hazards, probability of fire, and areas of suitable housing density that could create wildland urban interface fire protection strategy situations. The preliminary criteria and methodology for evaluating wildfire risk to communities is published in the Federal Register, January 4, 2001. The National Fire Plan identifies 43 "Communities at Risk" in Nevada County. These are shown in Table 4-83.

Table 4-83 Nevada County Communities at Risk to Wildfire

Communities at Risk		
Alta Hill	Hirschdale	Penn Valley
Alta Sierra	Hobart Mills	Prosser Lakeview Estates
Cedar Ridge	Kingvale	Red Dog
Cherokee	La Barr Meadows	Rough and Ready (Bitney Corner)
Cherry Creek Acres	Lake City	Sherwood Forest
Chicago Park (Pinecrest)	Lake of the Pines	Soda Springs
Donner	Lake Wildwood	Sweetland
Floriston	Mooney Flat	Truckee
Forest Knolls - Banner Mountain	Nevada City	Union Hill

Communities at Risk		
French Corral	Newtown	Washington
Glenbrook	Norden	Willaura Estates
Glenshire-Devonshire	North Bloomfield	Willow Valley-Cascade Shores
Gold Flat	North Columbia	You Bet
Grass Valley	North San Juan	
Higgins Corner (Wolf)	Peardale	

Source: CAL FIRE

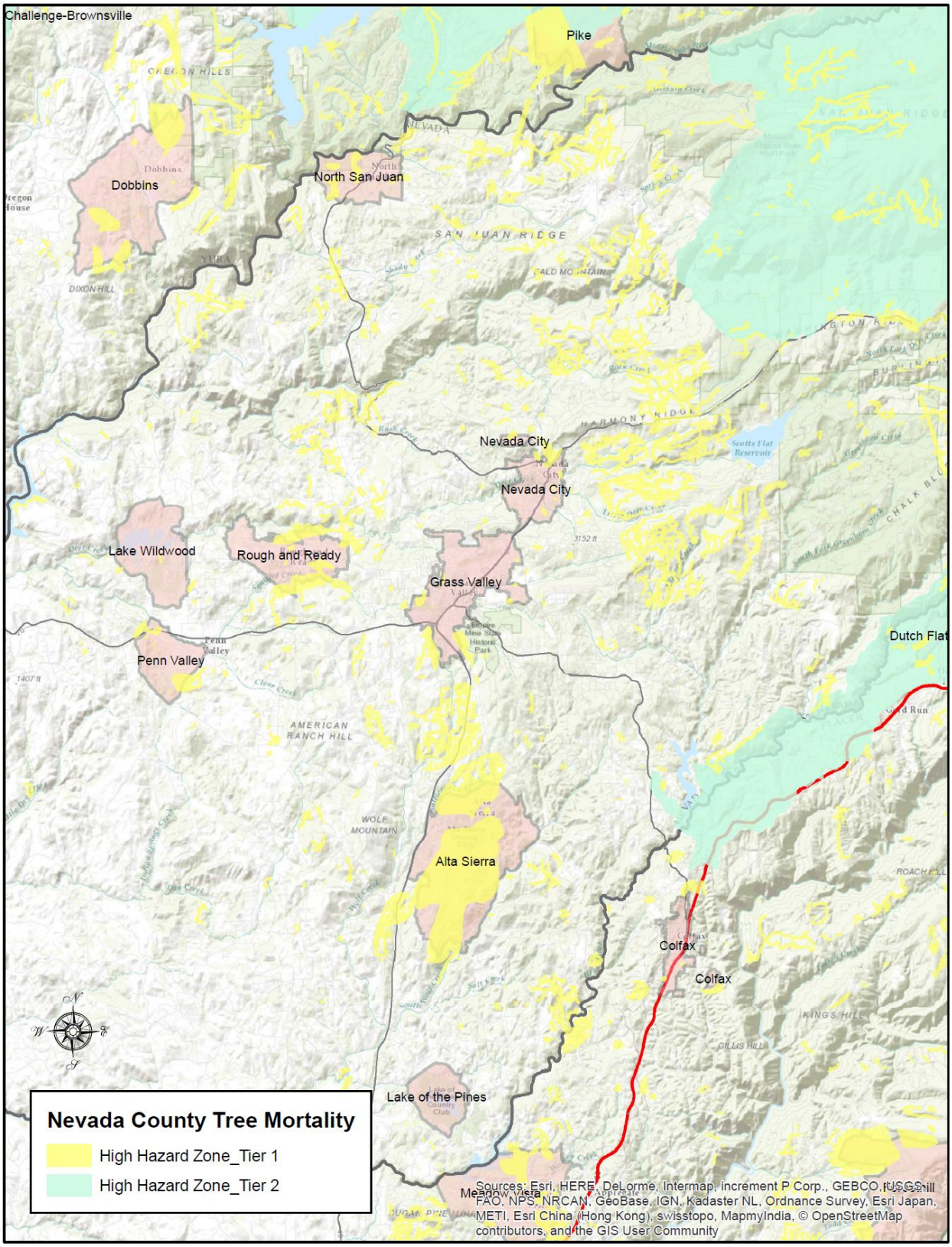
Tree Mortality and Beetle Kill

Drought can weaken trees, making them less resistant to bark beetles. These beetles attack trees weakened trees and can kill them. These trees then become fuel for wildfires. This is discussed in greater detail in Section 4.3.6.

On October 30, 2015, Governor Brown proclaimed a State of Emergency and included provisions to expedite the removal and disposal of dead and dying hazardous trees. As a result, costs related to identification, removal, and disposal of dead and dying trees caused from drought conditions may be eligible for California Disaster Assistance Act (CDAA) reimbursement.

Many areas in Nevada County have seen increases in tree mortality. The County has mapped these areas, and that map is shown in Figure 4-83.

Figure 4-83 Nevada County – Tree Mortality Areas



Source: Nevada County

Wildfire (Smoke) and Air Quality

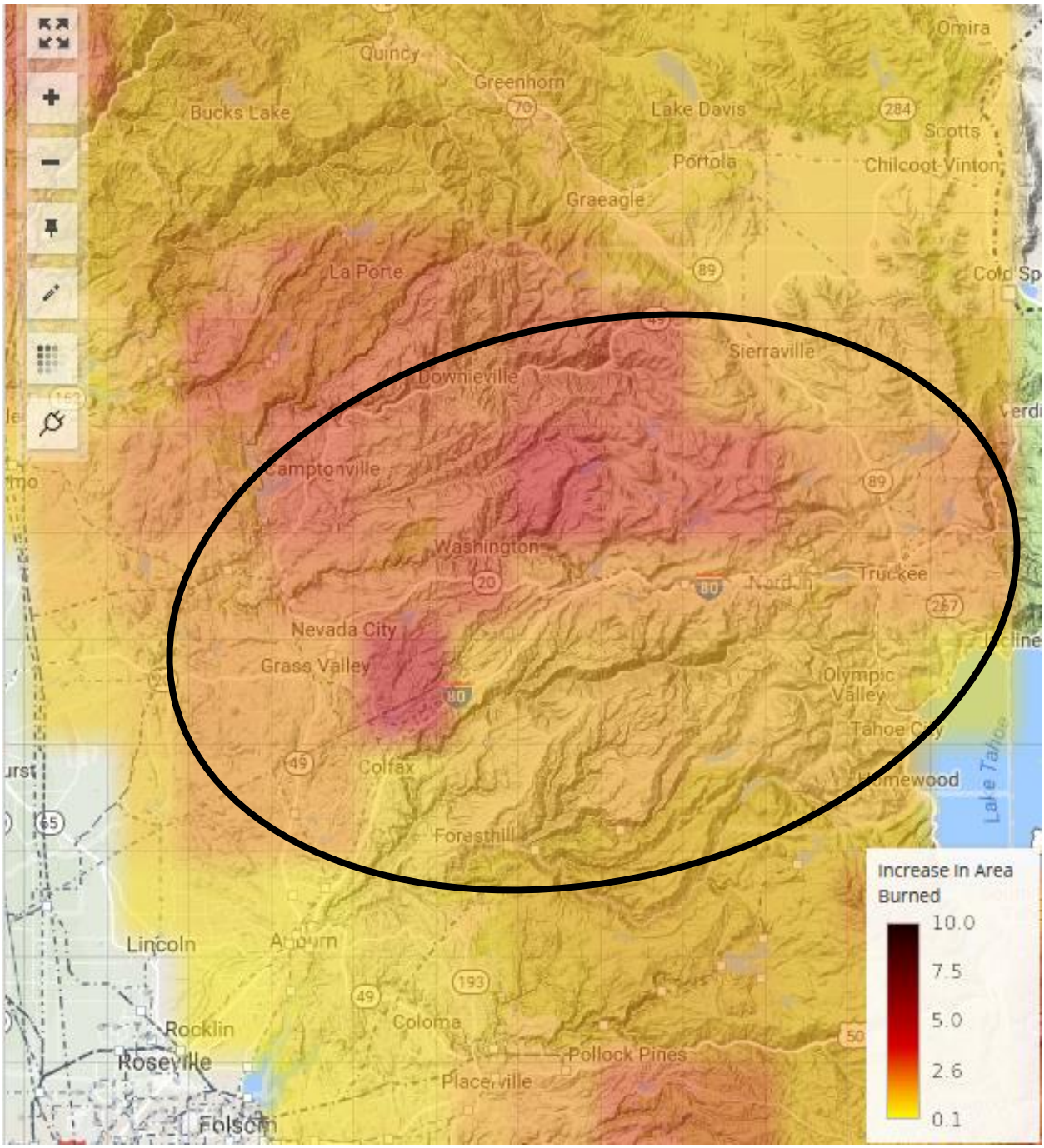
During many summer months in past years, Nevada County residents have had to breathe wildfire smoke, from fires both within and outside of the County. Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. While the summer of 2015 brought terrible wildfires along with severe smoke impacts to numerous locations in California, impacts in Nevada County were of a shorter duration then previous summers. During the summers of 2013 and 2014, several wildfire incidents occurred in Northern California and Nevada County which significantly influenced the PM2.5 concentration measurements within Nevada County.

The heavy smoke from these wildfires impacted air quality throughout the Sierra Foothills and nearby Tahoe areas. Wildfire smoke caused ambient air levels of fine particulate matter to increase to more than 100 times higher than air quality standards. This caused the cancellation of an Iron Man event in the Tahoe area. This cancellation caused financial impacts to the County and the Tahoe/Truckee area. The event will not return in the future to the Tahoe area.

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.

Cal-Adapt is an online tool put together by the California Energy Commission that downscales global climate models to the California level with projections for sea-level rise, drought, temperature increase, heat, and wildfire, from 2020 out to 2085. Figure 4-84 shows the 2020 wildfire projection for Nevada County. The lines represent transmission lines and the dots and squares power lines and transmission lines. Air quality in these areas of the County would be lower due to wildfire if the scenario projected is accurate.

Figure 4-84 2020 Wildfire Projections for Nevada County



Source: Cal-Adapt

Insurance in WUI Areas

The HMPC noted that in the WUI areas, there has been increased difficulty in obtaining home insurance and the cost of insurance premiums. This increases costs to those who live in the WUI.

Wildfire Conflagration

Conflagration fires are of concern to Nevada County and its jurisdictions. A conflagration is a large and destructive fire that threatens human life, animal life, health, and/or property. A conflagration can begin accidentally, be naturally caused (wildfire), or intentionally created (arson). Ten percent of all fires in Nevada County are believed to be arson related fires, either wildland interface or commercial. While both types of fire related incidents are of extreme concern to Nevada County, the commercial fire has a potential for great destruction and economic loss. A commercial fire within the business districts of Nevada City, Grass Valley, Truckee, Penn Valley, Lake of the Pines, or Lake Wildwood would result in serious losses of sales inventory, sales tax, property tax reduction, and loss of employment or loss of life.

Secondary effects could be felt in the transient occupancy tax and in the vibrancy of related businesses. In a worst case scenario, multiple businesses could be involved as well as the loss of housing stocks that are sometimes found as "over the store" units. The commercial districts of smaller foothills cities are normally found within one or two well-defined areas in each city. These areas are usually only a few blocks wide and a few blocks long but encompass much of the employment opportunities and commercial activity of the city. Areas of concern are shown in Table 4-84.

Table 4-84 Nevada County – Commercial Centers at Risk to Conflagration

City/Town	Commercial Area
Nevada City	Historic Downtown
Nevada City	Old Seven Hills
Nevada City	Gold Flat/New Mohawk Industrial area
Grass Valley	Historic Downtown
Grass Valley	Glenbrook
Grass Valley	Pine Creek
Grass Valley	Whispering Pines
Grass Valley	Loma Rica Industrial Park
Lake of the Pines	Combie Center
Lake Wildwood	Wildwood Center
Truckee	Historic Downtown/Brickletown
Truckee	Gateway Center
Truckee	Albertson's Center
Truckee	Airport Industrial Complex
Truckee	The Factory Outlet Mall
Truckee	Gateway Center, East and West
Truckee	Pioneer Industrial/Commercial Park
Penn Valley	Penn Valley Center

Source: Nevada County

Wildfire Analysis

Unincorporated Nevada County and the incorporated jurisdictions have mapped CAL FIRE data as further described below. GIS was used to determine the possible impacts of wildfire within the County and how the wildfire risk varies across the Planning Area. This wildfire analysis includes an analysis of affected parcels and values by Fire Responsibility areas and by CAL FIRE's Fire Hazard Severity Zones.

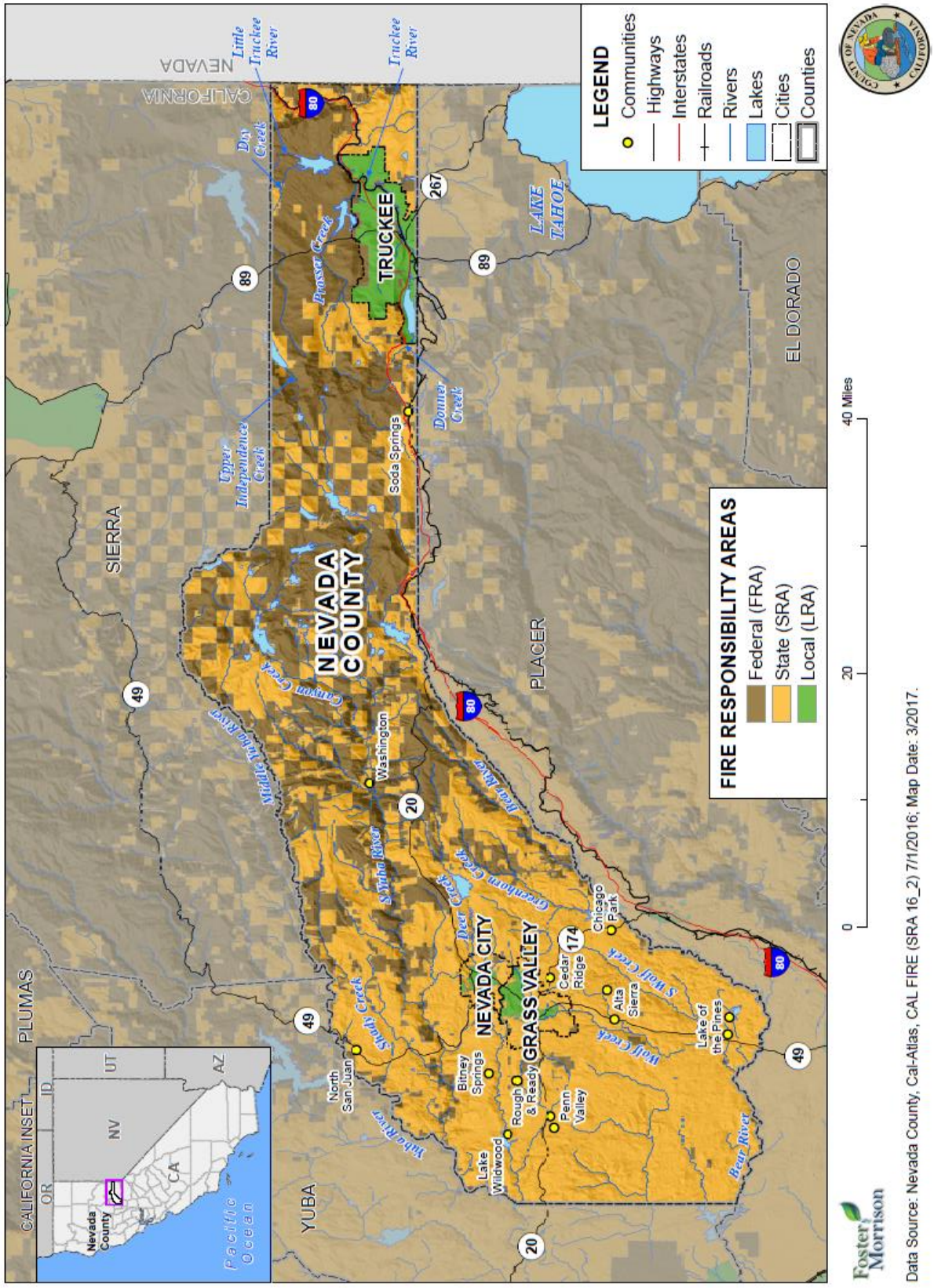
Fire Responsibility Areas

There are numerous wildland fire protection agencies that have responsibility within the county, including the USDA Forest Service (FS), the Bureau of Land Management (BLM), and the California Department of Forestry and Fire Protection (CAL FIRE). There are also numerous fire departments and fire protection districts that serve local areas, many of whom have mutual aid agreements with each other as well as state and federal agencies for fire suppression and protection. Fire Responsibility areas are generally categorized by Federal Responsibility Areas (FRA), State Responsibility Areas (SRA) and Local Responsibility Areas (LRA).

Methodology

CAL FIRE has a legal responsibility to provide fire protection on all SRA lands, which are defined based on land ownership, population density and land use. CAL FIRE's State Responsibility Area layer was used in this analysis to show Nevada County's parcel counts and values by FRA, SRA, and LRA. GIS was used to create a centroid, or point representing the center of the Nevada County parcel polygon. The FRA, SRA, LRA areas were then overlaid on the parcel centroids. For the purposes of this analysis, the wildfire responsibility area that intersected a parcel centroid was assigned as the threat zone for the entire parcel. Locations of each responsibility area are shown in Figure 4-85.

Figure 4-85 Nevada County Planning Area Fire Responsibility Areas by FRA, SRA, LRA



Fire Responsibility Areas and Values at Risk

The FRA in the County is relatively small. The largest is the SRA, with almost 97 percent of the parcels in the County falling in the SRA. The LRA falls within the local jurisdictions and mainly in the Town of Truckee. The FRA contains 1,171 parcels, of which only 10 are improved. The SRA contains 39,061 parcels, with over $9.4 billion in total value. The LRA has 23,195 parcels with $8 billion in total value. It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total county assets at risk. However, it is highly unlikely the whole County will ever be on fire at once.

The FRA contains 1,171 parcels, with an improved value of $11,228,967. The SRA contains 39,061 parcels, with over $12.6 billion in total value. The LRA has 23,195 parcels with $11.3 billion in total value. It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total county assets at risk. The County parcel inventory and associated values by responsibility area are provided in Table 4-85.

Table 4-85 Nevada County Planning Area – Count and Values at Risk in Local, State, and Federal Responsibility Areas by Jurisdiction and Property Use with Contents Replacement Values

Fire Responsibility Area /Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Total Improved Value	Estimated Contents Value	Total Value*
Grass Valley						
Federal Responsibility Area						
Agricultural	0	0	$0	$0	$0	$0
Commercial	2	0	$0	$0	$0	$0
Government	11	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	3	0	$0	$0	$0	$0
Total	**16**	**0**	**$0**	**$0**	**$0**	**$0**
State Responsibility Area						
Agricultural	7	1	$486,388	$254,841	$254,841	$996,070
Commercial	117	32	$15,602,176	$6,242,004	$6,242,004	$28,086,184
Government	62	2	$1,667,657	$5,625,082	$5,625,082	$12,917,821
Industrial	68	60	$16,696,317	$36,694,203	$55,041,305	$108,431,825
Institutional	6	3	$1,082,332	$9,599,325	$9,599,325	$20,280,982
Miscellaneous	12	0	$0	$0	$0	$0
Residential	1,841	1,614	$117,840,622	$218,337,164	$109,168,582	$445,346,368

Fire Responsibility Area /Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Total Improved Value	Estimated Contents Value	Total Value*
Total	**2,113**	**1,712**	**$153,375,492**	**$276,752,619**	**$185,931,139**	**$616,059,250**
Local Responsibility Area						
Agricultural	3	0	$0	$0	$0	$0
Commercial	667	504	$153,928,045	$302,261,671	$302,261,671	$758,451,387
Government	55	0	$712	$0	$0	$712
Industrial	70	62	$19,424,334	$60,790,636	$91,185,954	$171,400,924
Institutional	25	20	$2,680,504	$55,145,043	$55,145,043	$112,970,590
Miscellaneous	48	0	$0	$0	$0	$0
Residential	4,463	4,013	$329,221,402	$694,166,109	$347,083,055	$1,370,470,566
Total	**5,331**	**4,599**	**$505,254,997**	**$1,112,363,459**	**$795,675,723**	**$2,413,294,179**
Nevada City						
Federal Responsibility Area						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	14	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	5	2	$84,542	$254,314	$127,157	$466,013
Total	**19**	**2**	**$84,542**	**$254,314**	**$127,157**	**$466,013**
State Responsibility Area						
Agricultural	4	0	$0	$0	$0	$0
Commercial	9	4	$971,726	$1,590,530	$1,590,530	$4,152,786
Government	18	0	$13,042	$0	$0	$13,042
Industrial	1	1	$220,695	$868,297	$1,302,446	$2,391,438
Institutional	1	1	$71,376	$362,763	$362,763	$796,902
Miscellaneous	9	1	$133,566	$80,838	$80,838	$295,242
Residential	1,547	1,356	$145,632,327	$312,557,050	$156,278,525	$614,467,902
Total	**1,589**	**1,363**	**$147,042,732**	**$315,459,478**	**$159,615,102**	**$622,117,312**
Local Responsibility Area						
Agricultural	1	1	$267,882	$448,000	$448,000	$1,163,882
Commercial	243	199	$47,758,061	$87,685,991	$87,685,991	$223,130,043
Government	63	1	$135,416	$226,808	$226,808	$589,032
Industrial	19	19	$3,918,771	$10,982,653	$16,473,980	$31,375,404
Institutional	15	12	$1,000,154	$4,856,503	$4,856,503	$10,713,160
Miscellaneous	2	0	$671,000	$0	$0	$671,000

Fire Responsibility Area /Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Total Improved Value	Estimated Contents Value	Total Value*
Residential	1,427	1,255	$136,900,641	$228,218,258	$114,109,129	$479,228,028
Total	**1,770**	**1,487**	**$190,651,925**	**$332,418,213**	**$223,800,411**	**$746,870,549**
Truckee						
Federal Responsibility Area						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	22	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	2	0	$0	$0	$0	$0
Total	**24**	**0**	**$0**	**$0**	**$0**	**$0**
State Responsibility Area						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	1	0	$18,952	$0	$0	$18,952
Total	**1**	**0**	**$18,952**	**$0**	**$0**	**$18,952**
Local Responsibility Area						
Agricultural	46	5	$3,086,625	$468,704	$468,704	$4,024,033
Commercial	385	272	$134,246,598	$222,443,276	$222,443,276	$579,133,150
Government	127	2	$7,434,014	$116,760	$116,760	$7,667,534
Industrial	34	27	$15,021,422	$16,807,812	$25,211,718	$57,040,952
Institutional	13	9	$681,032	$4,770,691	$4,770,691	$10,222,414
Miscellaneous	64	1	$1,334,864	$27,000	$27,000	$1,388,864
Residential	15,424	12,116	$1,463,709,190	$4,024,518,201	$2,012,259,101	$7,500,486,492
Total	**16,093**	**12,432**	**$1,625,513,745**	**$4,269,152,444**	**$2,265,297,250**	**$8,159,963,439**
Unincorporated Nevada County						
Federal Responsibility Area						
Agricultural	71	2	$557,749	$21,929	$21,929	$601,607
Commercial	1	0	$0	$0	$0	$0
Government	955	1	$1,748,338	$735	$735	$1,749,808
Industrial	0	0	$0	$0	$0	$0

Fire Responsibility Area /Jurisdiction / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Total Improved Value	Estimated Contents Value	Total Value*
Institutional	1	1	$55,320	$817,869	$817,869	$1,691,058
Miscellaneous	6	0	$37,189	$0	$0	$37,189
Residential	78	4	$6,587,248	$64,029	$32,015	$6,683,292
Total	**1,112**	**8**	**$8,985,844**	**$904,562**	**$872,548**	**$10,762,954**
State Responsibility Area						
Agricultural	1,446	612	$116,771,319	$44,294,679	$44,294,679	$205,360,677
Commercial	200	142	$40,901,445	$67,924,911	$67,924,911	$176,751,267
Government	427	4	$2,657,557	$3,904,316	$3,904,316	$10,466,189
Industrial	25	23	$6,791,568	$18,911,915	$28,367,873	$54,071,356
Institutional	54	33	$4,953,832	$23,136,238	$23,136,238	$51,226,308
Miscellaneous	489	12	$9,719,761	$131,979	$131,979	$9,983,719
Residential	32,717	26,157	$2,884,859,875	$5,316,363,960	$2,658,181,980	$10,859,405,815
Total	**35,358**	**26,983**	**$3,066,655,357**	**$5,474,667,998**	**$2,825,941,976**	**$11,367,265,331**
Local Responsibility Area						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	1	0	$496,836	$0	$0	$496,836
Total	**1**	**0**	**$496,836**	**$0**	**$0**	**$496,836**

Source: CAL FIRE, Nevada County 2016/2017 Parcel/Assessor's Data

*Land and structure values

Fire Hazard Severity Zone Analysis

As part of the Fire and Resource Assessment Program (FRAP), CAL FIRE was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), then define the application of various mitigation strategies to reduce risk associated with wildland fires.

Fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The fire hazard model developed by CAL FIRE considers the wildland fuels. Fuel is that part of the natural vegetation that burns during the wildfire. The model also considers topography, especially the steepness

of the slopes. Fires burn faster as they burn up-slope. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. Finally, the model considers the production of burning fire brands (embers) how far they move, and how receptive the landing site is to new fires.

In 2007, CAL FIRE updated its fire hazard severity zone maps for the State of California to provide updated map zones, based on new data, science, and technology that will create more accurate zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources. The program is still ongoing with fire hazard severity zone maps being updated based on designated responsibility areas: FRA, SRA, and LRA.

Methodology

CAL FIRE's SRA and LRA Fire Hazard Severity Zones (FHSZs) data was used as the basis of this analysis in conjunction with the local Very High Fire Hazard Severity Zone Map for the incorporated communities. The Nevada County local fire maps were compiled using local fire data and input, which supplements the CAL FIRE SRA and LRA FHSZ data. Zones for these combined hazard layers are designated with Very High, High, Moderate, Non-Wildland/Non-Urban and Non-Very High hazard classes.

Specifically, the combination of the Adopted SRA FHSZ (fhszs06_3_29) dated November 2007 and the "Recommended" LRA (c29fhszl06_3) dated December 2008 layers yielded gaps in data for Nevada County so the "Draft" FHSZ (c29fhsz106_1) dated September 2007 layer was used to supplement these areas to get a complete coverage of Fire Hazards. As detailed above, where local City maps were available detailing VHFHSZ, this City mapped layers were used for the incorporated areas.

Analysis was performed using these three datasets, ensuring the local, jurisdictional datasets superseded the statewide datasets. Using GIS, the parcel layer were overlaid on the Draft, and Recommended FHSZ layers and the local VHFHSZ layer. For the purposes of this analysis, if the parcel centroid intersects the zone's area, it will be assumed that the entire parcel is in that area. This analysis illustrates the Fire Hazard Severity Zones specific to the Nevada County Planning Area.

Fire Hazard Severity Zones and Values at Risk

Results are presented by total Planning Area, unincorporated Nevada County, and for the incorporated jurisdictions (in their respective annexes to the plan), and detailed tables show improved parcel counts and their land and structure values by property use (residential, industrial, etc.) within each severity zone. According to the information in Table 4-86, almost two thirds of the assets of the County Planning Area fall in the moderate or higher fire severity category.

Nevada County Planning Area

The Fire Hazard Severity Zones are shown in Figure 4-86. Analysis results for the entire Nevada County Planning Area are summarized in Table 4-86, which summarizes by jurisdiction total parcel counts, improved parcel counts, and their improved and land values and the estimated contents replacement values

based on the CRV factors detailed in Table 4-36, as well as the percentage of parcels affected by each fire hazard severity zone.

Figure 4-86 Nevada County Planning Area – Fire Hazard Severity Zones

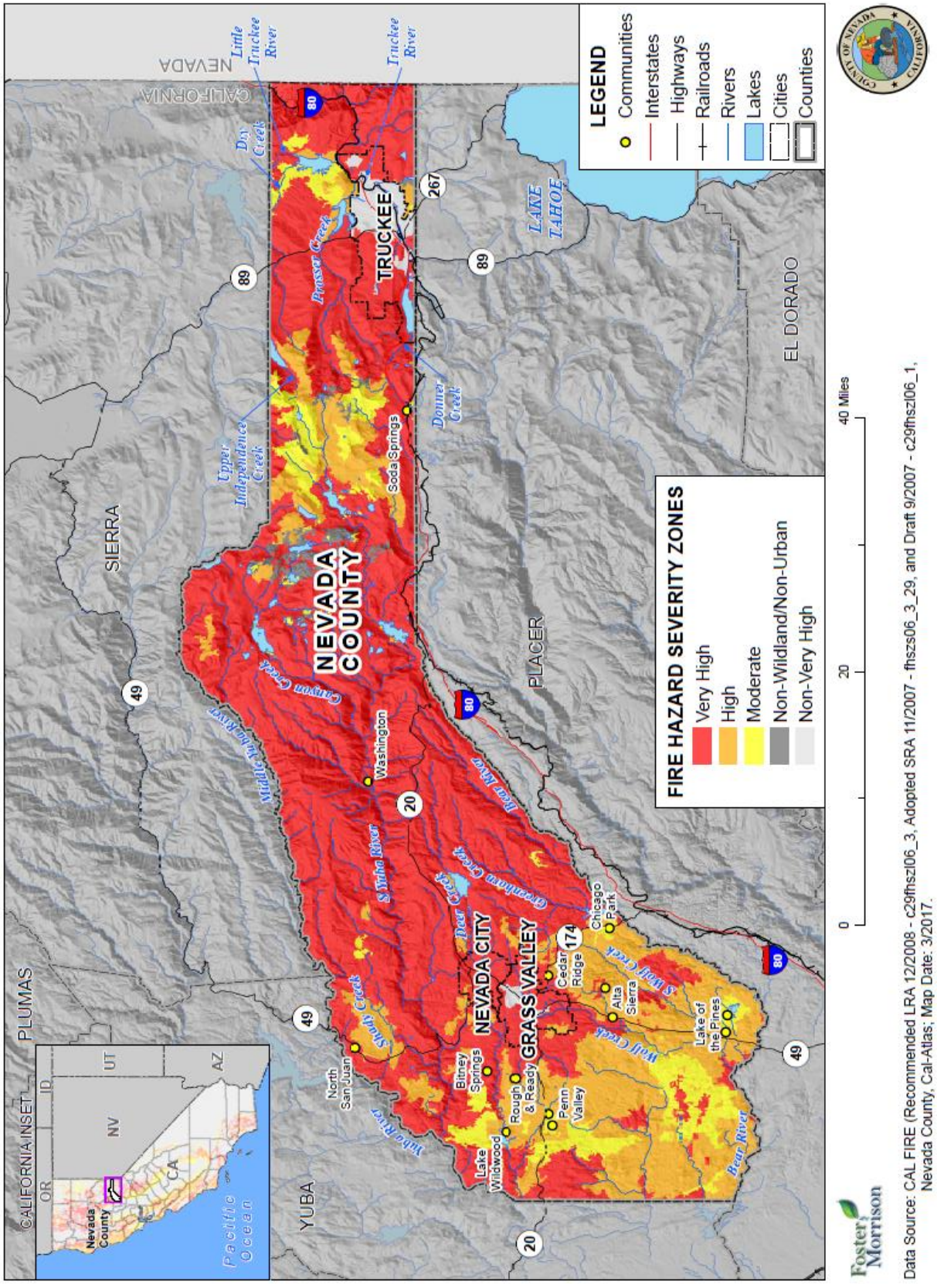


Table 4-86 Nevada County Planning Area – Count and Value of Parcels in Fire Hazard Severity Zones by Jurisdiction with Content Replacement Values

Fire Hazard Severity Zone / Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Very High						
Grass Valley	5,245	4,480	$412,981,529	$836,619,074	$523,860,791	$1,773,461,394
Nevada City	3,355	2,838	$335,359,965	$643,652,189	$381,302,761	$1,360,314,915
Truckee	11,733	9,358	$1,174,424,581	$3,153,989,549	$1,610,386,066	$5,938,800,196
Unincorporated Nevada County	16,255	10,270	$1,240,599,432	$2,054,198,686	$1,063,304,757	$4,358,102,875
Total	**36,588**	**26,946**	**$3,163,365,507**	**$6,688,459,498**	**$3,578,854,375**	**$13,430,679,380**
High						
Grass Valley	148	121	$10,306,331	$26,407,973	$21,932,164	$58,646,468
Nevada City	23	14	$2,419,234	$4,479,816	$2,239,908	$9,138,958
Truckee	0	0	$0	$0	$0	$0
Unincorporated Nevada County	15,726	12,951	$1,373,180,950	$2,593,494,910	$1,325,566,933	$5,292,242,793
Total	**15,897**	**13,086**	**$1,385,906,515**	**$2,624,382,699**	**$1,349,739,004**	**$5,360,028,218**
Moderate						
Grass Valley	0	0	$0	$0	$0	$0
Nevada City	0	0	$0	$0	$0	$0
Truckee	0	0	$0	$0	$0	$0
Unincorporated Nevada County	4,443	3,770	$462,213,784	$827,878,964	$437,942,834	$1,728,035,582
Total	**4,443**	**3,770**	**$462,213,784**	**$827,878,964**	**$437,942,834**	**$1,728,035,582**
Non-Wildland/Non-Urban						
Grass Valley	0	0	$0	$0	$0	$0
Nevada City	0	0	$0	$0	$0	$0
Truckee	0	0	$0	$0	$0	$0
Unincorporated Nevada County	47	0	$143,871	$0	$0	$143,871
Total	47	0	$143,871	$0	$0	$143,871
Non-VHFHSZ						
Grass Valley	2,067	1,710	$235,342,629	$526,089,031	$435,813,907	$1,197,245,567
Nevada City	0	0	$0	$0	$0	$0
Truckee	4,385	3,074	$451,108,116	$1,115,162,895	$654,911,184	$2,221,182,195
Unincorporated Nevada County	0	0	$0	$0	$0	$0
Total	**6,452**	**4,784**	**$686,450,745**	**$1,641,251,926**	**$1,090,725,090**	**$3,418,427,761**

Fire Hazard Severity Zone / Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Grand Total	**63,427**	**48,586**	**$5,698,080,422**	**$11,781,973,087**	**$6,457,261,303**	**$23,937,314,812**

Source: CAL FIRE, Nevada County 2016/2017 Parcel/Assessor's Data
*Land and structure values

Unincorporated Nevada County

Table 4-87 breaks out the details of FHSZ by property use for the unincorporated County, and includes the estimated contents replacement values based on the CRV factors detailed in Table 4-36 in Section 4.3.1.

Table 4-87 Unincorporated Nevada County – Count and Value of Parcels by Property Use and Fire Hazard Severity Zone with Content Replacement Values

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Very High						
Agricultural	1,077	384	$78,373,495	$28,364,251	$28,364,251	$135,101,997
Commercial	90	57	$12,336,679	$13,409,228	$13,409,228	$39,155,135
Government	1,107	5	$3,133,453	$3,905,051	$3,905,051	$10,943,555
Industrial	10	10	$2,278,938	$7,077,584	$10,616,376	$19,972,898
Institutional	29	19	$2,181,666	$12,506,480	$12,506,480	$27,194,626
Miscellaneous	316	7	$8,120,172	$70,650	$70,650	$8,261,472
Residential	13,626	9,788	$1,134,175,029	$1,988,865,442	$994,432,721	$4,117,473,192
Total	**16,255**	**10,270**	**$1,240,599,432**	**$2,054,198,686**	**$1,063,304,757**	**$4,358,102,875**
High						
Agricultural	326	176	$26,573,267	$10,598,543	$10,598,543	$47,770,353
Commercial	63	48	$10,127,405	$22,874,661	$22,874,661	$55,876,727
Government	145	0	$237,270	$0	$0	$237,270
Industrial	12	10	$3,460,831	$8,430,792	$12,646,188	$24,537,811
Institutional	21	12	$2,618,620	$7,294,807	$7,294,807	$17,208,234
Miscellaneous	136	1	$996,327	$9,360	$9,360	$1,015,047
Residential	15,023	12,704	$1,329,167,230	$2,544,286,747	$1,272,143,374	$5,145,597,351
Total	**15,726**	**12,951**	**$1,373,180,950**	**$2,593,494,910**	**$1,325,566,933**	**$5,292,242,793**
Moderate						
Agricultural	105	54	$12,361,181	$5,353,814	$5,353,814	$23,068,809
Commercial	48	37	$18,437,361	$31,641,022	$31,641,022	$81,719,405
Government	95	0	$1,035,172	$0	$0	$1,035,172

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Industrial	3	3	$1,051,799	$3,403,539	$5,105,309	$9,560,647
Institutional	5	3	$208,866	$4,152,820	$4,152,820	$8,514,506
Miscellaneous	43	4	$640,451	$51,969	$51,969	$744,389
Residential	4,144	3,669	$428,478,954	$783,275,800	$391,637,900	$1,603,392,654
Total	**4,443**	**3,770**	**$462,213,784**	**$827,878,964**	**$437,942,834**	**$1,728,035,582**
Non-Wildland/Non-Urban						
Agricultural	9	0	$21,125	$0	$0	$21,125
Commercial	0	0	$0	$0	$0	$0
Government	35	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	3	0	$122,746	$0	$0	$122,746
Total	**47**	**0**	**$143,871**	**$0**	**$0**	**$143,871**
Non-Very High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Grand Total	**36,471**	**26,991**	**$3,076,138,037**	**$5,475,572,560**	**$2,826,814,523**	**$11,378,525,120**

Source: CAL FIRE, Nevada County 2016/2017 Parcel/Assessor's Data

Population at Risk

A separate analysis was performed to determine population in fire hazard severity zones. Using GIS, the CAL FIRE fire hazard severity zone datasets were overlayed on the improved residential parcel data. Those parcel centroids that intersect each fire severity zone were counted and multiplied by the Census Bureau average household size for each incorporated community and the unincorporated County); results were tabulated by jurisdiction and fire severity zone (see Table 4-88). According to this analysis, there is a population of 61,478 in the moderate or higher fire hazard severity zone categories.

Table 4-88 Nevada County Planning Area – Population at Risk in Moderate or Higher Fire Hazard Severity Zones

	Grass Valley		Nevada City		Truckee		Unincorporated	
	Imp. Res. Parcels	Population	Imp. Res. Parcels	Population	Imp. Res. Parcels	Population	Imp. Res. Parcels	Population
Very High	4,287	8,745	2,599	5,431	9,271	23,548	9,788	23,002
High	105	214	14	29	0	0	12,704	29,854
Moderate	0	0	0	0	0	0	3,669	8,622
Total	**4,392**	**8,959**	**2,613**	**5,460**	**9,271**	**23,548**	**26,161**	**61,478**

Source: CAL FIRE, US Census Bureau, Nevada County 2016/2017 Assessor/Parcel Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**Census Bureau 2010 average household sizes are: Grass Valley – 2.04, Nevada City – 2.09; Truckee – 2.54, Unincorporated – 2.35

Critical Facilities at Risk

Wildfire analysis was performed on the critical facility inventory in Nevada County and all jurisdictions. GIS was used to determine whether the facility locations intersect a fire hazard severity zone provided by CAL FIRE, and if so, which zone it intersects. This is shown on Figure 4-87. There are 282 critical facilities in the Planning Area in the very high fire, 109 in the high fire severity zone, and 37 facilities in the moderate fire severity zone, as shown in Table 4-89. There are 171 facilities in the Unincorporated County in the very high fire, 106 in the high fire severity zone, and 37 facilities in the moderate fire severity zone, as shown in Table 4-90. Details of critical facility definition, type, name, address, and jurisdiction by fire severity zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the County, there are likely some that are present within identified fire hazard severity zones.

Figure 4-87 Nevada County Planning Area – Critical Facilities in Fire Hazard Severity Zones

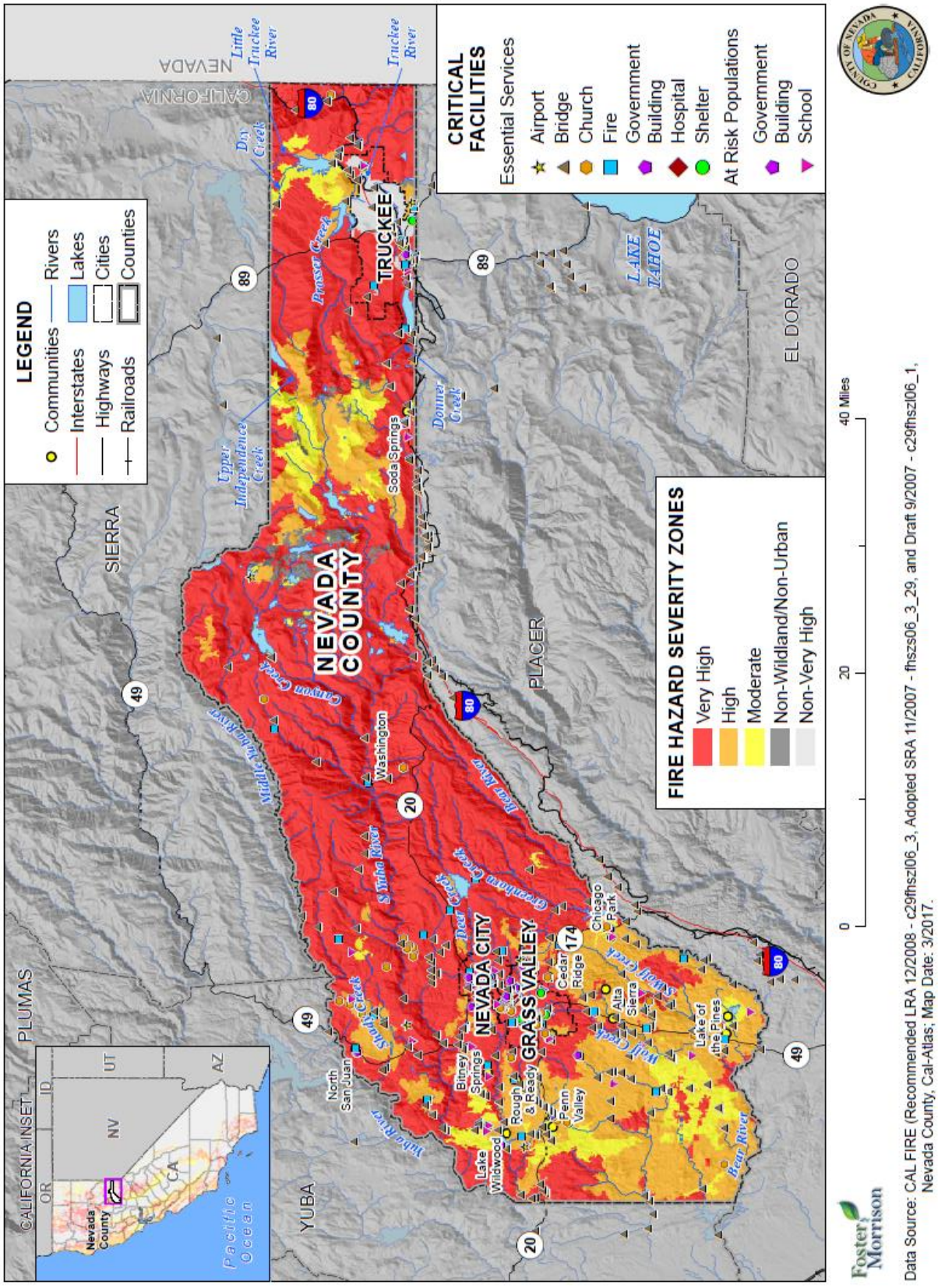


Table 4-89 Nevada County Planning Area – Critical Facilities in Fire Hazard Severity Zones

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
Very High		
Essential Services	Airport	4
	Bridge	153
	Church	34
	Fire	23
	Government Building	22
	Hospital	0
	School	0
	Shelter	11
	Total	**247**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	6
	Hospital	0
	School	29
	Shelter	0
	Total	**35**
Very High Total		**282**
High		
Essential Services	Airport	2
	Bridge	66
	Church	18
	Fire	10
	Government Building	2
	Hospital	0
	School	0
	Shelter	5
	Total	**103**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
	School	6
	Shelter	0
	Total	**6**
High Total		**109**
Moderate		
Essential Services	Airport	0
	Bridge	19
	Church	1
	Fire	3
	Government Building	2
	Hospital	0
	School	0
	Shelter	4
	Total	**29**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	8
	Shelter	0
	Total	**8**
Moderate Total		**37**
Non-Wildland/Non-Urban		
Essential Services	Airport	0
	Bridge	1
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**1**
Non-Wildland/Non-Urban Total		**1**
Non-Very High		
Essential Services	Airport	3

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Bridge	35
	Church	8
	Fire	3
	Government Building	26
	Hospital	6
	School	0
	Shelter	8
	Total	**89**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	12
	Shelter	0
	Total	**12**
Non-Very High Total		**101**
Grand Total		**530**

Source: CAL FIRE, Nevada County GIS

Table 4-90 Unincorporated Nevada County – Critical Facilities in Fire Hazard Severity Zones

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
Very High		
Essential Services	Airport	3
	Bridge	120
	Church	18
	Fire	14
	Government Building	3
	Hospital	0
	School	0
	Shelter	2
	Total	**160**
At Risk Populations	Airport	0
	Bridge	0
	Church	0

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Fire	0
	Government Building	1
	Hospital	0
	School	10
	Shelter	0
	Total	**11**
Very High Total		**171**
High		
Essential Services	Airport	2
	Bridge	65
	Church	18
	Fire	10
	Government Building	0
	Hospital	0
	School	0
	Shelter	5
	Total	**100**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	6
	Shelter	0
	Total	**6**
High Total		**106**
Moderate		
Essential Services	Airport	0
	Bridge	19
	Church	1
	Fire	3
	Government Building	2
	Hospital	0
	School	0
	Shelter	4
	Total	**29**

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	8
	Shelter	0
	Total	**8**
Moderate Total		**37**
Non-Wildland/Non-Urban		
Essential Services	Airport	0
	Bridge	1
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**1**
Non-Wildland/Non-Urban Total		**1**
Grand Total		**315**

Source: CAL FIRE, Nevada County GIS

Historical, Cultural, and Natural Resources at Risk

Nevada County has substantial historical, cultural and natural resources located throughout the County as previously described - all that are potentially at risk to a devastating wildfire. In addition, there are other natural resources at risk when wildland-urban interface fires occur. One is the watershed and ecosystem losses that occur from wildland fires. This includes impacts to water supplies and water quality as well as air quality. Another is the aesthetic value of the area. Major fires that result in visible damage detract from that value. Other assets at risk include wildland recreation areas, wildlife and habitat areas, and rangeland resources. The loss to these natural resources can be significant.

Overall Community Impact

The overall impact to the community from a severe wildfire includes:

- Injury and loss of life;

- Commercial and residential structural and property damage;
- Decreased water quality in area watersheds;
- Increase in post-fire hazards such as flooding, sedimentation, and mudslides;
- Damage to natural resource habitats and other resources, such as timber and rangeland;
- Loss of water, power, roads, phones, and transportation, which could impact, strand, and/or impair mobility for emergency responders and/or area residents;
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures;
- Negative impact on commercial and residential property values;
- Loss of churches, which could severely impact the social fabric of the community;
- Loss of schools, which could severely impact the entire school system and disrupt families and teachers, as temporary facilities and relocations would likely be needed; and
- Impact on the overall mental health of the community.

Future Development

Population growth and development in Nevada County has recently slowed. However, additional growth and development within the WUI areas of the County would place additional assets at risk to wildfire.

GIS Analysis

Future development areas for unincorporated Nevada County were made available by County GIS for this plan. An analysis was performed to quantify parcels within these development areas that are also in fire hazard severity zones. Results can provide information on how and where to grow in the future. GIS was used to determine the number of parcels in the fire hazard severity zones within the future development areas. GIS was used to create a centroid, or point representing the center of the parcel polygon.

The future development zones in the fire hazard severity zones are shown on Figure 4-88, and a summary of properties by property use and fire hazard severity zone is detailed in Table 4-91.

Figure 4-88 Nevada County – Future Development and Fire Hazard Severity Areas

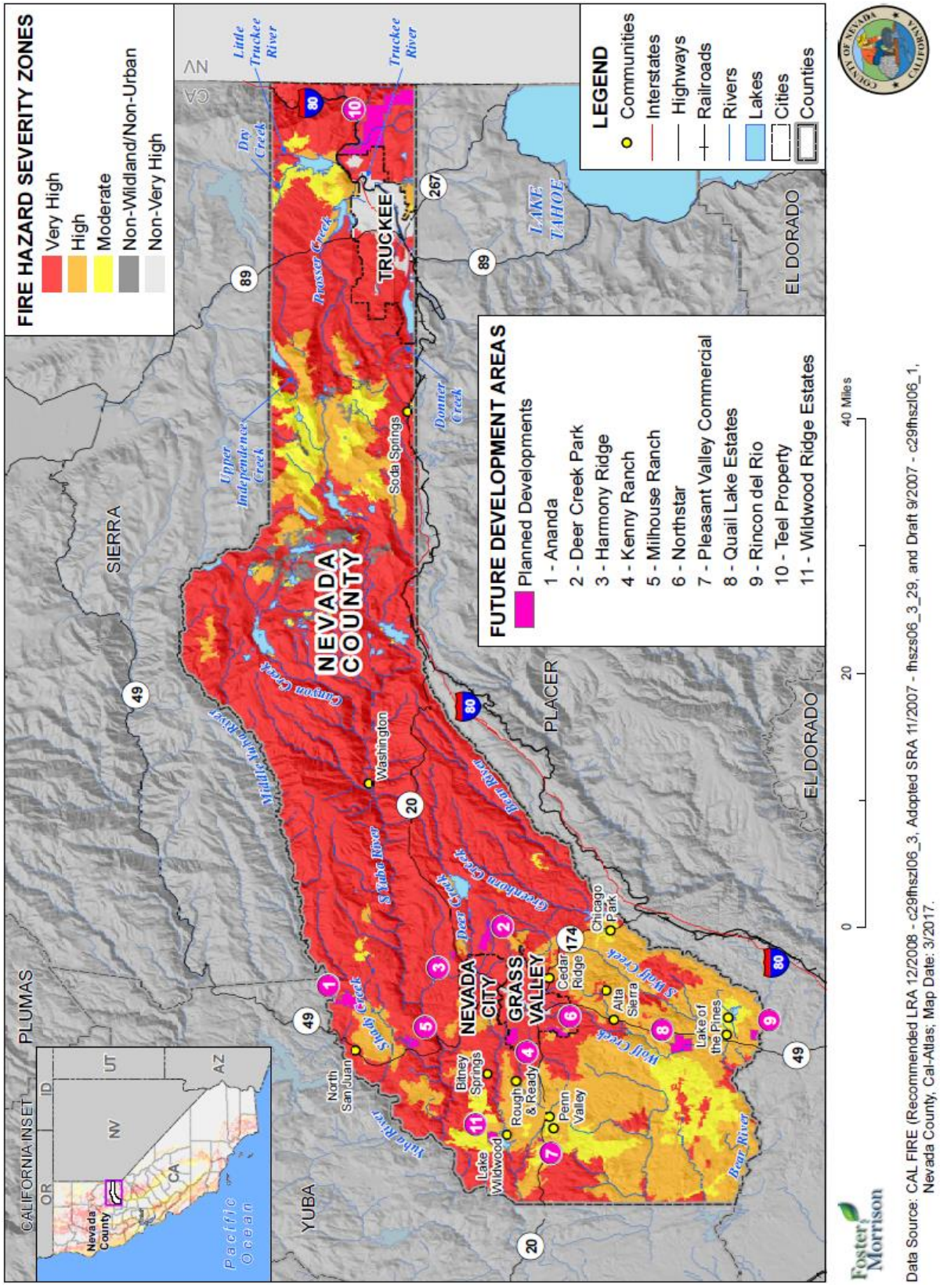


Table 4-91 Nevada County – Future Development in Fire Hazard Areas by Property Use

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
1 - Ananda		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	1	1
Institutional	3	1
Miscellaneous	0	0
Residential	1	0
Very High Total	**5**	**2**
High		
Agricultural	1	1
Commercial	2	2
Government	0	0
Industrial	0	0
Institutional	7	5
Miscellaneous	0	0
Residential	4	1
High Total	**14**	**9**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
1 - Ananda Total	**19**	**11**
2 - Deer Creek Park 2		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Miscellaneous	0	0
Residential	18	2
Very High Total	**18**	**2**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
High Total	**0**	**0**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
2 - Deer Creek Park 2 Total	**18**	**2**
3 - Harmony Ridge		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	1	1
Very High Total	**1**	**1**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
High Total	**0**	**0**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
3 - Harmony Ridge Total	**1**	**1**
4 - Kenny Ranch		
Very High		
Agricultural	0	0
Commercial	1	0
Government	1	0
Industrial	0	0
Institutional	2	1
Miscellaneous	0	0
Residential	7	1
Very High Total	**11**	**2**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
High Total	**0**	**0**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
4 - Kenny Ranch Total	**11**	**2**
5 - Milhouse Ranch		
Very High		
Agricultural	1	1
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	12	12
Very High Total	**13**	**13**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
High Total	**0**	**0**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
5 - Milhouse Ranch Total	**13**	**13**

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
6 - Northstar		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	1	0
Very High Total	**1**	**0**
High		
Agricultural	1	1
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	9	0
Residential	6	1
High Total	**16**	**2**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
6 - Northstar Total	**17**	**2**
7 - Pleasant Valley Commercial		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Residential	0	0
Very High Total	**0**	**0**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	2	0
High Total	**2**	**0**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
7 - Pleasant Valley Commercial Total	**2**	**0**
8 - Quail Lake Estates		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Very High Total	**0**	**0**
High		
Agricultural	5	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Miscellaneous	0	0
Residential	5	2
High Total	**10**	**2**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
8 - Quail Lake Estates Total	**10**	**2**
9 - Rincon del Rio		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	1	0
Very High Total	**1**	**0**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	4	1
High Total	**4**	**1**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
9 - Rincon del Rio Total	**5**	**1**
10 - Teel Property		
Very High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	6	0
Residential	15	0
Very High Total	**21**	**0**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
High Total	**0**	**0**
Non-VHFHSZ		
Agricultural	1	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**1**	**0**
10 - Teel Property Total	**22**	**0**
11 - Wildwood Ridge Estates		
Very High		
Agricultural	0	0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Very High Total	**0**	**0**
High		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	121	98
High Total	**121**	**98**
Non-VHFHSZ		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Non-VHFHSZ Total	**0**	**0**
11 - Wildwood Ridge Estates Total	**121**	**98**
Grand Total	**239**	**132**

Source: CAL FIRE, Nevada County GIS

4.4 Capability Assessment

Thus far, the planning process has identified the hazards posing a threat to the Planning Area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this plan.

The HMPC used a two-step approach to conduct this assessment for the County. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This section presents the County's mitigation capabilities and discusses select state and federal mitigation capabilities that are applicable to the County.

Similar to the HMPC's effort to describe hazards, risks, and vulnerability of the County, this mitigation capability assessment describes the County's existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This assessment is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; and mitigation education, outreach, and partnerships are discussed in Section 4.4.4. A discussion of other mitigation efforts follows in Section 4.4.5. Mitigation capabilities specific to other participating jurisdictions are included in their respective annexes to this Plan Update.

4.4.1. Nevada County's Regulatory Mitigation Capabilities

Table 4-92 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, and indicates those that are in place in the County. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 4-92 Nevada County Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
General Master Plan	Y 2013	Plan identifies hazards and includes a strategy to mitigate.
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	Y 2011	Plan identifies hazards and includes a strategy to mitigate.
Continuity of Operations Plan	N	
Transportation Plan	Y	There are multiple plans, but they do not address the hazards addressed in this plan.
Stormwater Management Plan/Program	Y	
Engineering Studies for Streams	N	
Community Wildfire Protection Plan	Y 2016	There are three in the County. One covers the County in full, the second covers Truckee, and the third covers San Juan

Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: 2016 CBC
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:		
Site plan review requirements		
Property Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts?** **Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	Ordinance is effective and adequately enforced.
Subdivision ordinance	Y	Ordinance is effective and adequately enforced.
Floodplain ordinance	Y	Ordinance is effective and adequately enforced.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Ordinance is effective and adequately enforced.
Flood insurance rate maps	Y	Ordinance is effective and adequately enforced.
Elevation Certificates	Y	Ordinance is effective and adequately enforced.
Acquisition of land for open space and public recreation uses		
Erosion or sediment control program	Y	Ordinance is effective and adequately enforced.
Other	Y	Hazardous vegetation.
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing and training; plan development, monitoring and updating; increased enforcement and updates to ordinances, policies, and procedures; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

As indicated in the tables above, Nevada County has several plans and programs that guide the County's mitigation of development of hazard-prone areas. Starting with the Nevada County General Plan, which is the most comprehensive of the County's plans when it comes to mitigation, some of these are described in more detail below.

Nevada County General Plan (2013)

A general plan is a legal document, required by state law, that serves as a community's "constitution" for land use and development. The plan must be a comprehensive, long-term document, detailing proposals for the "physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning" (Government Code §65300 et seq.). Time horizons vary, but the typical general plan looks 10 to 20 years into the future. The law specifically requires that the general plan address seven topics or "elements." These are land use, circulation (transportation),

housing, conservation, open space, noise, and safety. The plan must analyze issues of importance to the community, set forth policies in text and diagrams for conservation and development, and outline specific programs for implementing these policies.

Goals and policies related to mitigation from the General Plan are the following:

Safety Element

Goal EP-10.1	Provide a coordinated approach to hazard and disaster response preparedness.
Policy EP-10.1.1	Ensure a coordinated, interagency program for disaster preparedness that will facilitate federal and state disaster assistance by planning for the reduction of the effects of natural hazards.
Policy EP-10.1.2	The Local Hazard Mitigation Plan (LHMP), adopted by the County on July 17, 2012, in accordance with the Federal Disaster Mitigation Act of 2000 and Government Code 65302.6, shall serve as the implementation program for the coordination of hazard planning and disaster response efforts within the County. The LHMP shall be reviewed annually by the County Office of Emergency Services and updated as necessary to ensure compliance with the Federal Disaster Mitigation Act of 2000, as it exists or as may be amended.
Policy EP-10.1.3	Coordinate with the State Office of Emergency Services for wildfire, awareness of implementation of state programs. The local earthquake preparedness plan shall be coordinated with regional plans for earthquake preparedness through the local and State Office of Emergency Services.
Policy EP-10.1.4	Provide for adequate evacuation routes in areas of high fire hazard, high potential for dam failure, earthquake, seiches, avalanche, flooding or other natural disaster.
Policy EP-10.1.5	Promote the continued effectiveness and public awareness of the Nevada County and Nevada Operational Area Emergency Operations Plan, and Community Emergency Preparedness and Evacuation Guides, through the local Office of Emergency Services, as the focus for planning for emergency evacuation of threatened populations.
Policy EP-10.1.6	Transportation routes that are designated on the General Plan Land Use Maps as Interstates, freeways, highways, and other principal arterial routes shall be considered primary evacuation routes on a countywide basis. Such routes provide the highest levels of capacity and contiguity and serve as the primary means for egress from the County. The routes designated on the General Plan Land Use Maps as minor arterial or major collector routes shall be considered secondary evacuation routes on a countywide basis. These routes supplement the primary evacuation routes, and provide egress from local neighborhood and communities.
Policy EP-10.1.7	Support the development and maintenance of countywide and local emergency evacuation plans.
Policy EP-10.1.8	Recognize that the Emergency Preparedness and Evacuation Guides will be developed as supporting plans to the Nevada County and Nevada Operational Area Emergency Operations Plan.
Policy EP-10.1.9	Support the development of Community Emergency Preparedness and Evacuation Guides by local community members in collaboration with the County Office of Emergency Services.

GOAL GH-10.2	Minimize injury and property damage due to geologic and seismic hazards.
Policy GH-10.2.1	Ensure that new construction meets current structural and safety standards.

GOAL GH-10.2	Minimize injury and property damage due to geologic and seismic hazards.
Policy GH-10.2.2	Continue to cooperate with the State Department of Conservation – California Geological Survey, the State Office of Emergency Services and other appropriate federal, state and local agencies and incorporate the most current data concerning the following as the basis for the County's Site Development Standards, and project site plan review: a. geologic hazards; and b. seismic hazard data for sensitive land uses such as schools, medical facilities, high-density residential uses, and intensive commercial uses.
Policy GH-10.2.1.3	Carry out the requirements of the California Building Code, particularly with regard to seismic design.
Policy GH-10.2.1.4	Require that underground utility lines, particularly water and natural gas mains, be designed to withstand seismic forces.

GOAL FH-10.3	Reduce the potential for injury, property damage, and environmental damage from flooding.
Policy FH-10.3.1	Implement development standards to ensure new construction does not result in increased peak run-off or flood potential.
Policy FH-10.3.2	Avoid potential increases in downstream flooding potential by protecting natural drainage and vegetative patterns through project site plan review, application of Comprehensive Site Development Standards, use of clustered development and project subdivision design. The Comprehensive Site Development Standards shall include measures applicable to all discretionary and ministerial projects to avoid downstream flooding resulting from new development. Such measures, shall include, but not be limited to: a. Avoidance of stream channel modifications; b. Avoidance of excessive areas of impervious surfaces; and c. Use of on-site retention or detention of storm water.
Policy FH-10.3.3	Participate in County flood studies and programs.
Policy FH-10.3.4	Continue to work with appropriate local, state and federal agencies (particularly FEMA) in maintaining the most current flood hazard and flood plain information as a basis for project review in such areas in accordance with federal, state and local standards.
Policy FH-10.3.5	Continue to participate in the National Flood Insurance Program.

GOAL HM-10.5	Protect public health, safety, natural resources, and property through regulation of use, storage, transport, and disposal of hazardous materials.
Policy HM-10.5.1	Provide means for the identification, safe use, storage, transport, and disposal of hazardous materials.
Policy HM-10.5.2	In siting on and off-site hazardous waste management facilities, the County shall follow the criteria and mitigation measures set forth in the Nevada County Hazardous Waste Management Plan, and attendant Final Environmental Impact Report, in order to minimize safety hazards associated with hazardous material and hazardous waste incidents.
Policy HM-10.5.3	The County will encourage the cleanup of sites contaminated by mine wastes or other hazardous materials.
Policy HM-10.5.4	The County will actively promote prompt clean-up or remediation of properties contaminated by mine waste or other hazardous materials and shall not grant any discretionary or ministerial land use approvals to develop or change boundaries or reconfigure parcels believed to be contaminated unless and until the nature, extent, type and location of the contamination is determined and satisfactory arrangements are made for clean-up or remediation, in

GOAL SF-10.6	Ensure adequate public safety services and facilities through development standards, development fees, and land use patterns.
Policy SF-10.6.4	Land use patterns and development standards shall minimize hazards resulting from flooding, earthquake, slope failure, avalanche, and other natural occurrences.

GOAL FP-10.7	Enhance fire safety and improve fire protection effectiveness through infrastructure and service improvements.
Policy FP-10.7.1	Identify existing County-maintained roads not meeting design standards for current or anticipated use as designated on the General Plan Land Use Map.
Policy FP-10.7.2	Ensure that proposed private roads are maintained.
Policy FP-10.7.3	As a condition of development, require long-term maintenance of private roads to the standards of the original improvements, including roadside vegetation management.
Policy FP-10.7.4	Research the feasibility of a countywide rural fire protection water system that provides a cost-effective, adequate water supply.
Policy FP-10.7.5	Encourage fire protection agencies to determine appropriate levels of fire protection facilities and services for both Community and Rural Regions.
Policy FP-10.7.6.	Encourage the upgrading of facilities within existing fire protection districts, and encourage the expansion of existing districts where warranted by the population density allowed under the General Plan
Policy FP-10.7.7	Cooperate with CAL FIRE, US Forest Service, local fire districts, and the Nevada County Fire Safe Council in fire prevention programs.

GOAL FP-10.8	Reduce fire risk to life and property through land use planning, ordinances, and compliance programs.
Policy FP-10.8.1	As needed, review and revise existing wildland fire-related codes and ordinances to address the recognized hazards of development in the wildland urban interface.
Policy FP-10.8.2	Recognize the ignition-resistant building standards in Land Use and Development Code Chapter V, Building.
Policy FP-10.8.3	Comply with air quality regulations by encouraging alternatives to debris burning.
Policy FP-10.8.4	Support removal of fuels and chipping and onsite distribution of chipped material as preferred alternatives to burning.
Policy FP-10.8.5	Consider new wildfire safety codes and ordinances to meet the County's fire safe needs.
Policy FP-10.8.6	Review wildfire safety policies, codes, and ordinances, and report the findings to the Board of Supervisors at least every three years.
Policy FP-10.8.7	Review and recommend improvement of the "same practical effect" process for meeting the intent of the fire safety regulations.
Policy FP-10.8.8	Recognize the value of the "same practical effect" or "exception" process when the letter of the law may not be practically applied, but the intent of the law may be achieved through application of other measures. Develop a public information sheet to increase public awareness and understanding regarding the application of these processes.
Policy FP-10.8.9	Land use patterns and development standards shall minimize fire hazard.

GOAL FP-10.8	Reduce fire risk to life and property through land use planning, ordinances, and compliance programs.
Policy FP-10.8.10	The County shall coordinate and centralize firesafe reviews which will include coordination of development with respect to fire prevention and safety, and implementation of Nevada County fire safety programs, standards and procedures.
Policy FP-10.8.11	The following shall be included in the Comprehensive Site Development Standards as the basis for site plan review: a. Standards for roads and private driveways which will enhance the ability of emergency service providers to respond to structural and wildland fires, and calls for medical and law enforcement emergency assistance. The standards shall provide for secondary road access to new projects where necessary for fire safety or emergency access; b. Water supply standards which will provide necessary on-site water supply for fire protection; c. Sign and address standards which will provide for easy identification of roads, streets, driveways and buildings by emergency service providers; and d. Standards to reduce hazards associated with the structural and wildland intermix including: (1) Fuel modification; and vegetation management procedures adjacent to structures; (2) Vegetation management adjacent to roads and driveways to provide safe travel of residents and firefighting personnel; and (3) Building setbacks.
Policy FP-10.8.12	In those areas outside Community Regions, which are identified as having a high fire hazard, and/or lack adequate year-round fire protection facilities, maintain low-density land use designations (Rural or Forest) in order to minimize the potential fire hazard.

GOAL FP-10.9	Encourage fire safety education and support programs to promote participation, voluntary compliance, and community awareness of fire safety issues.
Policy FP-10.9.1	Inform the public how to undertake fuels management activities in accordance with environmental regulations and guidelines.
Policy FP-10.9.2	Make available educational materials regarding environmental regulations, guidelines, and protection measures that property owners should be aware of and are responsible for when planning and undertaking fuels management activities. These educational materials shall be available to members of the public at the County.
Policy FP-10.9.3	Increase public education and outreach on wildfire safety issues by utilizing the Fire Safe Council and collaborating with community and business associations.
Policy FP-10.9.4	Provide a better understanding to the public and to the architectural and building industry about the benefits and material/design options available with ignition-resistant building materials.
Policy FP-10.9.5	Support the development of a fuels management consulting and technical service contact list for private property owners by the appropriate fire agency.
Policy FP-10.9.63	Encourage the development and organization of a property owner assistance program for fuels treatment.
Policy FP-10.9.7	Encourage and support the effort for local neighborhoods and communities to become certified under the Firewise Communities USA® certification program through the Fire Safe Council.
Policy FP-10.9.8	Create a cooperative business environment that encourages business, professional services, and governmental agencies to provide landowners with prudent, safe, economical, and environmentally sensitive services.
Policy FP-10.9.9	Create incentives to encourage voluntary compliance with fire safe regulations.

GOAL FP-10.9	Encourage fire safety education and support programs to promote participation, voluntary compliance, and community awareness of fire safety issues.
Policy FP-10.9.10	The County shall work with the California Department of Insurance to obtain recognition that Nevada County has developed fire safety programs that promote compliance with fire safety regulations.
Policy FP-10.9.11	Assist the Fire Safe Council with identifying fuel reduction priorities for grant-funded projects.
Policy FP-10.9.12	Support the Fire Safe Council's public education efforts in order to ensure projects are consistent with County policies, resource standards, and ordinances.
Policy FP-10.9.13	Improve public awareness regarding Nevada County's ecosystem and fire history.
Policy FP-10.9.14	Encourage landowners to obtain fire safety educational information from the appropriate fire and resource agencies.
Policy FP-10.9.15	Support collaboration among CAL FIRE, the US Forest Service, the Bureau of Land Management, the Nevada County Superintendent of Schools, and other interested groups to develop a school curriculum based upon the role of cyclical historic fire in Sierra Nevada forests.
Policy FP-10.9.16	Explore the feasibility of a forest school within the Tahoe National Forest to provide students a laboratory in which to study

GOAL FP-10.10	Involve all stakeholders in collaborating on countywide fire safety goals and plans to consistently and efficiently implement fire safety-related best management practices.
Policy FP-10.10.1	Create a collaborative process for integration of countywide common goals into each fire agency's fire prevention program.
Policy FP-10.10.2	Facilitate a collaborative process with public and private land managers for integrated wildland-urban interface fuels management.

GOAL FP-10.11	Reduce fire severity and intensity through fuels management.
Policy FP-10.11.1	Recognize Public Resources Codes 4290 and 4291, and other defensible space standards and guidelines in order to protect structures from wildfire, protect wildlands from structure fires, and provide safe access routes for people and firefighters.

GOAL FP-10.11	Reduce fire severity and intensity through fuels management.
Policy FP-10.11.2	Recognize the Nevada County Defensible Space Standard as described in this policy. The Defensible Space Standard provides the basic protection measures for life and property from encroaching wildfire, and minimizes structure fires or other fires which may threaten to spread into the wildlands. The standard utilizes Public Resources Code 4291 and includes one component of Public Resources Code 4290, fuels treatment next to driveways, as the minimum fire safety standard in Nevada County. The following definitions apply to the Nevada County Defensible Space Standard: a. Flammable vegetation: Any live or dead vegetation that is combustible during normal summer weather. Vegetation which is pruned, limbed, cultivated, or considered ornamental shrubbery or plants, provided they are maintained and/or irrigated and they do not form a means of rapidly transmitting a fire from the surrounding wildlands, is not considered flammable vegetation and is permissible to be retained; b. Firebreak: An area where flammable vegetation and other combustible growth are removed and cleared to create a condition that avoids the spreads of fire to other vegetation or to a building or structure; c. Fuelbreak: An area that has been changed from dense, heavy vegetation to lower fuel volumes with tree pruning, intermediate shrub, brush, and dead fuel removed, and grasses and forbs replacing the shrub species; d. Structure Ignition Zone: A firebreak area free of flammable vegetation and other combustible growth around any structure. e. Reduced Fuel Zone: A fuelbreak area of separated vegetation, both vertically and horizontally, which extends beyond the Structure Ignition Zone; f. Extended Reduced Fuel Zone: An extension of the Reduced Fuel Zone on downslope areas that varies depending on slopes and vegetation characteristics, as shown in the table below; and g. Safe Access Route: A fuelbreak of spatially separated vegetation, both vertically and horizontally, adjacent to driveways that connect homes with roadways.
Policy FP-10.11.3	Recognize the following fuels treatment guidelines, which serve as recommendations for appropriate spatial arrangement, width, depth, and pruning/limbing height of vegetation in the Extended Reduced Fuel Zone during declared fire season. The guidelines also distinguish appropriate fuels treatment for the various vegetation types in the County: grass-oak woodlands, montane brush, mixed conifer forest and eastside pine with sage.
Policy FP-10.11.4	Recognize a stewardship program focusing on the management of flammable, hazardous vegetation in and around community areas to effectively reduce wildfire intensity and severity,
Policy FP-10.11.5	Support the Nevada County Wildland Stewardship Program, which provides flexible guidelines for managing hazardous vegetation and promotes property owners' understanding of the wildland environment and responsible land stewardship concepts, including voluntary property management and collaboration with neighbors. The Wildland Stewardship Program focuses on the area adjacent to the defensible space area to enhance protection for structures and protect surrounding natural resources. The Wildland Stewardship Program is described in educational materials which shall be available at the County. The Wildland Stewardship Program includes the following: a. The educational material, which provides background and supporting information describing the wildfire and regulatory setting, as well as other important information for property owners in understanding and maintaining defensible space. b. A property owner's guide to help property owners develop goals, identify types of fire fuels, select treatment processes, estimate cost and time frames, and understand environmental constraints and regulations. c. Good neighbor practices to help achieve adequate defensible space in situations where structures cannot achieve it due to parcel size or other constraints. d. Fuels management environmental protection measures to inform property owners of various regulations, provide contacts at resource and regulatory agencies, and explain how best to comply with the regulations. e. Technical and funding assistance information to facilitate fuels management activities.

GOAL FP-10.11	Reduce fire severity and intensity through fuels management.
Policy FP-10.11.6	The County shall collaborate with the Fire Safe Council in updating and maintaining the countywide Community Wildfire Protection Plan according to Healthy Forest Restoration Act guidelines.

GOAL WH-10.13	Minimize injury and property damage due to severe weather hazards (rain, snow, lightning, and high winds).
Policy WH-10.13.1	Ensure a coordinated, multi-jurisdictional preparedness program that will educate residents of Nevada County on how to best prepare for the hazards that severe weather can cause.
Policy WH-10.13.2	Continue to promote public awareness of emergency preparedness for potential severe weather hazards by: a. Providing education opportunities to local community groups; and b. Distributing the latest educational documents on emergency preparedness.

Nevada County Emergency Operations Plan (2011)

This Emergency Operations Plan or "EOP" delineates the preparation for, emergency response to and recovery from the effects of a natural disaster or a manmade incident occurring wholly within or affecting any unincorporated area of Nevada County. Throughout the plan are numerous references to those times and incidents where the County will function as an Operational Area (OA), which the California Emergency Services Act defines (for each county in California) as "…an intermediate level of state emergency management organization, consisting of the county and all political subdivisions within the county area." When functioning as an OA, Nevada County is authorized to coordinate emergency activities with its cities, towns, special districts, etc... However, at all times, political subdivisions such as cities, towns, special districts, etc. maintain their legal jurisdictional authorities. Additionally, an OA serves as a link in the communications system between all political subdivisions and the State.

Nevada County Flood Insurance Study (2010)

This countywide Flood Insurance Study investigates the existence and severity of flood hazards in, or revises and updates previous FISs/Flood Insurance Rate Maps (FIRMs) for the geographic area of Nevada County, California, including: the Cities of Grass Valley and Nevada City, the Town of Truckee, and the unincorporated areas of Nevada County. This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This FIS has developed flood risk data for various areas of the county that will be used to establish actuarial flood insurance rates. This information will also be used by Nevada County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Nevada County Community Wildfire Protection Plan (2016)

Residents of Nevada County are concerned about the effects of wildfire on their community. Devastating wildfires in the region have heightened the awareness of the potential impacts and have prompted local

residents, government officials, and fire department personnel to join together to review and update the Community Wildfire Protection Plan (CWPP) for Nevada County and plan actions to be taken to protect human life, property, and reduce the risk of future wildfire-related disasters to the natural environment. The primary goal of the CWPP is to protect human life, private property, essential infrastructure and natural resources through the implementation of fire prevention projects that work to increase public awareness, improve forest health, sustain local wildlife and preserve the natural beauty of the area through a shared responsibility concept.

North San Juan Fire Protection District Community Wildfire Protection Plan (2017)

In addition to the Nevada County CWPP, the North San Juan Fire Protection District (NSJFPD) put together a CWPP for their particular area of the County. It is important to remember that this Plan has two purposes. One is to provide a database of District information for inclusion in grant proposals or for other uses. The second is to satisfy the requirement for priority funding of grants under the Healthy Forests Restoration Act of 2003 that a Fire Plan exist giving "background information about a project area, a discussion of community values at risk, community base maps, a fire risk assessment, and recommendations that identify treatment areas for reducing fuels and promoting education and awareness about wildland fires."

The NSJFPD faces a severe risk of wildland fire. Years of fire suppression, soil disturbance, vegetation regrowth, rural development and road construction, often not to current specifications, have created the potential for severe fires and reduced fire-fighting capabilities. During the summer fire season our dense mixed forest understory composed of ladder fuels reduces fire suppression capabilities. Many of our buildings lack defensible space and some bridges, culverts and roads cannot safely accommodate fire suppression apparatus. Water supplies are often inadequate for fire protection and many citizens are unaware of actions they can take independently to improve their personal safety and protect their property. The size of our District, 70 square miles, and its location north of Nevada City and Grass Valley, magnify these challenges and present a risk to Nevada County's major population areas.

Truckee Fire Protection District Community Wildfire Protection Plan (2016)

In addition to the Nevada County CWPP, the Truckee Fire Protection District (TFPD) put together a CWPP for their particular area of the County. The purpose of this document is to provide a comprehensive, scientifically based assessment of the wildfire hazards and risks within the Truckee Fire Protection District which includes Town of Truckee; and the communities of Floriston, Hirschdale, Donner, Hobart Mills, Kingvale, Prosser Lakeview Estates, Glenshire/Devonshire, Soda Springs, Norden, Big Bend, Cisco Grove, and Serene Lakes.

Nevada County Noxious Invasive Weed Program

The Nevada County Agriculture Commissioner's Office is tasked with protecting the agriculture and natural resources of the county. This includes management and eradication of noxious invasive plants. The species we target in Nevada County include, but are not limited to mostly A- and B- state rated weeds. Methods used to eradicate these unwanted plants include hand pulling, shoveling, and herbicides. If herbicide treatment is required, selective products are used that only acts on the target plants. When utilizing herbicides spot spraying is done, leaving non-target plants unaffected, thereby mitigating herbicide drift

and damage to sensitive sites. Proper weed eradication and management takes many years and repeat visits to each site are necessary. Currently there 21 weed species at 320 different sites that we control.

Nevada County Ordinances

The Nevada County General Plan provides policy direction for land use, development, open space protection, and environmental quality; however, this policy direction must be carried out through numerous ordinances, programs, and agreements. The following ordinances are among the most important tools for implementing the General Plan and/or are critical to the mitigation of hazards identified in this plan.

Emergency Services Council (Title 1, Article 2)

Nevada County - Operational Area Emergency Services Council is hereby created. (Ord. 1958)

Zoning Regulations (Title 3, Chapter 2)

This Chapter shall be known as the "Nevada County Zoning Ordinance," Chapter II of the Nevada County Land Use and Development Code. This ordinance is adopted pursuant to Section 11 of Article XI of the Constitution of the State of California and in compliance with Title 7 of the Planning and Zoning Law of the Government Code for the purpose of promoting the health, safety and general welfare. The zoning ordinance is adopted in order to achieve the following objectives:

- To serve as the primary tool to implement and ensure consistency with the goals, objectives, and policies of the Nevada County General Plan based upon the following central themes:
  - ✓ Fostering a rural quality of life.
  - ✓ Sustaining a quality environment.
  - ✓ Development of a strong diversified, sustainable local economy.
  - ✓ Planned land use patterns to determine the level of public services appropriate to the character, economy, and environment of each region.
- To provide for the development of Nevada County as a balanced community with adequate amounts of land zoned in each district to achieve a balance among housing, employment, retail and commercial services, recreation, and public facilities.
- To provide for adequate mechanisms and standards to regulate the surface and subsurface uses of land, structures to meet the needs of residents, commerce, industry, agriculture, forestry, and other purposes in appropriate places.
- To provide for land use regulations that are clear, concise, enforceable, and effectively implement Nevada County General Plan provisions in a reasonable and balanced fashion.
- To provide for conservation of natural amenities, such as open space, wetlands, native vegetation, and wildlife.

Subdivision Regulations (Title 3, Chapter 4)

This Chapter is enacted pursuant to and supplementary to Division 2 of Title 7 of the Government Code (Sections 66410, et seq.) and other provisions of the State for the purpose of adopting regulations for the design and improvement of subdivisions within the unincorporated territory of the County of Nevada, State of California.

Building Regulations (Title 3, Chapter 5)

This Chapter is enacted for the purpose of providing minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures, regulated equipment, grading and construction activities that result in a land disturbance on private property within this jurisdiction.

Subject to the modifications and amendments contained in this Chapter, the following codes and standards are hereby adopted and incorporated into the Land Use and Development Code of Nevada County by reference and having the legal effect as if their respective contents were set forth herein:

- Division II, Scope and Administration, 2016 California Building Code.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 12 (California Referenced Standards Code), in whole thereof.
- The 2016 Edition of the California Building Code, known as the California Code of Regulations, Title 24, Part 2 (California Building Code), incorporating the International Building Code, 2015 Edition, of the International Code Council, the whole thereof with State amendments, including appendixes "C", "H", "I" and "J" and amendments set forth in Article 3 of this Chapter.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 9 (California Fire Code), incorporating the International Fire Code, 2015 Edition, of the International Code Council, the whole thereof with State amendments, save and except Article 86 thereof, including appendix chapters and amendments set forth in Article 5 of this Chapter.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 5 (California Plumbing Code), incorporating the Uniform Plumbing Code, 2015 Edition, of the International Association of Plumbing and Mechanical Officials, the whole thereof with State amendments, including appendix chapters and amendments set forth in Article 7 of this Chapter.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 4 (California Mechanical Code), incorporating the Uniform Mechanical Code, 2015 Edition, of the International Association of Plumbing and Mechanical Officials, the whole thereof with State amendments, including appendix chapters and amendments set forth in Article 8 of this Chapter.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 3 (California Electrical Code), incorporating the National Electrical Code, 2014 Edition, of the National Fire Protection Association, the whole thereof with State amendments, including annex chapters and amendments set forth in Article 12 of this Chapter.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 2.5 (California Residential Code) incorporating the International Residential Code, 2015 Edition, of the International Code Council, the whole thereof with State Amendments, including appendixes "H", "J", "K" and "S" and amendments as set forth in Article 4 of this chapter.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulation, Title 24, Part 11 (California Green Building Standards Code) in whole thereof, with State Amendments.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 6 (California Energy Code) in whole thereof, with State Amendments.

- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 8 (California Historical Building Code) in whole thereof, with State Amendments.
- The 2016 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24, Part 10 (California Existing Building Code), incorporating the International Existing Building Code, 2015 Edition, of the International Code Council, the whole thereof with State Amendments.
- The 2015 International Property Maintenance Code, of the International Code Council.
- The 1997 Uniform Code for the Abatement of Dangerous Buildings, of the International Conference of Building Officials.
- The 1997 Uniform Housing Code, of the International Conference of Building Officials.
- International Swimming Pool and Spa Code, 2015 Edition with the amendments set forth in Article 9 of this Chapter. (Ord. 2424, 12/13/16; Ord. 2374, 1/14/14)

Grading Ordinance (Title 3, Chapter V, Article 13)

The purpose of this article is to safeguard life, limb, property and the public welfare by regulating grading and construction activities that result in a land disturbance on private property. Whenever the Building Official determines that any existing excavation or embankment or fill on private property has become a hazard to life and limb, or endangers property, or adversely affects the safety, use or stability of a public way or drainage channel, the owner of the property upon which the excavation or fill is located, or other person or agent in control of said property, upon receipt of notice in writing from the Building Official, shall within the period specified therein repair or eliminate such excavation or embankment to eliminate the hazard and to be in conformance with the requirements of this code. Adequate protection from hazards shall be provided at excavations. All pits, shafts, etc. shall be barricaded or covered. Upon completion of exploratory excavations and other similar operations, temporary trenches, wells, pits, shafts, etc. shall be backfilled.

Water Supply and Resources (Title 3, Chapter 10, Article 1)

The purpose of this Chapter is to provide minimum standards for design, construction and operation of individual, small private and public water supplies in Nevada County. The Chapter aims to ensure (1) that every well is constructed so as not to pollute groundwater, (2) that potable water is provided in every building for which a plumbing permit is issued, and (3) that potable water resources are determined and made available for every parcel of land created after the effective date of this Chapter.

Floodplain Regulations (Title 3, Chapter 12, Article 1)

The Legislature of the State of California has in Government Code Sections 65302, 65560, and 65800 conferred upon local governments the authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore the Board of Supervisors of the County of Nevada does hereby adopt the following floodplain management regulations.This Chapter will provide the floodplain management criteria for all development in areas of special flood hazard within the unincorporated areas of Nevada County. It is the purpose of this Chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- To protect human life and health.
- To minimize expenditure of public money for costly flood control projects,
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public,
- To minimize prolonged business interruptions,
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard,
- To insure that potential buyers are notified that property is in an area of special flood hazard; and
- To insure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purpose, this Chapter includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which results in damaging increases in erosion or flood heights or velocities,
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction,
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters,
- Controlling filling, grading, dredging and other development which may increase flood damage, and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

This Chapter shall apply to all areas of special flood hazards within the unincorporated area of Nevada County.

Fire Safety Regulations (Title 3, Chapter XVI, Article 1)

The regulations contained in this Chapter and the provisions in Chapter II (Zoning Regulations), Chapter IV (Subdivision Regulations), Chapter VII (Street Addressing and Naming), and Chapter V (Buildings) and County adopted road standards collectively provide the necessary minimum wildfire protection standards that will minimize public safety effects with the establishment of land uses and buildings within State Responsibility Areas (SRA) lands within Nevada County. These regulations are intended to mitigate effects of wildland fire exposure to such land uses within the State Responsibility Areas and they are further adopted to equal, exceed, or provide the same practical effect contained in the California State Board of Forestry's Fire Safe Regulations adopted on November 7, 1990.

The fire safety regulations contained in these Chapters provide measures for emergency access, street name and building address signage, water reserves for emergency fire use, and vegetation modification. These regulations are not to be applied retroactively to existing dwelling units as reflected on the official tax rolls as of October 10, 1991, or to any approved and unexpired entitlements (tentative maps, use permits, site plans, building permits, etc.). They shall be applied to all activities set forth in Sec. L-XVI 2.2. (Ord. 1734)

Hazardous Vegetation Ordinance

It is the purpose of this Chapter to establish a hazardous vegetation abatement program that provides a process to identify and abate hazardous vegetation on parcels and protects the lives and property of the

citizens of Nevada County, while at the same time protecting sensitive plant and animal species and protecting against significant erosion and sedimentation. The removal of hazardous vegetation in the areas subject to this Article is recognized as an essential action homeowners and property owners can take to increase the chances that homes, structures and other property will survive a wildfire, while protecting the natural environment. Regular fuels management and modifications consistent with the requirements of this Article is necessary to ensure adequate defensible space is achieved. The defensible space required by this Article is necessary to significantly reduce the risk of transmission of flame or heat sufficient to ignite the structures, and there is no other feasible mitigation measure possible to reduce the risk of ignition or spread of wildfire to structures on adjacent improved parcels.

State and Federal Agencies and Programs

A number of state and federal programs exist to provide technical and financial assistance to local communities for hazard mitigation. Some of the primary agencies/departments that are closely involved with local governments in the administration of these programs and some of the key mitigation initiatives they support include:

- California Office of Emergency Services
  - ✓ State of California Multi-Hazard Mitigation Plan;
- California Department of Water Resources;
- California Department of Forestry and Fire Protection (CAL FIRE);*
- California Environmental Protection Agency;
- California Department of Fish and Game;*
- California State Parks and Recreation Department*
- California State Lands Commission;*
- Federal Emergency Management Agency (Region IX);
- U.S. Army Corps of Engineers;*
- Bureau of Reclamation;*
- USDA Forest Service;*
- National Parks Service;*
- USDA Natural Resources Conservation Service;*
- U.S. Environmental Protection Agency (Region IX); and
- American Red Cross.

*Owns and/or manages land and/or facilities (or has some sort of administrative role, e.g., fire protection) in the County; potential partner for mitigation activities

4.4.2. Nevada County's Administrative/Technical Mitigation Capabilities

Table 4-93 identifies the County personnel responsible for activities related to mitigation and loss prevention in the County.

Table 4-93 Nevada County Administrative/Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	Y	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	
Mutual aid agreements	Y	
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y FT	
Floodplain Administrator	Y FT	
Emergency Manager	Y FT	
Community Planner	Y FT	
Civil Engineer	Y FT	
GIS Coordinator	Y FT	
Other		
Technical	**Y/N**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Reverse 911
Hazard data and information	Y	
Grant writing	Y	
Hazus analysis	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

4.4.3. Nevada County's Fiscal Mitigation Capabilities

Table 4-94 identifies financial tools or resources that the County could potentially use to help fund mitigation activities.

Table 4-94 Nevada County Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Yes for bridge replacements and yes.
Authority to levy taxes for specific purposes	Y	Sewer and roads, yes
Fees for water, sewer, gas, or electric services	Y	Yes for sewer and yes
Impact fees for new development	Y	Yes for sewer and transportation and yes
Storm water utility fee	Y	No
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs	Y	Yes and yes
State funding programs	Y	Yes and yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

4.4.4. Mitigation Education, Outreach, and Partnerships

Table 4-95 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table 4-95 Nevada County Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	American Rivers, mitigation for stormwater issues

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	
Natural disaster or safety related school programs	Y	
StormReady certification	Y	
Firewise Communities certification	Y	
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

4.4.5. Other Mitigation Efforts

The HMPC noted that there are efforts to create more FireWise communities. There are currently 20 FireWise communities, with 18 more in process.

Chapter 5 Mitigation Strategy

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the Nevada County Local Hazard Mitigation Plan (LHMP) Update. It describes how the County and participating jurisdictions met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the Hazard Mitigation Planning Committee (HMPC) led to the mitigation strategy and mitigation action plan for this LHMP Update. As part of the LHMP Update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. Some of the initial goals and objectives from the 2011 Plan and 2013 Annex were refined and reaffirmed, some goals were deleted, and others were added. The end result was a new set of goals, reorganized to reflect the completion of 2011/2013 actions, the updated risk assessment and the new priorities of this Plan Update. To support the new LHMP goals, the mitigation actions from 2011/2013 were reviewed and assessed for their value in reducing risk and vulnerability to the Planning Area from identified hazards and evaluated for their inclusion in this LHMP Update (See Chapter 2 What's New). Section 5.2 below identifies the new goals and objectives of this LHMP Update and Section 5.4 details the new mitigation action plan.

Taking all of the above into consideration, the HMPC developed the following umbrella mitigation strategy for this LHMP Update:

- Communicate the hazard information collected and analyzed through this planning process as well as HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the action plan recommendations of this plan.
- Use existing rules, regulations, policies, and procedures already in existence.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged and broader constituent support may be garnered.

5.1.1. Continued Compliance with the NFIP

Given the flood hazard in the Planning Area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP) by all communities. Detailed below is a description of Nevada County's flood management program to ensure continued compliance with the NFIP. Also to be considered are the numerous flood mitigation actions contained in this LHMP that support the ongoing efforts by the County to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program. A summary of the flood management programs and continued compliance with the NFIP for the incorporated communities are detailed in their jurisdictional annexes.

Nevada County's Flood Management Program

Nevada County has participated in the Regular Phase of the NFIP since 1983. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The Community Rating System (CRS) was created in 1990. It is designed to recognize floodplain management activities that go above and beyond the NFIP's minimum requirements. If a community implements public information, mapping, regulatory, loss reduction and/or flood preparedness activities and submits the appropriate documentation to the FEMA, then its residents can qualify for a flood insurance premium rate reduction. The County does not currently participate in the CRS program, but will evaluate the overall value of joining the CRS in the future during the implementation phase of this LHMP.

Presently, the County manages its floodplains in compliance with NFIP requirements and implements a floodplain management program designed to protect the people and property of the County. Floodplain regulations are a critical element in local floodplain management and are a primary component in the County's participation in the NFIP. As well, the County's floodplain management activities apply to existing and new development areas, implementing flood protection measures for structures and maintaining drainage systems to help reduce the potential of flooding within the County.

The County will continue to manage their floodplains in continued compliance with the NFIP. An overview of the County's NFIP status and floodplain management program are discussed on Table 5-1.

Table 5-1 Nevada County NFIP Status

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	127 policies $112,575 premiums $34,044,400 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	15 claims $53,887.90 paid 1 substantial damage claim
How many structures are exposed to flood risk within the community?	449 (1% Annual Chance)) 155 (0.2% Annual Chance)

NFIP Topic	Comments
Describe any areas of flood risk with limited NFIP policy coverage	Undetermined
Is the Community Floodplain Administrator or NFIP Coordinator certified?	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review
What are the barriers to running an effective NFIP program in the community, if any?	No
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	4/1/2014
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	1983
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet or exceed. See Appendix C.
Provide an explanation of the permitting process.	
Community Rating System (CRS)	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: FEMA/Nevada County

5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard Mitigation actions are essential to weaving long-term resiliency into all community recovery efforts so that at-risk infrastructure, development, and other community assets are stronger and more resilient for the next severe storm event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps communities become more resilient and sustainable. It is often most efficient to fund all eligible infrastructure mitigation through FEMA's Public Assistance mitigation program if the asset was damaged in a storm event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial.

Integration of mitigation into post disaster recovery efforts should be considered by all communities as part of their post disaster redevelopment and mitigation policies and procedures. As previously described in Section 4.4, the Capability Assessment for the unincorporated County and in the annexes for the other incorporated communities, post-disaster redevelopment and mitigation policies and procedures will be evaluated and updated as part of the Emergency Operations Plan (EOP) updates for each community and other community efforts.

These EOP's, through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the community to their normal state of affairs. Mitigation is emphasized as a major component of recovery efforts. In addition, many of the individual mitigation actions identified for this LHMP Update in Table 5-2 below include additional measures for establishing and updating comprehensive post-disaster redevelopment and mitigation policies and procedures that fully integrate loss reduction activities into post disaster recovery efforts.

Mitigation Strategy Funding Opportunities

An understanding of the various funding streams and opportunities will enable the communities to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant funding opportunities available pre- and post- disaster are described below.

FEMA HMA Grants

Cal OES administers three main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, and (3) Flood Mitigation Assistance Program. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Community Development Block Grants

The California Department of Housing and Community Development administers the State's Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight, or meet an urgent need. Grant funds can generally be used in federally declared disaster areas for

CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

Small Business Loans

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

Increased Cost of Compliance

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to $30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under NFIP.

5.2 Goals and Objectives

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goals development and the identification and prioritization of mitigation alternatives by the HMPC.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Nevada County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used

as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2011 Plan and 2013 Annex as well as a list of other sample goals to consider. They were told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was given three index cards and asked to write a goal statement on each. Goal statements were collected and grouped into similar themes and displayed on the wall of the meeting room. The goal statements were then grouped into similar topics. New goals from the HMPC were discussed until the team came to consensus. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, which provide the direction for reducing future hazard-related losses within the Nevada County Planning Area.

- **Goal 1: Minimize risk and vulnerability of Nevada County to natural hazards and protect lives and prevent losses to property, public heath, economy, and the environment.**
  - ✓ Objective 1.1: Provide protection for existing and future development.
  - ✓ Objective 1.2: Provide protection for critical facilities, utilities, and services.
  - ✓ Objective 1.3: Provide protection for natural resources and the environment.

- **Goal 2: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote participation and voluntary compliance to reduce hazard-related losses.**
  - ✓ Objective 2.1: Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.
  - ✓ Objective 2.2: Emphasize preparedness and self-responsibility to residents.

- **Goal 3: Improve communities' capabilities to prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event.**
  - ✓ Objective 3.1: Continued improvements to emergency services and management capabilities.
  - ✓ Objective 3.2: Develop/improve warning, evacuation, and sheltering procedures and information for residents and businesses.
  - ✓ Objective 3.3: Continue to coordinate jurisdictional responsibilities for various hazards through County and community disaster/emergency response plans and exercises.
  - ✓ Objective 3.4: Improve interagency communications; Ensure functionality and redundancy of communications, information technology, and other critical systems.
  - ✓ Objective 3.5: Promote/maintain coordination, interoperability, and use of shared resources among agencies operating in Nevada County.
  - ✓ Objective 3.6: Increase use of technologies.
  - ✓ Objective 3.7: Improvements to safety-related infrastructure, services, and effectiveness – numbers, locations, levels, and responses.
  - ✓ Objective 3.8: Increase response capabilities for hazardous materials incidents.

- **Goal 4: Reduce fire severity and intensity in Nevada County**

- ✓ Objective 4.1: Reduce the wildfire risk and vulnerability in Nevada County
- ✓ Objective 4.2: Reduce life safety issues, property loss, and damages associated with wilfires.
- ✓ Objective 4.3: Develop a fuels management implementation strategy focusing on fuels reduction, education, and assistance
- ✓ Objective 4.4: Promote implementation of fuels management activities by all landowners on both public and private lands.
- ✓ Objective 4.5: Promote Tree Mortality mitigation activities
- ✓ Objective 4.6: Continued enhancement and implementation of wildfire awareness, education, and outreach program(s).

- **Goa1 5: Improve community resiliency to flooding in Nevada County**
  - ✓ Objective 5.1: Reduce the flood risk and vulnerability in Nevada County
  - ✓ Objective 5.2: Reduce life safety issues, property loss, and damages associated with flooding.
  - ✓ Objective 5.3: Review appropriate flood protection infrastructure improvements and implement where feasible and economically viable.
  - ✓ Objective 5.4: Promote public awareness and education concerning the risks associated with creek, stream and river flooding.

- **Goal 6: Maintain FEMA eligibility for grant funding**
  - ✓ Objective 6.1: Assure conformance to federal and state hazard mitigation initiatives and maximize potential for mitigation implementation.
  - ✓ Objective 6.2: Monitor and communicate available grant programs, timelines, and processes to all communities.
  - ✓ Objective 6.3: Implement and complete identified high priority projects listed in the plan.
  - ✓ Objective 6.4: Consider environment as part of mitigation strategy implementation.

5.3 Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated. Only those hazards that were determined to be a priority hazard for purposes of mitigation action development were considered further in the development of hazard-specific mitigation actions.

Table 5-2 Nevada County Planning Area: Mitigation Action Priority Hazards by Jurisdiction

Priority Hazards for Mitigation Action Development	Nevada County	Grass Valley	Nevada City	Truckee	Nevada Irrigation District	Truckee Donner PUD	Washington County Water District
Agricultural Hazards: Severe Weather/Insect Pests	Yes	No	No	No	No	No	No

Priority Hazards for Mitigation Action Development	Nevada County	Grass Valley	Nevada City	Truckee	Nevada Irrigation District	Truckee Donner PUD	Washington County Water District
Avalanche	No	No	No	No	No	No	No
Climate Change	Yes	No	No	No	Yes	No	No
Dam Failure	Yes	No	Yes	No	Yes	No	Yes
Drought and Water Shortage	Yes	No	Yes	Yes	Yes	No	No
Earthquake	Yes	Yes	No	Yes	No	No	Yes
Flood: 1%/0.2%	Yes	Yes	Yes	Yes	Yes	No	Yes
Flood: Localized/ Stormwater	Yes	Yes	Yes	Yes	Yes	No	Yes
Hazardous Material Transportation	Yes	No	Yes	No	No	No	No
Landslide, Debris, & Mudflow	Yes	No	No	No	Yes	No	No
Levee Failure	No	No	No	No	No	No	No
Severe Weather: Extreme Cold, Snow, and Freeze	Yes	No	Yes	Yes	Yes	No	No
Severe Weather: Extreme Heat	Yes	No	No	No	No	No	No
Severe Weather: Heavy Rains and Storms (wind/tornado/hail, lightning)	Yes	Yes	Yes	Yes	Yes	No	Yes
Volcano	No	No	No	No	No	No	No
Wildfire (smoke, tree mortality, conflagration)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The HMPC and each jurisdiction eliminated certain hazards from further consideration in the development of mitigation actions because the risk of a hazard event in their Jurisdiction is unlikely or nonexistent, the vulnerability is low, or capabilities are already in place to mitigate negative impacts.

It is important to note, however, that all the Hazards addressed in this plan are included in the countywide multi-hazard public awareness mitigation action, which is being conducted in conjunction with and on behalf of all participating jurisdictions, as well as in other multi-hazard, emergency management actions.

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the CRS:

- Prevention (required to be evaluated)
- Property protection

- Structural projects
- Natural resource protection
- Emergency services
- Public information

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a review and discussion of the six mitigation categories to assist in the review and identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

In addition to reviewing and incorporating the actions from the 2011/2013 plan, the committee also considered and defined numerous new actions. A comprehensive review of mitigation measures was performed using the criteria (alternatives and selection criteria) in Appendix C.

With these criteria in mind, HMPC members were each given a set of nine colored dots, three each of red, blue, and green. The dots were assigned red for high priority (worth five points), blue for medium priority (worth three points), and green for low priority (worth one point). The team was asked to use the dots to

prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.4. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized action plan for the Nevada County Planning Area.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the Nevada County Planning Area can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-3 identifies all mitigation actions for all participating jurisdictions to this LHMP Update. For each mitigation action item included in Table 5-3, a detailed mitigation implementation strategy has been developed. Only those actions where the County is the lead jurisdiction are detailed further in this section. Actions specific to other participating jurisdictions, or where other jurisdictions are taking the lead, are detailed in each respective jurisdictional annex to this plan.

The action plan detailed below contains both new action items developed for this LHMP Update as well as old actions that were yet to be completed from the 2011 plan. Table 5-3 indicates whether the action is new or from the 2011 Plan 2013 Annex and Chapter 2 contains the details for each 2011/2013 mitigation action items indicating whether a given action item has been completed, deleted, or deferred.

As described throughout this LHMP, Nevada County has many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this LHMP focuses only on those mitigation actions that are both reasonable and realistic for the community to consider for implementation over the next 5-years covered by this plan. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-3. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this plan came down to the actual priorities of individuals and departments based in part on department direction, staffing, and available funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this plan during annual plan reviews and/or the formal 5-year update process.

It is also important to note that Nevada County and the participating jurisdictions have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as stormwater and drainage plans, community wildfire protection plans/fire plans, and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The participating communities are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the community to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the CRS mitigation categories and criteria contained in Appendix C.

It should be noted that many of the projects submitted by each jurisdiction in Table 5-3 benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Table 5-3 Nevada County Planning Area Mitigation Actions

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Nevada County						
Multi-Hazard Actions						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	County and all jurisdictions	2011 Action	X	X		Prevention
Action 2. Public awareness, education, outreach, and preparedness program enhancements.	County and all jurisdictions	2011 Action	X	X	X	Public Information
Action 3. Install additional repeater sites in areas where there is no radio signal coverage.	County and all jurisdictions	New Action	X	X		Emergency Services
Action 4. Conduct evacuation and shelter planning for all communities and populations (to include all critical hazards, at risk populations, medical, ADA, animals, and an outreach component).	County and all jurisdictions	New Action	X	X		Prevention Emergency Services
Action 5. Recovery planning	County and all jurisdictions	New Action	X	X		Prevention Emergency Services
Agricultural Actions						
Action 6. Tree mortality: Chipping/Grinding Program	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Dam Failure Actions						
Action 7. Washington community warning system in the event of an up stream dam failure.	County and all jurisdictions	New Action	X	X	X	Emergency Services
Extreme Cold, Snow, and Freeze Actions						
Action 8. Public outreach/Preparedness/Backup Generator	County and all jurisdictions	New Action	X	X		Property Protection Public Information
Flood and Localized Flood Actions						
Action 9. Public awareness, education, outreach, & preparedness program.	County and all jurisdictions	New Action	X	X	X	Public Information

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 10. Retrac Way at Wolfe Creek Bridge replacement	County and all jurisdictions	New Action	X	X	X	Structural Projects Emergency Services
Action 11. Maybert Road Improvements	County and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 12. Backup power for critical wastewater infrastructure	County and all jurisdictions	New Action	X	X	X	Property Protection
Action 13. Wastewater Treatment Plants (WWTP) Improvements Project and Implement Sewer Master Plans	County and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Hazardous Material Actions						
Action 14. Establish Haz Mat Task Force	County and all jurisdictions	New Action	X	X		Emergency Services
Wildfire Actions						
Action 15. Roadside Vegetation Management	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 16. Fuel Break-Town of Washington/S Yuba Canyon	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 17. Juniper Hills (developed housing area) Ingress/Egress Improvement	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 18. North Bloomfield/Harmony Ridge Ingress/Egress Fuels Reduction	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 19. Ponderosa West Grass Valley Defense Zone	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 20. Red Dog/Buckeye Ingress/Egress Improvement	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 21. Scotts Flat/Cascade Shores Ingress/Egress Fuels Reduction	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 22. Tahoe Donner Fuel Reduction Project	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 23. Glenshire Green Belt Fuels Reduction	County and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
City of Grass Valley						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City, County, and all jurisdictions	2011 Action	X	X		Prevention
Action 2. Inventory Unreinforced Masonry structures within the city limits. Retrofit Unreinforced Masonry Historical Structures within the city.	City, County, and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects
Action 3. Improve (relocate) sewer pipes in identified problem areas near waterways and other sensitive areas.	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 4. Storm Water Drainage Improvements	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 5. Subsidence	City, County, and all jurisdictions	New Action	X	X		Property Protection Structural Projects
Action 6. Public Education- Fire, other events	City, County, and all jurisdictions	New Action	X	X		Public Information

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
City of Nevada City						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City, County, and all jurisdictions	2011 Action	X	X		Prevention
Action 2. Nevada City Tree Removal, Brushing and Debris Chipping	City, County, and all jurisdictions	New Action	X	X		Property Protection
Action 3. Nevada City Tree Management	City, County, and all jurisdictions	New Action	X	X		Prevention Property Protection
Action 4. Nevada City Storm Drain / Culvert Replacement for Oregon Ravine through downtown and along Commercial Street. Includes intersection of Commercial/ Main / Union streets	City, County, and all jurisdictions	New Action		X	X	Property Protection Structural Projects
Action 5. Little Deer Creek and Deer Creek - the 'Plaza': intersection of Broad/Boulder/Sacramento/Nevada streets	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 6. Little Deer Creek at Pioneer Park	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 7. Nevada City Water Intake Diversion	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 8. Nevada City Wastewater Treatment Plant Headworks	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 9. Nevada City Chlorine Gas System Replacement at Wastewater Plan	City, County, and all jurisdictions	New Action	X	X		Property Protection Structural Projects

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 10. Nevada City Water Line Replacement	City, County, and all jurisdictions	New Action	X	X		Property Protection Structural Projects
Town of Truckee						
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City, County, and all jurisdictions	2011 Action	X	X		Prevention
Action 2. Countywide, multi-agency exercises, training	City, County, and all jurisdictions	New Action	X	X		Emergency Services
Action 3.Brushing and Debris Chipping	City, County, and all jurisdictions	New Action	X	X		Property Protection
Action 4. Conduct URM inventories and identify retrofit projects	City, County, and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects
Action 5. Identify solutions to I-80 Gridlock	City, County, and all jurisdictions	New Action	X	X		Prevention
Action 6. Public Outreach/Preparedness	City, County, and all jurisdictions	New Action	X	X		Public Information
Action 7. Cold Stream/Donner Creek/Donner Pass Rd Bridge Intersection	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 8.Trout Creek Restoration, Reach 4 & 5	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 9. South Shore Drainage	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects Natural Resource Protection
Action 10. Donner Lake Area Stormwater Infrastructure Improvements	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 11. Glenshire Area Stormwater Infrastructure Improvements	City, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 12. Tahoe Donner Fuel Break Projects	City, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 13. Tahoe Truckee Airport Fuel Break Projects (Waddle Ranch Property)	City, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 14. CWPP Project Implementation	City, County, and all jurisdictions	New Action	X	X		Prevention Property Protection Natural Resource Protection Emergency Services Public Information
Action 15. Defensible Space Projects	City, County, and all jurisdictions	New Action	X	X		Property Protection
Nevada Irrigation District						
Action 1. NID Headquarters Office & Facilities Generator	District, County, and all jurisdictions	New Action	X	X		Property Protection Emergency Services

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 2. Reservoir Sediment Removal Program	District, County, and all jurisdictions	New Action	X	X	X	Property Protection Natural Resource Protection
Action 3. Scotts Flat Spillway Repair	District, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 4. Small Reservoir Cleaning	District, County, and all jurisdictions	New Action	X	X	X	Property Protection Natural Resource Protection
Action 5. Community Investment Projects	District, County, and all jurisdictions	New Action	X	X		Prevention Property Protection Structural Projects Natural Resource Protection
Action 6. Canal Culvert Replacement Program	District, County, and all jurisdictions	New Action	X	X	X	Prevention Property Protection
Action 7. Hazard Tree & Fire Fuel Removal	District, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Truckee Public Utility District						
Action 1. Fuel Reduction Plan – Trout Creek Trail Area	District, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Action 2. Fuel Reduction Plan - Hilltop	District, County, and all jurisdictions	New Action	X	X		Property Protection Natural Resource Protection
Washington County Water District						
Action 1. Impound Dam Intake Upgrade	District, County, and all jurisdictions	New Action	X	X	X	Structural Projects

Action Title	Benefitting Jurisdictions	New Action/ 2011/2013 Action	Address Current Development	Address Future Development	Continued Compliance with NFIP	CRS Category
Action 2. Yuba River Waterline Replacement	District, County, and all jurisdictions	New Action	X	X	X	Property Protection Structural Projects
Action 3. Filter Plant Wildfire Mitigation and Upgrade	District, County, and all jurisdictions	New Action	X	X		Property Protection

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: All hazards

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: Nevada County Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Benefits (Losses Avoided): Cost depends if anyone desires to construct structures that would be protected by the flood control system.

Potential Funding: Miners, developers, state or federal grants

Timeline: 2017-2022

Action 2. Public Awareness, Education, Outreach, and Preparedness Program Enhancements.

Hazards Addressed: All hazards with focus on Wildfire, Tree Mortality, and Flooding.

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Nevada County has many hazards which could impact communities, citizens, infrastructure and environment.

Project Description: Improve/Enhance public education, engagement, and preparedness, response, and recovery program for all hazards (simplify, multi-media, educate and clarify various emergency systems, messaging and training; promote self- responsibility)

Other Alternatives: No outreach, leave current outreach activities to current levels.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Nevada County, all jurisdictions, partnerships with local non-profits, fire, social services and law enforcement.

Responsible Office/Partners: Nevada County OES

Project Priority: Medium

Cost Estimate: Staff time, printing costs, advertising costs.

Benefits (Losses Avoided): Enhanced preparedness and greater understanding to pre-mitigation activities.

Potential Funding: Homeland Security Grants, Emergency Management Performance Grant

Timeline: FY 2019

Action 3. Install Additional Repeater Sites in Areas Where There is no Radio Signal Coverage.

Hazards Addressed: All, especially wildfire and first responder activities.

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The topography in Nevada County does not allow for normal communications coverage throughout the county. Mountains with steep canyons interfere with normal radio communications and coverage is very spotty in these areas. This is a great concern during emergency situations especially wildland fire incidents. There is no cell phone coverage in most of these areas.

Project Description: Install repeater site(s) to allow for radio communications in non-radio coverage areas within the county.

Other Alternatives: Do nothing and continue to have spotty radio communications in remote rural areas.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Nevada County OES and Nevada County Sheriff's Office

Project Priority: HIGH

Cost Estimate: To be determined

Benefits (Losses Avoided): Loss of life, property and impacts to the environment.

Potential Funding: Homeland Security Grant

Timeline: 2019

Action 4. Conduct Evacuation and Shelter Planning for all Communities and Populations (to Include all Critical Hazards, at risk Populations, Medical, ADA, Animals, and an Outreach Component).

Hazards Addressed: All – Wildfire would be priority hazard.

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Many housing areas were built prior to Wildfire Hazard Awareness and built in high hazard fire zones with narrow roads, roads with one ingress and egress and heavy vegetation. This will hamper evacuations, ingress of fire apparatus and other first responders.

Project Description: Develop Community Evacuation Plans specific to highly developed communities in the Wildland Urban Interface (WUI).

Other Alternatives: Widen roads, shelter in place, do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Wildfire Protection Plan and Operational Area Emergency Operations Plan.

Responsible Office/Partners: Nevada County OES, Nevada County Sheriff's Office and local Fire Districts.

Project Priority: HIGH

Cost Estimate: Staff time; other budgets as necessary

Benefits (Losses Avoided): Life, property and the environment.

Potential Funding: Homeland Security Grant, Emergency Management Performance Grant (EMPG)

Timeline: 2019 thru 2023

Action 5. Recovery Planning.

Hazards Addressed: Emergency Services/Multi-hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: History of local hazards in the canyon (Fires, floods, landslides, mudslides, road damage, stream bank erosion, etc.)

Project Description: Work with other agencies to educate and provide resources to the citizens of the community to help them in a post disaster recovery process.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Provide to the public pamphlets, Web sites, and contact information to government agencies that can possibly assist them in the recovery process.

Responsible Office/Partners: Washington Fire, NCOES, FSCNC, FEMA, CAL-OES, and other Federal & State agencies.

Project Priority: Medium

Cost Estimate: Minimal

Benefits (Losses Avoided): Life, repeated property damage's, Property tax revenues.

Potential Funding: Federal and State agencies.

Timeline: 1 year

Agriculture Actions

Action 6. Tree mortality: Chipping/Grinding Program

Hazards Addressed: Agriculture/Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Tree mortality due to bug infestations, both on TNF property and private property.

Project Description: Notify and educate property owners of the problem and provide them pamphlets and web sites they can go to for more information, and work with FSC to arrange chipping locations here in the canyon.

Other Alternatives: The property owner takes care of the problem or ignores it.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Public education and work with FSC and TNF.

Responsible Office/Partners: TNF, FSC, and private property owners

Project Priority: Medium/high

Cost Estimate: TBD

Benefits (Losses Avoided): Provide for a healthier forest and prevent additional tree mortality here in the river canyon.

Potential Funding: Grants from the State or Feds.

Timeline: 1-5 years

Dam Failure Actions

Action 7. Washington Community Warning System in the Event of an Upstream Dam Failure.

Hazards Addressed: Dam failures in the Canyon Creek and South Yuba River drainage's that could cause downstream flooding.

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Bowman Lake and its feeder lakes, Lake Spalding and its feeder lakes, Texas Creek, Fall Creek, and Rucker Creek all have impoundments on them that are upstream of the community Washington. In the event of a dam failure on any of these it would cause the South Yuba River to suddenly rise from a few feet to over 90 feet at Washington, in 15-60 minutes time.

Project Description: Install a tsunami type of radio telemetry warning system consisting of 3-5 air horns plus the one on the fire house, covering the canyon from about 1 mile west of town to above the confluence of Canyon Creek and the South Yuba River. See page 2 for a more detailed description.

Other Alternatives: The present system of radios, phone calls, pagers, activation of the reverse 911 system, and helicopters if available.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with other stakeholders to secure funding or grants to install the system.

Responsible Office/Partners: NCSO, Grass Valley ECC, Washington Fire, NID, PG&E, and NCOES

Project Priority: High

Cost Estimate: TBD

Benefits (Losses Avoided): It would be a faster warning system that could be activated much faster saving time and decreasing the potential loss of lives.

Potential Funding: From some of the stakeholders, Federal, and State grants.

Timeline: 1-5 years

Extreme Cold, Snow, and Freeze Actions

Action 8. Public Outreach/Preparedness/Backup Generator

Hazards Addressed: Freeze, Cold, and Snow/ Multi-hazard

Goals Addressed: 1, 2, 3, 6

Issue/Background: Occasionally we have a freeze/cold/or heavy snow event in the area. Most homes here in the canyon have more than 1 source of heat. There is a backup generator (PG&E operated) here for the community also. Many of the homes have generators also.

Project Description: Public outreach in the event that PG&E can't access their generator or it is an extended weather event. Make the Fire House a temporary shelter for anyone that needs assistance. To do this we need a backup generator for the Fire House in the event of prolonged outage. Working Through NCOES we would pass the people on to other agencies as soon as possible.

Other Alternatives: Encourage neighbors to check on each other.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The fire department contacts everyone in the canyon either by phone or in person to check on their welfare, checking heat, food, water, any medical conditions, any other needs they may have, or if we need to contact anyone for them.

Responsible Office/Partners: Washington Fire, NCOES, SNH, Red Cross

Project Priority: Medium

Cost Estimate: For a generator $3000-4000.

Benefits (Losses Avoided): Provide temporary shelter for those in need and contact the appropriate agencies. Potential loss of life.

Potential Funding: Federal or State grants.

Timeline: 1 year

Flood and Localized Flooding Actions

Action 9. Public Awareness, Education, Outreach, & Preparedness Program.

Hazards Addressed: Multi-hazard

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: History of flooding, fires, severe weather, road wash outs, etc. that has happened in the South Yuba river canyon.

Project Description: Make available to the community information through public outreach, pamphlets, web sites, news media and public education, how to prepare themselves and their property for natural disasters and be self-reliant in the event of a natural disaster for the first 24-48 hours when emergency services may be over extended until more resources start arriving to assist.

Other Alternatives: Status quo

Existing Planning Mechanism(s) through which Action Will Be Implemented: Posting notices on bulletin boards in town, mail out flyers, updating our emergency evacuation plan, reverse 911 system, local news media, and public meetings.

Responsible Office/Partners: Washington Fire & Rescue, NCSO, local news media, Fire Safe Council, NCPW, NCOES, TNF

Project Priority: Medium.

Cost Estimate: Unknown.

Benefits (Losses Avoided): Loss of life and minimize property damage.

Potential Funding: Federal and State grants.

Timeline: 6-12 months.

Action 10. Retrac Way at Wolfe Creek Bridge Replacement

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: The existing one-lane wooden bridge is structurally deficient and subject to periodic flooding during heavy storms, which often renders the bridge impassable. The proposed project will upgrade the structure by replacing the wooden timbers with either steel or concrete, providing grading and drainage work on the bridge approaches, and improved traffic passage using two lanes rather than one lane. In addition, the new bridge will be elevated 2 to 3 feet higher than existing grade to provide better access and roadway protection in the event of a 100-year flood.

Project Description: The Nevada County Public Works Department (DPW) is proposing to replace the existing timber and steel one-lane bridge on Retrac Way over Wolf Creek (17C-084). The new structure will be a two-lane, prefabricated single-span (steel or concrete) bridge measuring 28 feet wide and approximately 85 feet long. It will be located on the same alignment as the existing bridge and elevated approximately 2 to 3 feet above the existing grade to better accommodate 100- Year flood event(s). Other proposed improvements include upgrading the roadway approaches to the bridge extending approximately 150 to 200 feet to incorporate grading and drainage improvements.

Other Alternatives: Close bridge

Existing Planning Mechanism(s) through which Action Will Be Implemented: Nevada County Public Works Capital Improvement Program (CIP #: 17-03)

Responsible Office/Partners: Nevada County Public Works

Project Priority: High

Cost Estimate: $2,176,818

Benefits (Losses Avoided): Washed out bridge/road. Bridge replacement will ensure emergency access for property protection and life safety.

Potential Funding: Highway Bridge Program (HBP)

Timeline: Spring 2017

Action 11. Maybert Road Improvements

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: The narrow road adjacent to the South Yuba River has been washed out three times in recent years (1997 and twice in 2017) due to high river levels. When the road is washed out, access to the town of Washington's water filtration plant is also lost. Without more robust repairs/efforts to the roadway, the likelihood of it being washed out again is high.

Project Description: Construct more robust repairs/modifications to an approximate 300 foot long section of Maybert Road.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Nevada County Public Works

Project Priority: High

Cost Estimate: $500,000

Benefits (Losses Avoided): $75,000 per large rain event (access to water filtration system for the town of Washington)

Potential Funding: Highway User Tax Account Funds (HUTA)/Grants

Timeline: Not currently scheduled

Action 12. Backup Power for Critical Wastewater Infrastructure

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During large rain events, electrical power is often out of service and generators or other backup power measures are necessary to continue to treat wastewater.

Project Description: Provide backup power to critical wastewater infrastructure including lift stations and wastewater treatment plants.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Nevada County Sanitation Districts Sewer Master Plan addresses the need for backup power.

Responsible Office/Partners: Nevada County Sanitation District

Project Priority: High

Cost Estimate: $1,000,000

Benefits (Losses Avoided): Reduction in SSO's and substantial fines to the district.

Potential Funding: Sanitation District Rates/Grants

Timeline: Annual

Action 13. Wastewater Treatment Plants (WWTP) Improvements Project and Implement Sewer Master Plans

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During large rain events, infiltration and inflow (I/I) into our WWTP's can cause the systems to be overwhelmed resulting in a sewer system overflow (SSO).

Project Description: Eliminate infiltration into existing sewer lines by lining and/or replacing portions of the collection systems.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Nevada County annual budgets for I/I related projects

Responsible Office/Partners: Nevada County Sanitation District

Project Priority: High

Cost Estimate: $500,000 per year (currently only able to budget $250,000 per year)

Benefits (Losses Avoided): Reduction in SSO's and substantial fines to the district.

Potential Funding: Sanitation District Rates/Grants

Timeline: Annual

Hazardous Material Actions

Action 14. Establish Hazardous Materials Task Force

Hazards Addressed: Hazardous Materials Transportation

Goals Addressed: 1, 2, 3, 6

Issue/Background: Update equipment and supplies in Haz Mat trailers.

Project Description: Training and Exercises with other Fire Departments.

Other Alternatives: Status quo

Existing Planning Mechanism(s) through which Action Will Be Implemented: Keep updated on NCTOA training schedule and when training and exercises are happening in the county make sure that the fire department sends some personnel to participate.

Responsible Office/Partners: NCOES, NCEH, Local government fire departments

Project Priority: High

Cost Estimate: TBD

Benefits (Losses Avoided): Uniform training procedures within the fire agencies.

Potential Funding: Federal and State grants

Timeline: 1-5 years

Wildfire Actions

Action 15. Roadside Vegetation Management

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Many of the vegetation fires in the county are roadside starts. Roadside vegetation must be addressed annually in order to prevent wildfires. Currently, there is only enough funding to provide this service to approximately 10% of County maintained roads. More funding is needed to provide a more robust program.

Project Description: Multiple agencies would all have to work together to address this issue on all the roadways within the county.

Other Alternatives: Continue with current program.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Outreach and education for the private property owners within our fire district on the hazards of roadside fire starts if they don't maintain their property.

Responsible Office/Partners: Cal-Trans, NCPW, TNF, BLM, Fire Departments, Nevada County Public Works, and Property Owners

Project Priority: Medium/High

Cost Estimate: $150,000 annually

Benefits (Losses Avoided): Reduce the risk of vegetation fires from this source. (Protecting Life, property, and the environment.)

Potential Funding: Highway User Tax Account (HUTA)/Grants

Timeline: On going/Annually

Action 16. Fuel Break-Town of Washington/S Yuba Canyon

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Over the years there have been many fires in the S Yuba River Canyon from 1/10 acre to many thousands of acres, fortunately Washington has survived them, but in order to provide better protection for the community, a fire break would be of great benefit to the people, property, environment, and county property tax revenues.

Project Description: Create a fire break on the north and south sides of the S Yuba River to protect the community and land (both private and public) from wildfires.

Other Alternatives: Public education on fire wise property

Existing Planning Mechanism(s) through which Action Will Be Implemented: Working with other agencies to identify, develop, and implement a plan to create a fire break.

Responsible Office/Partners: TNF, FSCNC, NCOES, Washington Fire, Property owners.

Project Priority: High

Cost Estimate: TBD

Benefits (Losses Avoided): Protect life, property and the environment.

Potential Funding: Federal, State, and Local grant funds.

Timeline: 2-3 years

Action 17. Juniper Hills (developed housing area) Ingress/Egress Improvement

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Housing development within Wildland Urban Interface in a high fire severity area.

Project Description: Create a 300 foot wide shaded fuel break adjacent to the roadways to provide landscape fuel reduction and access for firefighting equipment.

Other Alternatives: Modify roads to handle increased traffic during evacuations. Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $347,600

Benefits (Losses Avoided): Community housing, life safety and environment protected by fuels reduction and better access.

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Action 18. North Bloomfield/Harmony Ridge Ingress/Egress Fuels Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Wildland Urban Interface in a high fire severity area. Narrow winding roads would hamper evacuation and response efforts. This route is identified on the County Cement Hill, North Bloomfield Evacuation Guide.

Project Description: 300 foot wide landscaped shaded fuel break from Highway 20 to Cooper Road. Creates landscape fuel break above Nevada City and provides emergency evacuation access from the greater North Bloomfield and Cooper Road areas to Highway 20.

Other Alternatives: Modify roads to handle increased traffic during evacuations. Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $375,000

Benefits (Losses Avoided): Community housing, life safety and environment protected by fuels reduction and better access.

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Action 19. Ponderosa West Grass Valley Defense Zone

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Wildland Urban Interface in a high fire severity area

Project Description: Create a 300 foot wide landscape shaded fuel break insulating the higher density community developments to the east from large public lands in a vegetation transition zone from moderate to high hazard levels. Project area would be from McCourtney Road and South Ponderosa Way to Highway 20. The South Ponderosa Way road was the original 1933 California Conservation Corps (CCC) 800 mile long fire break through the Sierra foothills.

Other Alternatives: A fuel break that is not as wide, do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $1,320,000

Benefits (Losses Avoided): Community housing, life safety and environment protected by firebreak

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Action 20. Red Dog/Buckeye Ingress/Egress Improvement

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Wildland Urban Interface in a high fire severity area. Narrow winding roads would hamper evacuation and response efforts. Would provide emergency equipment access over Dam Road while utilizing Pasquale and Quaker Hill for citizen evacuation.

Project Description: Roadside fuel break clearance to provide emergency access from the backside of Banner Mountain to You Bet Road and onto Highway 174. Historically, there was a bridge crossing Greenhorn Creek, but after failure in the 1980's it was never rebuilt. 4WD emergency evacuation access in summer months is relatively easy provided high clearance vehicles are used and adequate roadside vegetation management is conducted.

Other Alternatives: Modify roads to handle increased traffic during evacuations. Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $638,000

Benefits (Losses Avoided): Community housing, life safety and environment protected by fuels reduction and better access.

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Action 21. Scotts Flat/Cascade Shores Ingress/Egress Fuels Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Wildland Urban Interface in a high fire severity area. Narrow winding roads would hamper evacuation and response efforts. Would provide emergency equipment access over Dam Road while utilizing Pasquale and Quaker Hill for citizen evacuation.

Project Description: 300 foot wide landscaped shaded fuel break from Highway 20 to Pasquale Road. Creates landscape fuel break on NID property and private lands.

Other Alternatives: Modify roads to handle increased traffic during evacuations. Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $650,000

Benefits (Losses Avoided): Community housing, life safety and environment protected by fuels reduction and better access.

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Action 22. Tahoe Donner Fuel Reduction Project

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Housing developments within Wildland Urban Interface in a high fire severity area.

Project Description: Fuels reduction on common areas embedded between home site developments to reduce wildfire potential.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $282,000

Benefits (Losses Avoided): Community housing, life safety and environment protected by fuels reduction and better access.

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Action 23. Glenshire Green Belt Fuels Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Housing developments within Wildland Urban Interface in a high fire severity area.

Project Description: Fuels reduction on common areas embedded between home site developments to reduce wildfire potential.

Other Alternatives: Do nothing.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Community Wildfire Protection Plan (CWPP)
- Nevada County General Plan
- Nevada County Mitigation Plan
- Cal Fire Unit Plan (NEU)

Responsible Office/Partners:

- Firesafe Council of Nevada County
- Nevada County Public Works
- Nevada County Office of Emergency Services

Project Priority: High

Cost Estimate: $40,800

Benefits (Losses Avoided): Community housing, life safety and environment protected by fuels reduction and better access.

Potential Funding: State Responsibility Area Grants, Sierra Nevada Conservancy Grant, Federal Title II & III, Fire Safe California Grants Clearinghouse, Proposition 1 & 40, Western States Wildland-Urban Interface Grants.

Timeline: As soon as funding is available

Chapter 6 Plan Adoption

Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in from Nevada County and participating jurisdictions, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of the Disaster Mitigation Act (DMA) of 2000. For Nevada County and the incorporated communities this adoption also establishes compliance with AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan. Two resolutions were created – one for Nevada County and the incorporated communities and one for participating districts.

The governing board for each participating jurisdiction has adopted this 2017 Local Hazard Mitigation Plan by passing a resolution. A copy of the generic resolutions and the executed copies are included in Appendix D: Adoption Resolutions.

Chapter 7 Plan Implementation and Maintenance

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

Chapter 3 Planning Process includes information on the implementation and maintenance process since the 2011 Plan and 2013 Annex was adopted. This section includes information on the implementation and maintenance process for this Plan Update.

7.1 Implementation

Once adopted, the plan faces the truest test of its worth: implementation. While this plan contains many worthwhile actions, the participating jurisdictions will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful plan implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as general plans, stormwater plans, Community Wildfire Protection Plans (CWPPs), Emergency Operations Plans (EOPS), evacuation plans, and other hazard and emergency management planning efforts for Nevada County and participating jurisdictions. The County and participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation can be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Nevada County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This could include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the participating jurisdictions will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal programs and earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The elected officials and staff appointed to head each department within the County, Cities and Districts are charged with implementation of various activities in the plan. During the annual review as described later in this section, an assessment of progress on each of the goals and activities in the plan should be determined and noted. At that time, recommendations were made to modify timeframes for completion of activities, funding resources, and responsible entities. On an annual basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from the plan entirely and activities addressing problems unforeseen during plan development may be added.

7.1.1. Role of Hazard Mitigation Planning Committee (HMPC) in Implementation and Maintenance

With adoption of this plan, the participating jurisdictions will be responsible for the plan implementation and maintenance. The HMPC identified in Appendix A (or similar committee) will reconvene each year to ensure mitigation strategies are being implemented and to record the implementation status of each mitigation action. As such, Nevada County and the other participating jurisdictions will continue its relationship with the HMPC, and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended changes to the various governing boards or councils of all participating jurisdictions; and
- Inform and solicit input from the public.

The primary duty of the participating jurisdictions is to see the plan successfully carried out and to report to their community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website (and others as appropriate).

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized.

7.2.1. Maintenance Schedule

The Nevada County OES is responsible for initiating plan reviews and consulting with the other participating jurisdictions. In order to monitor progress and update the mitigation strategies identified in the action plan, Nevada County OES and the individual jurisdictions will revisit this plan annually and following a hazard event. The HMPC will meet annually to review progress on plan implementation and will provide annual evaluation reports. The HMPC will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this plan update anticipated to be fully approved and adopted in early 2017, the next plan update for the Nevada County Planning Area will occur in 2022.

7.2.2. Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).
- Increased vulnerability resulting from unforeseen or new circumstances.

Updates to this plan will:

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

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. All mitigation actions will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and submissions, as the HMPC deems appropriate and necessary, and as approved by the appropriate governing boards or councils of the other participating jurisdictions. In keeping with the five-year update process, the HMPC will convene public meetings to solicit public input on the plan and its routine maintenance and the final product will be adopted by the governing boards or councils.

Annual Review Process

For the LHMP Update review process, the Nevada County OES will be responsible for coordinating, scheduling, and facilitating reviews and maintenance of the plan. The LHMP is intended to be a living document. Review of the LHMP will normally occur on an annual basis each year and will be conducted by the HMPC as follows:

- The Nevada County OES will place an advertisement in the local newspaper advising the public of the date, time, and place for each annual review of the plan and will be responsible for leading the meeting to review the plan.
- Notices will be emailed to the members of the HMPC, federal, state, and local agencies, non-profit groups, local planning agencies, representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- County/City/District officials will be noticed by email and telephone or personal visit and urged to participate.
- Members of the Communities' Planning Commission and other appointed commissions and groups will also be noticed by email and either by telephone or personal visit.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted and a copy of the current plan will be available for public comment at Nevada County and the incorporated communities.
- After the review meeting, minutes of the meeting and an annual report will be prepared by the HMPC and forwarded to the news media (public) and other interested stakeholders. The report will also be presented to the County and City/District governing boards for review, and a request will be made that the Boards take action to recognize and adopt any changes resulting from the review.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the plan. More specifically, the reviews should include the following information:

- Community growth or change in the past year.
- The number of substantially damaged or substantially improved structures by flood zone
- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether or not the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services
- The dates of hazard events descriptions
- Documented damages due to the event
- Closures of places of employment or schools and the number of days closed
- Road or bridge closures due to the hazard and the length of time closed
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings

- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the Hazard Mitigation Plan. Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective is incorporation of the hazard mitigation plan recommendations and their underlying principles into other County and City plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this plan's capability assessment, the County and participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- County, City, and District general and master plans
- County and City Emergency Operations Plans and other emergency management efforts
- County and City ordinances
- Flood/stormwater management/master plans
- Community Wildfire Protection plans
- Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessments in the jurisdictional annexes
- Other plans, regulations, and practices with a mitigation focus

HMPC members involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, programs, etc., as appropriate. As described in Section 7.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the LHMP into existing planning mechanisms include:

1. As recommended by Assembly Bill 2140, each community should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plan(s). Evidence of such adoption (by formal, certified resolution) shall be provided to CAL OES and FEMA.

2. Integration of flood actions identified in this mitigation strategy with the actions and implementation priorities established in existing Watershed and Stormwater Drainage Plans.
3. Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing Community Wildfire Protection Plans.
4. Integration of many of the infrastructure, roads, and facility improvement projects with the jurisdictional Capital Improvement Programs.
5. Using the risk assessment information to update the hazard analysis and other data, such as Critical Facility locations, in local Emergency Operations Plans and other emergency management planning documents.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this hazard mitigation plan.

7.2.4. Continued Public Involvement

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stores from the plan implementation and seek additional public comment. The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Annual Reviews

The public will be noticed by placing an advertisement in local media and social media specifying the date and time for the review and inviting public participation. The HMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the HMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. In reconvening, the HMPC will be responsible for coordinating the activities necessary to involve the greater public. The HMPC will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held and public comments will be solicited on the plan update draft.

Prelude to Jurisdictional Annexes

For this 2017 Nevada County LHMP Update, the **Jurisdictional Annexes**, working in conjunction with the Base Plan, detail the hazard mitigation planning elements specific to participating jurisdictions. Each Annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan, as the umbrella document for this planning effort. As such, all Chapters 1-7 of the Base Plan and associated appendices, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction.

These jurisdictional annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy beyond that provided in the Base Plan.

Annex A City of Grass Valley

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Grass Valley, a previously participating jurisdiction to the Nevada 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 City. This Annex provides additional information specific to the City of Grass Valley, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

A.2 Planning Process

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

Table A-1 City of Grass Valley Planning Team

Name	Position/Title	How Participated
Mark Buttron	Fire Chief	Coordination, Research, Documentation, Attended Meetings
Tom Last	Director Community Development	Research
Tim Kiser	Director Public Works	Research

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the City integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2011 LHMP through other plans and programs shown in Table A-2.

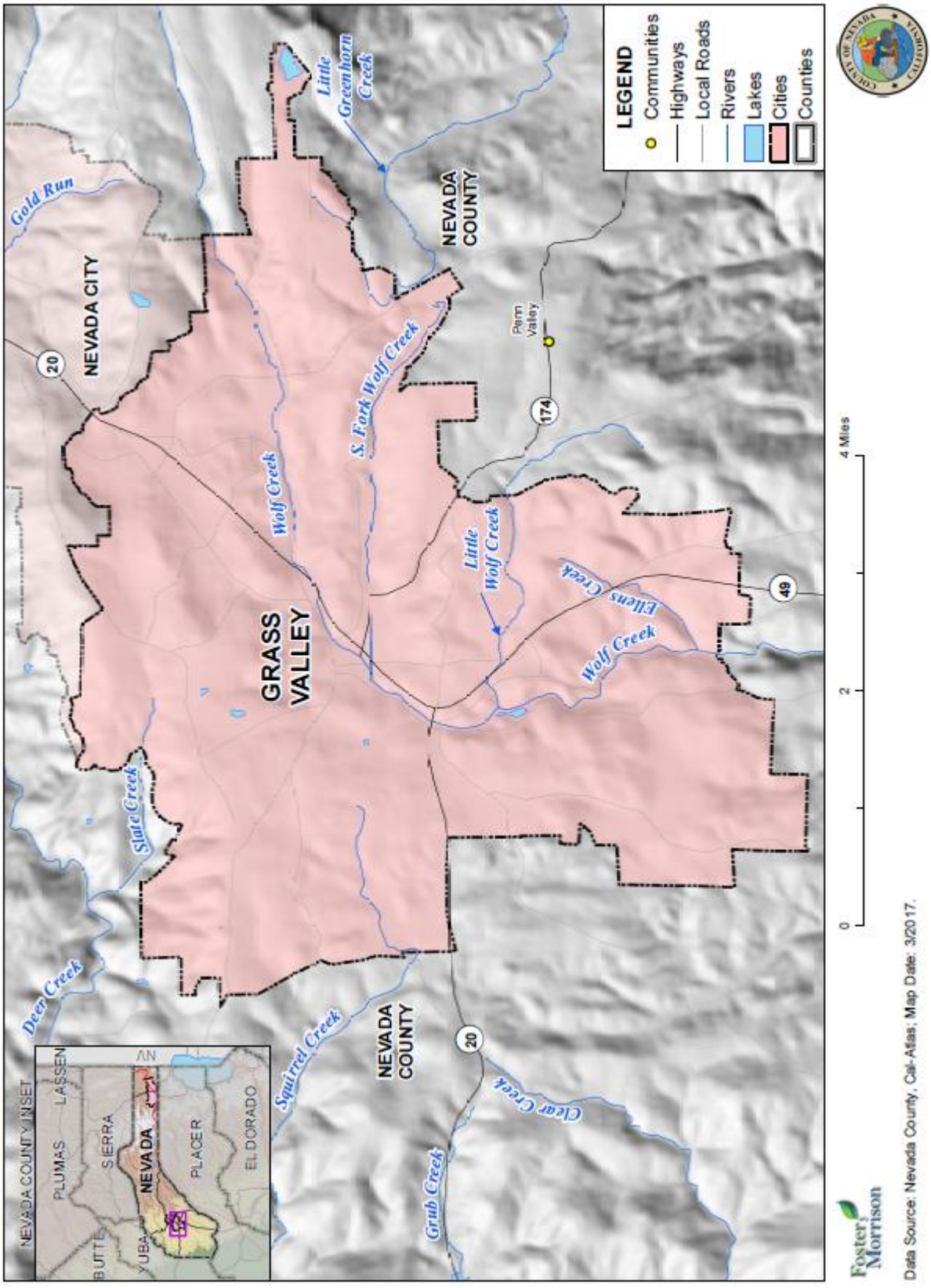
Table A-2 2011 LHMP Incorporation

Planning Mechanism 2011 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
None	Did not integrate the 2011 LHMP into other planning mechanisms

A.3 Community Profile

The community profile for the City of Grass Valley is detailed in the following sections. Figure A-1 displays a map and the location of the City of Grass Valley within Nevada County.

Figure A-1 City of Grass Valley



A.3.1. Geography and Climate

The City of Grass Valley is the largest city in the western region of Nevada County, California. Situated at roughly 2,500 feet elevation in the western foothills of the Sierra Nevada mountain range. According to the United States Census Bureau, the City has a total area of 4.7 square miles, all of it land.

A variety of igneous and metamorphic rock supports Grass Valley. Granitic rock such as quartz diorite underlies the downtown core and extends south along Highway 49. Metavolcanic rock and diabase underlie areas around the granitic zone. Here the vegetation is not as luxuriant as one would expect from the high average annual precipitation, and forested areas are often dominated by several species of oaks and the crooked, thin-crowned gray pine. Straight, dense ponderosa pine inhabitants the more fertile soils which include Musick series on granitic rock and Sites series on mafic or metamorphic rock.

Grass Valley has a hot-summer Mediterranean climate with warm to hot, dry summers and wet, cool, rainy winters. Summer is very dry, but thunderstorms may occur. The winter rains contribute to a heavy fuel-loading of brush and grass, which dry out during the summer, posing a wildfire hazard. Snow occurs at times.

A.3.2. History

Grass Valley's history is part of the colorful lore of the California Gold Rush. The first notations about the area are from the late 1840's when a party of men searching for cattle came upon a "grassy valley". Grass Valley's claim to historic fame is embedded in the vast amounts of gold discovered and extracted from its rich underground mines. In more than 100 years of mining, the mines of Grass Valley made it the richest of all California gold mining towns.

In December, 1848, President James K. Polk declared in a State of the Union address that large quantities of gold had been discovered in California. As word spread about the gold rush, prospectors flooded the foothills. The small settlement began looking like a village. Then in 1850, a settler by the name of George McKnight discovered gold in the quartz rock along Gold Hill and the real boom began.

A.3.3. Economy and Tax Base

Grass Valley has a fairly diversified economy. The gold rush days left a historical legacy and today, tourism and the related services sector are considered to constitute the bulk of the local economy. Many of those who do not commute to the Sacramento Valley, work locally in retail, wholesale, trade, engineering, manufacturing, construction, and other businesses, as well in various levels of local and state government. A significant number of high-tech electronics companies are in the area.

US Census estimates show economic characteristics for the City of Grass Valley. These are shown in Table A-3 and Table A-5. Mean household income in the City was $49,422. Median household income in the City was $33,700.

Table A-3 City of Grass Valley – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	80	1.7%
Construction	260	5.5%
Manufacturing	179	3.8%
Wholesale trade	120	2.5%
Retail trade	742	15.6%
Transportation and warehousing, and utilities	191	4.0%
Information	134	2.8%
Finance and insurance, and real estate and rental and leasing	128	2.7%
Professional, scientific, and management, and administrative and waste management services	610	12.9%
Educational services, and health care and social assistance	932	19.6%
Arts, entertainment, and recreation, and accommodation and food services	793	16.7%
Other services, except public administration	365	7.7%
Public administration	213	4.5%

Source: US Census Bureau American Community Survey 2011-2015 Estimates

Table A-4 City of Grass Valley – Income and Benefits

Income Bracket	Population	Percent
>$10,000	455	7.6%
$10,000 – $14,999	859	14.3%
$15,000 - $24,9999	945	15.7%
$25,000 – $34,999	853	14.2%
$35,000 – $49,999	924	15.4%
$50,000 – $74,999	909	15.1%
$75,000 – $99,999	519	8.6%
$100,000 – $149,999	317	5.3%
$150,000 – $199,999	95	1.6%
$200,000 or more	141	2.3%

Source: US Census Bureau, 2010

Major employers in Grass Valley include Raley's, Safeway, K-Mart, Starbucks, GNC, Jamba Juice, JC Penney, and Briar Patch. Other major employers include Nevada Union High School, Nevada Irrigation District, Sierra Nevada Memorial Hospital. Information on the taxable base for the City can be found in Section 1.4 of the Base Plan.

A.3.4. Population

The California Department of Finance estimated the January 1, 2016 total population for the City of Grass Valley was 12,955.

A.4 Hazard Identification

Grass Valley's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Grass Valley (see Table A-5).

Table A-5 City of Grass Valley—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Extensive	Likely	Critical	Low	Yes
Avalanche	Limited	Unlikely	Limited	Low	No
Climate Change	Limited	Likely	Limited	Low	–
Dam Failure	Significant	Occasional	Critical	High	No
Drought and Water Shortage	Extensive	Highly Likely	Critical	High	Yes
Earthquake	Extensive	Likely	Catastrophic	High	No
Flood: 100/500–year	Significant	Occasional	Limited	Medium	Yes
Flood: Localized/Storm water	Significant	Likely	Limited	Medium	Yes
Hazardous Materials Transportation (interstates, railroads, pipelines)	Significant	Occasional	Critical	Medium	No
Landslide, Debris & Mud Flows	Significant	Occasional	Limited	Medium	Yes
Levee Failure	N/A	–	–	–	No
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Low	Yes
Severe Weather: Extreme Cold, Snow, and Freeze	Extensive	Likely	Critical	Medium	Yes
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Extensive	Likely	Critical	Medium	Yes
Subsidence	Significant	Occasional	Critical	High	Yes
Volcano	N/A	–	–	–	No
Wildfire (smoke, tree mortality, conflagration)	Extensive	Highly Likely	Catastrophic	High	Yes

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

A.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Grass Valley's hazards and assess the City's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

A.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section A.5.2 includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

A.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Grass Valley's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Nevada County Assessor's Office is based on the 2016/2017 Assessor's data. The methodology used to derive land values, property values, and estimated contents values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table A-6 shows the 2016/2017 Assessor's values (e.g., the values at risk) broken down by property type for the City of Grass Valley.

Table A-6 City of Grass Valley – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcels	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	10	1	$486,388	$254,841	$254,841	$996,070
Commercial	786	536	$169,530,221	$308,503,675	$308,503,675	$786,537,571
Government	128	2	$1,668,369	$5,625,082	$5,625,082	$12,918,533
Industrial	138	122	$36,120,651	$97,484,839	$146,227,259	$279,832,749
Institutional	31	23	$3,762,836	$64,744,368	$64,744,368	$133,251,572
Miscellaneous	60	0	$0	$0	$0	$0
Residential	6,307	5,627	$447,062,024	$912,503,273	$456,251,637	$1,815,816,934
Total	**7,460**	**6,311**	**$658,630,489**	**$1,389,116,078**	**$981,606,861**	**$3,029,353,428**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Population and Special Populations at Risk

General Population

As previously described in the community profile, based on California Department of Finance estimates, the current January 1, 2016 total population for the City of Grass Valley was 12,955, all of which are potentially vulnerable to hazard events.

Special Populations

The HMPC noted that there are multiple assisted living and convalescent care facilities in the City that will need assistance in evacuation if necessary. This represents a large commitment of resources during periods of evacuation. In addition, the Sierra Nevada Memorial Hospital is located in the City. This also represents a large commitment of resources if evacuation is needed.

Critical Facilities and Infrastructure

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

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health 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, (3) Hazardous Materials Facilities.

- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
  - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers

- ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
- ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.
- ✓ Designated Emergency Shelters.
- ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio and other emergency warning systems.
- ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power and gas).
- ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.
- ✓ Transportation Lifeline Systems - Airports, helipads, and critical highways, roads, bridges and other transportation infrastructure (Note: Critical highways, roads, etc. will be determined during any hazard-specific evacuation planning and are not identified in this plan).

- **At Risk Population Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release of hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property.

A fully detailed list of all critical facilities in the planning are can be found in Appendix F. An inventory of critical facilities in the City of Grass Valley from Nevada County GIS is shown on Figure A-2 and detailed in Table A-7. Note that only Category 1, Essential Services, and Category 2, At-risk Populations were available in mapped form and are thus included on Figure A-2 and Table A-7. Category 3, Hazardous Materials Facilities, was only available in table format. Due to the large number of these facilities, they are included in Table F-2 in Appendix F. Also to note, the mapped layer is based on best available data and may not reflect a comprehensive inventory of critical facilities in the County based on the current definition; this is a work in progress.

Figure A-2 City of Grass Valley – Critical Facilities

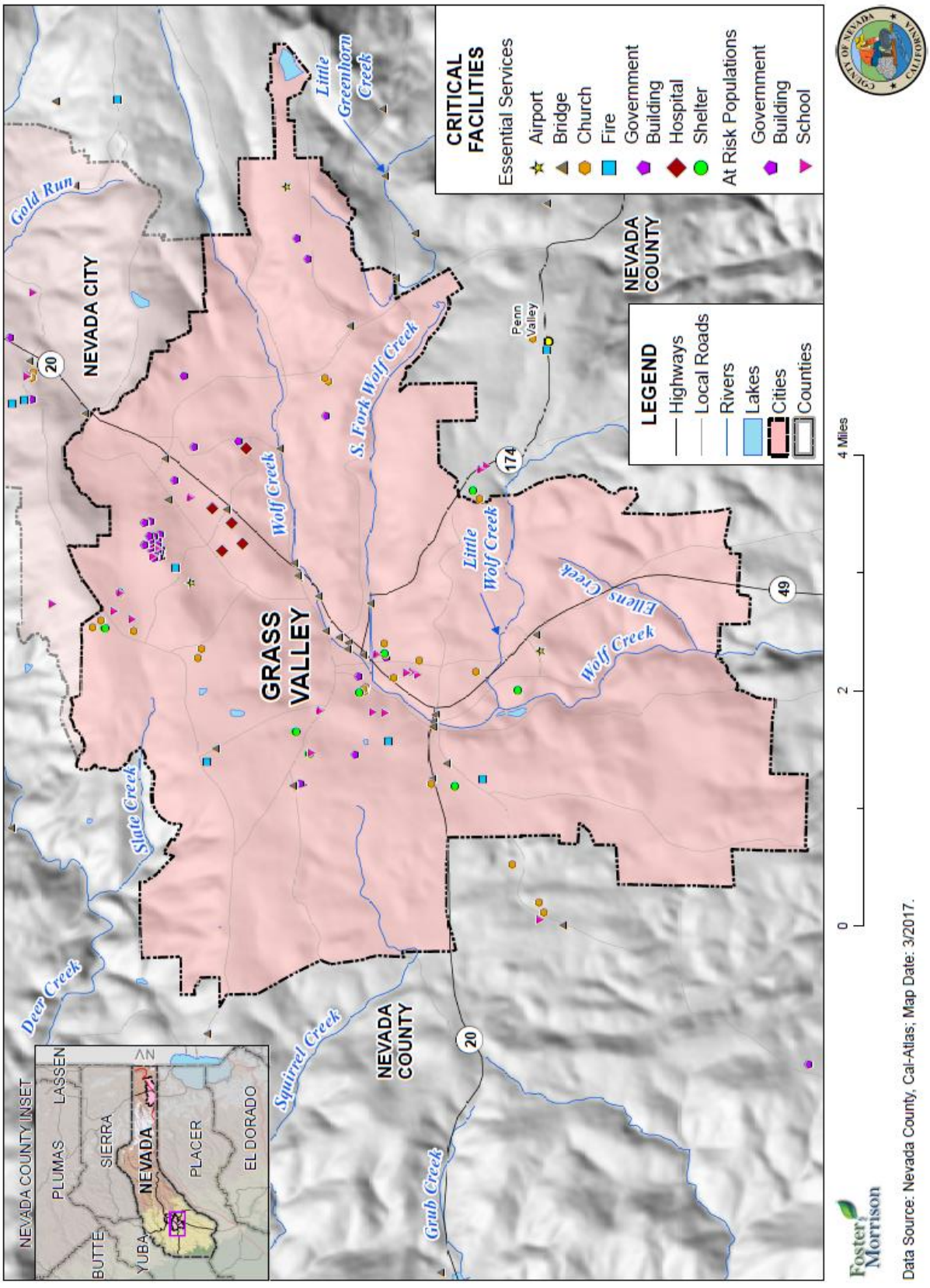


Table A-7 City of Grass Valley – Critical Facilities Inventory

Critical Facility Category	Critical Facility Type	Critical Facility Count
Essential Services	Airport	3
	Bridge	23
	Church	15
	Fire	4
	Government Building	28
	Hospital	5
	School	0
	Shelter	8
	Total	**86**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	1
	Hospital	0
	School	15
	Shelter	0
	Total	**16**
Grand Total		**102**

Source: Nevada County GIS

Natural Resources

The City of Grass Valley has a variety of natural resources of value to the community:

Permanent and intermittent streams and their surroundings comprise the Planning Area's principal hydrologic features. These include stream corridors, flood plains, riparian zones, wetlands, and canals.

Grass Valley lies primarily within the Wolf Creek drainage basin. The South Fork of Wolf Creek and Little Wolf Creek drain the eastern and southeastern portion of the Planning Area and discharge into Wolf Creek in the central Grass Valley area. Northwestern and western areas are within the upper reaches of the Deer Creek drainage basin, but do not include Deer Creek or substantial tributaries.

Stream corridors areas are high priorities for conservation efforts and open space designation. As "riparian" zones, the natural attributes and habitat values of river and stream corridors are sensitive to alteration. If such values are to be preserved, protection from alteration must be afforded the riverine environment.

Wetlands in Grass Valley are generally small, isolated features dependent on riparian water, ditch leaks or overflows, diversions, or natural seeps or springs. Man-made or naturally occurring wetlands provide an important biological resource both through provisions of localized habitat and habitat for migratory species and as a natural water filtration system. Wetlands are identified and defined by plants, soils, and frequency of inundation.

Mineral resources, particularly gold, have played a major role in the history of Nevada County and Grass Valley. Since 1849, when gold was first discovered in the area, to the years preceding World War II, most of the County's population was economically supported, directly or indirectly, by the local gold mining industry. Metals produced in the Grass Valley area since 1850 include lode gold, chromite, crushed stone, and placer gold.

Historic and Cultural Resources

Grass Valley has a rich historical heritage from the California gold rush of 1849, through the tumultuous mining period which followed. The last active gold mine (until the 1990's) closed in 1956, ending 107 years of continuous production. Many valuable historical resources still remain as a reminder of the City's legacy. The City of Grass Valley has registered federal historic sites. These are identified in Table A-8.

Table A-8 Nevada County Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Caroline Hansen House (P402)			X	5/9/1975	Grass Valley
DR. W.C. Jones Home (P547)			X	3/31/1980	Grass Valley
Emmanuel Episcopal Church (P246)			X	4/25/1972	Grass Valley
Empire Mine (298)	X	X		2/23/1939	Grass Valley
Gilmore Air Field (P242)			X	1/19/1972	Grass Valley
Grass Valley Public Library (N1755)	X			3/26/1992	Grass Valley
Holbrooke Hotel (914)		X		12/30/1977	Grass Valley
Home Of Lola Montez (292)		X		7/20/1938	Grass Valley
Home Of Lotta Crabtree (293)		X		8/15/1938	Grass Valley
Idaho-Maryland Mine Site (P640)			X	11/16/1984	Grass Valley
Mount Saint Mary's Convent And Academy (855)		X		4/24/1972	Grass Valley
Mount St. Mary's Academy And Convent (N285)	X			5/3/1974	Grass Valley
North Star Mine Powerhouse (843)		X		9/24/1970	Grass Valley
Old Bear River Bridge (P802)			X	8/23/1994	Grass Valley
Overland Emigrant Trail (799)		X		9/16/1964	Grass Valley
Pioneer Cemetery (P324)			X	3/15/1974	Nevada City
Plaza Grocery (P325)			X	3/15/1974	Nevada City
Red Castle, The (P191)			X	5/19/1971	Nevada City

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Red Dog Townsite (N2143)	X		X	9/14/2001	Nevada City
Root Cellar On Mexican War Land Grant (P603)			X	12/31/1982	Grass Valley
Site of One of the First Discoveries of Quartz Gold in California (297)		X		2/23/1939	Grass Valley
The Union - Grass Valley Newspaper (P247)			X	4/25/1972	Grass Valley

Source: California Department of Parks and Recreation Office of Historic Preservation, http://ohp.parks.ca.gov/

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

Growth and Development Trends

The population of Grass Valley and its Planning Area, estimated at 16,000, is projected to grow to 23,395 by the Year 2020. Infill development on undeveloped land within the City of Grass Valley is an important facet of the 2020 General Plan. Infill, and a compact development pattern will facilitate efficient use of land with a minimum of public service extensions. About one-quarter of the City remains undeveloped. Some of this land, however, is so constrained by natural factors that development may never occur.

It is realistic to expect infill development to accommodate about one-third of new housing in the Planning Area, including the City in the next 20 years. Depending on market factors, infill may be able to provide a larger percentage of non-residential development, but by no means will it be able to meet the total commercial and industrial land demand.

Although the basic development patterns within the city limits are already established, much can and should be done over the 20-year life of the 2020 General Plan. Fine tuning, rather than wholesale reconstruction, should be the watchword. Many outstanding, though subtle, land use concepts and changes can enhance the City incrementally. Downtown may expand outward a bit, accompanied by building “up rather than out”. Well-designed higher density housing can fit in if properly located, a concept in keeping with Grass Valley’s most significant demographic characteristic -- a disproportionately older-than-average population.

Renovation of individual homes and conservation of neighborhoods must keep up with further aging of an already old housing stock. Existing commercial areas must renovate and intensify. Housing code enforcement and effective use of re-development programs are essential “implementers” of the 2020 General Plan.

Grass Valley has seen slow and steady growth. The Grass Valley grew at a slower pace than Nevada County and the region, with a growth of 4.4 percent during the 1990 to 2000 decade, as compared to 17.5

and 13.8 percent for Nevada County and the state respectively. Grass Valley has seen increasing growth rates as shown in Table A-9. California Department of Finance estimates for July 1, 2014 were 13,804. In comparison to other cities in the county, Grass Valley has not experienced the same growth and thus has been able to retain a small-town atmosphere.

Table A-9 Population Trends in the City of Grass Valley

Year	Grass Valley	Nevada County	California
1990	9,048	78,510	29,758,213
2000	10,922	93,033	33,871,648
2010	12,860	98,764	37,253,956

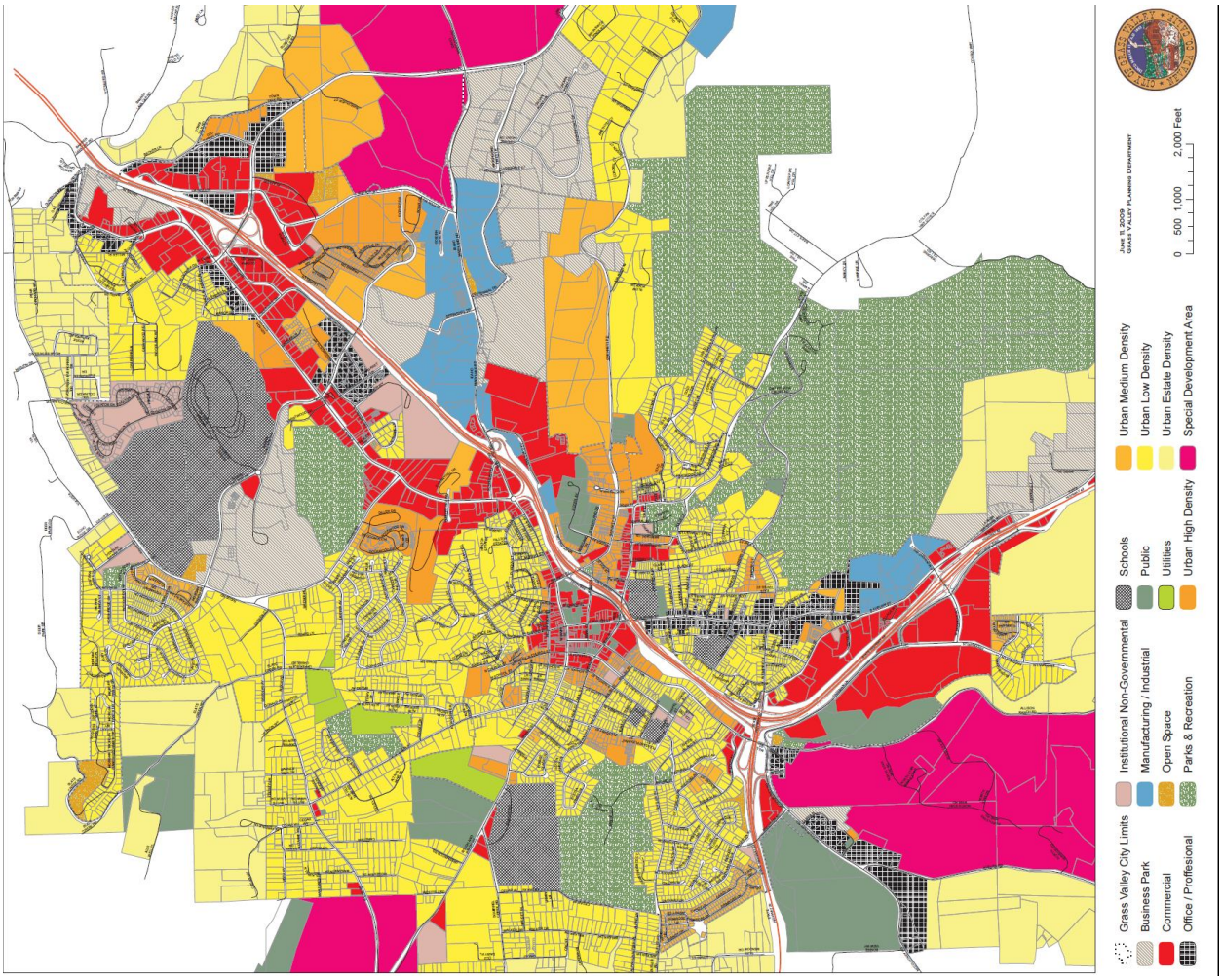
Source: California Department of Finance

Land Use

The 2020 General Plan perceives Downtown Grass Valley as continuing its role as the cultural center of the broader western Nevada County region, and recommends policies to assure that role. Numerous individual projects are identified as appropriate for Downtown: a plaza, a conference center, performing arts center; and even transit center. Grass Valley's neighborhoods are a combination of identifiable historic districts and modern developments. The 2020 General Plan supports the concept of neighborhood identification, preservation, and enhancement.

Four areas are designated Special Development Area (SDA) in the General Plan Land Use Chapter. They are Loma Rica Ranch, North Star, Kenny Ranch, and the Bear River Mill Site. The first three have been subjects of annexation agreements between the City of Grass Valley and the respective owners. Annexation agreements have resulted in the allocation of acreage to various land uses, and a fixed number of housing units to be allowed. The General Plan Land Use map is shown in Figure A-3.

Figure A-3 City of Grass Valley – Land Use Map



Source: City of Grass Valley 2020 General Plan

Development since 2011 Plan

As shown in Table A-10, Grass Valley has seen a gain of 0.1% of population between 2010 and January 1, 2016.

Table A-10 City of Grass Valley Population Changes Since 2011

Year	Population	Change	% Change
2010[1]	12,860	–	–
2016[2]	12,995	135	0.01%

Source: [1]US Census Bureau, [2]California Department of Finance

The City Building Department tracked total building permits issued since 2011 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table A-11 and Table A-12. All development in the identified hazard areas, including the wildfire risk areas, were completed in accordance with all current and applicable development codes and standards and should be

adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the City to identified priority hazards.

Table A-11 City of Grass Valley Total Development Since 2011

Property Use	2011	2012	2013	2014	2015	2016
Residential	12/8MF	4	5	84/80MF	7	2
Commercial			1	1	2	1
Industrial			1			
Other				1		
Total	**12**	**4**	**7**	**86**	**9**	**3**

Source: City of Grass Valley Building Department

Table A-12 City of Grass Valley Development in Hazard Areas since 2011

Property Use	1% Annual Chance Flood	Avalanche Prone Area	Landslide Susceptibility Area	Wildfire Risk Area[1]	Other
Residential				99	
Commercial					
Industrial				1	
Other					
Total	**0**	**0**	**0**	**100**	

Source: City of Grass Valley Building Department

[1]Moderate or higher wildfire risk area

Future Development

The City of Grass Valley has an area of the City that is slated for future development. A Specific Plan was completed for this area in 2011. Loma Rica Ranch consists of eight contiguous parcels measuring approximately 452 acres located 1.5 miles east of downtown Grass Valley and .4 miles south of the Glenbrook Basin. Brunswick Road runs north-south through the approximate center of the site, and the intersection of Idaho Maryland Road and Brunswick Road is the primary point of circulation within the project area. The western edge is primarily defined by Sutton Way and the Whispering Pines Business Park; the eastern edge is defined by the Nevada County Airpark and the Loma Rica Industrial Park; and the southern edge is defined by Loma Rica Drive. The Grass Valley General Plan identifies the Loma Rica Ranch SDA within the Core Area, with a 2005 annexation horizon. Loma Rica is an infill site. It abuts Grass Valley's city limits for nearly a mile along its western and southern edges, along Sutton Road, Idaho Maryland Road, and Brunswick Road. The property is completely surrounded by existing development of many different land uses. Whispering Pines Business Park provides light industrial, office, and commercial uses and is home to as many as 750 jobs. Additional commercial and multi-family residential properties line the western border of the site along Sutton Way. The Loma Rica Industrial Park provides approximately 950 jobs. To the north and northeast, low-density residential development borders the property.

GIS was obtained from the City of Grass Valley. The future development area of the Loma Rica Ranch area is shown on Figure A-4 and current parcel information is shown on Table A-13.

Figure A-4 City of Grass Valley – Loma Rica Ranch Future Development Area

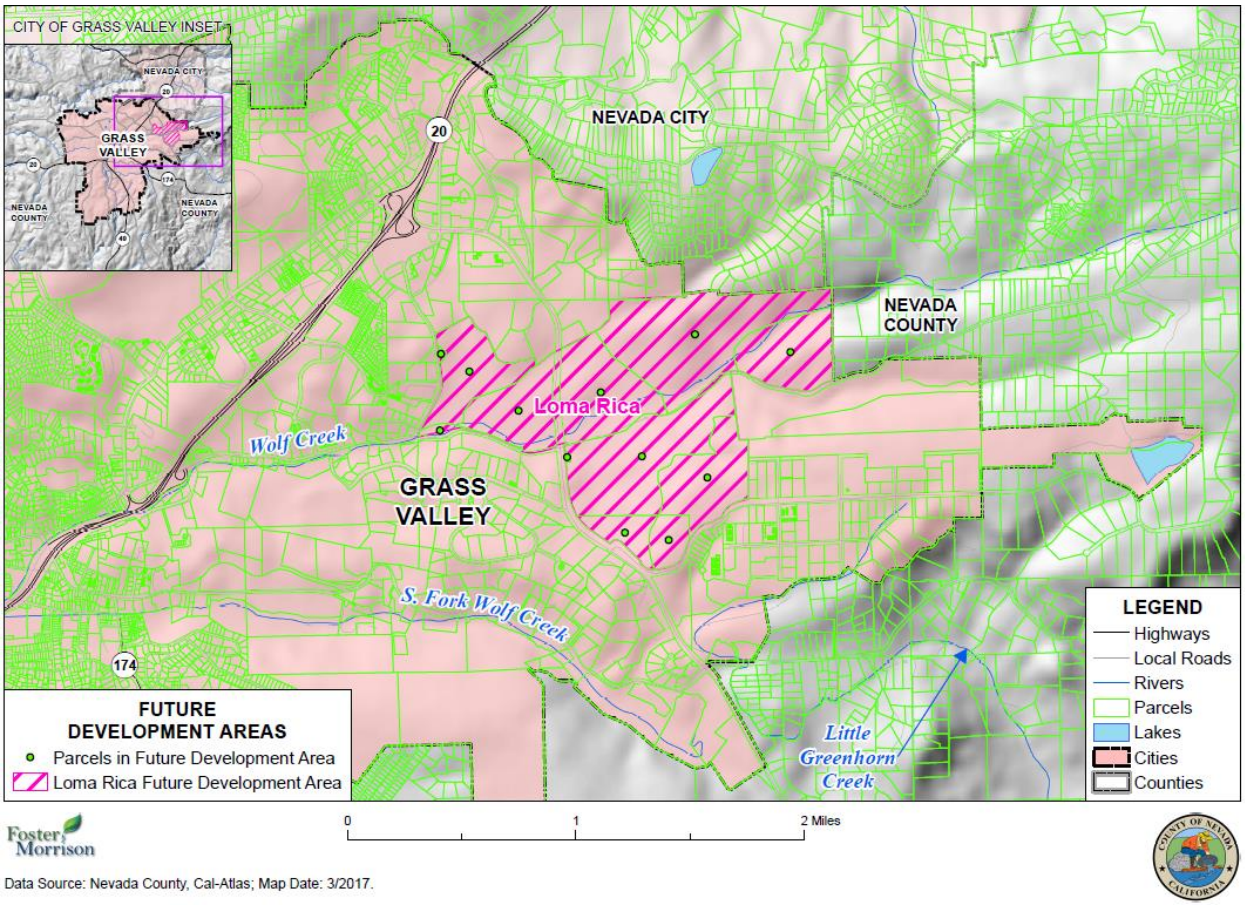


Table A-13 City of Grass Valley – Loma Rica Ranch Land Use and Parcels

Property Use	Total Parcel Count	Improved Parcel Count
Agricultural	0	0
Commercial	8	1
Government	1	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	3	1
Total	**12**	**2**

Source: City of Grass Valley; Nevada County 2016/2017 Parcel/Assessor's Data

More general information on growth and development in Nevada County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Nevada County Vulnerability and Assets at Risk of the Base Plan.

A.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table A-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Nevada County Planning Area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the Base Plan. In general, the most vulnerable structures are those located within the floodprone areas, WUI areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, populations at risk, historical, natural and cultural resources, critical facilities and infrastructure, and future development.

Dam Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If

prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

Flooding as a result of dam failure can occur as a result of manmade or natural causes. Such causes include improper siting, structural design flaws, erosion of the face of foundation, earthquakes, massive landslides, and rapidly rising flood waters. The only dam capable of inundating any portion of Grass Valley in event of failure is the Scotts Flat Lake Dam operated by NID. Inundation as a result of dam failure would most likely be the result of an earthquake. However, the area of Nevada County in which these dams exist is not located within an historical seismic zone. In fact, the western half of Nevada County is within the lowest earthquake intensity zone in California.

Past Occurrences

There have been no past occurrences related to dam failure in Grass Valley.

Vulnerability to Dam Failure

Dam failure of Scotts Flat could result in localized flooding mainly from over flow of creeks in the area fed by the dam or other tributaries which would include county roads, and structures along the inundation area of the dam.

Future Development

Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure, development in the dam inundation area will continue to occur.

Drought and Water Shortage

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Past Occurrences

In Grass Valley after the 2014 Governor's Drought Emergency Proclamation, the City adopted a resolution approving mandatory water conservation regulations on April 14, 2015. There have been two state disasters related to drought and water shortage in Nevada County issued in 1976 and 2014.

Vulnerability to Drought and Water Shortage

The vulnerability of Grass Valley to drought is citywide, but impacts may vary and include reduction in water supply, agricultural losses, and an increase in dry fuels. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

Future Development

According to the HMPC, Nevada County has access to large quantities of water through surface water as well as groundwater. However, population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth.

Earthquake

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. 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. 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 western half of the County, in which Grass Valley is located, is in the low intensity zone for earthquake severity. Grass Valley is not within an Alquist-Priolo zone. The closest active fault is the Cleveland Hill fault near Oroville. However, ground movement can be felt in Grass Valley from earthquakes at intermediate distances (i.e., the Truckee quake of 1968) and from distant earthquakes (i.e., the Winters-Vacaville 1892 event).

Past Occurrences

There are no past occurrences of earthquakes in Grass Valley. The HMPC also noted there have been no impacts in the City from earthquakes occurring elsewhere in the region.

Vulnerability to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while less developed areas are less vulnerable. Grass Valley is subject to some seismic activity, although this risk is relatively low compared to other places in the State.

In downtown Grass Valley on all structures are vulnerable and are available on GIS, within the rest of the City limits there are various structures that are vulnerable.

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake areas will continue to occur.

Flood: 1%/0.2% Annual Chance (100/500–year)

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

Grass Valley is traversed by several stream systems and is at risk to both the 1% annual chance flood as well as to localized stormwater flooding. According to the Safety Element of Grass Valley's General Plan, the average annual rainfall totals 35 inches, and although no major flooding is expected in the Planning Area, intermittent flooding and sheet wash occur along major drainage channels and adjoining areas on scattered sites. Areas with flood hazards are the natural drainage channels of the Grass Valley Ravine, Dutch Ravine and Rock Creek, and the tunnel section of the Grass Valley Ravine under Old Town. Other flood hazard areas include the numerous under-sized bridges and culverts within the Grass Valley/Bowman Area.

Grass Valley and the balance of the Planning Area lie primarily within the Wolf Creek drainage basin. The South Fork of Wolf Creek and Little Wolf Creek drain the eastern and southeastern portion of the City and discharge into Wolf Creek in the central Grass Valley area. Northwestern and western areas are within the upper reaches of the Deer Creek drainage basin, but do not include Deer Creek or substantial tributaries.

As previously described in Section 4.2.11 of the main plan, the Nevada County Planning Area and the City of Grass Valley have been subject to historical flooding. Within the City of Grass Valley, much of the flood damage occurs as a result of localized stormwater flooding, with limited flood damage occurring in the 1% and greater floodplains.

Past Occurrences

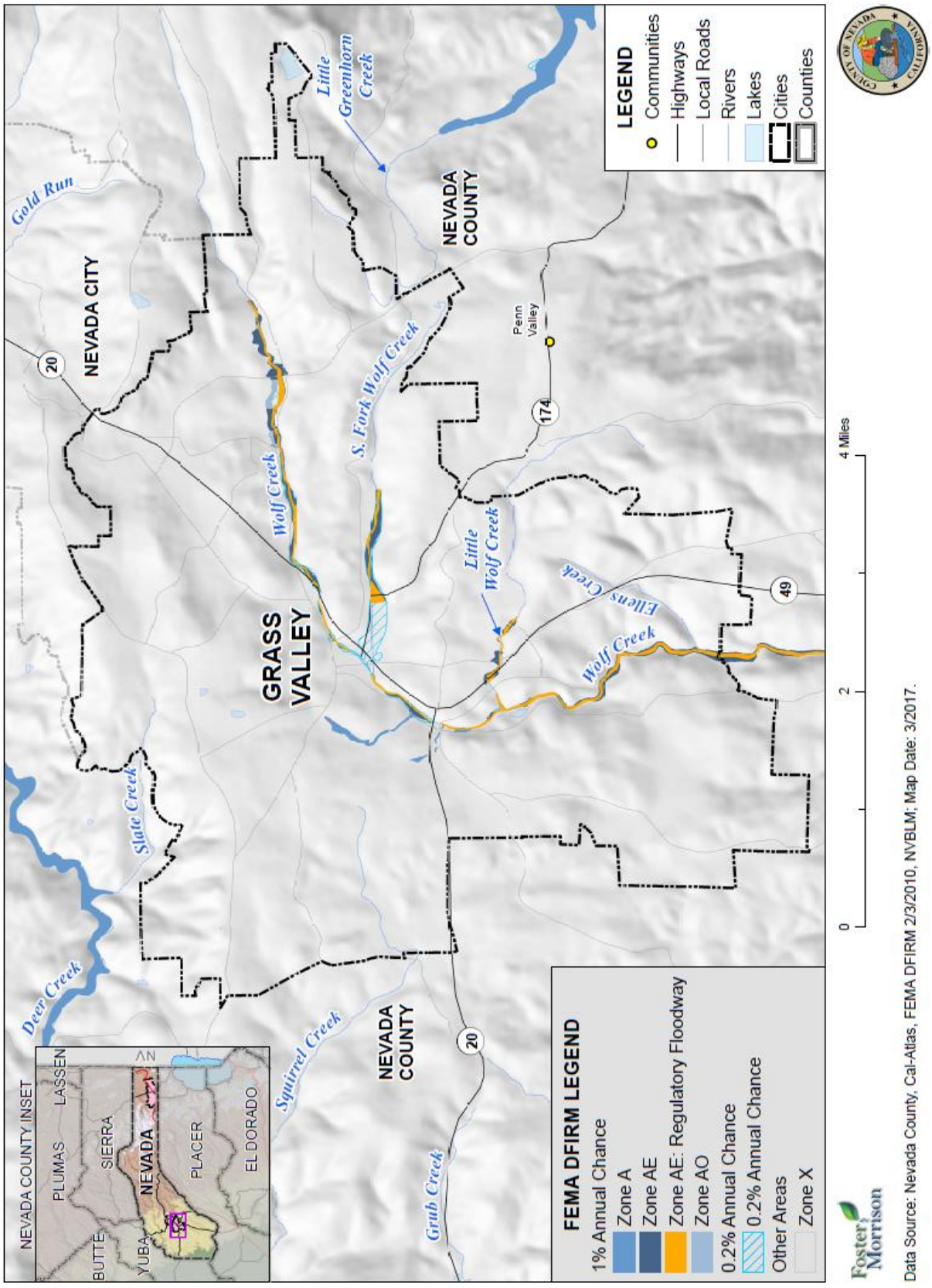
There have been no local declarations of emergency known to current staff regarding flooding in the City. Localized flooding related to storms occurs in limited areas within the City, mainly near Wolf Creek in the area of Mill and Hwy 20/49. Most recently, flooding occurred in December 2005/January 2006 as a result of heavy stormwater runoff caused by severe winter storms. Although actual damages were minimal, the storms impacted transit on public roads and caused some business closures due to limited access. Stormwater infrastructure also sustained limited damage.

Vulnerability to Flooding

FEMA Flood Zones

A very small portion of the City is located inside of the 1% annual chance flood zone as defined by the Federal Emergency Management Agency (FEMA). This is seen in Figure A-5.

Figure A-5 City of Grass Valley – FEMA DFIRM Flood Zones



Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Grass Valley. The methodology described in Section 4.3.8 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table A-14 shows the property use, improved parcel count, improved values, estimated contents (using the method described in Table 4-35 in Section 4.3.1), and total values estimated loss of parcels that fall in a floodplain in the City.

Table A-14 City of Grass Valley – Count and Improved Value by Property Use and Detailed Flood Zone with Contents Replacement Values

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone A – 1% Annual Chance Flood						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	20	17	$1,083,747	$2,542,417	$1,271,209	$3,813,626
Total	**20**	**17**	**$1,083,747**	**$2,542,417**	**$1,271,209**	**$3,813,626**
Zone AE – 1% Annual Chance Flood						
Agricultural	0	0	$0	$0	$0	$0
Commercial	6	3	$904,852	$723,802	$723,802	$1,447,604
Government	1	0	$0	$0	$0	$0
Industrial	4	4	$545,072	$41,390	$62,085	$103,475
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	17	12	$1,031,845	$1,763,493	$881,747	$2,645,240
Total	**28**	**19**	**$2,481,769**	**$2,528,685**	**$1,667,634**	**$4,196,319**
Zone AE Regulatory Floodway– 1% Annual Chance Flood						
Agricultural	1	0	$27,056	$0	$0	$0
Commercial	15	8	$1,267,105	$1,535,537	$1,535,537	$3,071,074
Government	2	0	$0	$0	$0	$0
Industrial	1	1	$23,676	$40,982	$61,473	$102,455
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	31	26	$1,032,087	$1,557,739	$778,870	$2,336,609
Total	**50**	**35**	**$2,349,924**	**$3,134,258**	**$2,375,880**	**$5,510,138**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1 % Annual Chance Grand Total	**98**	**71**	**$5,915,440**	**$8,205,360**	**$5,314,722**	**$13,520,082**
Zone X Shaded – 0.2% Annual Chance**						
Agricultural	0	0	$0	$0	$0	$0
Commercial	31	27	$2,825,302	$5,909,407	$5,909,407	$11,818,814
Government	3	0	$0	$0	$0	$0
Industrial	1	1	$55,154	$98,924	$148,386	$247,310
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0
Residential	51	50	$2,925,824	$5,648,209	$2,824,105	$8,472,314
Total	**87**	**78**	**$5,806,280**	**$11,656,540**	**$8,881,898**	**$20,538,438**
Zone D – Unmapped						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Zone X – Unshaded (No Mapped Flood Hazard)						
Agricultural	9	1	$459,332	$254,841	$254,841	$509,682
Commercial	734	498	$164,532,962	$300,334,929	$300,334,929	$600,669,858
Government	122	2	$1,668,369	$5,625,082	$5,625,082	$11,250,164
Industrial	132	116	$35,496,749	$97,303,543	$145,955,315	$243,258,858
Institutional	31	23	$3,762,836	$64,744,368	$64,744,368	$129,488,736
Miscellaneous	59	0	$0	$0	$0	$0
Residential	6,188	5,522	$440,988,521	$900,991,415	$450,495,708	$1,351,487,123
Total	**7,275**	**6,162**	**$646,908,769**	**$1,369,254,178**	**$967,410,242**	**$2,336,664,420**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table A-15 summarizes Table A-14 above and shows City of Grass Valley loss estimates and shows improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table A-15 City of Grass Valley – Flood Loss Summary

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count*	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	98	71	$8,205,360	$5,314,722	$13,520,082	$2,704,016	0.13%
0.2% Annual Chance**	87	78	$11,656,540	$8,881,898	$20,538,438	$4,107,688	0.20%
Grand Total	**185**	**149**	**$19,861,900**	**$14,196,619**	**$34,058,519**	**$6,811,704**	**0.33%**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

According to Table A-14 and Table A-15, the City of Grass Valley has 71 improved parcels and $13.5 million of structure and contents value in the 1% annual chance floodplain. The City has 78 improved parcels and $20.5 million in the 0.2% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.8 of the Base Plan, there is a 1% chance in any given year of a flood event causing roughly $2.7 million in damages, and a 0.2% chance of a flood event causing $4.1 million in damages in the City of Grass Valley. A loss ratio of 0.33% indicates that losses in Grass Valley to flood would be relatively minor, as a third of a percent of the total values in the City would be damaged.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.7 of the Base Plan, was used for the City of Grass Valley as well as for the County as a whole. Table A-16 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table A-16 City of Grass Valley – Flooded Acres

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
1% Annual Chance Flood Hazard		
Zone AE		
Agricultural	5	0
Commercial	34	15
Government	4	0
Industrial	4	2
Institutional	0	0
Miscellaneous	0	0

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Residential	34	12
Zone AE Total	**81**	**29**
Zone AE Floodway		
Agricultural	0	0
Commercial	38	21
Government	3	0
Industrial	4	3
Institutional	0	0
Miscellaneous	0	0
Residential	37	14
Zone AE Floodway Total	**82**	**39**
Zone AO		
Agricultural	0	0
Commercial	8	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Zone AO Total	**8**	**0**
Zone A		
Agricultural	0	0
Commercial	0	0
Government	4	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	13	8
Zone A Total	**18**	**8**
1% Annual Chance Flood Hazard Total	**190**	**76**
0.2% Annual Chance Flood Hazard		
Agricultural	0	0
Commercial	23	15
Government	14	0
Industrial	2	1
Institutional	0	0
Miscellaneous	2	0

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Residential	21	15
0.2% Annual Chance Flood Hazard Total	**63**	**32**
Zone X (unshaded) – No Mapped Flood Hazard*		
Agricultural	136	61
Commercial	3,100	840
Government	2,504	9
Industrial	704	562
Institutional	159	94
Miscellaneous	203	0
Residential	8,074	4,812
Zone X (unshaded) Total	**14,880**	**6,378**
Zone D (unmapped)		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Zone D (unmapped) Total	**0**	**0**
Grand Total	**15,133**	**6,486**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

*This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for Grass Valley. According to this analysis, there is a total population of 112 and 102 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table A-17.

Table A-17 City of Grass Valley – Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
A	17	35
AE	12	24
AE Floodway	26	53

Flood Zone	Improved Residential Parcels	Population*
Total 1% Annual Chance	**55**	**112**
Shaded X (0.2% Annual Chance)	**50**	**102**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data, US Census Bureau

* Average household populations from the 2010 US Census were used: Grass Valley– 2.04.

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Historical, Cultural, and Natural Resources at Risk

The City of Grass Valley has significant cultural and natural resources located throughout the City as previously described. Vulnerability analysis of these resources was not possible due to data limitations. However, it should be noted that all resources in the 1% and 0.2% annual chance floodplains are potentially at risk.

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Grass Valley in identified FEMA DFIRMs. GIS was used to determine whether the facility locations intersects a DFIRM flood hazard areas, and if so, which zone it intersects. Details of critical facilities in the floodplain in the City of Grass Valley are shown in Figure A-6 and Table A-18. As shown on the table and figure, Grass Valley has 2 critical facilities located in 1% annual chance and 2 critical facilities in the 0.2% annual chance DFIRM flood zones. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the City, there are likely some that are present within identified floodplains.

Figure A-6 City of Grass Valley – Critical Facilities and Flood Zones

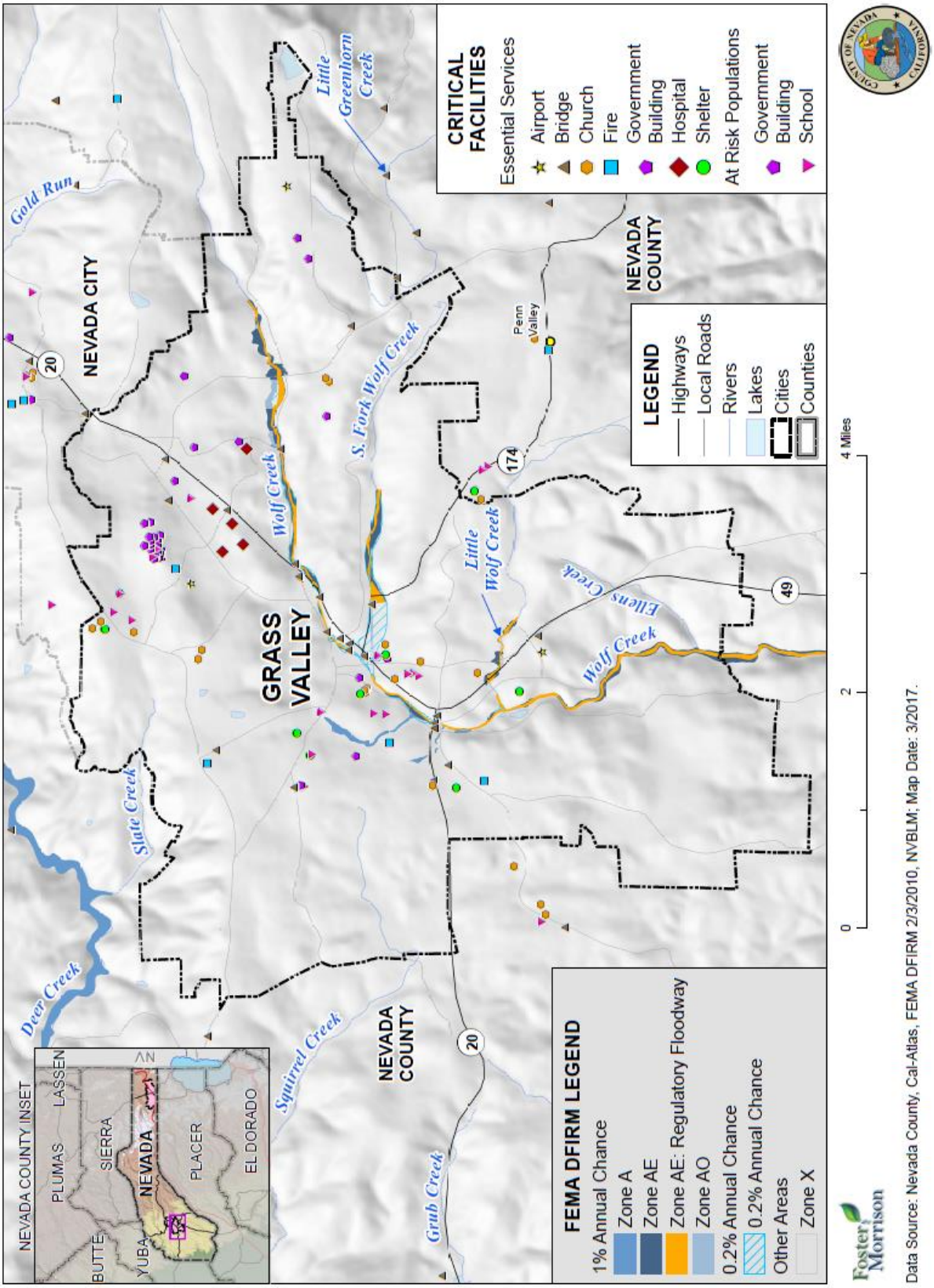


Table A-18 City of Grass Valley – Critical Facilities and Flood Zones

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
1% Annual Chance Flood		
Essential Services	Airport	0
	Bridge	2
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**2**
1% Annual Chance Flood Total		**2**
0.2% Annual Chance Flood (Shaded X)		
Essential Services	Airport	0
	Bridge	1
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**1**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	1
	Shelter	0
	Total	**1**
0.2% Annual Chance Flood Total		**2**
Zone X (unshaded) – No Mapped Flood Hazard		
Essential Services	Airport	3
	Bridge	20
	Church	15

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Fire	4
	Government Building	28
	Hospital	5
	School	0
	Shelter	8
	Total	**83**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	1
	Hospital	0
	School	14
	Shelter	0
	Total	**15**
Zone X (unshaded) Total		**98**
Grand Total		**102**

Source: FEMA 2010 DFIRM; Nevada County GIS

*This count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood will also include all critical facilities in the 1% annual chance floodplain.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Grass Valley joined the National Flood Insurance Program (NFIP) on September 30, 1982. The City does not participate in CRS program. NFIP data indicates that as of September 19, 2016, there were 29 flood insurance policies in force in the City with $6,713,900 of coverage. Of the 29 policies, 22 were residential (single-family homes), 3 were multi-family homes, and 4 were nonresidential; 14 of the policies were in A zones; the remaining 15 were in B, C, and X zones. The GIS parcel analysis detailed above identified 18 improved parcels in the 100-year flood zone. 14 policies for 71 improved parcels in the 100-year floodplain equates to insurance coverage of 19.7 percent.

There have been 10 historical claims for flood losses totaling $188,491; 7 were located in A zones, and 3 were located in B, C, or X zones. 7 of these were for pre-FIRM structures; 3 was for a post-FIRM structure. NFIP data further indicates that there are no repetitive loss (RL) buildings or severe repetitive loss (SRL) buildings.

California Department of Water Resources Best Available Maps (BAM)

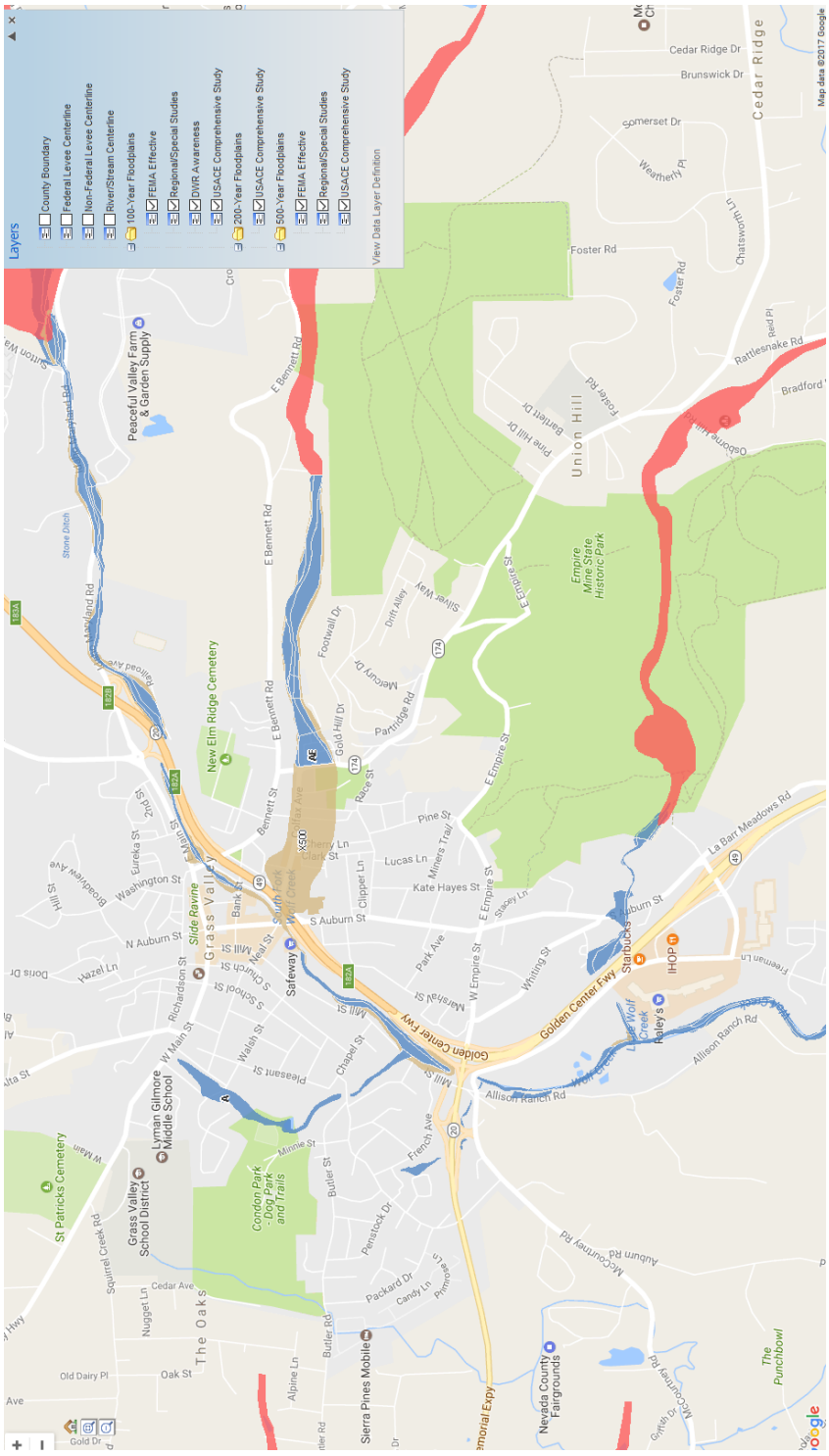
The FEMA regulatory maps provide just one perspective on flood risks in Nevada County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM)

displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 1$ annual chance flood risk, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance floodplain, it also supports identification of the need and requirement for flood insurance. The BAM map for Grass Valley is shown in Figure A-7.

Figure A-7 City of Grass Valley Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 100-Year (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chacne flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study)

Future Development

The City enforces the floodplain ordinance. If any development is to occur in the floodplain, it would have to conform to the elevation standards of the floodplain ordinance. No development is expected in the floodplain in the future.

Flood prevention and protection of life and property similarly justify management of the flood prone areas of stream corridors. Grass Valley's location near the headwaters of Wolf Creek and its tributaries minimizes the quantity and velocity of storm water flows through town. However, future development upstream could increase downstream flooding unless appropriate mitigation measures are employed. Keeping development out of flood prone areas is the most expeditious and effective mitigation measure. Flooding during a "100-year event" is limited to relatively narrow areas along Wolf Creek and tributaries (Wolf Creek South Fork and Little Wolf Creek) as they approach and course through Grass Valley.

Grass Valley's flood protection ordinance establishes a 100' building setback from streams and rivers subject to flooding. For stretches of stream corridors not covered by the FEMA maps, the 100' setback is used to define the OSO-designated zone. OSO designation will be reinforced by OS designation on the General Plan Land Use Plan map when better information for corridor delineation becomes available.

GIS was used to overlay the Loma Rica Ranch future development area on the FEMA DFIRM. This is shown on Figure A-8 and detailed by land use in Table A-19. As shown, there is one improved commercial parcel in the 1% annual chance flood zone.

Figure A-8 City of Grass Valley – Loma Rica Ranch and Flood Zones

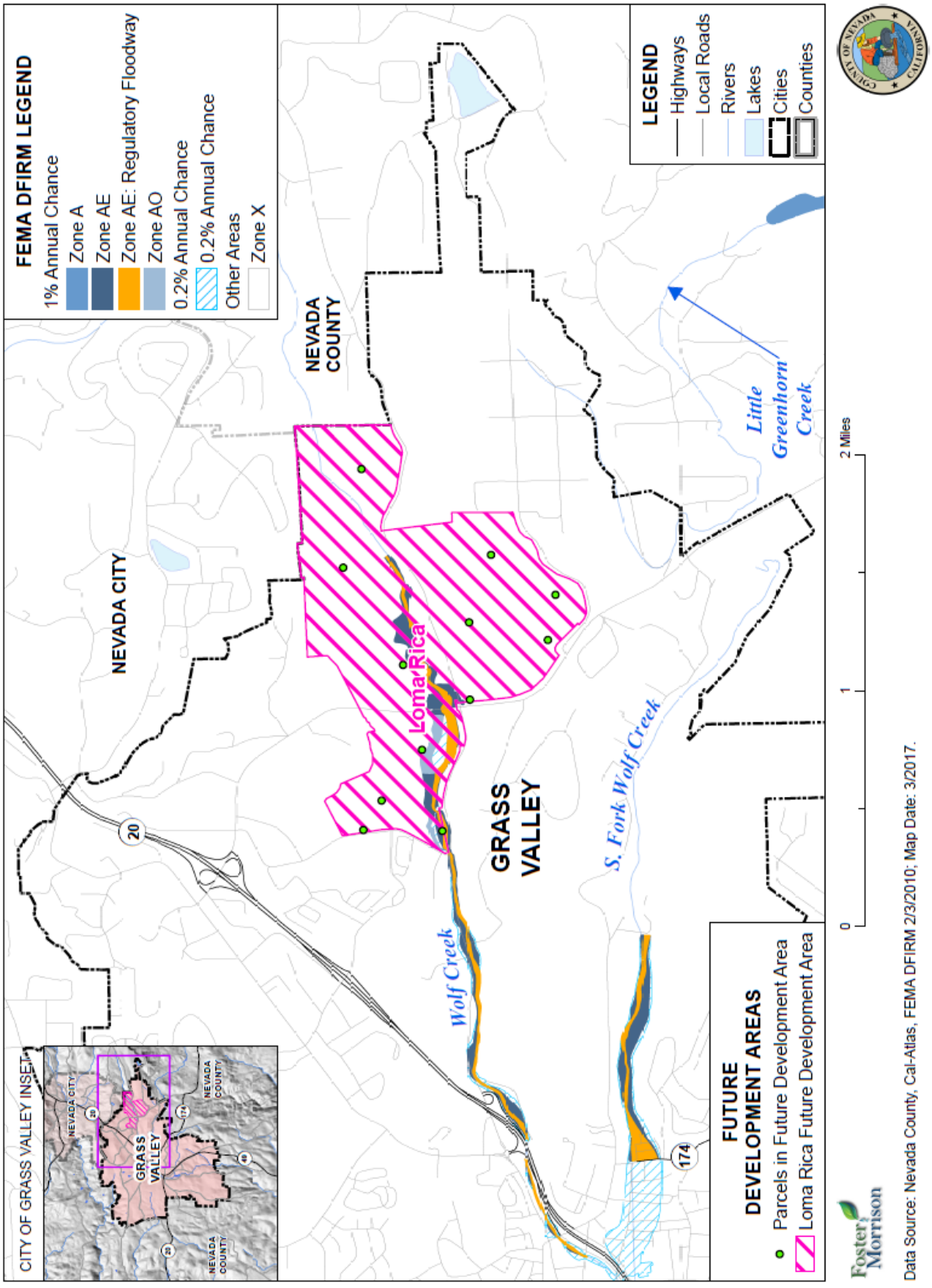


Table A-19 City of Grass Valley – Loma Rica Ranch Development Area by Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count
Zone AE - Floodway		
Agricultural	0	0
Commercial	1	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Total	**1**	**0**

Source: City of Grass Valley, FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

Flood: Localized/Stormwater

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Flooding and other issues caused by severe weather events, primarily heavy rains and severe storms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community. Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems.

Past Occurrences

Past occurrences include storm flooding on Mill Street due to Wolf Creek and also on Idaho Maryland Drive due to Wolf Creek and Hughes Road due to runoff. Additional descriptions of problem areas and past occurrences are included above in the discussion of 1% and 0.2% flood hazards and below in the table of localized flooding issues.

Vulnerability to Localized Flooding

Flooding and other issues caused by severe weather events, primarily heavy rains and thunderstorms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community. Table A-20 identifies known and past occurrences of such areas and the associated problems encountered. This list is an initial inventory of key problem areas and is not intended to be a complete inventory of all problems and locations associated with severe weather events and localized flooding in the City of Grass Valley.

Table A-20 City of Grass Valley's Road List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Idaho Maryland	Yes	Yes	No	Yes			
Mill St				Yes		Yes	
E. Main	Yes	Yes		Yes			
Idaho Maryland	Yes	Yes	No	Yes			

Source: City of Grass Valley

Future Development

Future development in the City will add more impervious surfaces and need to drain those waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Hazardous Materials Transportation (interstates, railroads, pipelines)

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

The significance of environmental or human exposure to hazardous materials depends on the type, location, and quantity of the material released. In the Grass Valley area, hazardous materials may be transported via roadways, railways, and airways. Industrial facilities that use, store, or dispose of hazardous materials present the greatest potential to toxic exposure due to accidental release. However, most of the hazardous waste stream in Nevada County, including Grass Valley, is generated by "small quantity generators." Hazardous materials and wastes are regulated by federal and state laws and are required to be recycled or properly disposed. Transport of hazardous materials is also heavily regulated. However, illegal storage and disposal and unintentional releases of hazardous materials from leaks and accidents can still occur.

Past Occurrences

There have been no federal or state disaster declarations for hazardous materials in Grass Valley. A summary of rail and highway incidents since 1970 in the City are shown in Table A-21. 11 separate events were contained in the database.

Table A-21 City of Grass Valley – Hazardous Materials Incidents by Date

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
9/30/1990	Grass Valley	720 S Auburn St	Highway	Unloading	Fuel Oil	30 Gallons	$695

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
1/29/1992	Grass Valley	12025 Charles Drive	Highway	In Transit	Compounds - Cleaning Liquids	0.25 Gallons	$175
2/13/1992	Grass Valley	12025 Charles Drive	Highway	Unloading	Potassium Hydroxide Solution	1.5 Gallons	$201
2/26/1992	Grass Valley	12025 Charles Drive	Highway	Unloading	Ammonia Solution	0.015625 Gallons	$52
12/18/2006	Grass Valley	15421 Gary Way	Highway	Unloading	Liquefied Petroleum Gas	0.26736 cubic feet	$0
10/3/2007	Grass Valley	12025 Charles Road	Highway	Unloading	N/A	0.25 lbs	$0
3/11/2008	Grass Valley	12025 Charles Road	Highway	Unloading	Flammable Liquids N.O.S.	0.5 Gallons	$0
12/6/2012	Grass Valley	13045 Grass Valley Ave.	Highway	Unloading	Liquefied Petroleum Gas	1 Gallons	$0
1/14/2013	Grass Valley	12025 Charles Road	Highway	Unloading	Carbon Dioxide	0	$0
6/17/2015	Grass Valley	109 Spring Hill Drive	Air	Unloading	Fire Extinguishers Container	2.204623 lbs	$0
9/29/2015	Grass Valley	12025 Charles Road	Highway	Unloading	Flammable Liquids N.O.S.	0.03125 Gallons	$0
Totals							**$1,123**

Source: PHMSA Database – Search dates 01/01/1970 – 03/01/2017

Vulnerability to Hazardous Materials

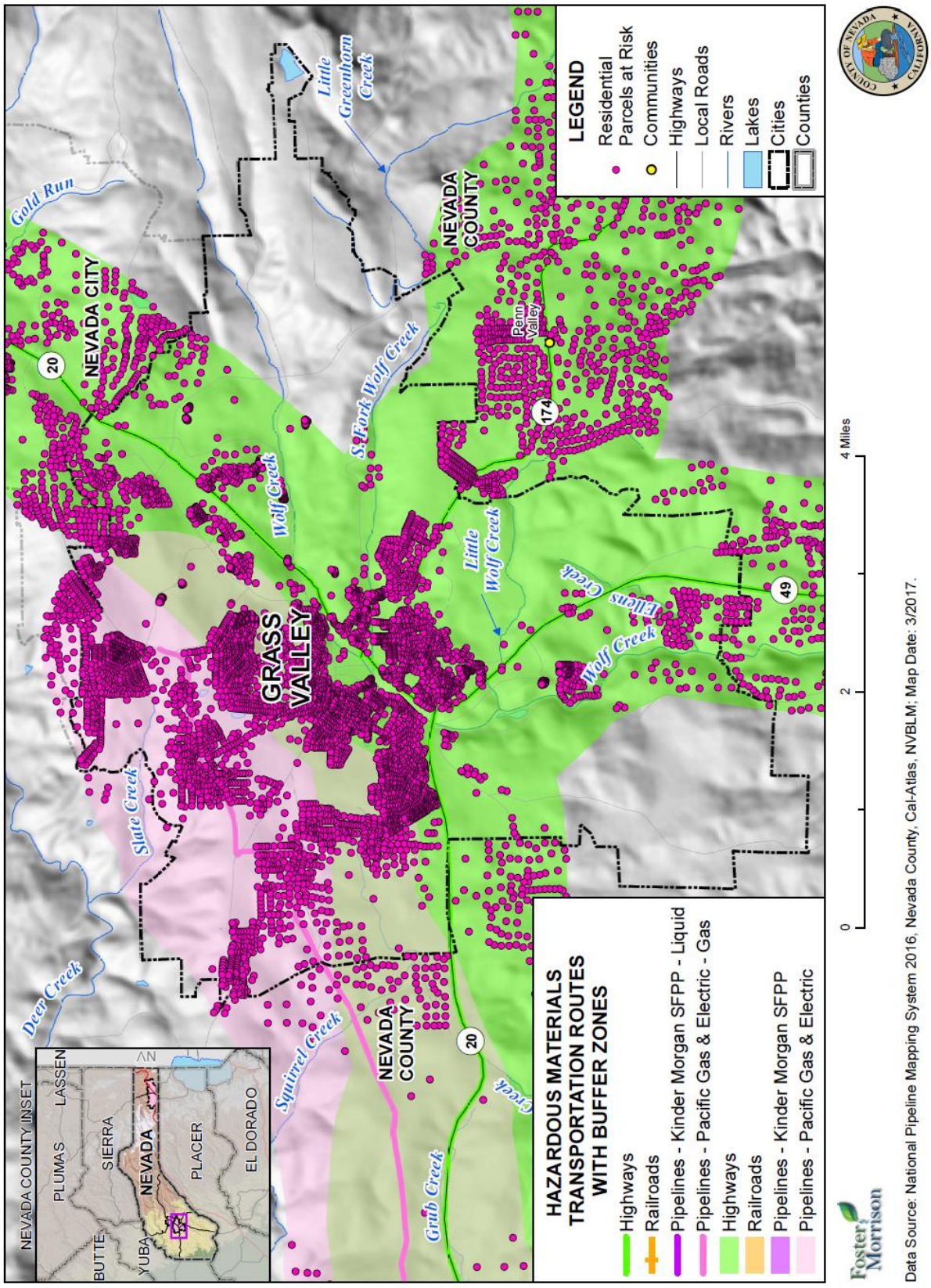
Values at Risk

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key Planning Area assets relative to the hazardous materials sites and transportation corridors (highway, rail, and pipeline).

An analysis of the potential vulnerability of the Planning Area to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable, a one mile buffer was applied to both sides of Interstate 80 and State Routes 20, 49, 89,

174, and 267; the Union Pacific railroad tracks (which roughly parallel I-80) and the Kinder Morgan petroleum pipeline. The result is a two-mile buffer zone around each transportation corridor that is used for risk-analysis. More information on this methodology can be found in Section 4.3.10 of the Base Plan. The buffer zone and residential parcels at risk are shown in Figure A-9.

Figure A-9 City of Grass Valley – Residential Parcels in Hazardous Materials Buffer Zones



Populations at Risk

To determine the populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway, railroad, and pipeline corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel data and results tabulated for the City of Grass Valley as found in Table A-22. Those parcel centroids that intersect the buffered corridor were counted and multiplied by the 2010 Census Bureau average household factors for the City. According to this analysis, there is a total population of 10,965 in the buffered corridor.

Table A-22 City of Grass Valley – Populations at Risk in Hazardous Materials Corridors

Jurisdiction	Residential Parcels	Population
Grass Valley	5,375	10,965

Source: Cal Trans, Nevada County GIS, US Census Bureau

* Census Bureau 2010 average household sizes are: Grass Valley – 2.04

Historical, Cultural, and Natural Resources at Risk

The City of Grass Valley has significant cultural and natural resources located throughout the City as previously described. Vulnerability analysis of these resources was not possible due to data limitations.

Critical Facilities

To determine the critical facilities at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the facilities located within the two-mile buffer zone of the highway, railroad, and pipeline corridors. Using GIS, the buffered corridor was overlaid on the Nevada County critical facilities layer and results tabulated for the City, shown in Figure A-10 and detail in Table A-23. There are 95 facilities in the buffered corridor in the Planning Area. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the City, there are likely some that are present within identified floodplains.

Figure A-10 City of Grass Valley – Critical Facilities in Hazardous Materials Buffer Zones

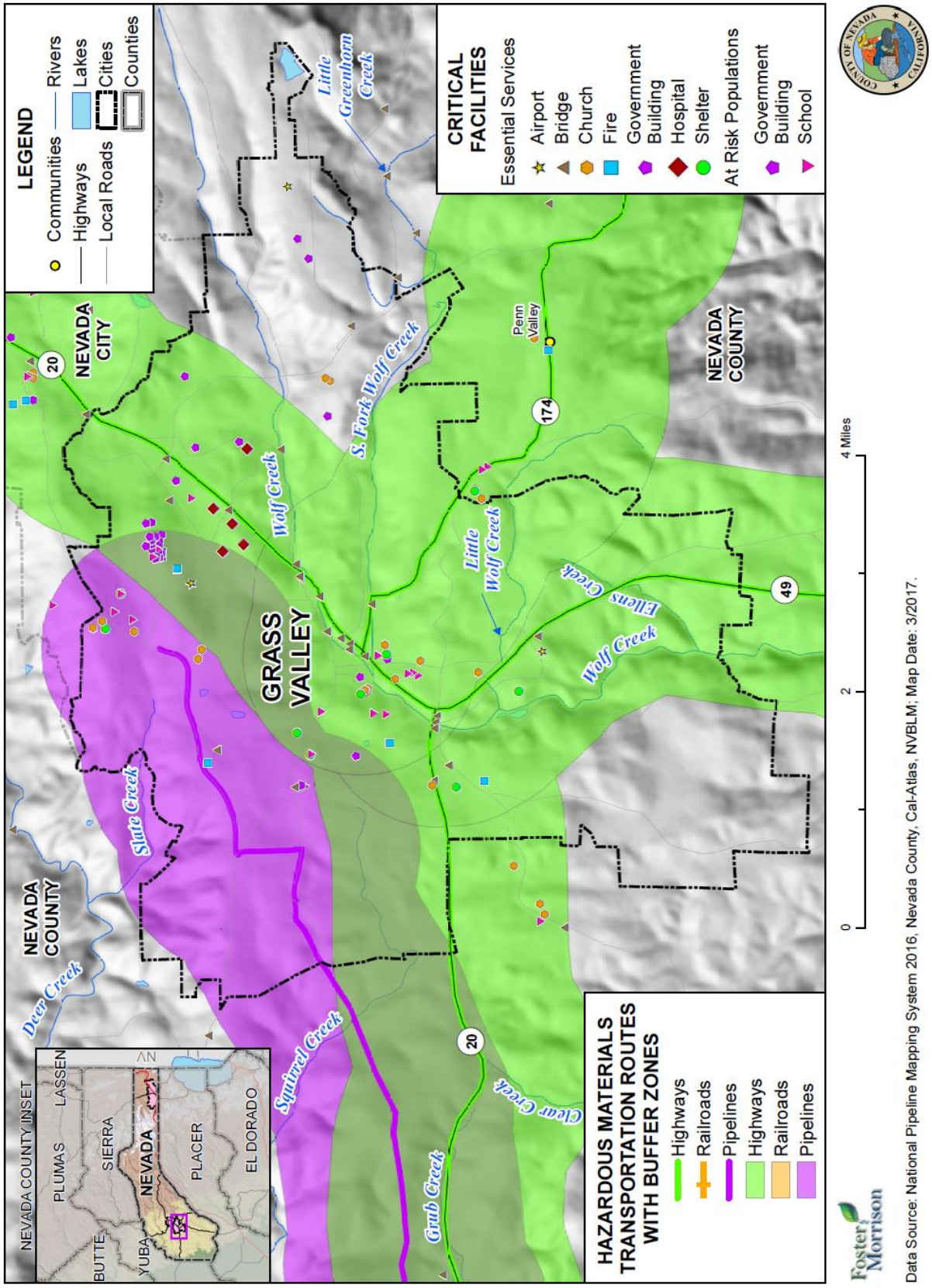


Table A-23 City of Grass Valley – Critical Facilities in Hazardous Materials Buffer Zones

Critical Facility Type	Critical Facility Count
Essential Services	
Airport	2
Bridge	22
Church	13
Fire	4
Government Building	26
Hospital	5
School	0
Shelter	8
Essential Services Total	**80**
At Risk Populations	
Airport	0
Bridge	0
Church	0
Fire	0
Government Building	0
Hospital	0
School	15
Shelter	0
At Risk Populations Total	**15**
Grand Total	**95**

Source: Cal Trans, National Pipeline Mapping System 2016, Nevada County GIS

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

GIS was used to overlay the Loma Rica Ranch future development area on the hazardous material buffer zone. This is shown on Figure A-11 and detailed by land use in Table A-25. As shown, the hazardous material buffer zone does intersect the Loma Rica Ranch area, but there are currently no improved parcels in the hazardous material buffer zone.

Figure A-11 City of Grass Valley – Loma Rica Ranch and Hazardous Materials Routes

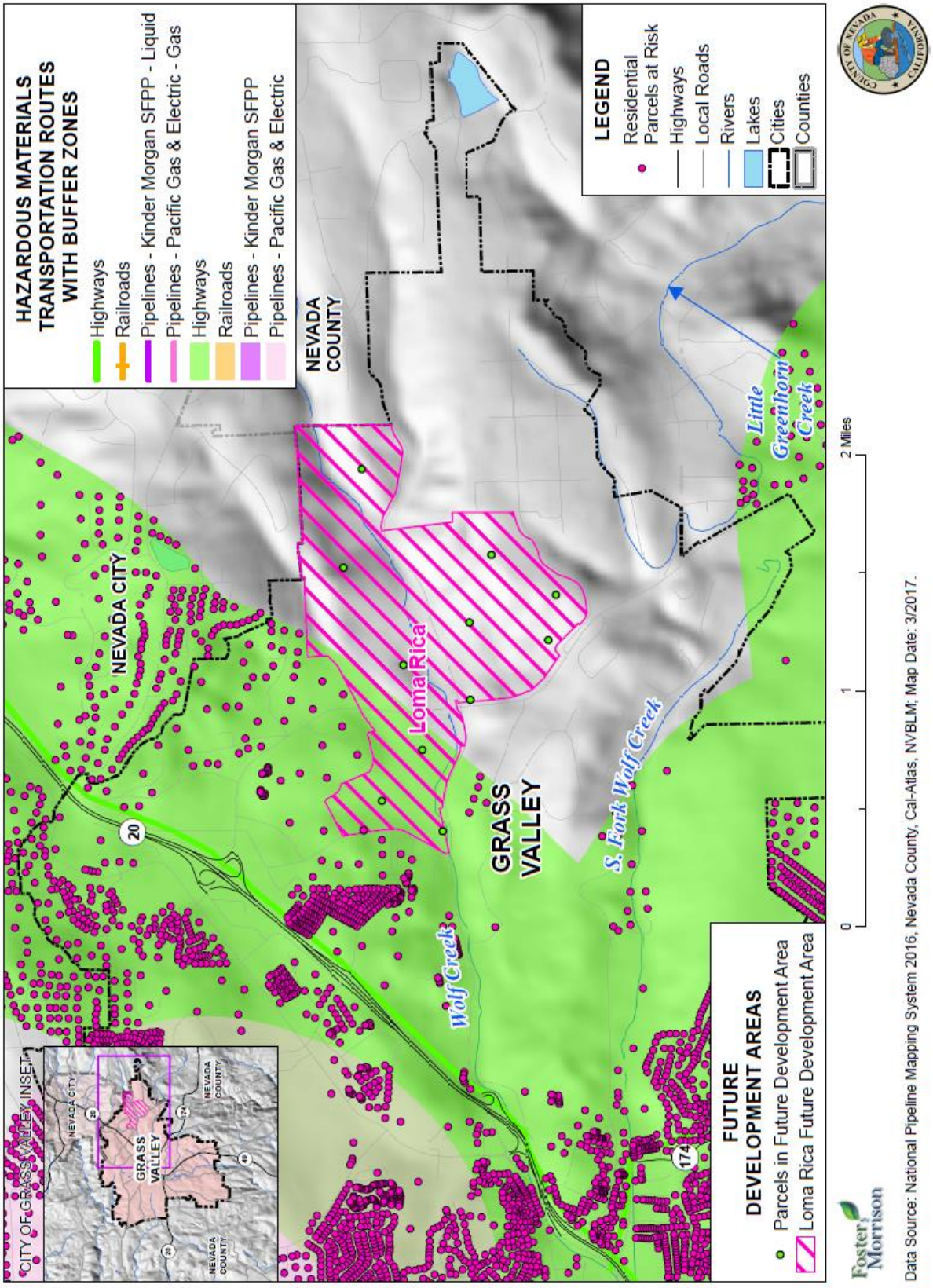


Table A-24 City of Grass Valley – Loma Rica Ranch Development Area in Hazardous Material Buffer Zone

Property Use	Total Parcel Count	Improved Parcel Count
Agricultural	0	0
Commercial	3	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	1	0
Total	**4**	**0**

Source: City of Grass Valley, Cal Trans, Nevada County 2016/2017 Parcel/Assessor's Data

Landslide, Debris & Mud Flows

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

According to the California Geological Survey, landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Landslides may be triggered by both natural and human-induced changes in the environment that result in slope instability.

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas.

Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

Landslides are events in which surface masses of slope-forming earth move outward and downward from their underlying and stable floors in response to the force of gravity. Unstable or potentially unstable slopes are susceptible to slide, falls, creeps, or mud flows. Although slope movements can occur in any type of rock material, certain bedrock formations exhibit a high susceptibility to such movement. This type is generally not found in the western portion of the County, but could occur on a local basis.

Past Occurrences

There have been no disaster declarations associated with landslides in the City of Grass Valley. Further, although the City could not identify any specific landslide prone areas or past occurrences, the City noted that the potential for future damaging landslide events remains in the sloped areas of the City.

Vulnerability to Landslide

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that landslides will continue to have potentially large economic impacts to certain areas. However, many of the landslides in the City are minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

Although new growth and development corridors could potentially fall in areas affected by risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide area will continue to occur.

Severe Weather: Extreme Cold, Snow, and Freeze

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the WRCC, in the western portion of Nevada County, monthly average minimum temperatures from November through April range from the low to mid-30s. The lowest recorded daily extreme was 3°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 72.7 days with no days falling below 0°F. Average snowfall is 10.0 inches. The highest annual snowfall fell in 1972, when 26.7 inches fell. Highest monthly snowfall accumulation came in March of 1974, when 23.0 inches fell. Average snow depths in January through March fall at 1 inches.

Past Occurrences

A disaster declaration for Nevada County was issued by the state government in 1972 for freeze and severe weather conditions.

Vulnerability to Extreme Cold, Snow, and Freeze

Winter snow storms, including strong winds and blizzard conditions can result in localized power and phone outages and closures of streets, highways, schools, businesses, and nonessential government operations. During periods of heavy snow there is also an increase in the number and severity of traffic accidents. People can become isolated in their homes and vehicles and are unable to receive essential services. Snow removal costs can impact budgets significantly. Heavy snowfall during winter can lead to flooding or landslides during the spring if the area snowpack melts too quickly and also create numerous challenges for emergency responders.

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the City shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the Planning Area as well as people retiring to the area. However, as previously mentioned, many of the residents of the City are self-sufficient and accustomed to rural living.

Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

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

Nevada County—West (Grass Valley Weather Station, Period of Record 1966 to 2016)

According to the WRCC, average annual precipitation in the western side of Nevada County is 53.26 inches per year. The highest recorded annual precipitation is 94.77 inches in 1983; the highest recorded precipitation for a 24-hour period is 7.02 inches on December 31, 2005. The lowest recorded annual precipitation was 16.51 inches in 1976.

Past Occurrences

A search of FEMA and Cal OES disaster declarations turned up multiple events. 11 state disaster declarations have occurred in the County – 1950, 1955, 1958 (twice), 1963, 1982, 1986, 1990, 1995, 1997, and 2008. 9 federal disaster declarations have occurred in the County – 1955, 1958, 1963, 1964, 1983, 1986, 1995, 1997, and twice in 2006.

Vulnerability to Heavy Rain and Storms

According to historical hazard data, severe weather is an annual occurrence in Grass Valley. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While minimal damages have occurred to critical facilities in the past due to lightning, hail, or high winds and tornadoes, there still remains future risk. With development occurring in the region, future losses to new development may occur.

Subsidence

Likelihood of Future Occurrence—Occasional
Vulnerability–High

Hazard Profile and Problem Description

Subsidence, the sinking of the ground due to the movement of underground material causing a shift or collapse, is a concern to the Nevada County Planning Area. There are several major sources of subsidence present in Nevada County: water drawdown, abandoned mines, karst and any underground voids caused by a variety of factors including underground utilities and culverts. One of the primary sources for the City, abandoned mines, had data available to conduct additional analysis of possible locations of future mine-related subsidence, and is thus the focus of the remainder of this section. Mine-related hazards include the presence of open holes at ground surface; inadequately covered/shored up shafts and tunnels below ground level; tailings, and other abandoned mining features. Safety and hazard concerns resulting from old mine operations include the risk of falling into open shafts, surface collapse/subsidence into old shafts, and the presence of residual toxic materials generated in mining processes.

A substantial portion of the Grass Valley area is underlain by a deep, extensive labyrinth of abandoned mine tunnels. The Empire Mine tunnels alone extend some 365 miles beneath the City of Grass Valley. Dozens of mining claims were "worked" in the Grass Valley area during the height of gold mining. Some were large, mechanized operations. Most were small and more labor-intensive.

The collapse of the Old Brunswick shaft of the Idaho-Maryland Mine Complex near Grass Valley during the 1998 storm season dramatized the danger to persons and property presented by abandoned mines. In that May, 1998, incident, the sudden subsidence of land above a long-hidden mine entrance claimed property and undercut the foundation of a new home near Grass Valley.

Past Occurrences

Due to the event occurring January of 2017, the City of Grass Valley proclaimed a local Emergency via council action and the State and Federal agencies have affirmed the declaration.

The HMPC noted an event that occurred in January of 2017. A storm in January caused a sinkhole to open in Grass Valley. Grass Valley Public Works Director Tim Kiser stated the ground opened up next to the parking lot of Liberty Motors, just off of Freeman Lane. The large sinkhole, described as being seven stories deep and 80 feet in diameter when it first formed, occurred when a 7.5 foot-diameter underground culvert for Little Wolf Creek failed along the 600 block of Freeman Lane. Pictures from this event are shown in Figure A-12.

Figure A-12 City of Grass Valley – January 2017 Sinkhole

Source: Nevada County OES

Vulnerability to Subsidence

Grass Valley is underlain by known mine sites. Those sites and their possible effects are discussed below.

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Grass Valley. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk known mine areas. Areas susceptible to subsidence based on the historic mining operations (a mine inventory) are shown in Figure A-13 and detailed in Table A-25 and Table A-26. Table A-27 shows the property use, improved parcel count, improved values, estimated contents, total values and estimated loss of parcels that fall in a known mine area in the City.

Figure A-13 City of Grass Valley – Known Mine Inventory

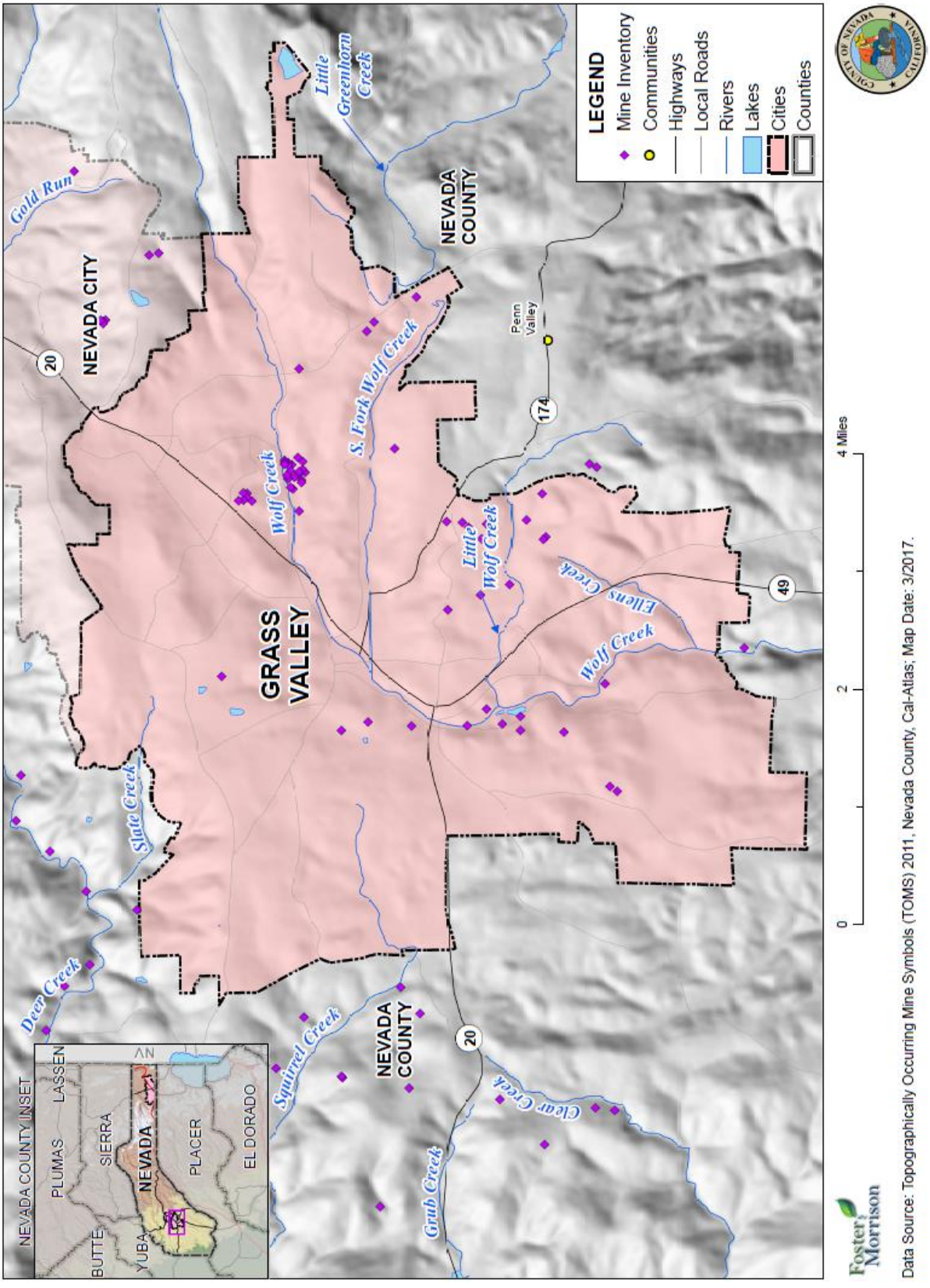


Table A-25 City of Grass Valley – Mine Types and Counts

Jurisdiction / Mine Type	Mine Count
Borrow Pit	0
Building	26
Diggings	0
Dredger Tailings	0
Gravel Pit	0
Intricate Surface Area	0
Mine Shaft	15
Mine Tunnel	1
Open Pit	0
Placer Diggings	0
Prospect	1
Quarry	0
Strip Mine	0
Tailings	14
Tailings Pond	3
Grand Total	**60**

Source: TOMS 2011

Table A-26 City of Grass Valley – Mine Names Located on Affected Parcels

Mine Name	Mine Count
Empire Mine	6
Idaho Maryland Mine	21
New Brunswick Mine	1
North Star Central Shaft	1
North Star Mine	2
Old Brunswick Mine	1
Pennsylvania Mine	1
Scotia Mine	1
Spring Hill Mine	6
Unknown	20
Grand Total	**60**

Source: TOMS 2011

Table A-27 City of Grass Valley – Parcel County and Values at Risk from Subsidence (Known Mine Inventory) by Property Use with Content Replacement Values

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	$0	$0	$0	$0
Commercial	7	2	$1,517,355	$2,751,696	$2,751,696	$7,020,747
Government	7	0	$0	$0	$0	$0
Industrial	10	9	$2,876,133	$5,938,012	$8,907,018	$17,721,163
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	14	7	$4,856,668	$1,163,072	$581,536	$6,601,276
Total	**38**	**18**	**$9,250,156**	**$9,852,780**	**$12,240,250**	**$31,343,186**

Source: TOMS 2011, Nevada County 2016/2017 Parcel/Assessor's Data

Population at Risk

The known mine areas were overlayed on the parcel layer. Those residential parcel centroids that intersect the known mine areas were counted and multiplied by the 2010 Census Bureau average household factors for Grass Valley. According to this analysis, there is a total population of 14 residents of the City at risk to known mine areas. This is shown in Table A-28.

Table A-28 City of Grass Valley – Count of Improved Residential Parcels and Population in Subsidence (Known Mine Inventory) Areas

Improved Residential Parcels	Population*
7	14

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data, US Census Bureau

* Average household populations from the 2010 US Census were used: Grass Valley– 2.04.

Historical, Cultural, and Natural Resources at Risk

The Grass Valley Planning Area has significant historical, cultural, and natural resources located throughout the County as previously described. Risk analysis of these resources was not possible due to data limitations.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory for the Nevada County Planning Area including all jurisdictions to determine critical facilities in known mine areas. Using GIS, the mine inventory data were overlayed on the critical facility GIS layer. There are no critical facilities in the known mine areas in Grass Valley. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the

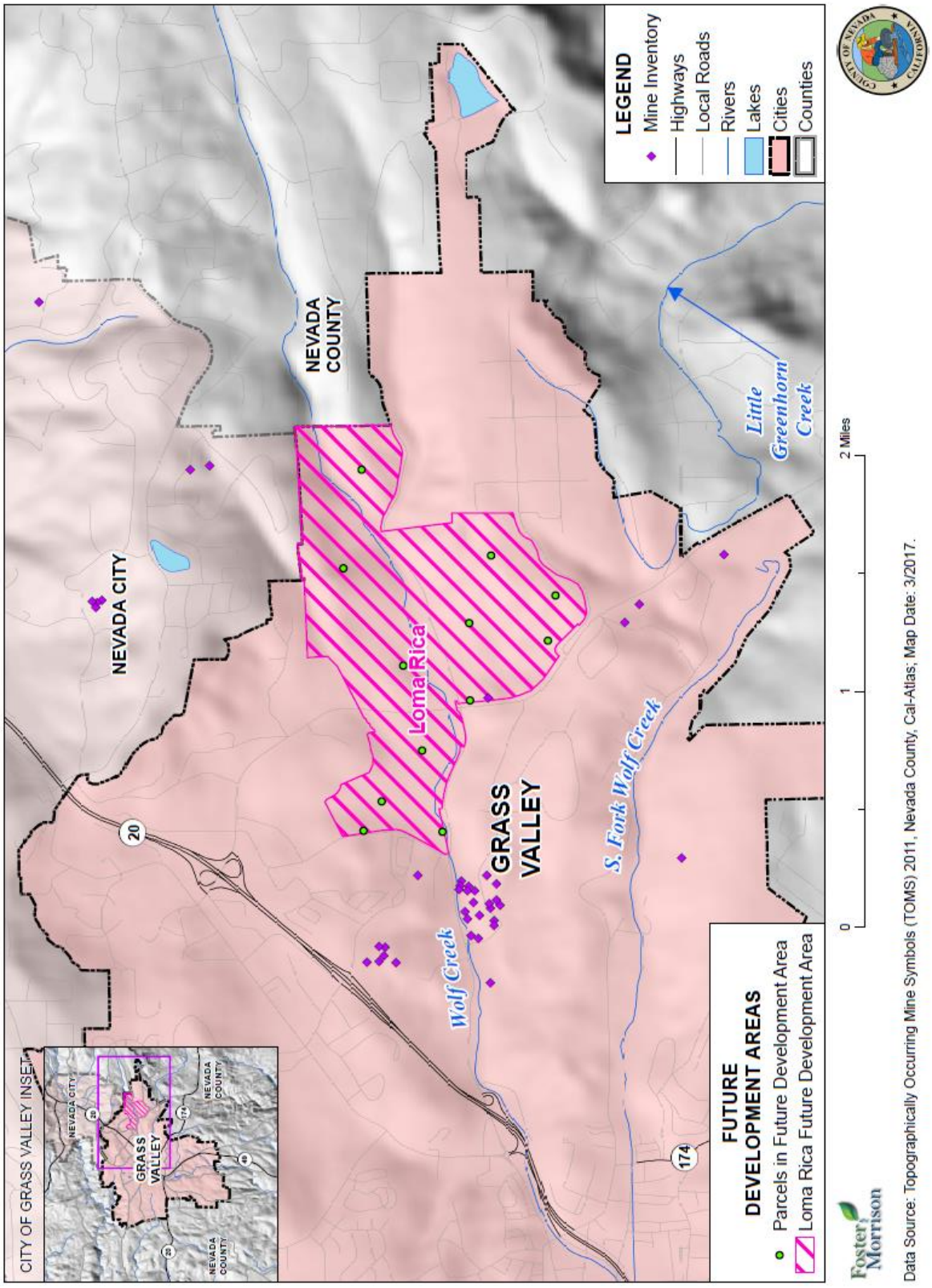
number of facilities that use and store hazardous materials in the City, there are likely some that are present within identified floodplains.

Future Development

Many of the subsidence and mine areas in the City are known, but many still remain unknown and untracked. The risk of subsidence to future development can be minimized by accurate recordkeeping and tracking of previously unknown abandoned mines. Knowing these locations and choosing not to develop in those areas or mitigating against future issues will reduce future risks of losses due to subsidence.

GIS was used to overlay the Loma Rica Ranch future development area on the known mine inventory. This is shown on Figure A-14. As shown, there are currently no known mine areas in the future development area.

Figure A-14 City of Grass Valley – Loma Rica Ranch and Subsidence (Known Mine Inventory) Areas



Wildfire (smoke, tree mortality, conflagration)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Three types of fires are of concern to the City of Grass Valley: wildland, wildland urban interface, and, to a lesser extent, structural fires. According to the Safety Element of Grass Valley's General Plan, wildland and urban interface fires have occurred close to or encroached into the City, especially in the heavily fueled areas to the east and south. Urban structural fires have been due largely to human accidents, with are the older buildings in the City business districts the most vulnerable.

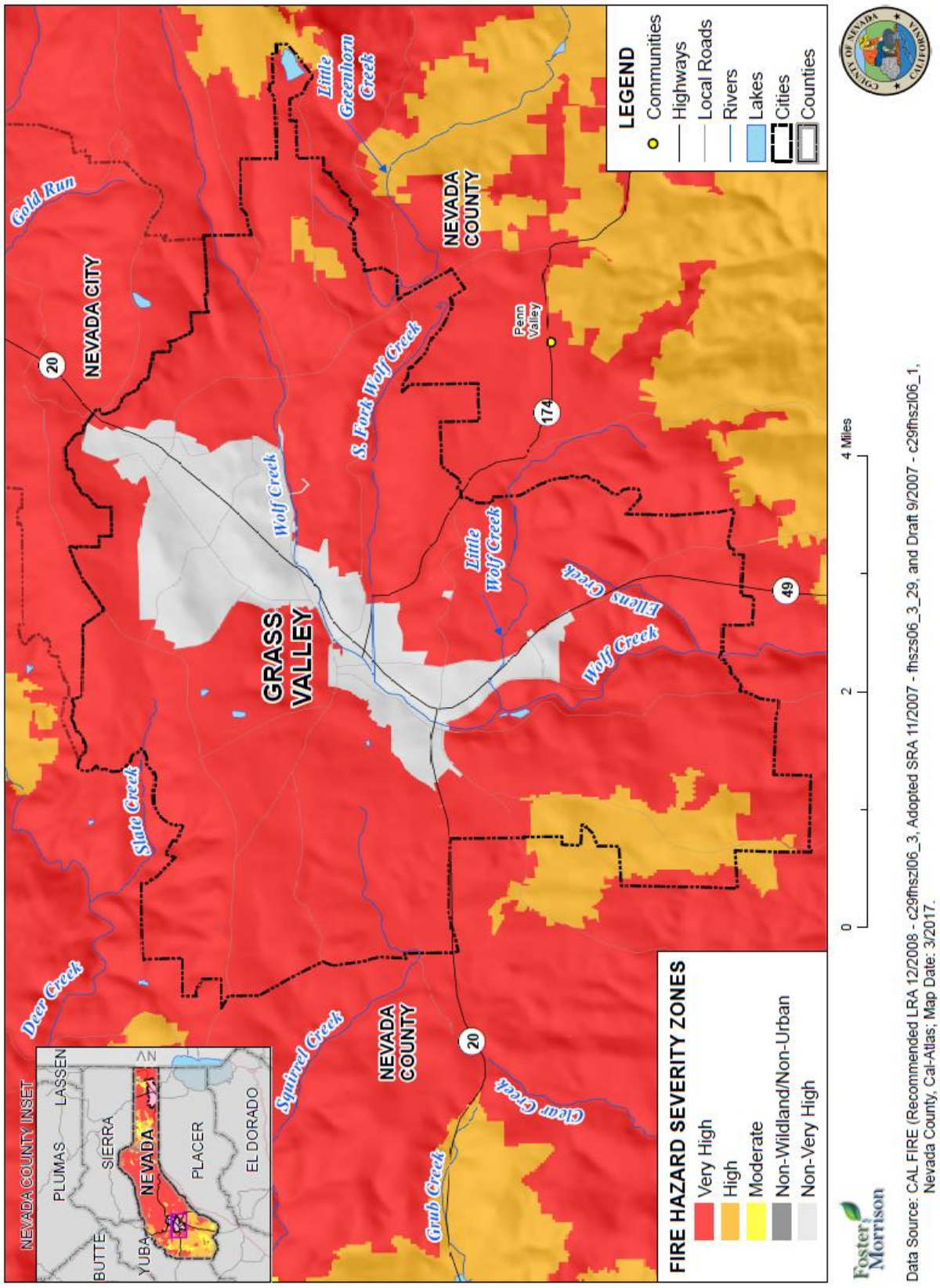
Past Occurrences

Generally, within the City incidents have been mitigated prior to damage in the Urban Interface. Interface fires of note are the Berryhill Incident and South Auburn Incident. Both incidents impacted homes immediately although no structures were lost.

Vulnerability to Wildfire

Following the methodology described in Section 4.3.2 Vulnerability of Nevada County to specific hazards, a wildfire map for the City of Grass Valley was created (see Figure A-15). Wildfire severity zones within the City ranges from high to very high.

Figure A-15 City of Grass Valley – Fire Severity Zones



Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Grass Valley. The methodology described in Section 4.3.16 of the Base Plan was followed in determining structures and values at risk in CAL FIRE fire hazard severity zones. Analysis results for Grass Valley are shown in Table A-29, which summarizes total parcel counts, improved parcel counts, land values, structure values, and contents values by occupancy type as well as the percentage of parcels affected by fire. The estimated contents replacement values are based on the CRV factors detailed in Table 4 35 in Section 4.3.1 of the Base Plan.

Table A-29 City of Grass Valley – Count and Value of Parcels by Property Use and Fire Severity Zone with Contents Replacement Values

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High						
Agricultural	6	0	$353,834	$0	$0	$353,834
Commercial	266	102	$52,122,106	$79,384,934	$79,384,934	$210,891,974
Government	90	2	$1,667,657	$5,625,082	$5,625,082	$12,917,821
Industrial	88	78	$22,086,402	$53,454,593	$80,181,890	$155,722,885
Institutional	16	11	$1,867,371	$19,183,306	$19,183,306	$40,233,983
Miscellaneous	47	0	$0	$0	$0	$0
Residential	4,732	4,287	$334,884,159	$678,971,159	$339,485,580	$1,353,340,898
Total	**5,245**	**4,480**	**$412,981,529**	**$836,619,074**	**$523,860,791**	**$1,773,461,394**
High						
Agricultural	1	1	$132,554	$254,841	$254,841	$642,236
Commercial	6	6	$145,394	$442,261	$442,261	$1,029,916
Government	3	0	$0	$0	$0	$0
Industrial	10	9	$2,454,617	$8,379,626	$12,569,439	$23,403,682
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	9	0	$0	$0	$0	$0
Residential	119	105	$7,573,766	$17,331,245	$8,665,623	$33,570,634
Total	**148**	**121**	**$10,306,331**	**$26,407,973**	**$21,932,164**	**$58,646,468**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Non-Wildland/Non-Urban						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Non-Very High						
Agricultural	3	0	$0	$0	$0	$0
Commercial	514	428	$117,262,721	$228,676,480	$228,676,480	$574,615,681
Government	35	0	$712	$0	$0	$712
Industrial	40	35	$11,579,632	$35,650,620	$53,475,930	$100,706,182
Institutional	15	12	$1,895,465	$45,561,062	$45,561,062	$93,017,589
Miscellaneous	4	0	$0	$0	$0	$0
Residential	1,456	1,235	$104,604,099	$216,200,869	$108,100,435	$428,905,403
Total	**2,067**	**1,710**	**$235,342,629**	**$526,089,031**	**$435,813,907**	**$1,197,245,567**
Grand Total	**7,460**	**6,311**	**$658,630,489**	**$1,389,116,078**	**$981,606,861**	**$3,029,353,428**

Source: Nevada County 2016/2017 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The fire hazard severity zone dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for the City of Grass Valley. According to this analysis, there is a total population of 8,959 residents of Grass Valley at risk in the high and very high wildfire risk. This is shown in Table A-30.

Table A-30 City of Grass Valley – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

Fire Severity Zone	Improved Residential Parcels	Population*
Very High	4,287	8,745
High	105	214
Moderate	0	0
Total	**4,392**	**8,959**

Source: Nevada County 2015 Parcel/Assessor's Data, CAL FIRE

* Average household populations for Grass Valley (2.04) from the 2010 US Census were used

Critical Facilities at Risk

Wildfire analysis was performed on the critical facility inventory in Nevada County and all jurisdictions. GIS was used to determine whether the facility locations intersect a fire hazard severity zone provided by CAL FIRE, and if so, which zone it intersects. There are 32 facilities in the high or very high fire hazard severity zones in the City. These are shown in Figure A-16 and detailed in Table A-31. Details of critical facility definition, type, name and address and jurisdiction by fire severity zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the City, there are likely some that are present within the fire hazard severity zones.

Figure A-16 City of Grass Valley – Critical Facilities in Fire Hazard Severity Zones

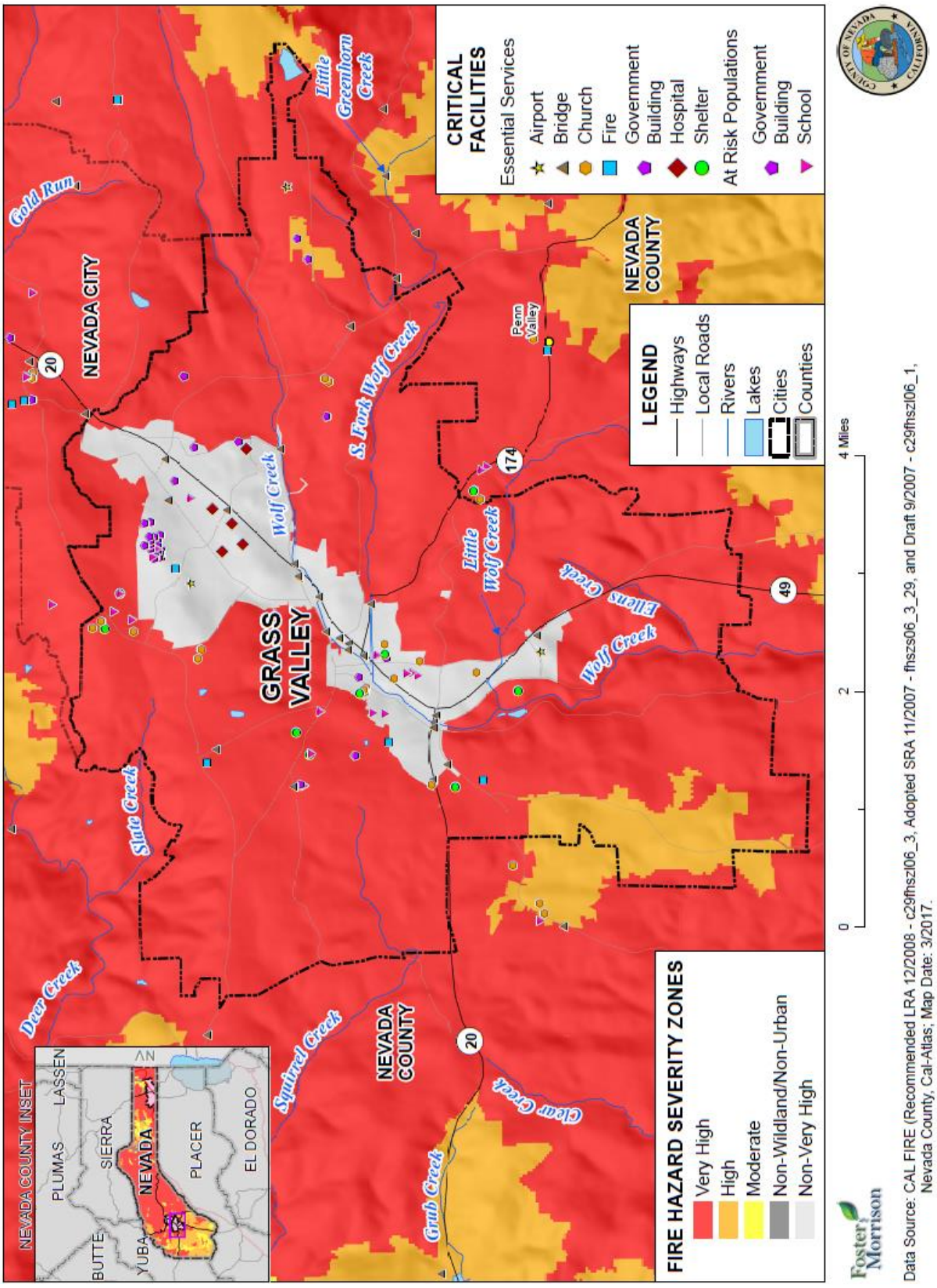


Table A-31 City of Grass Valley – Critical Facilities in Fire Hazard Severity Zones

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
Very High		
Essential Services	Airport	1
	Bridge	3
	Church	7
	Fire	3
	Government Building	3
	Hospital	0
	School	0
	Shelter	6
	Total	**23**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	1
	Hospital	0
	School	6
	Shelter	0
	Total	**7**
Very High Total		**30**
High		
Essential Services	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	2
	Hospital	0
	School	0
	Shelter	0
	Total	**2**
High Total		**2**
Non-Very High		
Essential Services	Airport	2
	Bridge	20
	Church	8

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Fire	1
	Government Building	23
	Hospital	5
	School	0
	Shelter	2
	Total	**61**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	9
	Shelter	0
	Total	**9**
Non-Very High Total		**70**
Grand Total		**102**

Source: CAL FIRE, Nevada County GIS

Historical, Cultural, or Natural Resources at Risk

Grass Valley has substantial historical, cultural and natural resources located throughout the City. In addition, there are other natural resources at risk when wildland-urban interface fires occur. One is the watershed and ecosystem losses that occur from wildland fires. This includes impacts to water supplies and water quality as well as air quality. Another is the aesthetic value of the area. Major fires that result in visible damage detract from that value. Other assets at risk include wildland recreation areas, wildlife and habitat areas, and rangeland resources. The loss to these natural resources can be significant.

Future Development

Development may occur in the high or very high wildfire severity areas; however, City ordinances for building in these areas are enforced. The Fire Department reviews projects as submitted for assessment of impact from fire especially those in the Urban Interface. Through planning and partnerships development can occur with fire safety a critical component in the design, layout and building materials used for future projects.

GIS was used to overlay the Loma Rica Ranch future development area on the Fire Hazard Severity Zones. This is shown on Figure A-17 and detailed by land use in Table A-32. As shown, the Loma Rica Ranch area is in the Very High zone, but there are currently only two improved parcels in the Very High Fire zone.

Figure A-17 City of Grass Valley – Loma Rica Ranch and Fire Hazard Severity Zones

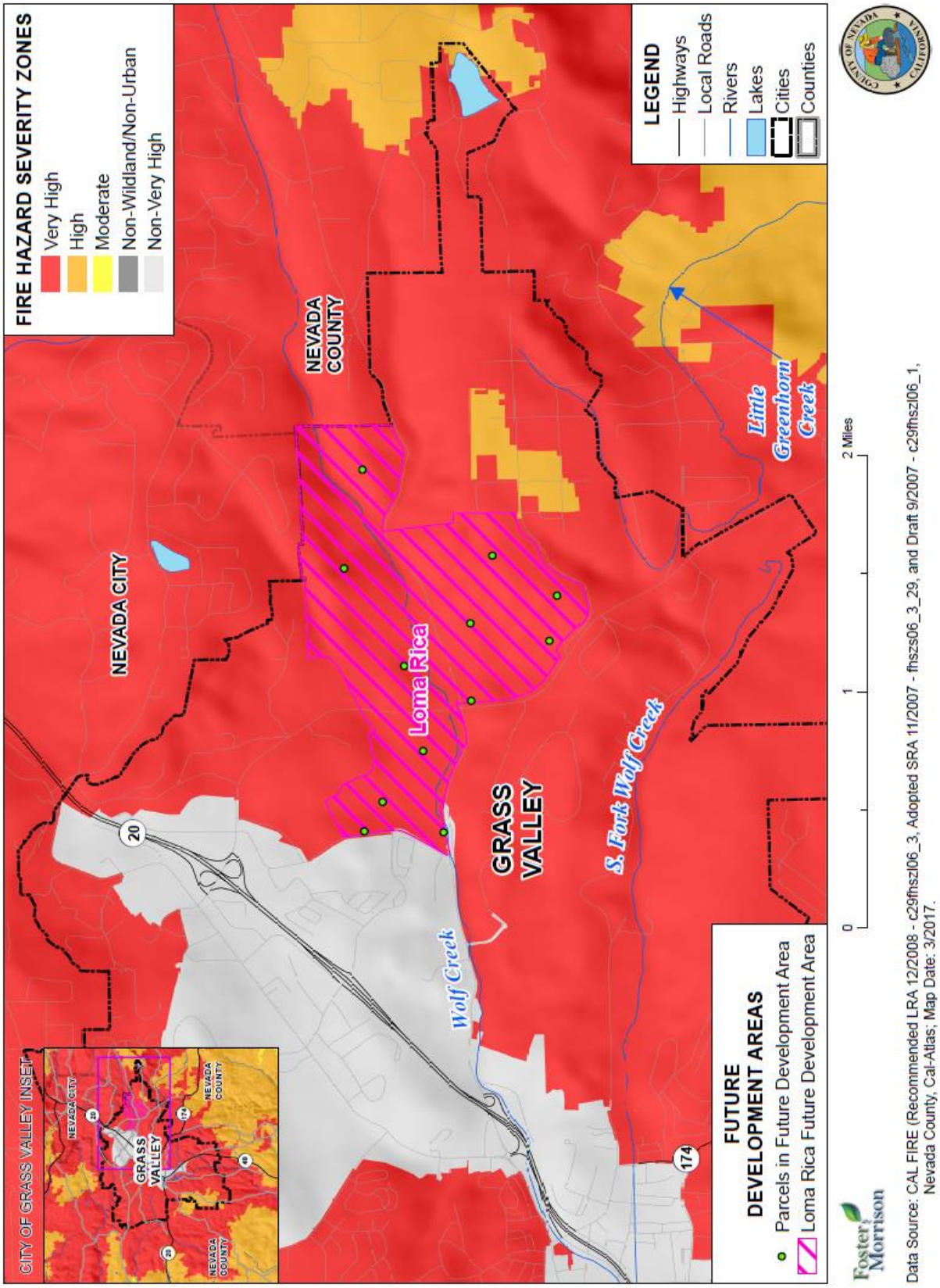


Table A-32 City of Grass Valley – Loma Rica Ranch Development Area in Fire Hazard Severity Zones

Fire Zone / Property Use	Total Parcel Count	Improved Parcel Count
Very High		
Agricultural	0	0
Commercial	8	1
Government	1	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	3	1
Total	**4**	**2**

Source: City of Grass Valley, Cal Trans, Nevada County 2016/2017 Parcel/Assessor's Data

A.6 Capability Assessment

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

A.6.1. Regulatory Mitigation Capabilities

Table A-33 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Grass Valley.

Table A-33 City of Grass Valley's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Yes	
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan	Yes - 2009	
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program	Y	
Engineering Studies for Streams		

Community Wildfire Protection Plan	Y	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: 2016 Yes
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	Y	Yes
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	
Subdivision ordinance	Y	
Floodplain ordinance	Y	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y-FEMA	
Elevation Certificates		
Acquisition of land for open space and public recreation uses	Y	
Erosion or sediment control program	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Grass Valley

The City of Grass Valley General Plan Program, 2020

The City of Grass Valley General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Grass Valley Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and man-made hazards. Mitigation-related goals, are presented below.

Safety Element Goals	
Goal 1-SG	Reduce the potential risk of death, injury, property damage, and economic and social dislocation resulting from hazards.
Goal 1-SO	Assurance of a high level of protection from geologic and seismic hazards for all residents, structures and vital services.
Goal 2-SO	Reduction of risk from exposure to hazards related to past and present mining, including shafts, tunnels, tailings and toxic materials.
Goal 3-SO	Reduction of risk from exposure to flood hazards.
Goal 4-SO	Reduction of risk from exposure to structural and wildlife fires.
Goal 5–SO	Reduction of risk from exposure to hazardous materials, including contaminated sites.

Mitigation Related Ordinances

Grass Valley's flood protection ordinance establishes a 100' building setback from streams and rivers subject to flooding.

Resolution 2015-11 establishes mandatory water conservations regulations in Grass Valley.

A.6.2. Administrative/Technical Mitigation Capabilities

Table A-34 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Grass Valley.

Table A-34 City of Grass Valley's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Coordination is effective, planning review of projects
Mitigation Planning Committee		
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Hazard tree mitigation due to bark beetle. Mitigation for clearage of drainage Public Works responsibility.
Mutual aid agreements	Y	Fire boundary drop, closest resource dispatching with CAD
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y FT	Yes, some, yes
Floodplain Administrator	N	
Emergency Manager	Y	Yes, yes, yes
Community Planner	Y FT	Yes, some, yes
Civil Engineer	Y FT	Yes, some, yes
GIS Coordinator	Y PT	Yes, N/A, yes

Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Yes
Hazard data and information	N	N
Grant writing	Y	Y
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Grass Valley

A.6.3. Fiscal Mitigation Capabilities

Table A-35 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A-35 City of Grass Valley's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Various, yes
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	Various
Impact fees for new development	Y	
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	Y	Applied
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Grass Valley

A.6.4. Mitigation Education, Outreach, and Partnerships

Table A-36 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. More information can be found below the table.

Table A-36 City of Grass Valley's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Various organizations throughout County focus on environmental concerns.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	As requested by community, as opportunity present.
Natural disaster or safety related school programs	Y	Fire Prevention/Education, as requested
StormReady certification	No	
Firewise Communities certification	No	
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Grass Valley

A.6.5. Other Mitigation Efforts

The City of Grass Valley has many other ongoing mitigation efforts that include the following:

- Community outreach such as Disaster Management, Emergency Preparedness, Agency Coordination and Local Response (DEAL)

A.7 Mitigation Strategy

As part of the overall HMPC for the development of this multi-jurisdictional Nevada County LHMP Update, each jurisdiction followed the mitigation strategy development process detailed in Chapter 5 and Appendix C of the Base Plan, which included the development of plan goals and objectives and the resulting mitigation actions and projects.

A.7.1. Mitigation Goals and Objectives

The City of Grass Valley adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

A.7.2. NFIP Mitigation Strategy

The City of Grass Valley joined the National Flood Insurance Program (NFIP) on September 30, 1982. As a participant of the NFIP, the City of Grass Valley has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Grass Valley will continue to comply with the requirements of the NFIP in the future. In addition, the City of Grass Valley actively participates with the County of Nevada to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Grass Valley as for Nevada County since participation at the County level includes all local jurisdictions.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development, and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City's Municipal Code has a Flood Damage Prevention Section under the Zoning Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Nevada County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Grass Valley is not a current participant in the CRS program.

More information about the floodplain administration in the City of Grass Valley can be found in Table A-37.

Table A-37 City of Grass Valley Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	29 policies $26,697 in annual premiums $6,713,900 of coverage in force
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	10 paid losses $188,494.05 in paid claims 0 substantial damage claims

NFIP Topic	Comments
How many structures are exposed to flood risk within the community?	71 (1% annual chance flood) 78 (0.2% annual chance flood)
Describe any areas of flood risk with limited NFIP policy coverage	Unknown
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Standard Service
What are the barriers to running an effective NFIP program in the community, if any?	None
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues (i.e., current violations)?	None aware of
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	Unknown
Is a CAV or CAC scheduled or needed?	Unknown
Regulation	
When did the community enter the NFIP?	1982
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes
Provide an explanation of the permitting process.	Development Review Process
Community Rating System	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	–
What categories and activities provide CRS points and how can the class be improved?	–
Does the plan include CRS planning requirements?	–

A.7.3. Mitigation Actions

The planning team for the City of Grass Valley identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

It should be noted that many of the projects submitted by each jurisdiction in Table 5 2 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 public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by

this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: All hazards

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Grass Valley Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Inventory Unreinforced Masonry structures within the city limits. Retrofit Unreinforced Masonry Historical Structures within the city.

Hazards Addressed: Earthquake and fire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Age and construction of buildings in Grass Valley, especially in the 'downtown' area, are outside of current best construction practices. Many of the structures are of early 1900's construction if not older. Preserving the structures against seismic or fire events in protection of life safety and economic benefit is necessary

Project Description: Categorize, prioritize URM's in the City. Mitigate potential construction deficiencies in protection of life and property.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: To be developed

Responsible Office/Partners: City of Grass Valley

Project Priority: Medium

Cost Estimate: Varies, TBD

Benefits (Losses Avoided): Life, property, history

Potential Funding: FEMA HMGP

Timeline: Fall 2019

Action 3. Improve (relocate) sewer pipes in identified problem areas near waterways and other sensitive areas.

Hazards Addressed: Flood and earthquake

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Many sewer pipes route under streams and waterways in the local area. Most of these clay sewer pipes were installed over 80 years ago and are failing.

Project Description: Replace/Reinforce or relocate sewer pipe to ensure adequate capacity during extreme storm events and mitigate during earthquake events.

Other Alternatives: None. Increased risk of potential pollution and disruption of a critical services.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CIPP

Responsible Office/Partners: City of Grass Valley

Project Priority: High

Cost Estimate: TBD

Benefits (Losses Avoided): Water contamination, critical infrastructure loss and no sewer service.

Potential Funding:

Timeline: 1-5 years

Action 4. Storm Water Drainage Improvements

Hazards Addressed: Flood/Localized Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Improve storm drainage within the City. During heavy rain events storm drainage systems become overwhelmed and cause localized flooding in many areas of the City. This is very apparent during "Atmospheric River" events

Project Description: Improve storm draining to reduce flooding especially in known areas of Mill Street and Idaho Maryland Road.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: CIPP- Storm Drainage

Responsible Office/Partners: City of Grass Valley

Project Priority: High

Cost Estimate: 5,350,000

Benefits (Losses Avoided): Flooding, water contamination, critical infrastructure, personal property

Potential Funding:

Timeline: 1-5 years

Action 5. Subsidence

Hazards Addressed: Subsidence

Goals Addressed: 1, 2, 3, 6

Issue/Background: Grass Valley has several hundred miles of mine shafts under the City from past mining operations. Subsidence from environmental factors impacting the mine shaft or other issues leading to subsidence are a concern for the City.

Project Description: Evaluate, identify and if possible, mitigate potential known subsidence conditions and locations.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: To be developed

Responsible Office/Partners: City of Grass Valley

Project Priority: High

Cost Estimate: TBD

Benefits (Losses Avoided): Life Safety, Critical Infrastructure, Economic Hardship and displacement from residence of business.

Potential Funding: FEMA HMGP

Timeline: 1-5 years

Action 6. Public Education- Fire, other events

Hazards Addressed: Fire, All Hazards.

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Through education and community outreach provide public information regarding fire safety, fire protection, and preparedness for general emergencies requiring evacuation and which might require persons to be self-sustaining prior to emergency shelters.

Project Description: Expand delivery of programs to inform public of best practices related to fire safety, preparation for emergencies, evacuation planning, and related issues. A unified message, inclusive of all agencies, delivered by chosen representatives of agencies and delivered to the public at scheduled times and locations.

Other Alternatives: Continue with current program.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Meetings. Programs currently exist and are presented on a requested basis by local agencies. A County approach would benefit all agencies and communities.

Responsible Office/Partners: City of Grass Valley, outside agencies.

Project Priority: High

Cost Estimate: 150,000

Benefits (Losses Avoided): Life, personal property, infrastructure.

Potential Funding: WMD Grant, other grants

Timeline: 1-5 years

Annex B City of Nevada City

B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Nevada City, a previously participating jurisdiction to the Nevada 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 City. This Annex provides additional information specific to the City of Nevada City, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

B.2 Planning Process

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

Table B-1 City of Nevada City Planning Team

Name	Position/Title	How Participated
Mark Prestwich	City Manager	City Manager during planning process
Sam Goodspeed	Fire Chief	Hazard ID and Mitigation Strategy for Fire and Life/ Safety
Bryan McAlister	City Engineer	Hazard ID and Mitigation Strategy for Public Works Infrastructure
William Falconi	Asst. City Engineer	Hazard ID and Mitigation Strategy for Public Works Infrastructure

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the City integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2011 LHMP through other plans and programs shown in Table B-2.

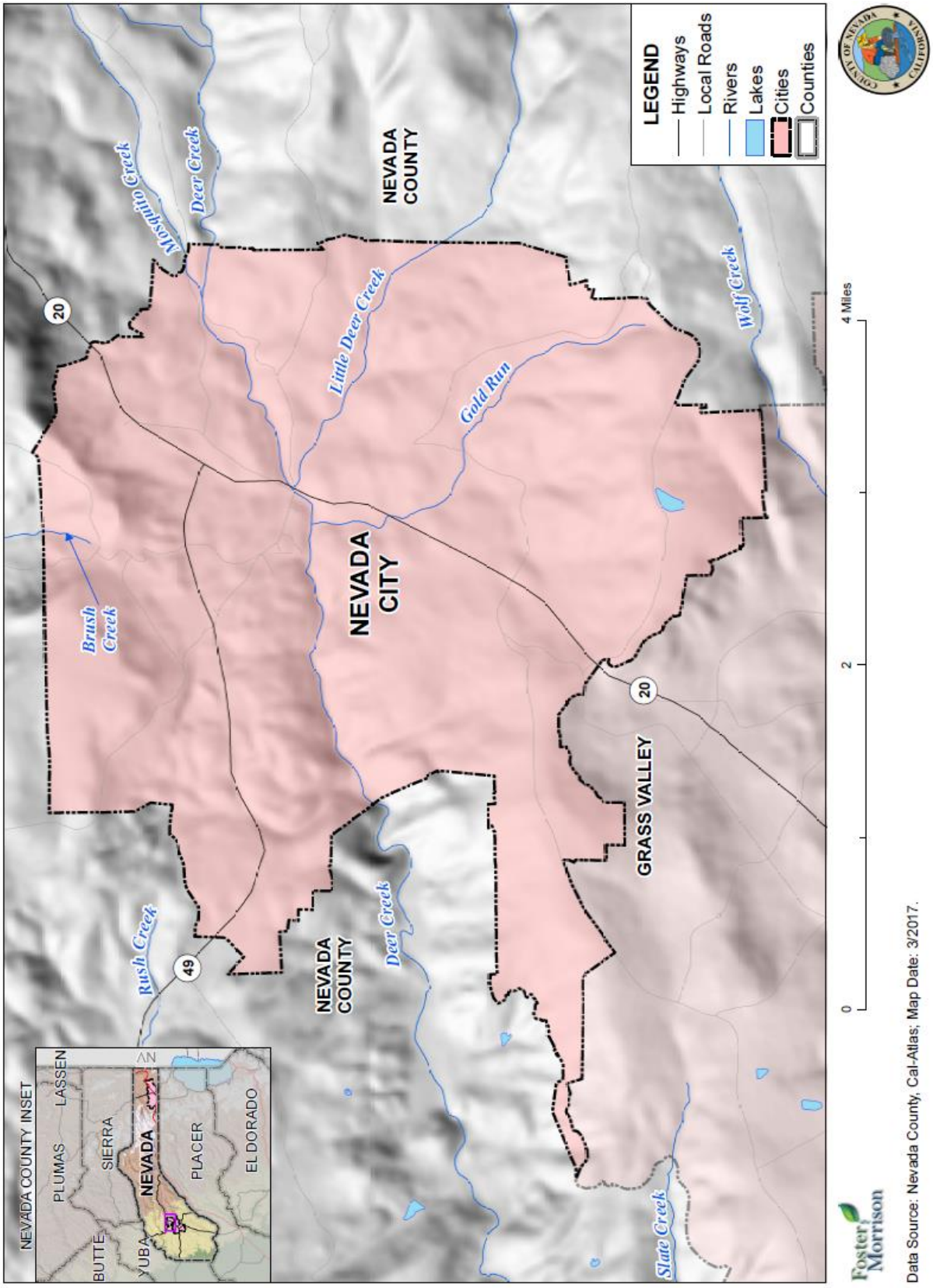
Table B-2 2011 LHMP Incorporation

Planning Mechanism 2011 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
None	Did not integrate the 2011 LHMP into other planning mechanisms

B.3 Community Profile

The community profile for the City of Nevada City is detailed in the following sections. Figure B-1 displays a map and the location of the City of Nevada City within Nevada County.

Figure B-1 City of Nevada City



B.3.1. Geography and Climate

Nestled in a basin on the Western Slope of the Sierra Nevada, Nevada City is framed and protected by ridge tops and promontories. At 2,500 feet above sea level, Nevada City is surrounded by forest. The City has a total area of 2.2 square miles.

Owing to its exposed location on the western slopes of the Sierra Nevada, Nevada City receives moderate to heavy rainfall for California at 59 inches, though its climate is otherwise fairly typical for the state. Although exceedingly heavy snow falls on the nearby mountains, it very rarely falls in the city. During a typical year, there are 31 days with temperatures of 90°F or higher and, conversely, 75 freezing nights and 60 days where the temperature fails to reach 50°F. The record high temperature is 111°F, set on August 14, 1933, and the record low temperature is −1°F, set on January 21, 1937 and on December 9, 1972.

B.3.2. History

For thousands of years Nevada City environs were inhabited by Paleo-Indians including the Southern Maidu, otherwise known as Nisenan. Nevada City was first settled in 1849 during the California Gold Rush as Nevada. In 1850-51, it was the most important mining town in California, Nevada County being the leading gold-mining county in the state. The town of Nevada was incorporated on April 19, 1856. In 1864, the word "City" was added to the name to relieve confusion with the bordering state of Nevada, and the town was legally known as "Nevada City" ever since.

With the diminution of gold mining and timber harvesting, plus the slice that the Golden State Freeway took out of the core of the City in the 1960s, city leaders looked to historic preservation as the path to the future. Creating its own historical district in 1968 has led to a slow but steady increase in visitors and vitality as well as designation on the National Register of Historic Places.

B.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Nevada City. These are shown in Table B-3 and Table B-4. Mean household income in the City was $73,664. Median household income in the City was $47,981.

Table B-3 City of Nevada City Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	14	1%
Construction	88	6.2%
Manufacturing	129	9.1%
Wholesale trade	0	0.0%
Retail trade	168	11.9%
Transportation and warehousing, and utilities	80	5.7%
Information	0	0.0%

Industry	Estimated Employment	Percent
Finance and insurance, and real estate and rental and leasing	60	4.2%
Professional, scientific, and management, and administrative and waste management services	184	13.0%
Educational services, and health care and social assistance	368	26.0%
Arts, entertainment, and recreation, and accommodation and food services	170	12.0%
Other services, except public administration	68	4.8%
Public administration	84	5.9%

Source: US Census Bureau American Community Survey 2011-2015 Estimates

Table B-4 City of Nevada City Income and Benefits

Income Bracket	Population	Percent
>$10,000	55	3.7%
$10,000 – $14,999	127	8.6%
$15,000 - $24,9999	105	7.1%
$25,000 – $34,999	199	24.0%
$35,000 – $49,999	58	7.0%
$50,000 – $74,999	172	20.7%
$75,000 – $99,999	82	9.9%
$100,000 – $149,999	98	11.8%
$150,000 – $199,999	55	6.6%
$200,000 or more	76	9.2%

Source: US Census Bureau, 2010

The City of Nevada City is the county seat and houses the Nevada County government offices and it is the headquarters for the Tahoe National Forest. The top employers in Nevada City include high tech manufacturing, the school district, and some industrial services. Information on the taxable base for the City can be found in Section 1.4 of the Base Plan.

B.3.4. Population

The California Department of Finance estimated the January 1, 2016 total population for the City of Nevada City was 3,260.

B.4 Hazard Identification

The City of Nevada City's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Nevada City (see Table B-5).

Table B-5 City of Nevada City—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Limited	Highly Likely	Limited	Medium	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Occasional	Limited	Medium	Medium
Dam Failure	Significant	Unlikely	Catastrophic	High	Medium
Drought and Water Shortage	Extensive	Occasional	Critical	Medium	High
Earthquake	Significant	Unlikely	Limited	Medium	Low
Flood: 1%/0.2% Annual Chance	Limited	Likely	Limited	Medium	High
Flood: Localized/Stormwater	Significant	Highly Likely	Limited	Medium	High
Hazardous Materials Transportation (interstates, railroads, pipelines)	Limited	Unlikely	Limited	Medium	Low
Landslide, Debris & Mud Flows	Limited	Unlikely	Limited	Medium	Medium
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: Extreme Cold, Snow, and Freeze	Extensive	Occasional	Limited	Medium	Medium
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Significant	Likely	Critical	High	High
Subsidence	Limited	Unlikely	Limited	Medium	Medium
Volcano	Limited	Unlikely	Limited	Medium	Medium
Wildfire (smoke, tree mortality, conflagration)	Significant	Highly Likely	Critical	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

B.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Nevada City's hazards and assess the City's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

B.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section B.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the planning area.

B.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Nevada City's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Nevada County Assessor's Office is based on the 2016/2017 Assessor's data. The methodology used to derive land values, property values, and estimated contents values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table B-6 shows the 2016/2017 Assessor's values (e.g., the values at risk) broken down by property type for the City of Nevada City.

Table B-6 City of Nevada City – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	5	1	$267,882	$448,000	$448,000	$1,163,882
Commercial	252	203	$48,729,787	$89,276,521	$89,276,521	$227,282,829
Government	95	1	$148,458	$226,808	$226,808	$602,074
Industrial	20	20	$4,139,466	$11,850,950	$17,776,425	$33,766,841
Institutional	16	13	$1,071,530	$5,219,266	$5,219,266	$11,510,062
Miscellaneous	11	1	$804,566	$80,838	$80,838	$966,242
Residential	2,979	2,613	$282,617,510	$541,029,622	$270,514,811	$1,094,161,943
Total	**3,378**	**2,852**	**$337,779,199**	**$648,132,005**	**$383,542,669**	**$1,369,453,873**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Population and Special Populations at Risk

General Population

As previously described in the community profile, based on California Department of Finance estimates, the current January 1, 2016 total population for the City of Nevada City was 3,260 all of which are potentially vulnerable to hazard events.

Special Populations

According to the Nevada City Housing Element, senior citizens make up about 13 percent of the City's population and about 17 percent of the City's households. Senior population decreased in Nevada City by 7.6 percent or by 34 persons between 2000 and 2010.

There are about 292 family households with children in the City. Of these households, 81 or 27.7 percent are headed by single females.

Approximately 26 families or 1.9 percent of the City's population were below the poverty level. The number of families below the poverty level doubled from 13 to 26 from 2000 to 2010.

Critical Facilities and Infrastructure

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

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health 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, (3) Hazardous Materials Facilities.

- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
  - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers
  - ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
  - ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.
  - ✓ Designated Emergency Shelters.
  - ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio and other emergency warning systems.
  - ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power and gas).
  - ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.
  - ✓ Transportation Lifeline Systems - Airports, helipads, and critical highways, roads, bridges and other transportation infrastructure (Note: Critical highways, roads, etc. will be determined during any hazard-specific evacuation planning and are not identified in this plan).
- **At Risk Population Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release of hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property.

A fully detailed list of all critical facilities in the planning are can be found in Appendix F. An inventory of critical facilities in the City of Nevada City from Nevada County GIS is shown on Figure B-2 and detailed in Table B-7. Note that only Category 1, Essential Services, and Category 2, At-risk Populations were available in mapped form and are thus included on Figure B-2 and Table B-7. Category 3, Hazardous Materials Facilities, was only available in table format. Due to the large number of these facilities, they are included in Table F-2 in Appendix F. Also to note, the mapped layer is based on best available data and may not reflect a comprehensive inventory of critical facilities in the County and the City based on the current definition; this is a work in progress.

Figure B-2 City of Nevada City – Critical Facilities

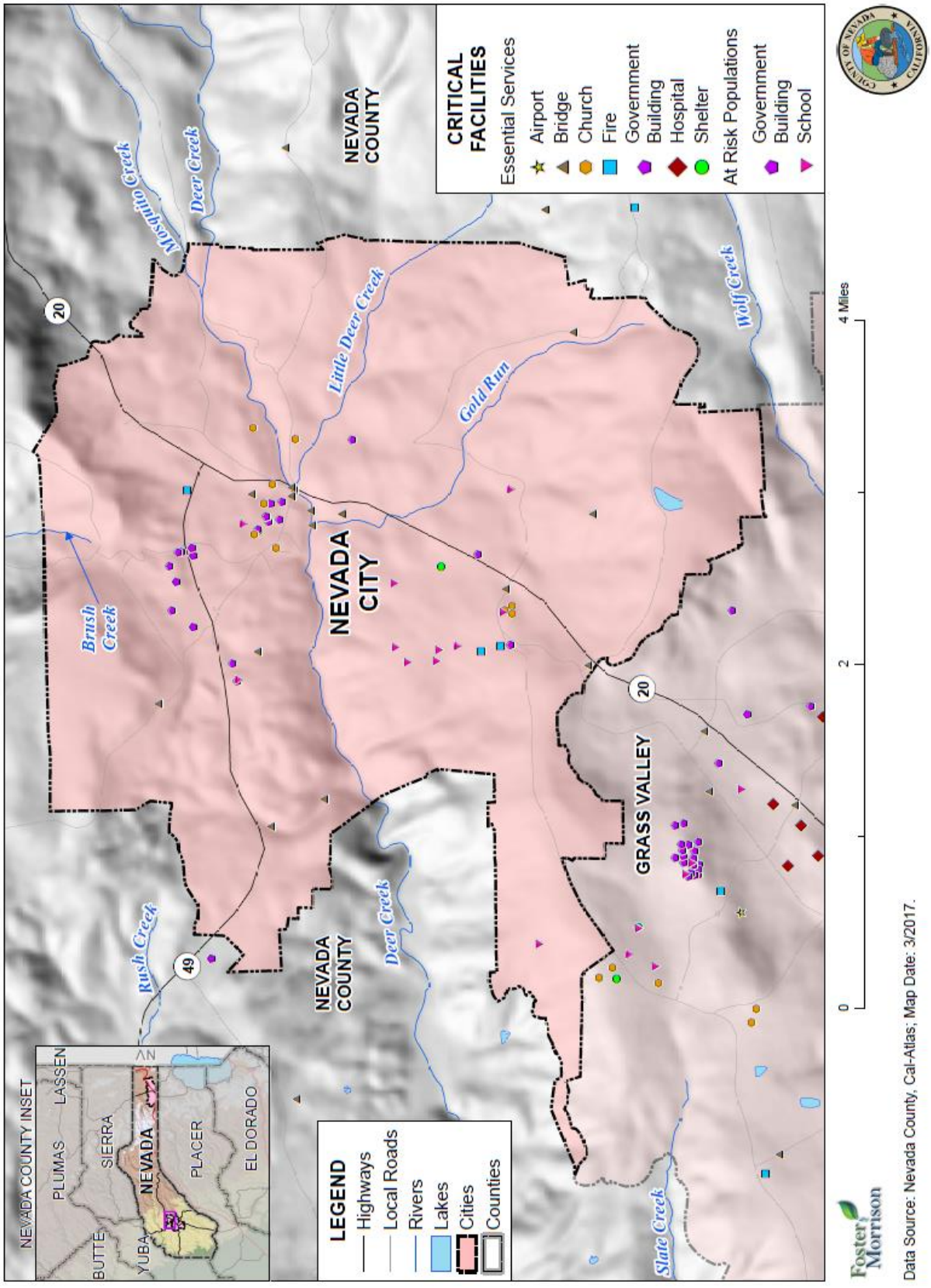


Table B-7 City of Nevada City – Critical Facilities Inventory

Critical Facility Category	Critical Facility Type	Critical Facility Count
Essential Services	Airport	0
	Bridge	15
	Church	9
	Fire	3
	Government Building	15
	Hospital	0
	School	0
	Shelter	2
	Total	**44**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	4
	Hospital	0
	School	11
	Shelter	0
	Total	15
Grand Total		**59**

Source: Nevada County GIS

Natural Resources

The City has a variety of natural resources of value to the community. As described in the current General Plan and Municipal Code for the City of Nevada City, protected natural resources include water quality, tree preservation, scenic views, historic structures and open space. The life and character of Nevada City and the value of property in the City are directly related to preservation of these natural resources.

Historic and Cultural Resources

The City of Nevada City has registered historic sites identified in Table B-8.

Table B-8 Nevada City Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
A. A. Sargent Residence, Sargent-Freeman Residence (P305)			X	7/13/1973	Nevada City
Aaron Baruh House (P382)			X	3/20/1975	Nevada City

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
American Hill Diggins (P273)			X	11/1/1972	Nevada City
BR #17C-24 / Purdon Bridge (P839)			X	9/13/2000	Nevada City
Caldwell's Upper Store Site (P304)			X	7/13/1973	Nevada City
Columbia Hill School (P194)			X	5/19/1971	Nevada City
Englebright House (P326)			X	3/15/1974	Nevada City
First Manufacturing Site Of The Pelton Wheel (1012)		X		5/27/1993	Nevada City
Lone Grave, The (P8)			X	12/16/1966	Nevada City
Marsh, Martin Luther, House (N225)	X			4/11/1973	Nevada City
Martin Luther Marsh House (P241)			X	1/19/1972	Nevada City
National Hotel (899)	X	X		6/16/1976	Nevada City
Nevada Brewery (N1380)	X			9/12/1985	Nevada City
Nevada City Downtown Historic District (N1382)	X			9/23/1985	Nevada City
Nevada City Firehouse No. 2 (N286)	X			5/3/1974	Nevada City
Nevada City Free Public Library (N1659)	X			12/10/1990	Nevada City
Nevada Theatre (863)	X	X		9/13/1973	Nevada City
North Bloomfield Mining And Gravel Company (852)		X		1/20/1972	Nevada City
Ott's Assay Office (N346)	X			4/14/1975	Nevada City
Pioneer Cemetery (P324)			X	3/15/1974	Nevada City
Plaza Grocery (P325)			X	3/15/1974	Nevada City
Red Castle, The (P191)			X	5/19/1971	Nevada City
Red Dog Townsite (N2143)	X		X	9/14/2001	Nevada City
Sargent, Aaron A., House (N884)	X			6/20/1980	Nevada City
Searls Historical Library (P257)			X	6/22/1972	Nevada City
South Yuba Canal Office (832)		X		8/29/1969	Nevada City
William Morris Stewart House (P272)			X	11/1/1972	Nevada City
You Bet Townsite (P400)			X	5/9/1975	Nevada City

Source: California Department of Parks and Recreation Office of Historic Preservation, http://ohp.parks.ca.gov/

Growth and Development Trends

Nevada City has seen slow and steady growth. The City grew at a slower pace than Nevada County and the region, with a growth of 4.4 percent during the 1990 to 2000 decade, as compared to 17.5 and 13.8 percent for Nevada County and the state respectively. Nevada City has seen increasing growth rates as shown in Table A-9. Between 2000 and 2010, Nevada County and the State of California saw growth rates of about 16 percent and 1.0 percent respectively, while Nevada City's population increased by 20.8 percent. California Department of Finance estimates for July 1, 2014 were 13,804. In comparison to other cities

in the county, Nevada City has not experienced the same growth and thus has been able to retain a small-town atmosphere.

Given the current City boundaries and its micro-urban character that provide limited in-fill development opportunities, population continues to grow at a slow steady pace. Due to limited availability of vacant land in the City, projected growth is expected to continue at a similar slow pace through 2019. However, with the October 2008 adoption of the City's Sphere of Influence, there are some potential annexation possibilities that could further expand the City's population and related housing opportunities.

Table A-9 City of Nevada City – Population Trends

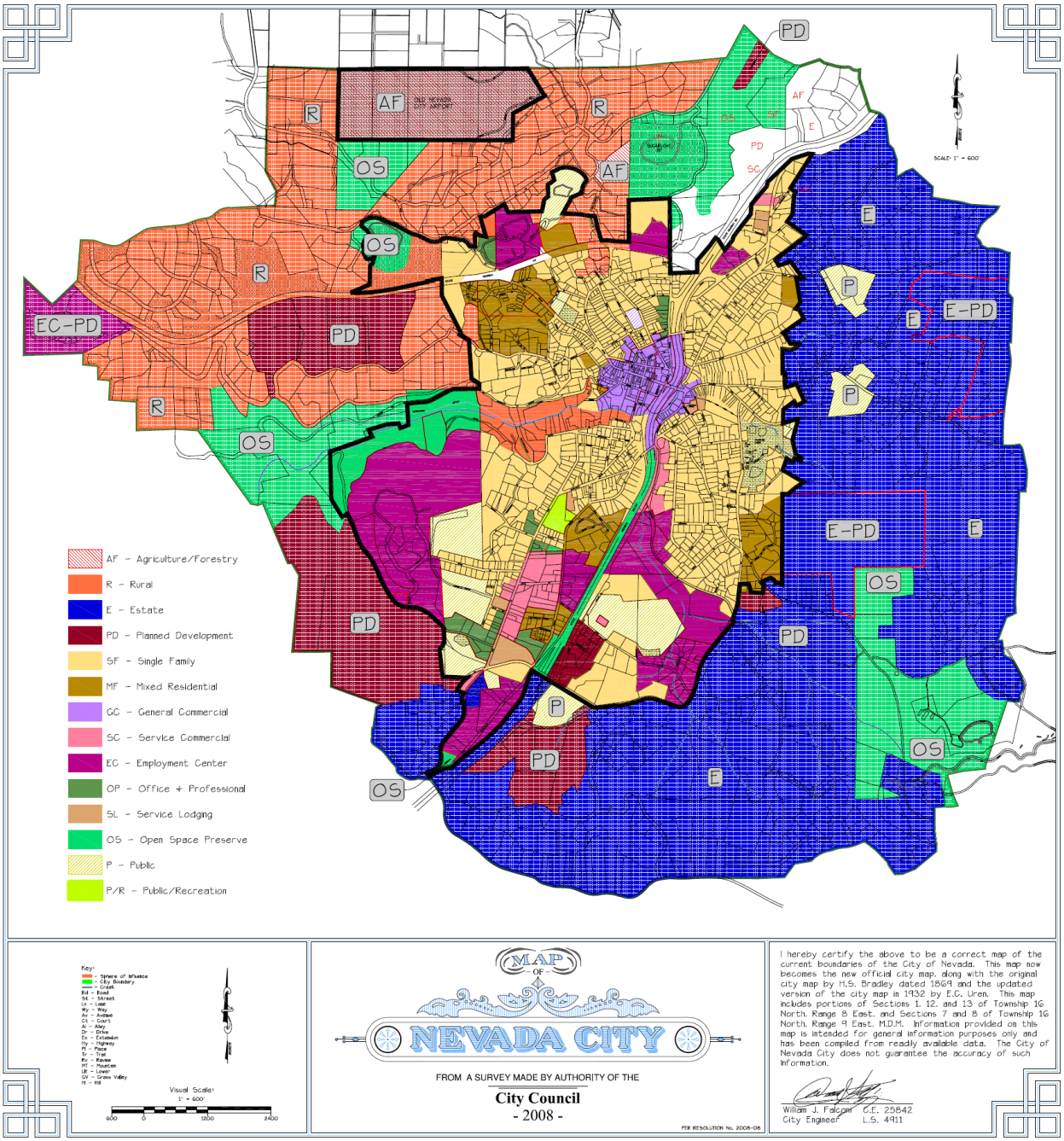
Year	Nevada City	Nevada County	California
2000	3,001	78,510	29,758,213
2010	3,068	93,033	33,871,648
2015	3,272	98,764	37,253,956

Source: City of Nevada City Housing Element, January 2014

Land Use

Land use for Nevada City has largely followed the principal objectives outlined in the General Plan. This includes 1) preserving the sense of wooded enclosure by maintaining rural density surrounding a tight urban cluster; 2) enhancement of the historic core; and 3) creating opportunities for employment and revenue generators. The Land Use map for the City is shown on Figure B-3.

Figure B-3 City of Nevada City – Land Use Map



Source: City of Nevada City

Development since 2011 Plan

As shown in Table B-10, Nevada City has seen a gain of 6.2% of population between 2010 and January 1, 2016.

Table B-10 City of Nevada City – Population Changes Since 2011

Year	Population	Change	% Change
2010[1]	3,068	–	–
2016[2]	3,260	192	6.3%

Source: [1]US Census Bureau, [2]California Department of Finance

The City Engineering Department tracked total building permits issued since 2011 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table B-11 and Table B-12. All development in the identified hazard areas, including any within the 1% annual chance floodplains, avalanche and landslide prone areas, and moderate or higher wildfire risk areas, were completed in accordance with all current and applicable development codes and standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the City to identified priority hazards.

Table B-11 City of Nevada City Total Development Since 2011

Property Use	2011	2012	2013	2014	2015	2016
Residential		4	7	6	12	10
Commercial		3	3	4	5	4
Industrial						
Other					1	
Total		**7**	**10**	**10**	**18**	**14**

Source: City of Nevada City Engineering Department

Table B-12 City of Nevada City Development in Hazard Areas since 2011

Property Use	1% Annual Chance Flood	Avalanche Prone Area	Landslide Susceptibility Area	Wildfire Risk Area[1]	Other
Residential	0	0	0	8	0
Commercial	0	0	0	1	0
Industrial	0	0	0	0	0
Other	0	0	0	1	0
Total	**0**	**0**	**0**	**12**	**0**

Source: City of Nevada City Engineering Department

[1]Moderate or higher wildfire risk area

Future Development

New Construction reflects a total of 154.43 acres of vacant and under-utilized land currently zoned residential (RR, R1, R2 and R3) in Nevada City. These lands could accommodate up to 240 new housing units, well in excess of the 131 units specified by the City's current Regional Housing Needs Assessment

for the 2014-2019 Housing Element period. The possible conversion of existing motel units may provide housing opportunities for extremely low income persons and/or seniors.

More general information on growth and development in Nevada County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Nevada County Vulnerability and Assets at Risk of the Base Plan.

B.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table B-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Nevada County Planning Area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the Base Plan. In general, the most vulnerable structures are those located within the floodprone areas, WUI areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment includes information on values at risk, critical facilities and infrastructure, populations at risk, natural resources, historic and cultural resources, and future development.

Ag Hazards: Severe Weather/Insect Pests

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Given the importance of agriculture to Nevada County, agricultural hazards continue to be an ongoing concern. The primary causes of agricultural losses are severe weather events, such as drought, freeze, and insect infestations. According to the HMPC, agricultural losses occur on an annual basis throughout the County including the City, are usually associated with these severe weather events.

Past Occurrences

Located on the western slope of the Sierra Nevada between 1,000 and 6,000 feet in elevation, the agricultural lands of Nevada County have historically been affected by weather related events such as heavy rain, freezing temperatures (including late spring frosts and early fall frosts) and drought. The severe weather events can have devastating effects on fruit set and harvest causing losses in yield and affecting quality. Past occurrences for the City of ag hazards are similar to the County as a whole. Those past occurrences were listed in Section 4.2.5 of the Base Plan.

Vulnerability to Ag Hazards: Severe Weather/Insect Pests

According to the HMPC, the consequences of agricultural disasters to the Planning Area include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products). When these hazards cause a mass die-off of livestock, other issues occur that include the disposal of animals, depopulation of affected herds, decontamination, and resource problems. Those disasters related to severe weather may also require the evacuation and sheltering of animal populations. Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community and the City.

Future Development

Future development in the City is not likely to have an impact on agricultural hazards in Nevada County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing.

Climate Change

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Nevada County, the HMPC noted that each year it seems to get a bit warmer and snow seems to start at higher levels. It was also noted that 2017 was one of the wettest years ever. California's Adaptation Planning Guide: Understanding Regional Characteristics has divide California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Nevada County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state.

Past Occurrences

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

Vulnerability to Climate Change

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

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Nevada County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

Nevada City in general 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. For example, excessive heat and drought may make wildfires worse for the City. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact the Nevada County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

The primary dam capable of impacting Nevada City in event of failure is the Scotts Flat Lake Dam operated by NID. Inundation as a result of dam failure would most likely be the result of an earthquake. However, the area of Nevada County in which these dams exist is not located within an historical seismic zone. In fact, the western half of Nevada County is within the lowest earthquake intensity zone in California.

Past Occurrences

There have been no disasters declarations related to dam failure in Nevada City.

Vulnerability to Dam Failure

Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the County, however there is no specific evidence to support the City is vulnerable.

Future Development

Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur.

Drought and Water Shortage

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Northern Sacramento Valley counties, including Nevada County, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought. For example, Northern California agencies, including those from Nevada County, were major participants in the Governor's Drought Water Bank of 1991, 1992, and 1994.

Past Occurrences

Based on historical information, the occurrence of drought in California, including Nevada County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. There has been two state disaster related to drought and water shortage in Nevada County issued in 1976 and 2014.

Nevada City depends on rain and snow that generally falls from late October through March for drinking water year-round. Historical precipitation and water use records used to be fairly reliable when planning for future water supply. But more recent documented changes in local snowpack, precipitation, and temperatures show that is no longer the case.

Vulnerability to Drought and Water Shortage

With more precipitation likely falling as rain instead of snow, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought 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.

Future Development

The City will continue to develop and grow. The City has been aggressive in its efforts to reduce the demand for water, and to move toward more sustainable water use.

Earthquake

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. 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. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. A 1986 study by the California Bureau of Reclamation concluded that the Dog Valley Fault and Mohawk Valley Faults could result in a maximum credible earthquake of 6.75 and 7.0 magnitude respectively.

Past Occurrences

There have been numerous occurrences of low magnitude Earthquakes in the vicinity of Nevada City, Calif., according to the U.S. Geological Survey. None have had major impacts on the City due to the City's geographic location in the County. Nevada City is primarily in the 10-15% peak ground acceleration zone.

Vulnerability to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. Nevada City is subject to some seismic activity, although this risk is relatively low compared to other places in the State.

There are approximately 20 unreinforced masonry buildings in downtown Nevada City.

Future Development

Although new growth and development corridors would occur in areas at risk to future earthquakes, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

Flood: 1% and 0.2% Annual Chance (100/500-Year)

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

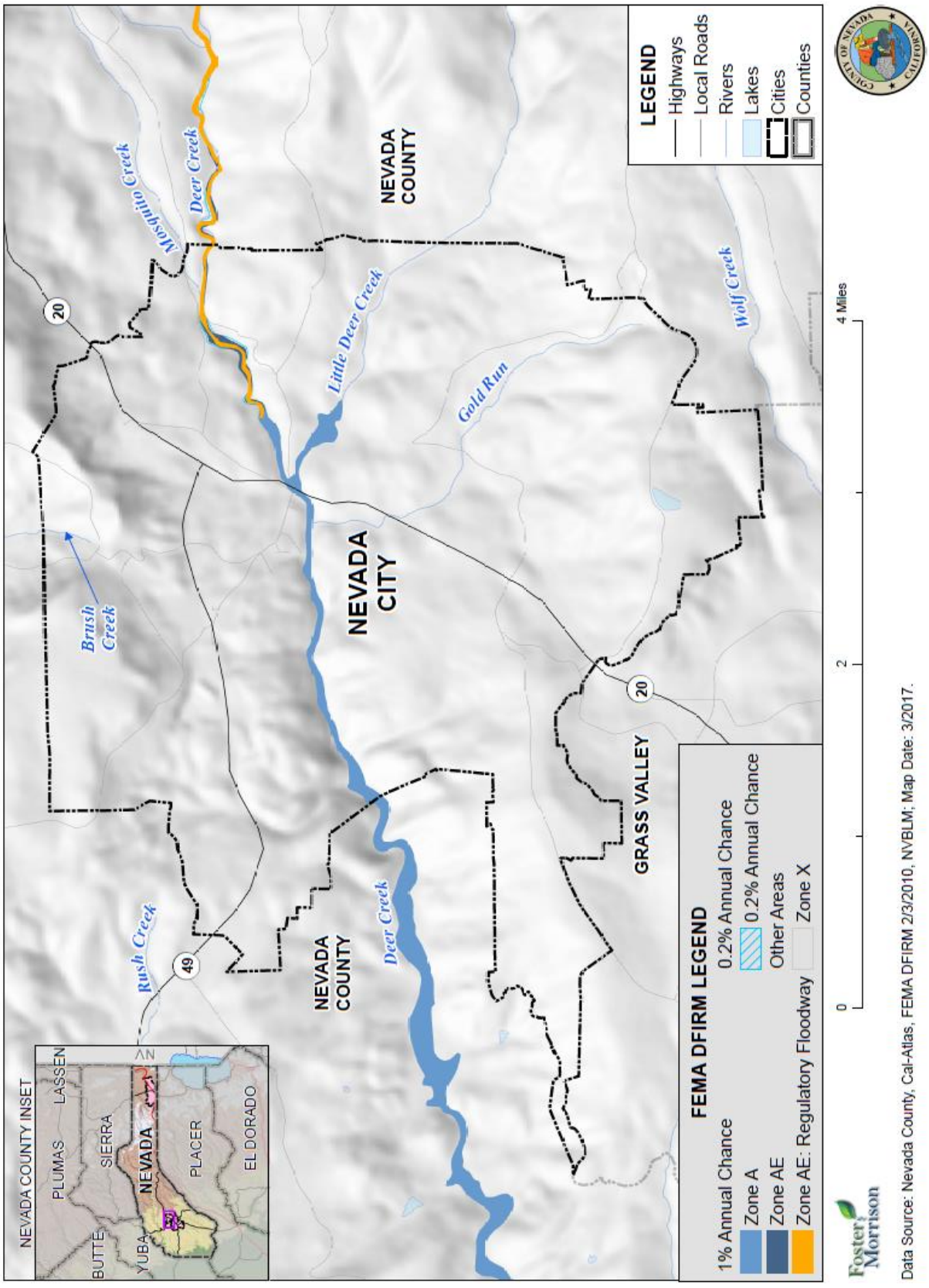
Hazard Profile and Problem Description

As previously described in Section 4.2.11 of the main plan, the Nevada County Planning Area and the City of Nevada City have been subject to historical flooding. Within the City of Nevada City, much of the flood damage occurs as a result of localized stormwater flooding, with limited flood damage occurring in the 1% (100-year) and greater floodplains. Most recently, flooding occurred in December 2016, January 2017 and February 2017 as a result of heavy stormwater runoff caused by severe winter storms. Although actual damages were minimal, the storms impacted transit on public roads and caused some business closures due to limited access. Stormwater infrastructure also sustained limited damage.

FEMA Flood Zones

A small portion of the City is located inside of the1% annual chanceflood zone as defined by the Federal Emergency Management Agency (FEMA). This is seen in Figure B-4.

Figure B-4 City of Nevada City – FEMA DFIRM Flood Zones



Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Nevada City. The methodology described in Section 4.3.7 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table B-13 shows the property use, improved parcel count, improved values, estimated contents (using the methodology in Table 4.35 in Section 4.3.1), total values and estimated loss of parcels that fall in a floodplain in the City.

Table B-13 City of Nevada City– Count and Improved Value by Property Use and Detailed Flood Zone with Contents Replacement Values

Flood Zone / Property Use	Total Parcel Count*	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone A (1% Annual Chance Flood)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	6	5	$939,352	$1,314,199	$1,314,199	$2,628,398
Government	8	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	20	16	$1,765,247	$2,543,709	$1,271,855	$3,815,564
Total	**34**	**21**	**$2,704,599**	**$3,857,908**	**$2,586,054**	**$6,443,962**
Zone AE (1% Annual Chance Flood)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	2	1	$244,207	$381,397	$190,699	$572,096
Total	**2**	**1**	**$244,207**	**$381,397**	**$190,699**	**$572,096**
Zone AE Floodway (1% Annual Chance Flood)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	1	1	$113,000	$210,000	$105,000	$315,000
Total	**1**	**1**	**$113,000**	**$210,000**	**$105,000**	**$315,000**

Flood Zone / Property Use	Total Parcel Count*	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1 % Annual Chance Grand Total	**37**	**23**	**$3,061,806**	**$4,449,305**	**$2,881,752**	**$7,331,057**
Shaded X (0.2% Annual Chance **)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	2	2	$49,767	$331,655	$165,828	$497,483
Total	**2**	**2**	**$49,767**	**$331,655**	**$165,828**	**$497,483**
Zone D – Unmapped						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Zone X – Unshaded (No Mapped Flood Hazard)						
Agricultural	5	1	$267,882	$448,000	$448,000	$896,000
Commercial	246	198	$47,790,435	$87,962,322	$87,962,322	$175,924,644
Government	87	1	$148,458	$226,808	$226,808	$453,616
Industrial	20	20	$4,139,466	$11,850,950	$17,776,425	$29,627,375
Institutional	16	13	$1,071,530	$5,219,266	$5,219,266	$10,438,532
Miscellaneous	11	1	$804,566	$80,838	$80,838	$161,676
Residential	2,954	2,593	$280,445,289	$537,562,861	$268,781,431	$806,344,292
Total	**3,339**	**2,827**	**$334,667,626**	**$643,351,045**	**$380,495,090**	**$1,023,846,135**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table B-14 summarizes Table B-13 above and shows City of Nevada City loss estimates and shows improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table B-14 City of Nevada City – Flood Loss Summary

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count *	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	37	23	$4,449,305	$2,881,752	$7,331,057	$1,466,211	0.15%
0.2% Annual Chance **	2	2	$331,655	$165,828	$497,483	$99,497	0.01%
Grand Total	**39**	**25**	**$4,780,960**	**$3,047,580**	**$7,828,540**	**$1,565,708**	**0.16%**

Source: FEMA DFIRM, Nevada County 2015 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

According to Table B-13 and Table B-14, the City of Nevada City has 23 improved parcels and $7.3 million of structure and contents value in the 1% annual chance floodplain. The City has 2 improved parcels and $0.5 million in the 0.2% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.8 of the Base Plan, there is a 1% chance in any given year of a flood event causing roughly $1.5 million in damages, and a 0.2% chance of a flood event causing $0.1 million in damages in the City of Nevada City. A loss ratio of 0.16% indicates that losses in Nevada City to flood would be relatively minor, as a sixth of a percent of the total values in the City would be damaged.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.7 of the Base Plan, was used for the City of Nevada City as well as for the County as a whole. Table B-15 represents a detailed and summary analysis of total and improved acres for each FEMA DFIRM flood zone in the City.

Table B-15 City of Nevada City– Flooded Acres

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
1% Annual Chance Flood Hazard		
Zone AE		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Residential	9	6
Zone AE Total	**9**	**6**
Zone AE Floodway		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	15	8
Zone AE Floodway Total	**15**	**8**
Zone AO		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Zone AO Total	**0**	**0**
Zone A		
Agricultural	0	0
Commercial	3	2
Government	23	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	57	25
Zone A Total	**82**	**27**
1% Annual Chance Flood Hazard Total	**106**	**41**
0.2% Annual Chance Flood Hazard		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Residential	4	2
0.2% Annual Chance Flood Hazard Total	**4**	**2**
Zone X – Unshaded (No Mapped Flood Hazard)		
Agricultural	44	26
Commercial	509	299
Government	748	1
Industrial	56	56
Institutional	51	36
Miscellaneous	63	31
Residential	5,657	4,211
Zone X (unshaded) Total	**7,128**	**4,661**
Zone D – Unmapped		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Zone D (unmapped) Total	**0**	**0**
Grand Total	**7,238**	**4,704**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for Nevada City. According to this analysis, there is a total population of 41 residents of the City at risk to flooding, 37 in the 1% and 4 in the 0.2% annual chance floodplain. This is shown in Table B-16.

Table B-16 City of Nevada City – Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
A	16	33
AE	1	2
AE Floodway	1	2
Total 1% Annual Chance	**18**	**37**

Flood Zone	Improved Residential Parcels	Population*
Shaded X (0.2% Annual Chance)	2	4

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data, US Census Bureau

* Average household populations from the 2010 US Census were used: Nevada City – 2.09.

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Nevada City in identified FEMA DFIRMs. GIS was used to determine whether the facility locations intersect a DFIRM flood hazard area, and if so, which zone it intersects. Details of critical facilities in the floodplain in Nevada City are shown in Figure B-5 and Table B-17. As shown on the table and figure, Nevada City has 4 critical facilities located in 1% annual chance and 0 critical facilities in the 0.2% annual chance DFIRM flood zones. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the City, there are likely some that are present within identified floodplains.

Figure B-5 City of Nevada City – Critical Facilities and Flood Zones

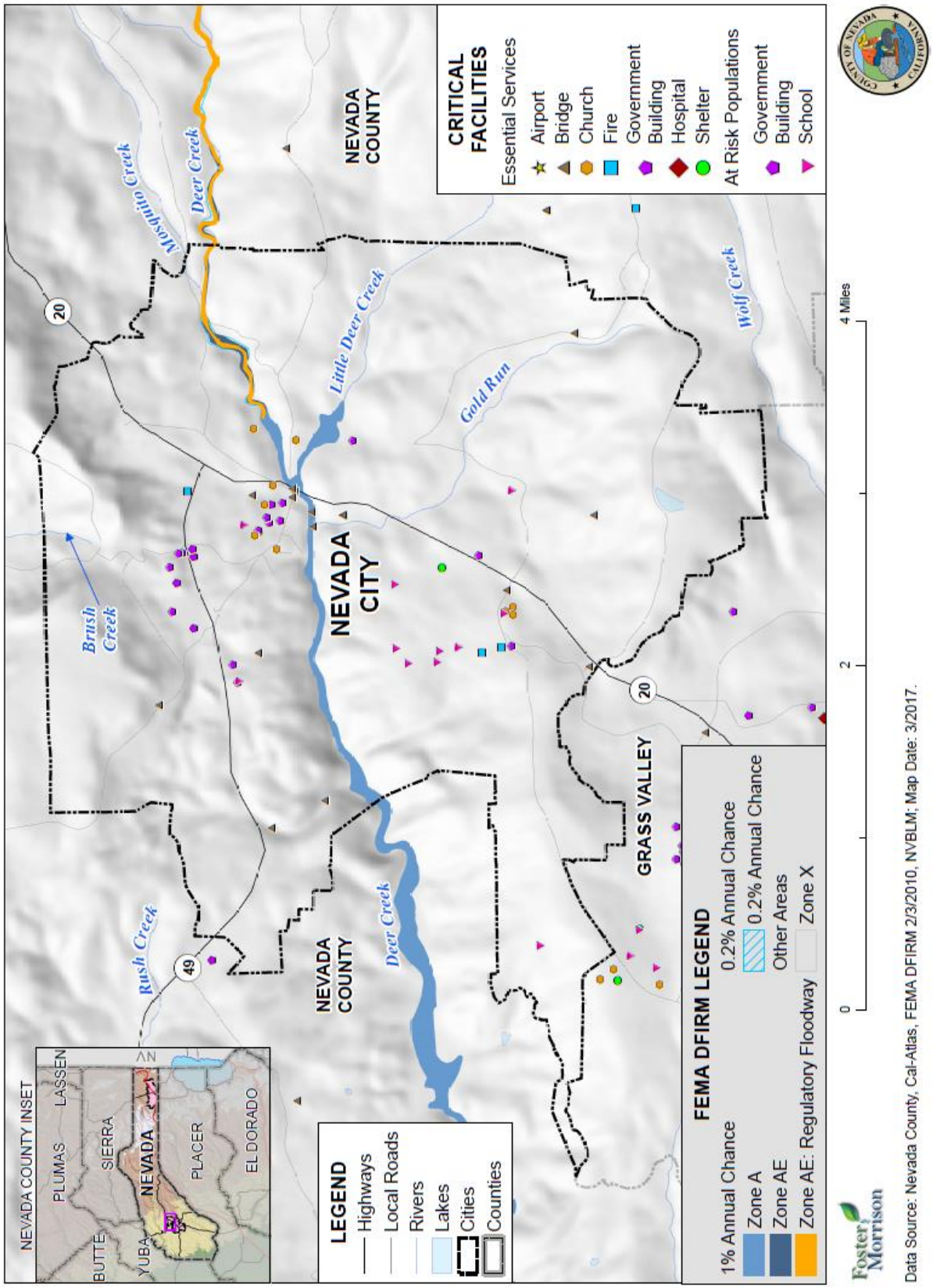


Table B-17 City of Nevada City – Critical Facilities and Flood Zones

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
1% Annual Chance Flood		
Essential Services	Airport	0
	Bridge	4
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**4**
1% Annual Chance Flood Total		**4**

Source: FEMA 2010 DFIRM; Nevada County GIS

Historical, Cultural, and Natural Resources at Risk

The City of Nevada City has significant cultural and natural resources located throughout the City as previously described. Vulnerability analysis of these resources was not possible due to data limitations. However, anything located inside the 1% or 0.2% annual chance floodplain would potentially be vulnerable.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Nevada City joined the National Flood Insurance Program (NFIP) on February 3, 2010. The City does not participate in CRS program. NFIP data indicates that as of August 19, 2016, there were 11 flood insurance policies in force in the City, $1,312,900 of coverage, and $14,038 in annual premiums. Of the 11 policies, 2 were residential (single-family homes), 6 were multi family, and 3 were nonresidential. 1 of the policies were in A zones; the remaining 10 were in B, C, and X zones. The GIS parcel analysis detailed above identified 18 improved parcels in the 100-year flood zone. 1 policies for 18 improved parcels in the 100-year floodplain equates to insurance coverage of 5.3 percent.

There has been 1 historical claim for flood losses totaling $3,572.37; however, details on the flood zone or type of property were unavailable. There are no repetitive loss (RL), severe repetitive loss (SRL), or substantial damage claims for structures in the City.

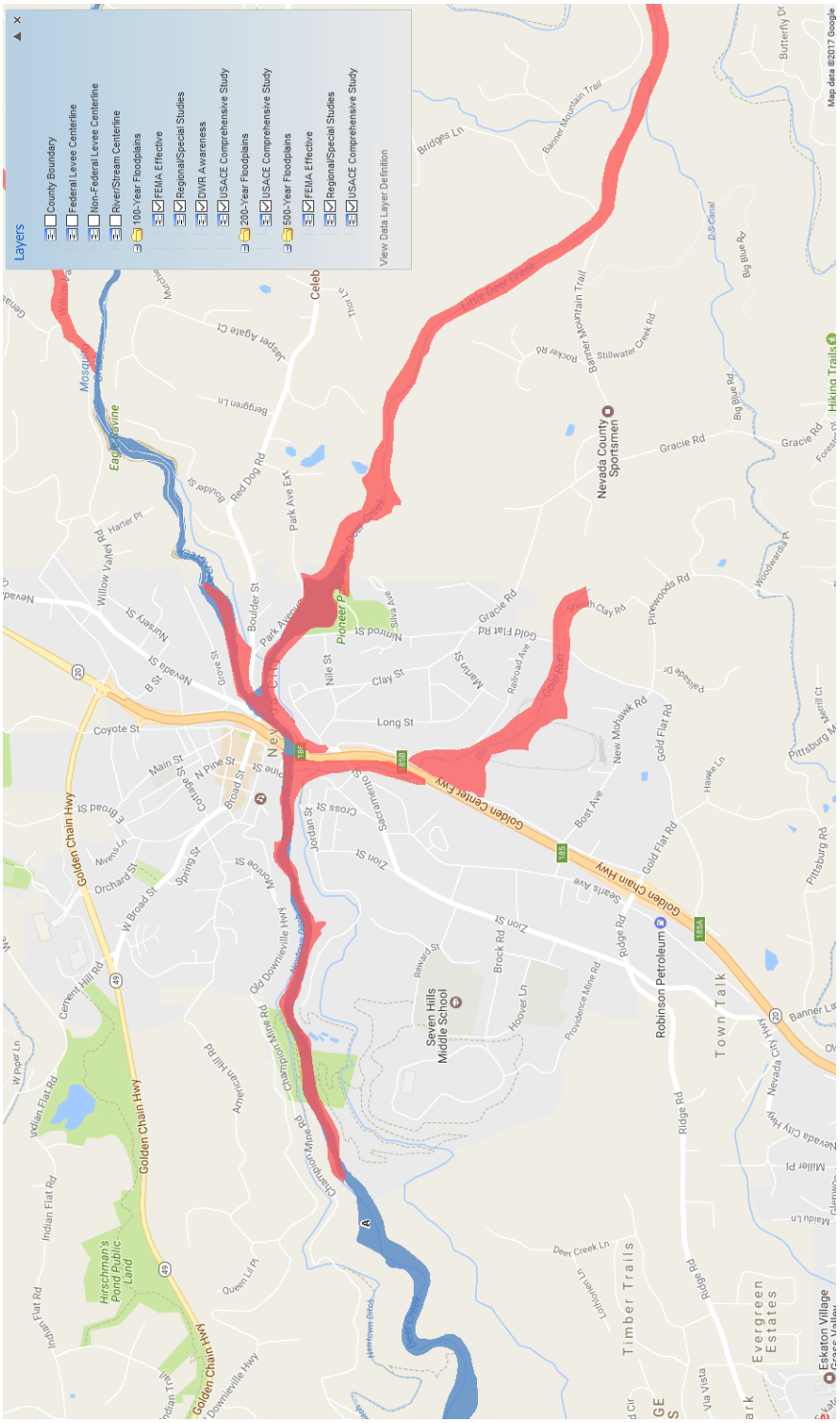
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Nevada County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 1$ annual chance flood risk, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance floodplain, it also supports identification of the need and requirement for flood insurance. The BAM map for Nevada City is shown in Figure B-6.

Figure B-6 City of Nevada City Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 100-Year (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chacne flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study)

Future Development

The City enforces their floodplain ordinance. If any development is to occur in the floodplain, it would have to conform to the elevation standards of the City's floodplain ordinance. More information of the floodplain ordinance can be found in Section B.6.1 below.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Nevada City has reoccurring flooding at natural water courses (two creeks and five ravines) that flow through historic areas of the City. In particular, Little Deer Creek, Deer Creek, and Oregon Ravine have had flooding for storms at 10-yr or greater frequency. In addition to impacts on businesses and private properties, heavy storm flows have impacted City Streets including the 'Plaza' intersection of Broad/Boulder/Sacramento/Nevada streets; and the intersection of Commercial/ Main / Union streets.

Pioneer Park has also had extensive flooding from Little Deer Creek for storms at 10-yr or greater frequency. This has impacted recreation areas and City buildings and infrastructure at the park.

Past Occurrences

In the following years, 1986, 1995, 1997, 2004, 2005, 2016, 2017 – there have been several locations in the City that have been affected by localized flooding. Areas affected are:

- Little Deer Creek and Deer Creek - flooding at the 'Plaza', located at the intersection of Broad/Boulder/Sacramento/Nevada streets
- Flooding in Oregon Ravine through downtown and along Commercial Street. Includes intersection of Commercial/ Main/Union streets
- Damage to Pioneer Park caused by flooding from overflow from Little Deer Creek, with resulting damage to the tennis courts, baseball diamond and horse shoe pits.
- Failure of an underground culvert that connects Deer Creek and Little Deer Creek in a parking lot at the intersection of Sacramento Street and Broad Street resulting in failure of the parking lot surface.

Residential flooding has occurred in the past primarily as a result of clogged drainage ditches and seasonal dry creeks. When flooding does occur, it is usually confined to a portion of the property and recedes usually within a few minutes to a few hours.

Vulnerability to Localized Flooding

Flooding and other issues caused by severe weather events, primarily heavy rains and thunderstorms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community. Table B-18 identifies known and past occurrences of such areas and the associated problems encountered. This list is an initial inventory of key problem areas and is not intended to be a complete inventory of all problems and locations associated with severe weather events and localized flooding in the City of Nevada City.

Table B-18 City of Nevada City's Road List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Broad/Boulder	Y	Y	Y	Y	Y	Y	Y
Commercial/Main	Y	Y	Y	Y	Y	Y	Y
Pioneer Park	Y	Y	Y	Y	Y	Y	Y

Source: City of Nevada City

Future Development

Future development in the City will add more impervious surfaces and need to drain those waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Hazardous Materials Transportation

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

Hazardous materials include a wide variety of substances commonly used in households and businesses. Used motor oil, paint, solvents, lawn care and gardening products, household cleaners, gasoline and refrigerants are among the diverse range of substances classified as hazardous materials. Nearly all businesses and residences generate some amount of hazardous waste; certain businesses and industries generate larger amounts of such substances, including gas stations, automotive service and repair shops, printers, dry cleaners and photo processors. Hospitals, clinics and laboratories generate medical waste, which is also potentially hazardous.

Use, storage and transportation of hazardous wastes is heavily regulated by federal, State and local agencies, including the California Department of Toxic Substances Control, which is authorized to implement the regulations of the Federal Environmental Protection Agency. The Nevada County Environmental Health Department monitors commercial storage and use of hazardous materials, including issuing permits for use and storage of significant quantities of hazardous materials or substances.

Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. Much of the hazardous materials transported through Nevada County are carried by truck on the State Highway, railway systems, and underground pipelines. In the City, highways 20 and 49 carry hazardous materials.

Past Occurrences

There have been no federal or state disaster declarations for hazardous materials transportation releases in the City of Nevada City.

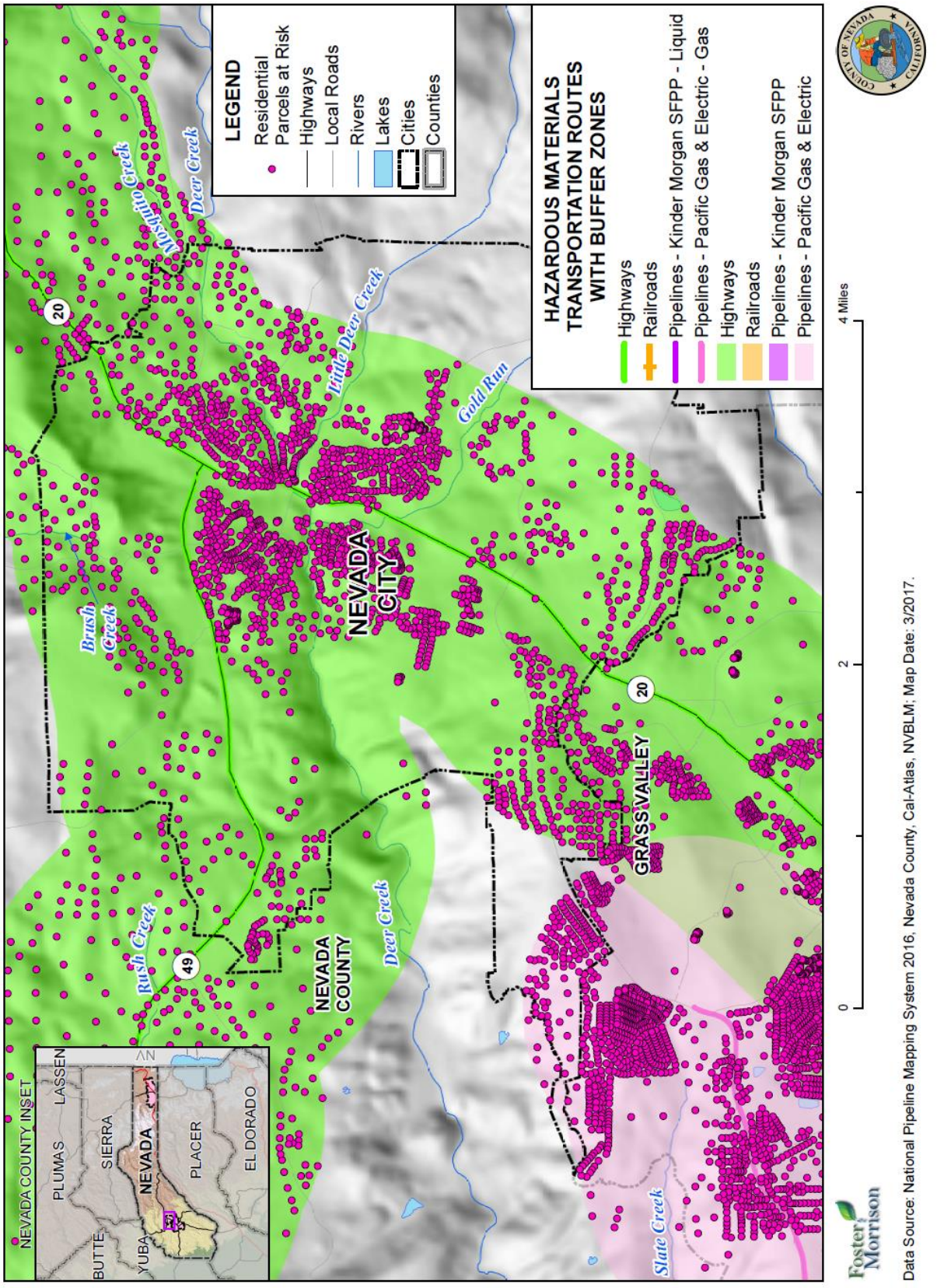
Vulnerability to Hazardous Materials Transportation

Values at Risk

It is often quite difficult to quantify the potential losses from human-caused hazards, such as that associated with a hazardous material transportation release or spill. While buildings within the City have a tangible dollar value, loss from a human-caused hazard such as a release of hazardous materials often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Given the difficulty in quantifying the losses to Nevada City associated with a hazardous materials transporation release, this section focuses on analyzing key City assets relative to the hazardous materials sites and transportation corridors (highway, rail, and pipeline).

An analysis of the potential vulnerability of the City to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable, a one mile buffer was applied to both sides of Interstate 80 and State Routes 20, 49, 89, 174, and 267; the Union Pacific railroad tracks (which roughly parallel I-80) and the Kinder Morgan petroleum pipeline. The result is a two-mile buffer zone around each transportation corridor that is used for risk-analysis. More information on this methodology can be found in Section 4.3.10 of the Base Plan. The buffer zone and residential parcels at risk are shown in Figure B-7.

Figure B-7 City of Nevada City – Residential Parcels in Hazardous Materials Buffer Zones



Populations at Risk

To determine the populations at risk in Nevada City from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway, railroad, and pipeline corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel data and results tabulated for the City of Nevada City as found in Table B-19. Those parcel centroids that intersect the buffered corridor were counted and multiplied by the 2010 Census Bureau average household factors for the City. According to this analysis, there is a total population of 4,496 in the buffered corridor. All of these are in highway corridors, none are in rail or pipeline corridors.

Table B-19 City of Nevada City – Populations at Risk in Hazardous Materials Corridors

Jurisdiction	Residential Parcels	Population
Nevada City	2,151	4,496

Source: Cal Trans, Nevada County GIS, US Census Bureau

* Census Bureau 2010 average household sizes are: Nevada City – 2.09

Historical, Cultural, and Natural Resources at Risk

The City of Nevada City has significant cultural and natural resources located throughout the City as previously described. Vulnerability analysis of these resources was not possible due to data limitations. However, any resource in the buffer zone would be potentially at risk.

Critical Facilities

To determine the critical facilities at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the facilities located within the two-mile buffer zone of the highway and railroad corridors. Using GIS, the buffered corridor was overlaid on the Nevada County critical facilities layer and results tabulated for the City, shown in Figure B-8 and detail in Table B-20. There are 58 facilities in the buffered corridor in the City. All of these are in highway corridors, none are in rail or pipeline corridors. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis.

Figure B-8 City of Nevada City – Critical Facilities in Hazardous Materials Buffer Zones

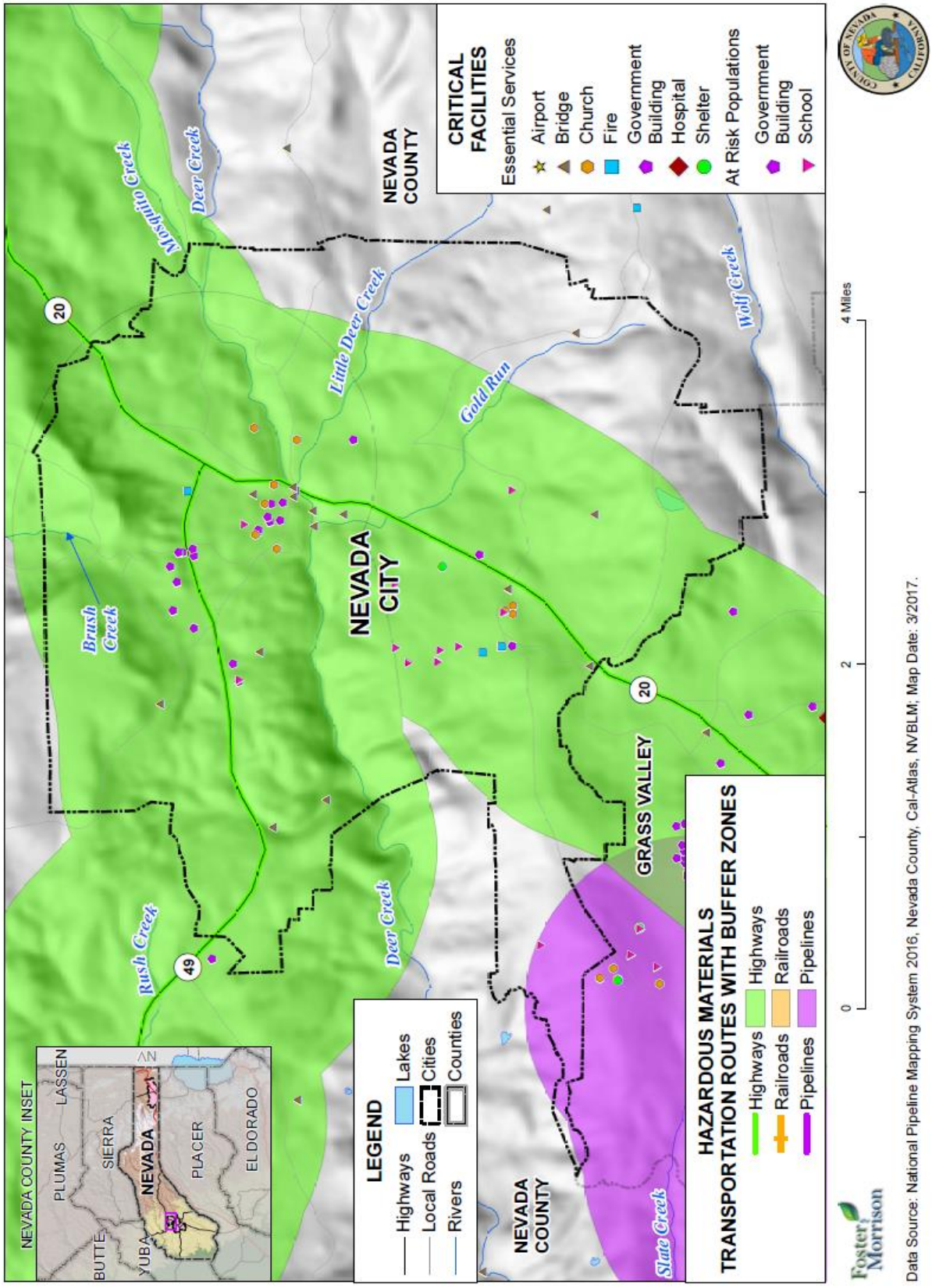


Table B-20 City of Nevada City – Critical Facilities in Hazardous Materials Buffer Zones

Critical Facility Type	Critical Facility Count
Essential Services	
Airport	0
Bridge	14
Church	9
Fire	3
Government Building	15
Hospital	0
School	0
Shelter	2
Essential Services Total	**43**
At Risk Populations	
Airport	0
Bridge	0
Church	0
Fire	0
Government Building	4
Hospital	0
School	11
Shelter	0
At Risk Populations Total	**15**
Grand Total	**58**

Source: Cal Trans, National Pipeline Mapping System 2016, Nevada County GIS

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

Landslides, Debris, and Mudflows

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and

proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas.

Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

Past Occurrences

There have been no disaster declarations associated with landslides in Nevada City. Further, although the City could not identify any specific landslide prone areas or past occurrences, the City noted that the potential for future damaging landslide events remains in the sloped areas of the City.

Vulnerability to Landslides, Debris and Mudflows

The City remains at risk to future landslide events. Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that landslides will continue to have potentially large economic impacts to certain areas. However, many of the landslides in the City are minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

Although new growth and development corridors could potentially fall in areas affected by risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide area will continue to occur.

Severe Weather: Extreme Cold, Snow, and Freeze

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

According to the WRCC, in the western portion of Nevada County, monthly average minimum temperatures from November through April range from the low to mid-30s. The lowest recorded daily extreme was 3°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 72.7 days with no days falling below 0°F. Average snowfall is 10.0 inches. The highest annual snowfall fell in

1972, when 26.7 inches fell. Highest monthly snowfall accumulation came in March of 1974, when 23.0 inches fell. Average snow depths in January through March fall at 1 inches.

Past Occurrences

A disaster declaration for Nevada County was issued by the state government in 1972 for freeze and severe weather conditions, however extreme cold, snow and freeze is an annual occurrence in the City and will continue to occur based on our geographic location in California.

Vulnerability to Severe Weather: Extreme Cold, Snow, and Freeze

Winter snow storms, including strong winds and blizzard conditions can result in localized power and phone outages and closures of streets, highways, schools, businesses, and nonessential government operations. During periods of heavy snow there is also an increase in the number and severity of traffic accidents. People can become isolated in their homes and vehicles and are unable to receive essential services. Snow removal costs can impact budgets significantly. Heavy snowfall during winter can lead to flooding or landslides during the spring if the area snowpack melts too quickly and also create numerous challenges for emergency responders.

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the City shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the City as well as people retiring to the area.

Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

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

Nevada County—West (Grass Valley Weather Station, Period of Record 1966 to 2016)

According to the WRCC, average annual precipitation in the western side of Nevada County is 53.26 inches per year. The highest recorded annual precipitation is 94.77 inches in 1983; the highest recorded precipitation for a 24-hour period is 7.02 inches on December 31, 2005. The lowest recorded annual precipitation was 16.51 inches in 1976.

Past Occurrences

Heavy rains and severe storms are not stranger to Nevada City. These events occur annually in Nevada City and will continue.

Vulnerability to Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

According to historical hazard data, severe weather is an annual occurrence in Nevada City. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact on the City.

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While minimal damages have occurred to critical facilities in the past due to lightning, hail, or high winds and tornadoes, there still remains future risk. With development occurring in the region, future losses to new development may occur.

Subsidence

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

Subsidence, the sinking of the ground due to the movement of underground material causing a shift or collapse, is a concern to the Nevada County Planning Area. There are several major sources of subsidence present in Nevada County: water drawdown, abandoned mines, karst and any underground voids caused by a variety of factors including underground utilities and culverts. One of the primary sources for the City, abandoned mines, had data available to conduct additional analysis of possible locations of future mine-related subsidence, and is thus the focus of the remainder of this section. Past mining activities have created surface subsidence in some areas and have created the potential for subsidence in other areas. Nevada County is home to many abandoned mines.

A substantial portion of the Nevada City area is underlain by a deep, extensive labyrinth of abandoned mine tunnels. Dozens of mining claims were worked in the Nevada City area during the heyday of gold mining. Some were large, mechanized operations. Most were small and more labor-intensive.

Past Occurrences

There have been no disaster declarations related to subsidence in Nevada City.

Vulnerability to Subsidence

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Nevada City. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk known mine areas. Areas susceptible to subsidence based on the historic mining operations (a mine inventory) are shown in Figure B-9 and detailed in Table B-21 and Table B-22. Table B-23 shows the property use, improved parcel count, improved values, estimated contents, total values and estimated loss of parcels that fall in a known mine area in the City.

Figure B-9 City of Nevada City – Subsidence (Known Mine) Inventory

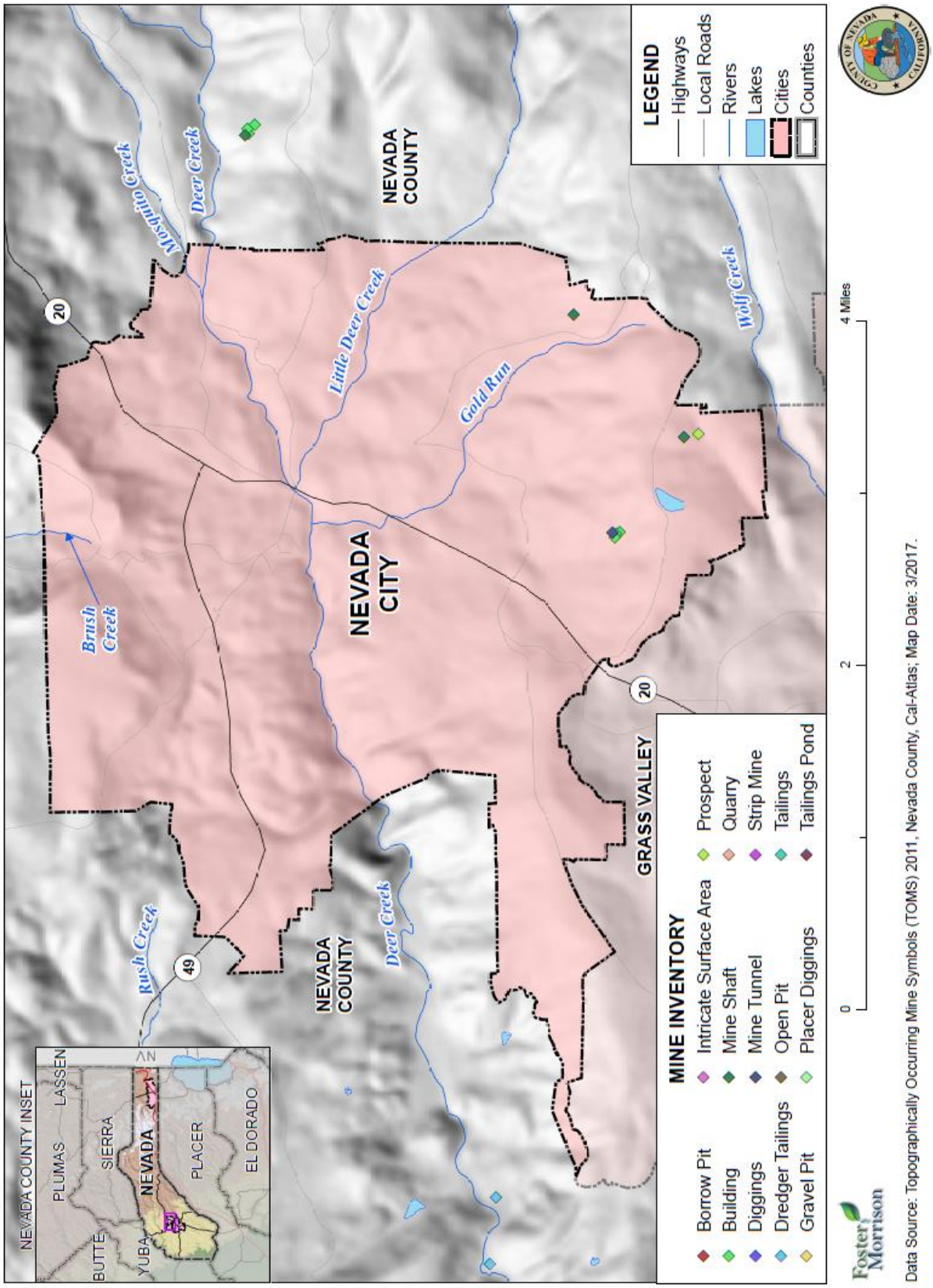


Table B-21 City of Nevada City – Mine Types and Counts

Jurisdiction / Mine Type	Mine Count
Borrow Pit	0
Building	3
Diggings	0
Dredger Tailings	0
Gravel Pit	0
Intricate Surface Area	0
Mine Shaft	2
Mine Tunnel	1
Open Pit	0
Placer Diggings	0
Prospect	1
Quarry	0
Strip Mine	0
Tailings	0
Tailings Pond	0
Grand Total	**7**

Source: TOMS 2011

Table B-22 City of Nevada City – Mine Names Located on Affected Parcels

Mine Name	Mine Count
Banner Mtn Mine	2
Gracie Mine	1
Unknown	4
Grand Total	**7**

Source: TOMS 2011

Table B-23 City of Nevada City – Parcel County and Values at Risk from Subsidence (Known Mine Inventory) by Property Use with Content Replacement Values

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Residential	4	4	$754,953	$1,048,683	$524,342	$2,327,978
Total	**4**	**4**	**$754,953**	**$1,048,683**	**$524,342**	**$2,327,978**

Source: TOMS 2011, Nevada County 2016/2017 Parcel/Assessor's Data

Population at Risk

The known mine areas were overlayed on the parcel layer. Those residential parcel centroids that intersect the known mine areas were counted and multiplied by the 2010 Census Bureau average household factors for Nevada City. According to this analysis, there is a total population of 8 residents of the City at risk to known mine areas. This is shown in Table B-24.

Table B-24 City of Nevada City – Count of Improved Residential Parcels and Population in Subsidence (Known Mine Inventory) Areas

Improved Residential Parcels	Population*
4	8

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data, US Census Bureau

* Average household populations from the 2010 US Census were used: Nevada City– 2.09.

Historical, Cultural, and Natural Resources at Risk

The Nevada City Planning Area has significant historical, cultural, and natural resources located throughout the County as previously described. Risk analysis of these resources was not possible due to data limitations. However, any resource that falls into an abandoned mine area could be at risk.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory for the Nevada County Planning Area including all jurisdictions to determine critical facilities in known mine areas. Using GIS, the mine inventory data were overlayed on the critical facility GIS layer. There are no critical facilities in the known mine areas in Nevada City. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. H

Future Development

Many of the subsidence and mine areas in the City are known, but many still remain unknown and untracked. The risk of subsidence to future development can be minimized by accurate recordkeeping and tracking of previously unknown abandoned mines. Knowing these locations and choosing not to develop in those areas or mitigating against future issues will reduce future risks of losses due to subsidence.

Wildfire (smoke, tree mortality, conflagration)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Three types of fires are of concern to the City of Nevada City: wildland, wildland urban interface, and, to a lesser extent, structural fires. According to the Safety Element of Nevada City's General Plan, wildland and urban interface fires have occurred close to or encroached into the City, especially in the heavily fueled areas to the east and south. Urban structural fires have been due largely to human accidents, with are the older buildings in the City business districts the most vulnerable.

The drought and water shortage events in 2014 through 2016 caused the City to be at greater risk to wildfire due to stress placed on the forested areas in and around the City. Between the drought and the beetles, many trees in the area died, which increases the risk of fire due to the increased fire fuel load in and around the City.

Past Occurrences

Nevada City is surrounded by natural wooded areas and open space. Wildfires have affected the City on an annual basis with the Wildland-Urban Interface (WUI) areas. According to the 2011 LHMP, from 1950 to 2011 there were no past occurrences directly in Nevada City, however with the terrain, climate, rainfall, and forest land/urban mix, it is a certainty that significant wildland fires are going to continue as a threat

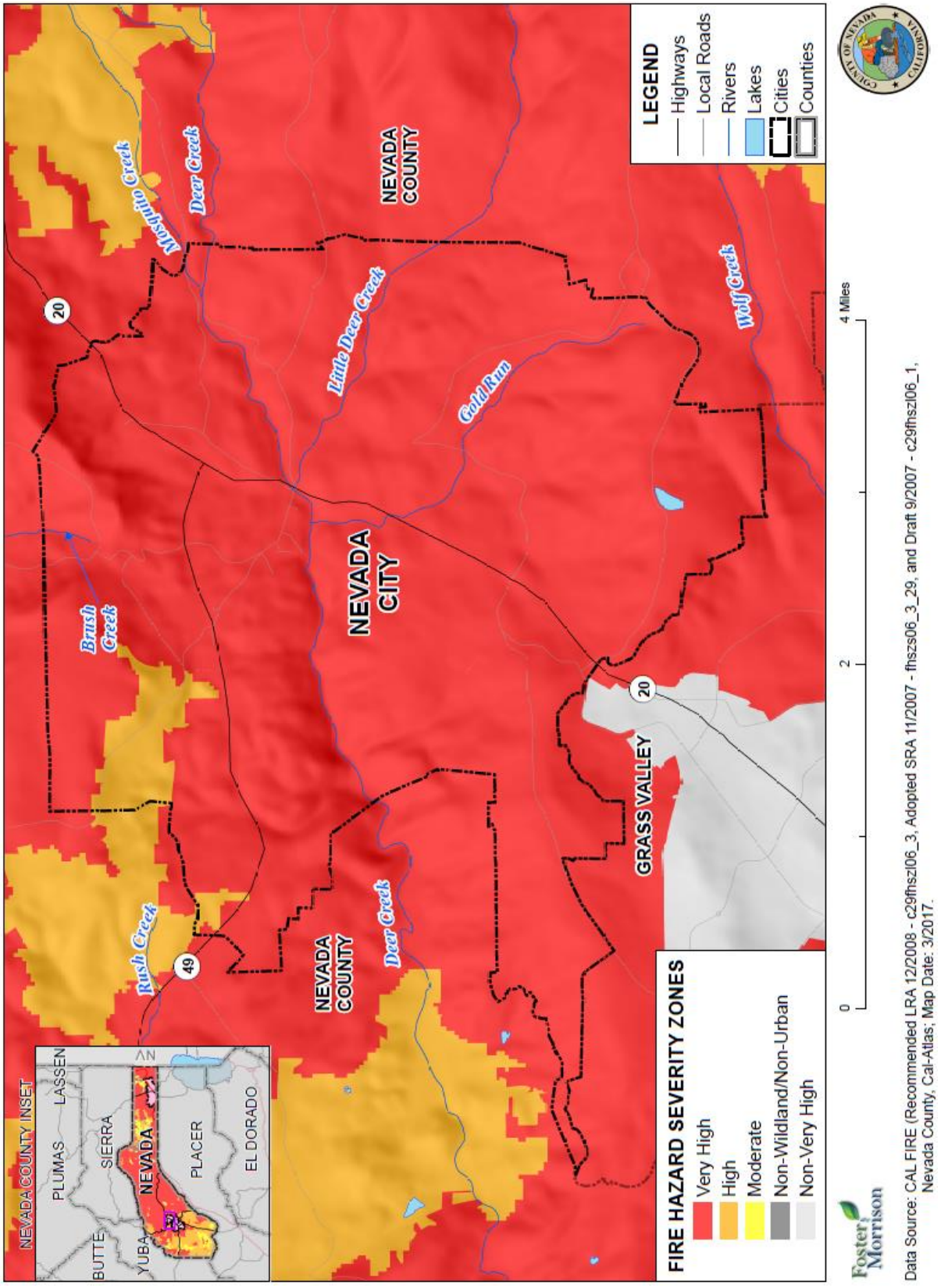
Vulnerability to Wildfire

Wildland fire is a serious concern to Nevada City. Many of the roadways in the city are not city maintained roads so there are a great number of single lane roads and double lane roads that are not to current standards for city maintained roads. Many residential parcels have driveways that are also only single lane, some paved but most not, that may have only sporadic clearing of encroaching vegetation.

A second and probably more significant issue is the large amount of fuel load remaining on unincorporated lands. Nevada City is surrounded federal forest lands where fire suppression has been the recently, most dominant fire management strategy. Any fire in the unincorporated areas of Nevada County has a significant potential to become a catastrophic fire when wind, temperature and humidity can combine to enlarge fires very quickly.

Following the methodology described in Section 4.3.2 Vulnerability of Nevada County to specific hazards, a wildfire map for the City of Nevada City was created (see Figure B-10). Fire Severity Zones within the City ranges from high to very high, with most of the City in the very high severity zone.

Figure B-10 City of Nevada City's Fire Severity Zones



Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Nevada City. The methodology described in Section 4.3.16 of the Base Plan was followed in determining structures and values at risk in CAL FIRE fire hazard severity zones. Analysis results for Nevada City are shown in Table B-25, which summarizes total parcel counts, improved parcel counts, land values, structure values, and estimated contents values by occupancy type. The estimated contents replacement values are based on the CRV factors detailed in Table 4 35 in Section 4.3.1 of the Base Plan.

Table B-25 City of Nevada City– Count and Value of Parcels by Property Use and Fire Severity Zone with Contents Replacement Values

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Very High						
Agricultural	5	1	$267,882	$448,000	$448,000	$1,163,882
Commercial	252	203	$48,729,787	$89,276,521	$89,276,521	$227,282,829
Government	94	1	$148,458	$226,808	$226,808	$602,074
Industrial	20	20	$4,139,466	$11,850,950	$17,776,425	$33,766,841
Institutional	16	13	$1,071,530	$5,219,266	$5,219,266	$11,510,062
Miscellaneous	11	1	$804,566	$80,838	$80,838	$966,242
Residential	2,957	2,599	$280,198,276	$536,549,806	$268,274,903	$1,085,022,985
Total	**3,355**	**2,838**	**$335,359,965**	**$643,652,189**	**$381,302,761**	**$1,360,314,915**
High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	1	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	22	14	$2,419,234	$4,479,816	$2,239,908	$9,138,958
Total	**23**	**14**	**$2,419,234**	**$4,479,816**	**$2,239,908**	**$9,138,958**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value*
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Non-Wildland/Non-Urban						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	0	0	$0	$0	$0	$0
Non-Very High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	0	0	$0	$0	$0	$0
Grand Total	**3,378**	**2,852**	**$337,779,199**	**$648,132,005**	**$383,542,669**	**$1,369,453,873**

Source: Nevada County 2016/2017 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The fire hazard severity zone dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for the City of Nevada City. According to this analysis, there is a total population of 5,461 residents of Nevada City at risk to high or very high wildfire risk. This is higher than the number of residents in the City, most likely due to one of the two following factors: the Census Bureau household size is an estimate and not entirely accurate, or that there are residential homes in the City that are second homes and not always occupied. In either instance, it can be assumed that the entire population of the City is in a high or higher fire hazard severity zone, or mapped into the non-very high areas. This is shown in Table B-26.

Table B-26 City of Nevada City – Count of Improved Residential Parcels and Population by Fire Severity Zone

Fire Severity Zone	Improved Residential Parcels	Population*
Very High	2,599	5,432
High	14	29
Moderate	0	0
Total	**2,613**	**5,461**

Source: Nevada County 2015 Parcel/Assessor's Data, CAL FIRE

* Average household populations for Nevada City (2.09) from the 2010 US Census were used

Critical Facilities at Risk

Wildfire analysis was performed on the critical facility inventory in Nevada County and all jurisdictions. GIS was used to determine whether the facility locations intersect a fire severity zone provided by CAL FIRE, and if so, which zone it intersects. There are 59 facilities in the high or very high fire severity zone in the City. These are shown in Figure B-11 and detailed in Table B-27. Details of critical facility definition, type, name and address and jurisdiction by fire severity zone are listed in Appendix F.

Figure B-11 City of Nevada City – Critical Facilities in Fire Hazard Severity Zones

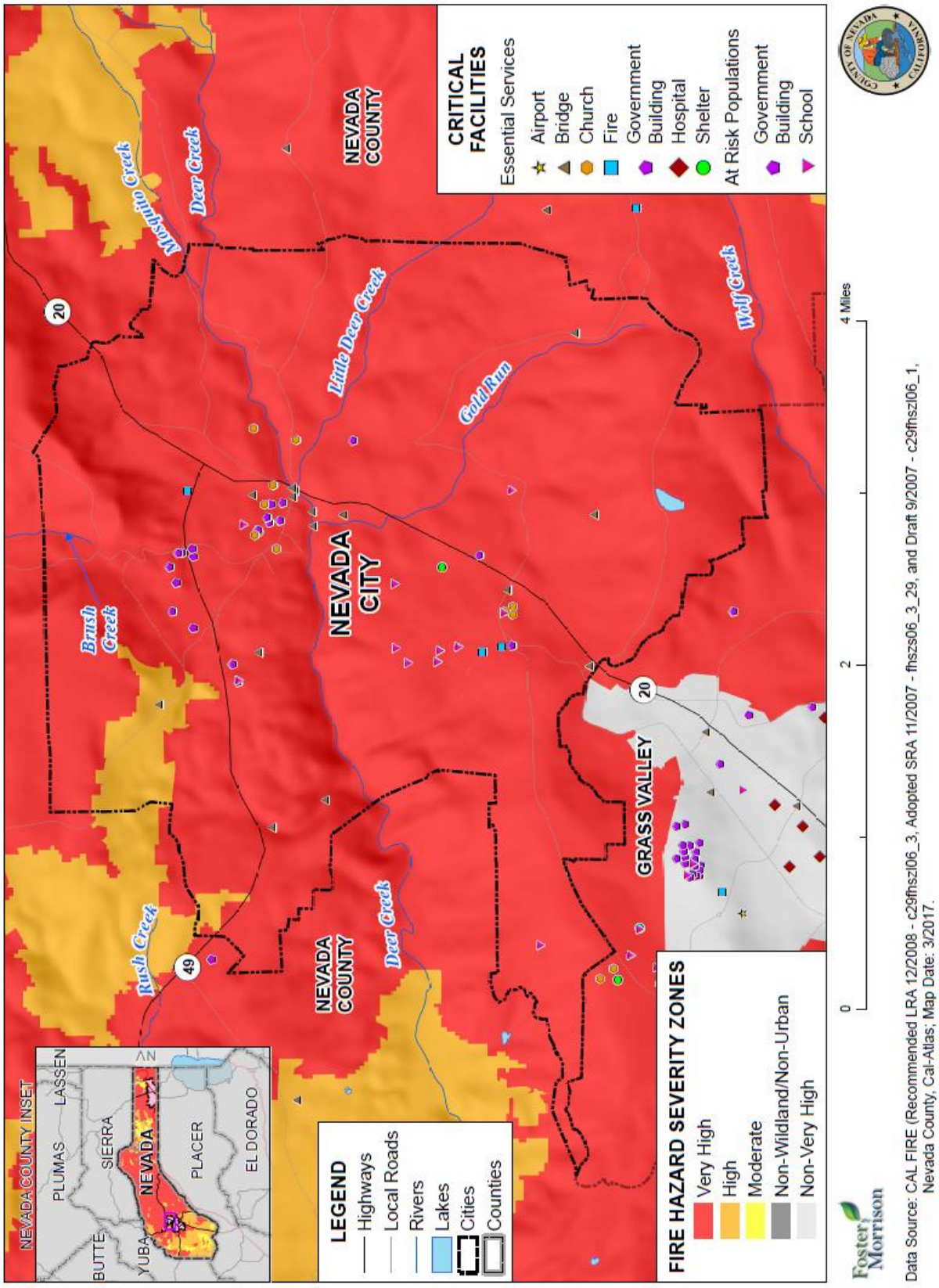


Table B-27 City of Nevada City – Critical Facilities in Fire Hazard Severity Zones

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
Very High		
Essential Services	Airport	0
	Bridge	14
	Church	9
	Fire	3
	Government Building	15
	Hospital	0
	School	0
	Shelter	2
	Total	**43**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	4
	Hospital	0
	School	11
	Shelter	0
	Total	**15**
Very High Total		**58**
High		
Essential Services	Airport	0
	Bridge	1
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**1**
High Total		**1**
Grand Total		**59**

Source: CAL FIRE, Nevada County GIS

Historical, Cultural, or Natural Resources at Risk

Nevada City has substantial historical, cultural and natural resources located throughout the City. In addition, there are other natural resources at risk when wildland-urban interface fires occur. One is the watershed and ecosystem losses that occur from wildland fires. This includes impacts to water supplies and water quality as well as air quality. Another is the aesthetic value of the area. Major fires that result in visible damage detract from that value. Other assets at risk include wildland recreation areas, wildlife and habitat areas, and rangeland resources. The loss to these natural resources can be significant.

Future Development

Development will continue to occur in the wildfire severity areas; however, City ordinances for building in these areas are enforced. Population growth and development in Nevada City has recently slowed. However, additional growth and development within the WUI areas of the City would place additional assets at risk to wildfire.

B.6 Capability Assessment

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

B.6.1. Regulatory Mitigation Capabilities

Table B-28 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Nevada City.

Table B-28 City of Nevada City's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y	The Safety Element addresses hazards.
Capital Improvements Plan	Y	Includes infrastructure improvements (limited by funding)
Economic Development Plan	Y	Active Member with Economic Resource Council
Local Emergency Operations Plan	Y	Fire/ Police
Continuity of Operations Plan		
Transportation Plan	Y	Updated every five years by Nevada County Transportation Commission
Stormwater Management Plan/Program	N	The City does not have a current plan
Engineering Studies for Streams	Y	In collaboration with Sierra Streams and Sierra Fund non-profit groups

Community Wildfire Protection Plan	Y	In coordination with County, CALFIRE
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Brownfileds cleanup in collaboration with Sierra Streams and Sierra Fund non-profit groups. Water Conservation / Drought Plan developed in 2014
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: January 2016
Building Code Effectiveness Grading Schedule (BCEGS) Score	N	Score:
Fire department ISO rating:	Y	Rating: 03 / 3X
Site plan review requirements	Y	City Planning, Engineering and Fire Department
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	Yes
Subdivision ordinance	N	
Floodplain ordinance	Y	Yes
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Yes, implemented with development review in accordance with Municipal Code and Zoning requirements.
Flood insurance rate maps	Y	Updated by FEMA
Elevation Certificates	Y	If needed, provided by registered Land Surveyors
Acquisition of land for open space and public recreation uses	Y	City acquired and privately designated as open space.
Erosion or sediment control program	Y	By Ordinance
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Nevada City

The City of Nevada City General Plan Program, 1986

The City of Nevada City General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Nevada City Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and human-caused hazards. Mitigation-related goals, are presented below.

Safety Element Goals	
Goal 1	Protect the citizens and visitors of the City of Nevada City area from loss of life while protecting property and watershed resources from unwanted fires through preplanning, education, fire defense improvements, and fire suppression.
Goal 2	Protect the lives and property of the citizens of the City of Nevada City area from unacceptable risk resulting from flood hazards.
Goal 3	Minimize hazards to public health, safety, and welfare resulting from natural and man-made hazards.
Goal 4	Protect all residents from hazardous materials and the hazards associated with transport of such materials.
Goal 5	Maintain and enhance City emergency services.

City of Nevada City Disaster Plan, 2011

The City has a comprehensive Disaster plan in place to address an all hazards response within the City. It describes the roles and responsibilities of the City and outlines the requirements to respond to a disaster in California.

Mitigation Related Ordinances

The City has implemented a Floodplain Management Plan with regulations designed to promote the public health, safety, and general welfare of its citizenry. Methods and provisions for reducing flood losses include:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- Control filling, grading, dredging, and other development which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

B.6.2. Administrative/Technical Mitigation Capabilities

Table B-29 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Nevada City.

Table B-29 City of Nevada City's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	

Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	Ongoing programs by City Public Works, Parks, and Fire Department. The City uses outside assistance from jail crews, conservation corp and other volunteer groups.
Mutual aid agreements	Y	Police and Fire
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Outsourced to Nevada County
Floodplain Administrator	Y	City Engineer
Emergency Manager	Y	City Assistant Manager
Community Planner	Y	City Planner
Civil Engineer	Y	City Engineer
GIS Coordinator	Y	City Engineer
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	911 through police dept
Hazard data and information	Y	Through County OES
Grant writing	Y	By City with assistance from County OES
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Nevada City

B.6.3. Fiscal Mitigation Capabilities

Table B-30 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table B-30 City of Nevada City's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	The City Capital Improvement Plan is updated annually as required by Govt. Code. This includes projects with funding sources identified and projects that are necessary but lack financial backing.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Authority to levy taxes for specific purposes	Y	Voter Approved Tax Measure B approved in 2016 provides funding for additional City Fire and Police staff
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	This is used as a funding source to mitigate the effects of new development on existing infrastructure and City services.
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	N	
Community Development Block Grant	Y	
Other federal funding programs	Y	Congestion Mitigation and Air Quality Improvement Program is used for street and sidewalk improvements. Highway Bridge Replacement & Rehabilitation Program (HBRRP) is used for bridges
State funding programs	Y	CAL FIRE Fire Prevention Grant was used in 2017 for High Tree Mortality Areas CABY grant for the Integrated Regional Water Management (IRWM) group Prop 184 used for water facility improvements in 2014 -2017
Other		
How can these capabilities be expanded and improved to reduce risk?		
Funding for infrastructure is needed due to the fact that much of the City was constructed more than 100 years ago. Narrow roads, aging water lines, sewer lines and drainage systems are in need of improvement and rehabilitation.		

Source: City of Nevada City

B.6.4. Mitigation Education, Outreach, and Partnerships

Table B-31 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. More information can be found below the table.

Table B-31 City of Nevada City's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Informational brochures from the Nevada County OES office
Natural disaster or safety related school programs	Y	School programs are provided by City police and fire department
StormReady certification	N	
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: City of Nevada City

B.6.5. Other Mitigation Efforts

The City of Nevada City has many other ongoing mitigation efforts that include the following:

- Annual assessment of capital improvement needs and research of available funding sources.
- A Brushing and Debris Chipping and ladder fuel reduction on public lands and street rights-of-way is currently ongoing.
- Fuel Management for Wildfire Mitigation Fuel Break at Sugarloaf Mountain and Deer Creek Environs was implemented in 2012.
- In 2013, as part of Prop 84 CABY, Nevada City installed an Inter-Tie with NID water district near Gracie Road for Water System Reliability.
- A Fire Suppression System being implemented as part of building permits for renovation of existing Buildings in Historic Downtown is ongoing and in process.

B.7 Mitigation Strategy

As part of the overall HMPC for the development of this multi-jurisdictional Nevada County LHMP Update, each jurisdiction followed the mitigation strategy development process detailed in Chapter 5 and Appendix C of the Base Plan, which included the development of plan goals and objectives and the resulting mitigation actions and projects.

B.7.1. Mitigation Goals and Objectives

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

B.7.2. NFIP Mitigation Strategy

The City of Nevada City joined the National Flood Insurance Program (NFIP) on February 3, 2010. As a participant of the NFIP, the City of Nevada City has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Nevada City will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Nevada City actively participates with the County of Nevada to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Nevada City as for Nevada County since participation at the County level includes all local jurisdictions.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and new development, and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The City's Municipal Code has a Flood Damage Prevention Section under the Zoning Ordinance that regulates construction in the floodplain. The City intends to continue to implement the ordinance and participate at the regional level with Nevada County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Nevada City is not a current participant in the CRS program.

More information about the floodplain administration in the City of Nevada City can be found in Table B-32.

Table B-32 City of Nevada City Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	11 policies $14,038 in annual premiums $1,312,900 of coverage in force
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	1 paid losses $3,572.37 in paid claims 0 substantial damage claims
How many structures are exposed to flood risk within the community?	23 (1% annual chance flood) 2 (0.2% annual chance flood)
Describe any areas of flood risk with limited NFIP policy coverage	
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	The City uses outside consultants for this on an as-needed basis.
What are the barriers to running an effective NFIP program in the community, if any?	No
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	?
Is a CAV or CAC scheduled or needed?	?
Regulation	
When did the community enter the NFIP?	2/3/2010
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes, through implementation of the Floodplain Management Plan and our Zoning and Planning approval process
Provide an explanation of the permitting process.	All projects are reviewed by City Departments and Planning Commission in accordance with our Municipal Code which includes the Floodplain Management Plan
Community Rating System	
Does the community participate in CRS?	N
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

B.7.3. Mitigation Actions

The planning team for the City of Nevada City identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

It should be noted that many of the projects submitted by each jurisdiction in Table 5 2 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 public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: All hazards

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Nevada City Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Nevada City Tree Removal, Brushing and Debris Chipping

Hazards Addressed: Multi-hazard: Tree Mortality (Drought and Bark Beetle Infestation), Fire Hazard, Flooding

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Nevada City is surrounded by natural forested areas with approximately 300 acres of open space that is owned and managed by the City. Hazardous trees that pose a threat to public health and safety should be removed to address the risk and potential impact of wildfire to habitable structures and/or the potential to obstruct storm flows through natural drainage courses.

Project Description: Tree Removal, Brushing and Debris Chipping Program will be used to remove trees that are dead or are dying from invasion of bark beetle and drought conditions and trees that are hazardous. This project will enhance and contribute to the City's ongoing effort to reduce fire fuel on the City's Open Space Parcels, provide safety for public and provide clear paths for natural drainage.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $400,000

Potential Funding: Dept. of Water Resources, CALFIRE

Benefits (avoided Losses): Extensive loss of property and buildings due to fire.

Schedule: 2018-2023

Action 3. Nevada City Tree Management

Hazards Addressed: Multi-hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Annually, tree and/or branches fall from trees located on City property or public streets due to severe storm damage. This project would fund the assessment by a certified arborist; an annual maintenance plan would be created and followed to prevent trees and branches from falling unexpectedly.

Project Description: Implement a program to annually monitor, remove and dispose of hazardous trees and branches.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $50,000

Potential Funding: TBD

Benefits (avoided Losses): Trees and/or branches falling put members of public and property at risk.

Schedule: 2017-2023

Action 4. Nevada City Storm Drain / Culvert Replacement for Oregon Ravine through downtown and along Commercial Street. Includes intersection of Commercial/ Main / Union streets

Hazards Addressed: Flooding/Localized Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During flood events the current drainage system overflows causing erosion to the surrounding area and flood damage to City Streets and private properties within the historic district.

Project Description: Replace storm drain pipes, culverts or inlets that are damaged, aging or deficient.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $1,000,000

Potential Funding: TBD

Benefits (avoided Losses): Damage to structures in the downtown area during a major flood event could far exceed the costs associated with completing this project.

Schedule: 2017-2023

Action 5. Little Deer Creek and Deer Creek - the 'Plaza': intersection of Broad/Boulder/Sacramento/Nevada streets

Hazards Addressed: Flooding/Localized Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During flood events the two converging creeks overtop banks, roadways and culverts causing stream bank erosion and flood damage to City Streets and private properties. This also results in closure of critical intersection of two arterial roadways and two collector roadways.

Project Description: Replace culverts, storm drain or inlets that are damaged, aging or deficient. Creek remediation to improve conveyance of storm flows. Replacement or realignment of concrete walls, bridge footings or piers where they are limiting capacity of the creek.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $2,000,000

Potential Funding: TBD

Benefits (avoided Losses): Damage to structures in the downtown area during a major flood event could far exceed the costs associated with completing this project.

Schedule: 2017-2023

Action 6. Little Deer Creek at Pioneer Park

Hazards Addressed: Flood damage to Pioneer Park

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During flood events the creek overtops banks causing flood damage to City public park facilities. This also results in short term closure of roadways and parking areas at Pioneer Park.

Project Description: Creek restoration to reduce flood potential, and sediment delivery to the stream channel from unstable banks.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $500,000

Potential Funding: TBD

Benefits (avoided Losses): Damage to park facilities during a major flood event could far exceed the costs associated with completing this project.

Schedule: 2020

Action 7. Nevada City Water Intake Diversion

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During high flows, water in the diversion intake is able to bypass the flow control gate and enter the pipeline, resulting an unregulated discharge into the pipeline to the City's water treatment plant. The raw water then flows into a small intermediate concrete structure known as the "rock box" that prevents large gravel and rocks to pass into the sedimentation box located just downstream of the rock box. During unregulated flows from the main diversion structure, water overflows the rock box, from washing out soils around the structure itself as well as the sedimentation box.

Project Description: The rock box needs to be modified with an overflow structure and pipe that prevents uncontrolled overflows, and routes the water directly back to the creek. The sedimentation box will also be improved for settlement of small debris that passes through the rock box. Water flows will be routed through the rock box and sedimentation box in series prior to release into the raw water pipeline which conveys water to the reservoir.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $100,000

Potential Funding: TBD

Benefits (avoided Losses): Extensive savings in filter media and water treatment processes for public water use during and after storm events.

Schedule: 2020

Action 8. Nevada City Wastewater Treatment Plant Headworks

Hazards Addressed: Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During large storm events, the plant headworks is inundated with heavy sewer flows with large rocks and pipe fragments in the influent. This large debris can hit and puncture the mechanical screens. There is a bypass channel around the mechanical screens but this is a bottleneck and sandbags and pumps are used to keep high flow contained.

Project Description: Provide a rock trap structure prior to the screens to allow heavy debris to fall out so it can be removed before damaging equipment. Increase the size and capacity of the bypass channel and headworks.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $200,000

Potential Funding: TBD

Benefits (avoided Losses): Extensive savings in filter media, screens and wastewater treatment processes during and after storm events.

Schedule: 2020

Action 9. Nevada City Chlorine Gas System Replacement at Wastewater Plant

Hazards Addressed: Hazardous Materials Leak

Goals Addressed: 1, 2, 3, 6

Project Description: Chlorine gas is used as part of the treatment process at the City of Nevada City Wastewater Plant. Chlorine gas is highly toxic and dangerous and an accidental release would place thousands of people at risk. The existing gas chlorine system at the wastewater treatment plants has the potential of a chlorine gas release and this potential would be mitigated by replacement with an alternative treatment system.

Issue/Background: Conversion of wastewater facilities to remove all gaseous chlorine chemical feed systems and replace this with a new storage tank and piping for Sodium Hypochlorite. This would also require converting the chemical storage building or relocating facilities to accommodate the new tank.

Other Alternatives: Liquid Chlorine (not recommended due to other hazardous risk factors)

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: TBD

Potential Funding: $800,000

Benefits (avoided Losses): Avoidance of catastrophic impact for chlorine gas release.

Schedule: 2019

Action 10. Nevada City Water Line Replacement

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: The typical life span of a water main is 75 to 100 years, depending on the materials, soils, and other factors. The City's water distribution system consists of approximately 20 linear miles of water mains, of which approximately 25,000 linear feet (or 4.8 linear miles) are greater than 140 years old. The aging pipe has minimized capacity for fire flow due to internal corrosion and carbuncles.

Project Description: Replace 4,000 linear feet (or 0.75 linear miles annually) of water main, including hydrants and water service connections for domestic and fire sprinkler use.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Environmental Review and CEQA Notice of Exemption to be completed by City staff.

Responsible Office: City of Nevada City

Priority (H, M, L): High

Cost Estimate: $6,000,000

Potential Funding: TBD

Benefits (avoided Losses): Fire prevention for residents and businesses within the City.

Schedule: 2017-2023

Annex C Town of Truckee

C.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Town of Truckee, a previously participating jurisdiction to the Nevada 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 Town. This Annex provides additional information specific to the Town of Truckee, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

C.2 Planning Process

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

Table C-1 Town of Truckee Planning Team

Name	Position/Title	How Participated
Sgt. Robert Womack	Emergency Preparedness Coordinator	Team leader and Town Coordinator for LHMP
Todd Landry, PE	Senior Engineer	Attended Meetings and provided information for the planning process
Drew Jack	Engineering Technician	Attended Meetings and provided information for the planning process

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the City integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2011 LHMP through other plans and programs shown in Table C-2.

Table C-2 2011 LHMP Incorporation

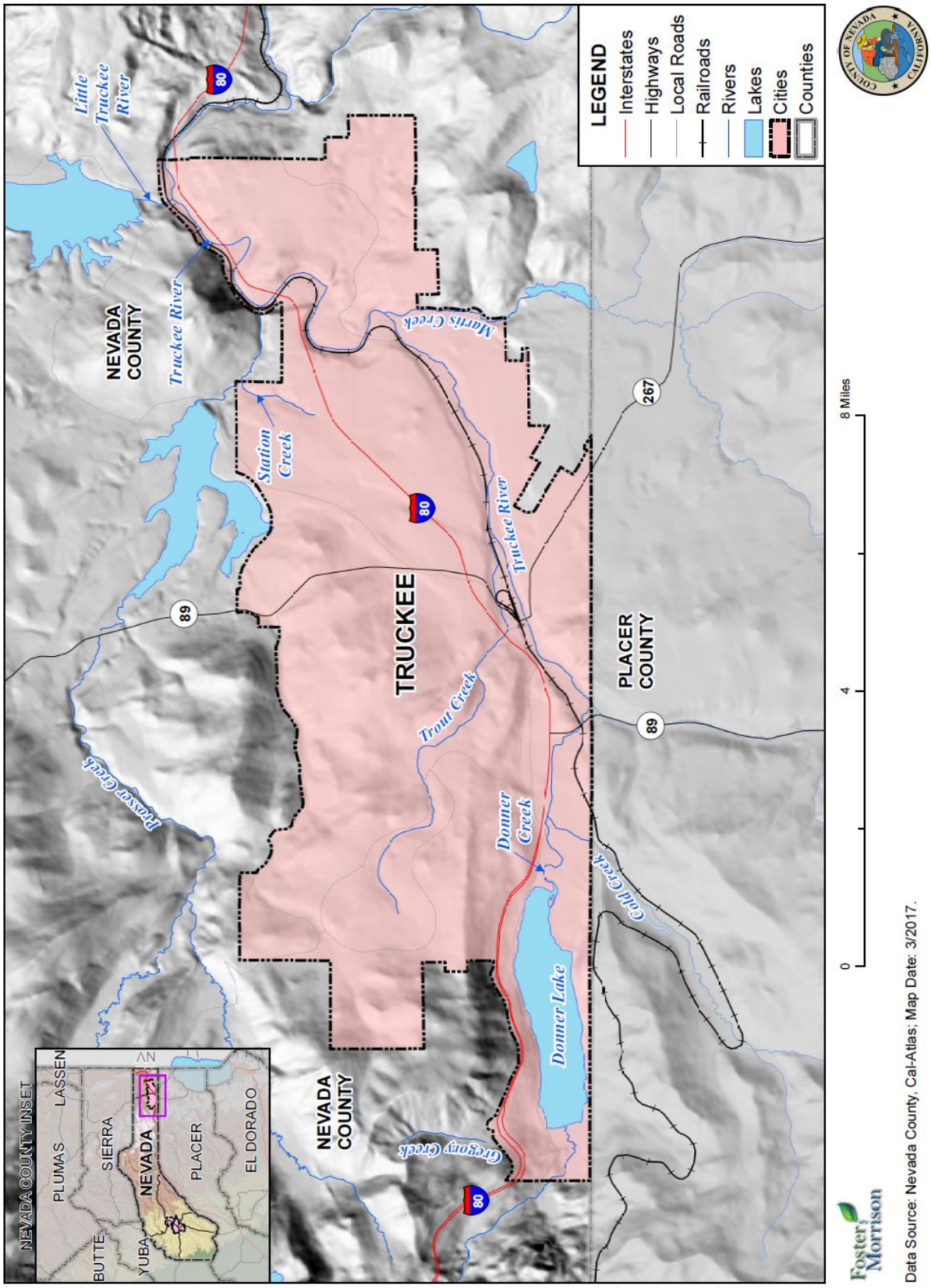
Planning Mechanism 2011 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
2025 General Plan	General Plan Safety Element used LHMP info.

Source: Town of Truckee

C.3 Community Profile

The community profile for the Town of Truckee is detailed in the following sections. Figure C-1 displays a map and the location of the Town of Truckee within Nevada County.

Figure C-1 Town of Truckee



C.3.1. Geography and Climate

Situated in a valley containing the Truckee River, Truckee is surrounded by prominent peaks and ridgelines of the Sierra Nevada and Carson mountain range. In Truckee itself, elevations range from 5,540 feet in the vicinity of Boca to nearly 7,500 feet in Tahoe Donner. Truckee has a dry-summer continental climate. Winters are extremely snowy and cold if not severe, while summers are cool-to-warm and dry, with occasional periods of intense thunderstorms. Its location near the Sierra Nevada crest at 5,899 ft provides conditions for winter storms to commonly deposit nearly a meter of snow in a 24-hour storm event and the occasional week-long storm event can deliver six to ten feet of snow.

A key element in the Town's physical character is its abundance of undeveloped open space areas and natural features including Donner Lake in the western part of the Town, and the Truckee River, which runs through the central portion of the Town. In addition to the Truckee River that drains Lake Tahoe to the south to Pyramid Lake to the northeast in Nevada, several other important creeks and streams flow through Truckee, notably Trout Creek, Alder Creek, Cold Creek, Donner Creek and Martis Creek. Open space areas in the Town are numerous, and encompass relatively flat alluvial areas in the eastern part of the town, and areas of steeper slopes and more varied terrain around Donner Lake, in the Tahoe Donner Area, and north of Interstate 80.

C.3.2. History

The Truckee area is rich in historic sites, reflecting its rich historic legacy. The Washoe, Maidu and Paiute people were the earliest occupants of the Truckee and Lake Tahoe Area, relying on the rich supply of fish, game and edible plants for food and sustenance. The earliest history of Truckee relates primarily to emigration from the east. The two most famous emigrant parties were the Murphy-Stevens-Townsend Party, some of whom encamped at Donner Lake (then called Mountain Lake) in the winter of 1844, and the Donner Party, who encamped at Donner Lake in the winter of 1846. The town initially grew up around the emigrant trail, and later, in 1868, began to grow around the station for the newly built Transcontinental Railroad. Logging was a major industry in the area until the 1920s. Winter sports began to be a major source of economic activity at the turn of the century, increasing greatly with the 1960 Winter Olympics at Squaw Valley Ski Resort. Today, Truckee continues to be a center for outdoor sports, both in the summer and in the winter, and is considered to be the gateway to the Lake Tahoe Region from the north.

C.3.3. Economy and Tax Base

Truckee's outstanding mountain environment, plentiful recreation opportunities, and strategic location along key transportation routes have contributed to the town's desirability as a place to live, work and visit. These assets have allowed Truckee to sustain strong growth in residential development and tourism, even as other communities in California have suffered from declining economic fortunes.

However, broader economic development in Truckee has lagged behind residential and tourist development. While local employment conditions and the economic vitality of the Downtown has shown improvement since the Town prepared the Economic Development Strategic Plan in 2001, Truckee continues to face economic challenges. These challenges stem in large part from the character of the local

economy, which is dominated by the retail and service sectors and by seasonal recreation-based tourism. Information on the taxable base for the City can be found in Section 1.4 of the Base Plan.

US Census estimates show economic characteristics for the Town of Truckee. These are shown in Table C-3 and Table C-5. Mean household income in the Town was $101,216. Median household income in the Town was $74,800 according to the the Town of Truckee Housing Study (2016).

Table C-3 Town of Truckee Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	29	0.3%
Construction	1,221	14%
Manufacturing	224	2.6%
Wholesale trade	74	0.8%
Retail trade	628	7.2%
Transportation and warehousing, and utilities	359	4.1%
Information	102	1.2%
Finance and insurance, and real estate and rental and leasing	676	7.7%
Professional, scientific, and management, and administrative and waste management services	1,070	12.3%
Educational services, and health care and social assistance	1,495	17.1%
Arts, entertainment, and recreation, and accommodation and food services	1,991	22.8%
Other services, except public administration	512	5.9%
Public administration	352	4.0%

Source: US Census Bureau American Community Survey 2011-2015 Estimates

Table C-4 Town of Truckee Income and Benefits

Income Bracket	Population	Percent
<$10,000	210	3.3%
$10,000 – $14,999	170	2.7%
$15,000 - $24,9999	294	4.6%
$25,000 – $34,999	494	7.8%
$35,000 – $49,999	712	11.2%
$50,000 – $74,999	1,106	17.4%
$75,000 – $99,999	1,168	18.4%
$100,000 – $149,999	1,189	18.7%
$150,000 – $199,999	475	7.5%
$200,000 or more	540	8.5%

Source: US Census Bureau, 2010

Truckee's visitor-based economy is highly seasonal in nature, which generates large annual fluctuations in demand for goods and services and in the staffing requirements of local employers. Annual retail business sales patterns reflect the highly seasonal nature of the Truckee economy. This creates challenges for employers in sustaining a viable business on a year- round basis, and in managing human resources. Local residents that desire full-time permanent employment can experience a shortage of such jobs locally. Further, many of the jobs associated with the recreation, retail, and service employment sectors that dominate the local economy do not provide wages at levels commensurate with local housing costs, contributing to the growing disparity between the cost of housing and its affordability to the local work-force. The following are some of the major employers in the area including but not limited too: Boreal Mountain Resort, Clear Channel, Sierra Nevada College, Safeway, The Lodge at Tahoe Donner and Tahoe Forest Hospital.

C.3.4. Population

The California Department of Finance estimated the January 1, 2016 total population for the Town of Truckee was 15,370.

C.4 Hazard Identification

Truckee's planning team identified the hazards that affect the Town and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Truckee (see Table C-5).

Table C-5 Town of Truckee—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Significant	Occasional	Limited	Low	High
Avalanche	Limited	Occasional	Negligible	Low	Low
Climate Change	Extensive	High Likely	Negligible	High	High
Dam Failure	Significant	Unlikely	Limited	Medium	Low
Drought and Water Shortage	Limited	Unlikely	Critical	Low	Low
Earthquake	Significant	Occasional	Limited	High	Low
Flood: 100/500–year	Significant	Occasional/ Unlikely	Critical	High	Medium
Flood: Localized/Stormwater	Significant	Likely	Limited	High	Medium
Hazardous Materials Transportation (interstates, railroads, pipelines)	Significant	Occasional	Critical	High	Low
Landslide, Debris & Mud Flows	Limited	Occasional	Limited	Medium	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Limited	Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Cold, Snow, and Freeze	Significant	Likely	Limited	High	Medium
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Extensive	Occasional	Negligible	Medium	High
Subsidence	Limited	Unlikely	Negligible	Low	Low
Volcano	Limited	Unlikely	Negligible	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Extensive	Likely	Critical	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

C.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Truckee's hazards and assess the Town's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the Town is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the Town and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

C.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section C.5.2 includes a hazard profile/problem description as to how each medium or high significant hazard affects the Town and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

C.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Truckee's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Nevada County Assessor's Office is based on the 2016/2017 Assessor's data. The methodology used to derive land values, property values, and estimated contents values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the Town. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table C-6 shows the 2016/2017 Assessor's values (e.g., the values at risk) broken down by property type for the Town of Truckee.

Table C-6 Town of Truckee – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	46	5	$3,086,625	$468,704	$468,704	$4,024,033
Commercial	385	272	$134,246,598	$222,443,276	$222,443,276	$579,133,150
Government	149	2	$7,434,014	$116,760	$116,760	$7,667,534
Industrial	34	27	$15,021,422	$16,807,812	$25,211,718	$57,040,952
Institutional	13	9	$681,032	$4,770,691	$4,770,691	$10,222,414
Miscellaneous	64	1	$1,334,864	$27,000	$27,000	$1,388,864
Residential	15,427	12,116	$1,463,728,142	$4,024,518,201	$2,012,259,101	$7,500,505,444
Total	**16,118**	**12,432**	**$1,625,532,697**	**$4,269,152,444**	**$2,265,297,250**	**$8,159,982,391**

Source: Nevada County 2016/2017 Parcel/Assessor's Data

Population and Special Populations at Risk

General Population

As previously described in the community profile, based on California Department of Finance estimates, the current January 1, 2016 total population for the Town of Truckee was 15,370, all of which are potentially vulnerable to hazard events.

Special Populations

The Town Planning Team noted the following special populations who reside in the Town:

- Elderly and Special Needs – Truckee Donner Senior Apartments
- 37 bed Long Term Care Facility at Tahoe Forest Hospital
- Mobile Home Parks: Coachland RV Park, Village Green Mobile Home Park, Donner Creek Mobile Home Park, Sunset Inn 1,2, and La Bamba
- Transient and Homeless Populations
- Second homes that may sit empty for portions of the year.

Critical Facilities and Infrastructure

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

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health 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, (3) Hazardous Materials Facilities.

- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
  - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers
  - ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
  - ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.
  - ✓ Designated Emergency Shelters.
  - ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio and other emergency warning systems.
  - ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power and gas).
  - ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.
  - ✓ Transportation Lifeline Systems - Airports, helipads, and critical highways, roads, bridges and other transportation infrastructure (Note: Critical highways, roads, etc. will be determined during any hazard-specific evacuation planning and are not identified in this plan).
- **At Risk Population Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release of hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property.

A fully detailed list of all critical facilities in the Planning Area can be found in Appendix F. An inventory of critical facilities in the Town of Truckee from Nevada County GIS is shown on Figure C-2 and detailed in Table C-7. Note that only Category 1, Essential Services, and Category 2, At-risk Populations were available in mapped form and are thus included on Figure C-2 and Table C-7. Category 3, Hazardous Materials Facilities, was only available in table format. Due to the large number of these facilities, they are included in Table F-2 in Appendix F. Also to note, the mapped layer is based on best available data and may not reflect a comprehensive inventory of critical facilities in the Town based on the current definition; this is a work in progress.

Figure C-2 Town of Truckee– Critical Facilities

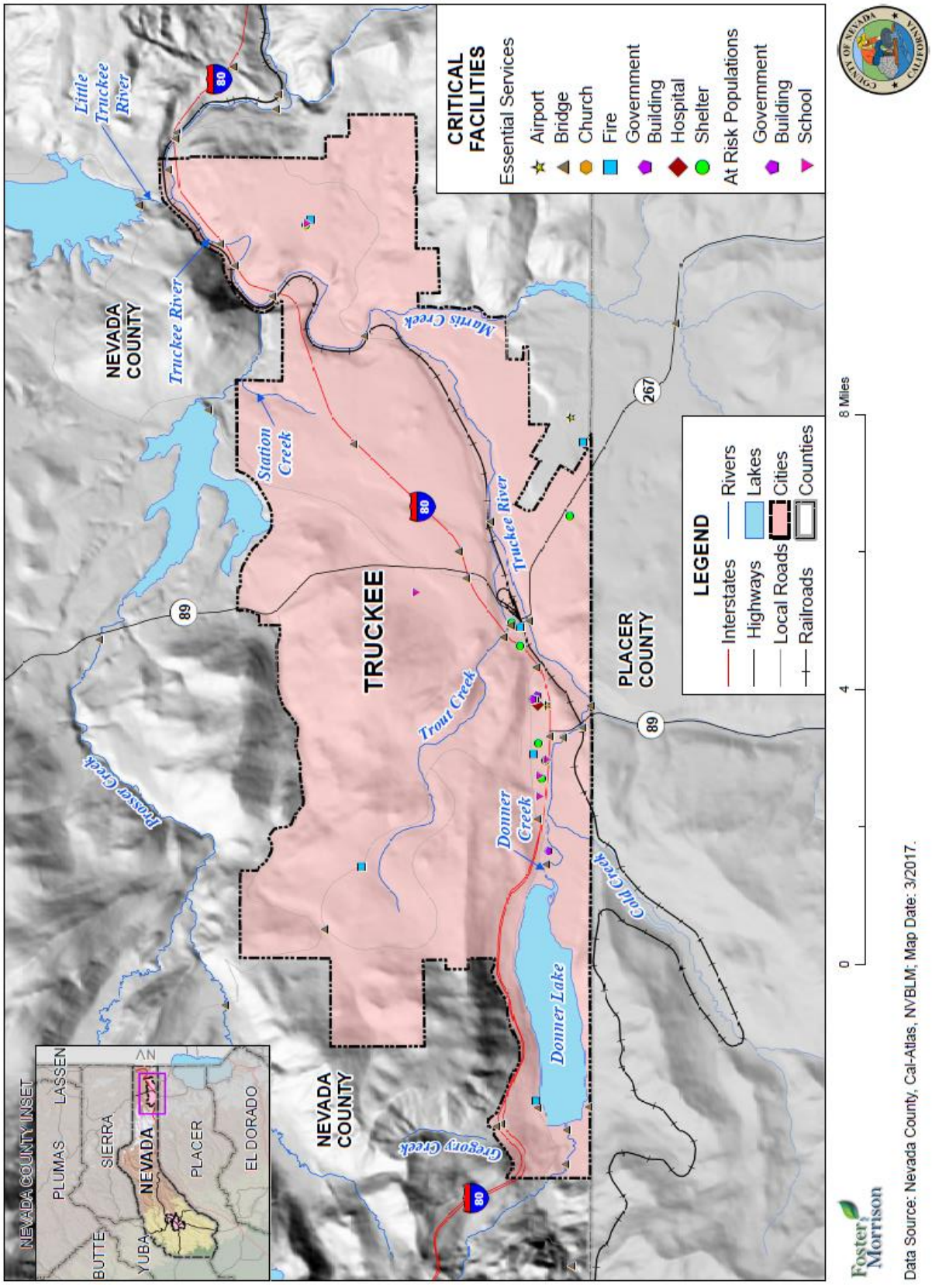


Table C-7 Town of Truckee – Critical Facilities Inventory

Critical Facility Category	Critical Facility Type	Critical Facility Count
Essential Services	Airport (Located in County)	1
	Bridge	31
	Church	4
	Fire	7
	Government Building	38
	Hospital	1
	School	8
	Shelter	7
	Total	**97**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	1
	School	8
	Shelter	15
	Total	5
Grand Total		**118**

Source: Nevada County GIS

*In the At risk populations category, the critical facility count is a total of 15 facilities in the Town of those 15, 7 facilities are daycare centers.

Natural Resources

The Town of Truckee has a variety of natural resources of value to the community:

Truckee's landscape can be conceptualized as a series of distinct terrain areas, defined both by topography and vegetation. They include the high mountain peaks and ridges of the Sierra Nevada and Carson Range that lie outside the Town limits but are visible from many places within Truckee; the forested uplands lying within and bordering the Town; meadowlands; and the valleys of the Truckee River and Martis Creek watersheds.

The mountains surrounding Truckee are a dominant landscape element in both scale and mass, dwarfing the town's built environment. Distinct ridgelines create a sharp contrast with the sky, draw the eye and reinforce the sense of the town nestled in the Truckee River Basin, a refuge from the high, rugged mountain environment. The region's mountains and ridgelines are high in scenic quality and visual interest, thickly forested at lower elevations and rocky and often snow-capped at their peaks.

Forested upland areas within the Town limits provide definition to the town's form, and a transition to the more gentle landscapes of the Truckee River Valley and meadowland areas. Forested uplands are primarily concentrated in the north and west portions of the town, and include Alder Hill and upland areas south of Prosser Lake, Tahoe Donner's uplands, the steep slopes north of the Interstate 80 (I-80) corridor, and, on a more modest scale, McIver Hill and Hilltop in the Downtown area. More moderate terrain extends through Truckee to the east and southeast, with a landscape best described as open meadows or treed lowlands, consisting of rolling terrain, scattered trees and denser stands, and a generally more expansive visual character.

Many open space areas are important because they provide habitat for signifi- cant biological resources. While frequently encompassing wide areas and pristine open space, important habitat open space can also take a linear form, such as a river corridor or wildlife migration route; or can exist in smaller pockets in more developed open space areas. Biological resource open space areas also frequently possess a high level of scenic value, and often serve as a venue for low-impact active and passive recreation. The degree of human access can vary depending on the nature and sensitivity of those resources, but development is generally secondary to the goals of habitat preservation, and typically limited to facilities for passive recreational use.

The Truckee Basin and adjacent upland and mountain areas are rich in bio- logical resources, both within the town and in the surrounding region. Several special status habitats, plant species, and wildlife species have been identified or have the potential to occur in the Truckee area. The General Plan EIR includes additional information and mapping of special status species that are known or suspected to occur in the Truckee area, as identified by the California Natural Diversity Database (CNDDB). Truckee's important bio- logical resource open space includes both vegetation and habitat areas, as well as wildlife corridors and migration routes that traverse the town.

Vegetation and Habitat Areas. Several important vegetation and habitat areas exist in Truckee and its surrounds. These vegetation and habitat areas host a wide range of flora and fauna, some of which are designated as special status species, reflecting the high level of biodiversity present in the entire Tahoe region.

Important habitat types found within the town and its surrounding area include Jeffrey Pine Forest and Great Basin Sage Scrub. Other important habitat is associated with riparian, aquatic and wetland resources. These include the Truckee River, the most prominent waterway in Truckee, and supporting riparian habitat; creeks and waterways such as Donner Creek, Martis Creek, Gregory Creek, Alder Creek, Summit Creek, Cold Creek, and Trout Creek, all of which are part of the Truckee River watershed; and open waters such as Donner Lake, and Prosser and Boca Reservoirs. Montane Meadow habitat, which is dependent on a perennial or seasonal water source, is also associ- ated with some of these aquatic resources.

Wildlife Corridors and Deer Migration Routes. Wildlife movement corridors are another important component of the natural environment in Truckee. These corridors generally reflect areas of undisturbed, con- tinuous vegetation, such as riparian areas along the Truckee River and streams that provide shelter and food sources for resident and migratory wildlife species.

Truckee's riparian, shrub communities, and forested areas are important habitats for local and migratory deer populations, referred to as the Loyalton-Truckee Herd. The Verdi sub-unit of the herd migrates annually in the spring from Nevada to the Martis Valley, utilizing the Truckee River and Interstate 80, sometimes making use of the Prosser Village and Fi- berboard undercrossings.

Managed Resource Areas. This category of open space includes land under public or private ownership in which uses focus on the land's resource values from activities such as cattle grazing, forestry, or mineral extraction. Generally minimally developed and covering an extensive area, resource open space often also serves recreational uses, such as hiking, horseback riding, fishing, camping or off-road vehicle use. Although important scenic resources can be found within these areas, some of the particular resource extraction activities, such as timber clear- cutting or large scale aggregate mining may create an undesirable visual character.

Managed resource open space in Truckee includes that associated with the following resources:

Mineral Resources. A number of important mineral resource areas, as defined by the State of California, exist in Truckee. Mineral resources are generally associated with alluvial deposits along the length of the Truckee River Valley, although some mineral resources are associated with vol canic features, such as the Hirschdale cinder cone. Alluvial aggregates consist of gravel, sand and broken stone that are used in production of concrete and asphalt; cinders are also used for building and road construc- tion materials. State law requires that the General Plan include policies for important mineral resource areas that address the conservation and development of identified mineral deposits, balance the value of these de- posits against competing land uses, and minimize the impacts of mining activities.

An example of the need to balance preservation of important mineral resources with other uses can be found in the case of the mineral areas mapped in the Downtown and Gateway areas. Since development of mining operations would be entirely incompatible with existing development in these places, the General Plan does not directly support the protection of mineral resources in these areas, and instead focuses on places where mining would be a compatible land use, such as the TTSA/TSD lands in southeast Truckee.

Grazing and Forestry Resources. Potential grazing and forestry re- source open space generally coincides with rangeland vegetation areas and forest land, respectively. Despite the potential for these uses, there is no active grazing taking place in Truckee today, and no commercial forestry, although some timber harvesting for forest management does occur.

Historic and Cultural Resources

As a community, Truckee is rich in historic resources. Primarily focused in the Downtown, Truckee's historic buildings and sites reflect the town's dynamic past, and its critical role in the history of California and the west. A wide range of residential, commercial, civic and industrial buildings, many dating from the late 19th and early 20th centuries are found in Truckee, representing a diversity of architectural styles. The Donner Memorial State Park, east of Donner Lake, is dedicated to preserving the history of the Over- land Emigrant Trail and the Donner Party tragedy, a key and symbolic chapter in the history of the West's early settlement.

Documentation of the presence of historic and prehistoric archaeological resources in Truckee is relatively limited, and much of the Town's area remains unsurveyed. In 1996, it was estimated that only between eight and twenty percent of the Town had been inventoried for cultural resources, as records associated with these surveys indicate more than 100 historic, prehistoric and historic-prehistoric sites, diverse Native American artifacts and sites from the Martis and other cultures, 19th century charcoal production sites, Chinese work camps, and linear sections of the Overland Emigrant Trail and the Transcontinental Railroad.

Although a number of archaeological sites are known in Truckee, their specific locations are generally kept confidential in order to avoid disturbance. The Central Information Center in Sacramento provides site location data and/or the contents of surveyed sites only to licensed archaeologists, who are then prohibited from disclosing this information to the public. California Government Code Section 6254.10 exempts archaeological site information from the California Public Records Act, which requires that public records be open to public inspection.

Cultural artifacts tend to be unevenly distributed across the landscape, generally occurring in concentrations near areas of human activity linked to specific environmental conditions, such as proximity to water, food sources and productive natural resources. Almost the entire town is considered moderately to extremely sensitive in terms of cultural resources, with areas of moderate terrain, close to water sources.

Historical properties and resources in the Town of Truckee are identified in Table C-8.

Table C-8 Town of Truckee – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City
Boca Dam (N947)	X			3/25/1981	Truckee
Boca Ice Harvest Site (P610)			X	3/2/1983	Truckee
Donner Monument (Or) Pioneer Monument (134)		X		1/31/1934	Truckee
First Transcontinental Railroad-Truckee (780)		X		11/20/1962	Truckee
Kruger House (N1115)	X			6/17/1982	Truckee
Truckee Jail (P193)			X	5/19/1971	Truckee
Western Skisport Museum (P192)			X	5/19/1971	Truckee

Source: California Department of Parks and Recreation Office of Historic Preservation, http://ohp.parks.ca.gov/

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

Growth and Development Trends

According to the Town's General Plan the growth projections for the 20-year planning cycle, based on recent historic growth rates, estimate that there will be approximately 17,800 housing units in Truckee by 2025, and 20,082 unit at buildout of the General Plan, which is estimated to occur in 2030.

Truckee has seen slow and steady growth. Truckee grew at a slower pace than Nevada County and the region, with a growth of 4.4 percent during the 1990 to 2000 decade, as compared to 17.5 and 13.8 percent for Nevada County and the state respectively. Truckee has seen mostly increasing growth rates as shown in Table C-9, with some loss in population in recent years.

Table C-9 Population Trends in the Town of Truckee

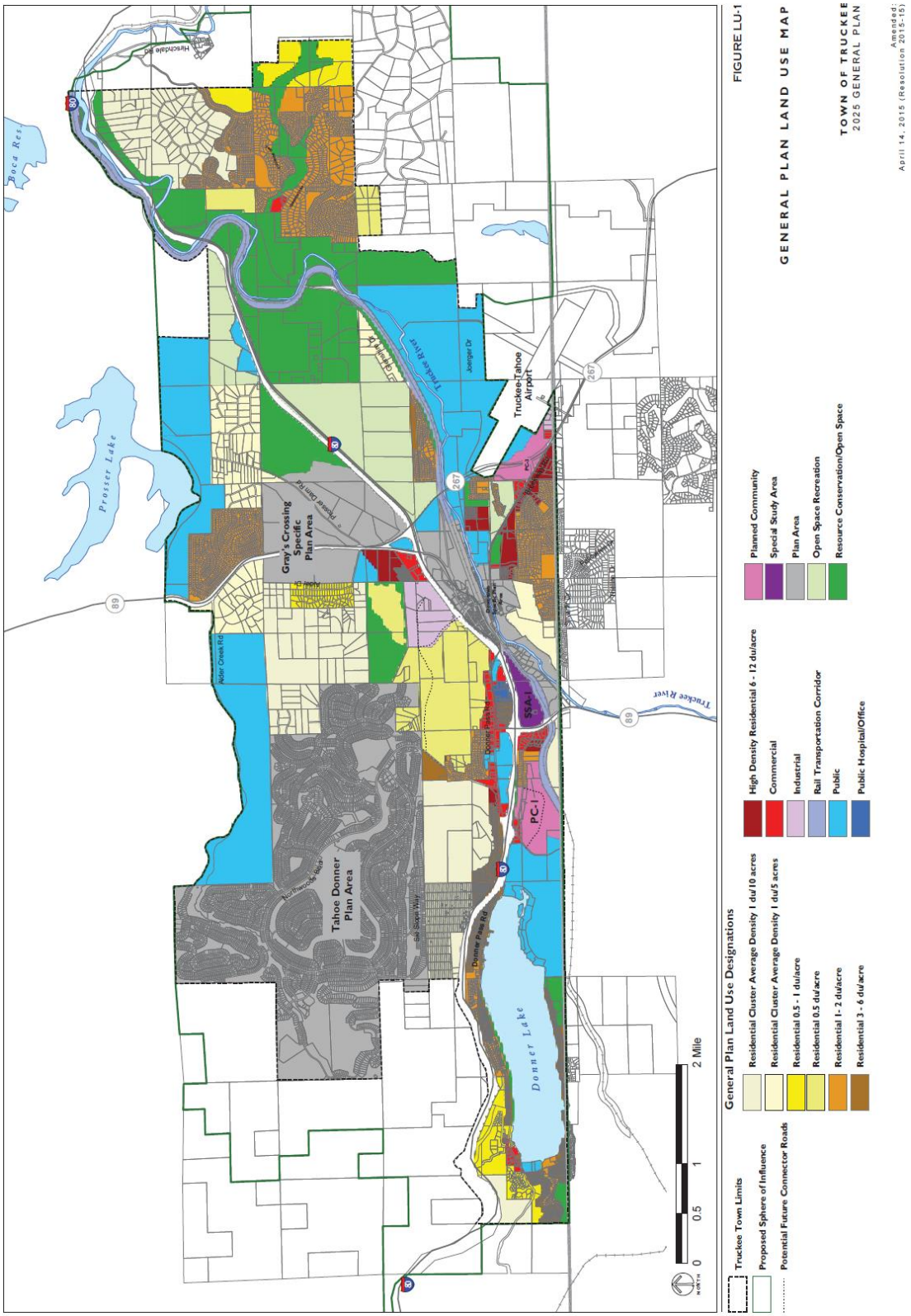
Year	Town of Truckee
1990	3,484
2000	13,967
2010	16,180
2017	15,370

Source: California Department of Finance

Land Use

Existing land use patterns in Truckee are reflective of the historic development patterns of the community, and the legacy of land use planning that occurred under Nevada County's jurisdiction, prior to Truckee's incorporation. About 30% of the land within the Town limits is vacant or undeveloped, and another 25 % is in open space uses, including parks and recreation areas, Donner Lake, golf courses, permanent open space easements, and forestry lands. Residential uses comprise about 25 percent of land within the town limits, accommodating about 10,800 housing units. Of this, the vast majority is single family housing. Industrial uses comprise a very small percentage of total land use (approximately 80 acres) in Truckee. The largest industrial areas in Truckee are located around the Tahoe-Truckee Airport and in the newer Pioneer Commerce Center along Pioneer Trail north of I-80. Existing (non-open space) public/institutional land uses in Truckee include schools, government and utilities offices and facilities, the Tahoe Forest Hospital, and a number of churches and religious institutions. Other major land uses not included among those dscribed above include land dedicated to infrastructure such as roads and the railway, which accounts for approximately 13 % of all land within the Town limit, and the mining operations in the southeast part of Truckee, which cover about 200 acres. The land use map for the Town is shown on Figure C-3.

Figure C-3 Town of Truckee – Land Use Map



Source: Town of Truckee 2025 General Plan Land Use Element

Development since 2011 Plan

As shown in Table C-10, Truckee has seen a loss of 5.1% of population between 2010 and January 1, 2016.

Table C-10 Town of Truckee Population Changes Since 2011

Year	Population	Change	% Change
2010[1]	16,180	–	–
2016[2]	15,370	-810	-5.1%

Source: [1]US Census Bureau, [2]California Department of Finance

The Town Building Department tracked total building permits issued since 2011 for the Town. These are tracked by total development, property use type, and hazard risk area. These are shown in Table C-11 and Table C-12. All development in the identified hazard areas, including the 1% annual chance floodplains, and moderate or higher wildfire risk areas, were completed in accordance with all current and applicable development codes and standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the Town to identified priority hazards.

Table C-11 Town of Truckee Total Development Since 2011

Property Use	2011	2012	2013	2014	2015	2016
Residential	1	1	12	~74	~100	
Commercial	0	0	0	0	1	
Industrial	-	-	-	-	-	
Other	-	-	-	--	-	
Total	**1**	**1**	**12**	**74**	**101**	

Source: Town of Truckee Building Department

Table C-12 Town of Truckee Development in Hazard Areas since 2011

Property Use	1% Annual Chance Flood	Avalanche Prone Area	Landslide Susceptibility Area	Wildfire Risk Area[1]	Other
Residential	~1 (FEMA Zone AE)			Nearly All	
Commercial	0			Nearly All	
Industrial	0			Nearly All	
Other	0			All	
Total	**1**			**Nearly All**	

Source: Town of Truckee Building Department

[1]Moderate or higher wildfire risk area

Future Development

There are several development projects currently in process in the Town of Truckee:

- **Pollard Station** - An age-restricted senior housing project proposed for the Hilltop Master Plan area in Truckee. The project includes a variety of housing options for seniors, from fully independent living progressing to memory care.
- **Truckee Springs** - Currently in the early stages of review, this project is located on 26.2 acres of land at the western of South River Street, along the Truckee River. Plan options include 40 single family residential units, or 80 multi-family units, or a 120-unit hotel. The applicants are currently preparing a master plan for Town review.
- **Canyon Springs** – Located east of current Glenshire subdivision presently going through EIR and Planning Commission review. 203 lots are planned for this site.
- **Coldstream Specific Plan (PC-1)** - A planned community located on Coldstream Road on the Teichert property between Donner Memorial State Park and The Boulders Condominiums.
- **Truckee Railyard** - The Town of Truckee has approved the Truckee Railyard Master Plan, a large 75-acre multi- phase project just east of Downtown Truckee. The proj- ect is located on former railroad property that previously housed a large lumber mill. The project will provide a variety of housing, commercial and light industrial uses, func- tioning as an extension of the existing Commercial Row downtown area.
- **Pioneer Commerce Center -** This 19-acre light industrial/commercial development complex is located on Pioneer Trail and has had significant construction occur already with a variety of tenants (Clear Capital, Pioneer Boat Storage, Full Belly Deli, EventMasters, etc...). There is remaining vacant land that has been approved for development in an additional phase.

More general information on growth and development in Nevada County as a whole can be found in "Growth and Development Trends" in Section 4.3.1 Nevada County Vulnerability and Assets at Risk of the Base Plan.

C.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table C-5 as high or medium significance hazards. Impacts of past events and vulnerability of the Town to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Nevada County Planning Area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the Base Plan. In general, the most vulnerable structures are those located within the floodprone areas, WUI areas, unreinforced masonry buildings, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the Town to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.

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

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, natural resources, historic and cultural resources, and future development.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing. According to an article in the Sierra Sun, Town planners want to move Truckee toward investing further in sustainable energy and measures it can take to reduce emissions caused by tourists and residents. The Town is moving forward in the development of a Climate Change Action Plan and although it is not complete, there are many things being done that are leading edge.

Past Occurrences

Climate change has never been directly linked to any declared disasters. The Town of Truckee did not note any past occurrences of climate change.

Vulnerability to Climate Change

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

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Nevada County Planning Area is part of:

- Temperature increases

- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

The Town of Truckee in general 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. For example, sea level rise may disrupt economic activity and housing in coastal communities, resulting in migration to inland urban areas. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact the Nevada County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. In addition to population increases, wildfires could worsen, due to drought and heat conditions.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

There are several dams that could potentially affect the Town of Truckee, those are the Prosser Reservoir, Boca Reservoir and Stampede Reservoir, which are located just north of Truckee. A smaller dam is also located at Donner Lake, and another at Martis Creek Lake, south of the town. While each of these dams has the potential to fail and to release a volume of water that could result in severe short-term flooding, Truckee would not be significantly affected by potential inundation.

Past Occurrences

There have been no disasters declarations related to dam failure in Truckee. The HMPC noted no past dam failures.

Vulnerability to Dam Failure

Based on recent modeling completed by the US Bureau of Reclamation, maximum outflow from a failure of the Prosser, Boca and Stampede dams would back-flow upstream into the Truckee River about two miles from their associated confluences, and would be contained in the main channel of the Truckee River between three and five miles from their source, depending on which dam provides the source.

Failure of the Prosser Dam would result in backflow to about half a mile down- stream of the Truckee sewage plant (about 3.5 miles from Downtown Truckee). It is anticipated that a segment of I-80 and the railroad, near the confluence of Prosser Creek in the Truckee River Canyon would be inundated by such a failure.

Failure of the Stampede Dam or Boca Dam would result in backflow to the confluence of Prosser Creek, about five miles south of Downtown. Inundation from dam failure at Donner Lake is not considered to pose a serious threat to Truckee, given the relatively small volume of water contained in Donner Lake (approximately 9,500 acre feet, compared to about 41,000 acre feet in Boca Reservoir alone). The California Department of Water Resources is undertaking improvements to the Donner Lake Dam, which should provide additional safeguards against seismically-induced failure.

The Martis Dam has the potential, depending on water level, to inundate the sewer treatment plant serving Truckee and North Tahoe. Martis Dam is ranked as one of the top 6 dams in the U.S. to have an issue. It is intentionally being held low by the Army Corp of Engineers (Dam Owner) due to seepage along the edges of the dam. While the major threat is to Reno, a failure of the dam would likely cut-off the Glenshire subdivision and at just about any level of water being held, inundate the sewage treatment Plant. In addition to the seepage, the spillway is inadequate, leading to uncontrollable fill issues in heavy run-off and if that wasn't enoufh, recently discovered seismic issues. The USACE noted that:

> *The Martis Creek Project is located on Martis Creek, a tributary of the Truckee River, about 32 miles southwest of Reno, Nev. It is comprised of an earthfill dam, creating a reservoir with a gross storage capacity of 20,391 acre-feet. The project provides flood risk management and recreational benefits, and also retains the design purpose of future water storage. A population of approximately 72,000 is within the inundation zone for Martis Creek Dam, and includes large portions of the cities of Reno, Sparks and Truckee Meadows. The dam is currently experiencing underseepage and other failure patterns that lead experts at the Corps of Engineers to believe that a large flood event could potentially lead to failure of the dam. This, along with the presence of a large population downstream constitutes a high "risk." In 1995, the seepage issue at the dam was discovered to be serious during a test filling of the reservoir. In 2002, a spillway adequacy study was performed for the Martis Creek Dam, identifying the spillway capacity inadequacy. In 2005, the Corps' Screening Portfolio Risk Assessment identified Martis Creek as one of the top 6 Corps of Engineers dams in the nation in terms of risk. This was due to the potential loss of life in the highly populated Reno-Sparks area and the unacceptably high probability of failure of the dam due to seepage.*

Future Development

Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur.

Earthquake

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Faults located near Truckee include the Mohawk Valley Fault, the southern section of which lies approximately 20 miles northwest of Truckee in Sierra County, and the Dog Valley Fault, which extends in from Dog Valley (approximately 20 miles northeast of Truckee) southwest to near Donner Lake. Several small trace faults are also located within the Town limits. None of these faults are designated as Alquist-Priolo Special Study Zones, which identify fault areas considered to be of greatest risk in the state. The Polaris Fault, a relative new fault is being monitored by the Town.

A 1986 study by the California Bureau of Reclamation concluded that the Dog Valley Fault and Mohawk Valley Faults could result in a maximum credible earthquake of 6.75 and 7.0 magnitude respectively.

Past Occurrences

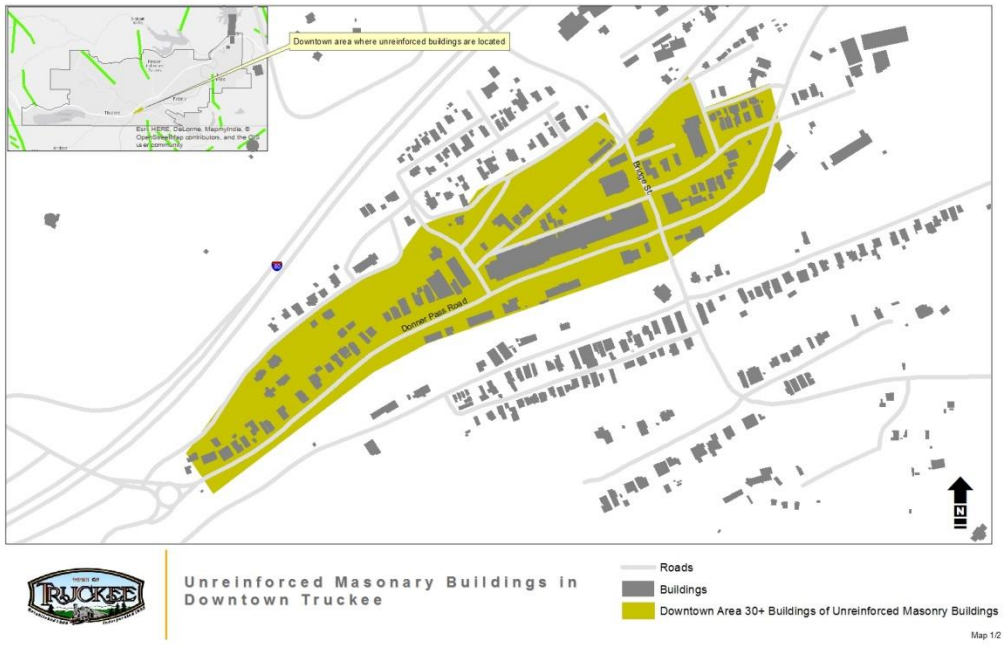
There has been seismic activity felt in Truckee in recent years, including a magnitude 6+ earthquake in 1966, a magnitude 3.6 earthquake in 1998, a magnitude 4.5 earthquake, centered six miles south of Truckee, in June of 2004, and a swarm of 28 earthquakes with largest being 3.9 in June, 2017, but there have been no disaster declarations in the Town.

Vulnerability to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. Truckee is subject to some seismic activity, although this risk is relatively low compared to other places in the State.

There are approximately 30 buildings primarily located within the Historic Downtown that are unreinforced masonry and are vulnerable to an earthquake. These have been mapped by the Town and are shown on Figure C-4.

Figure C-4 Town of Truckee – Earthquake Faults and Unreinforced Masonry Buildings



Source: Town of Truckee

Future Development

Although new growth and development corridors would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

Flood: 1% and 0.2% Annual Chance (100/500-Year)

Likelihood of Future Occurrence–Occasional/Unlikely
Vulnerability–High

Hazard Profile and Problem Description

Flooding is a serious concern in several parts of Truckee, particularly within those areas identified as falling within Federal Emergency Management Agency (FEMA) 1% annual chance (100-year) flood zones. These include areas around the Donner Lake shore, along Donner Creek, lower Trout Creek, and Cold Creek, and along the Truckee River. Along the Truckee River, the 1% annual chance flood zone extends as far as 300 feet from the banks of the river.

Past Occurrences

Flooding in the Town of Truckee has been a recurring problem, occasionally leading to flood damage to businesses and residents in the impacted areas. Past, current, and proposed flooding abatement activities have been and remain focused on keeping the run-off water safely flowing through these developed areas.

There was flooding along West River Street during the flood of 1997. Of more concern in terms of mitigation however, has been the recurrent flooding (1995, 1997, and 2005) along Gregory Creek, Trout Creek, along Donner Lake Road and South Shore Road.

There was flooding in 1997 creating numerous road issues, flooding in the downtown area and issues with Donner Creek near SR-89. Localized Flooding in 2006 and the most recent storms in 2017 receved both a state and federal declaration for the flooding.

Figure C-5 Flooding in Truckee

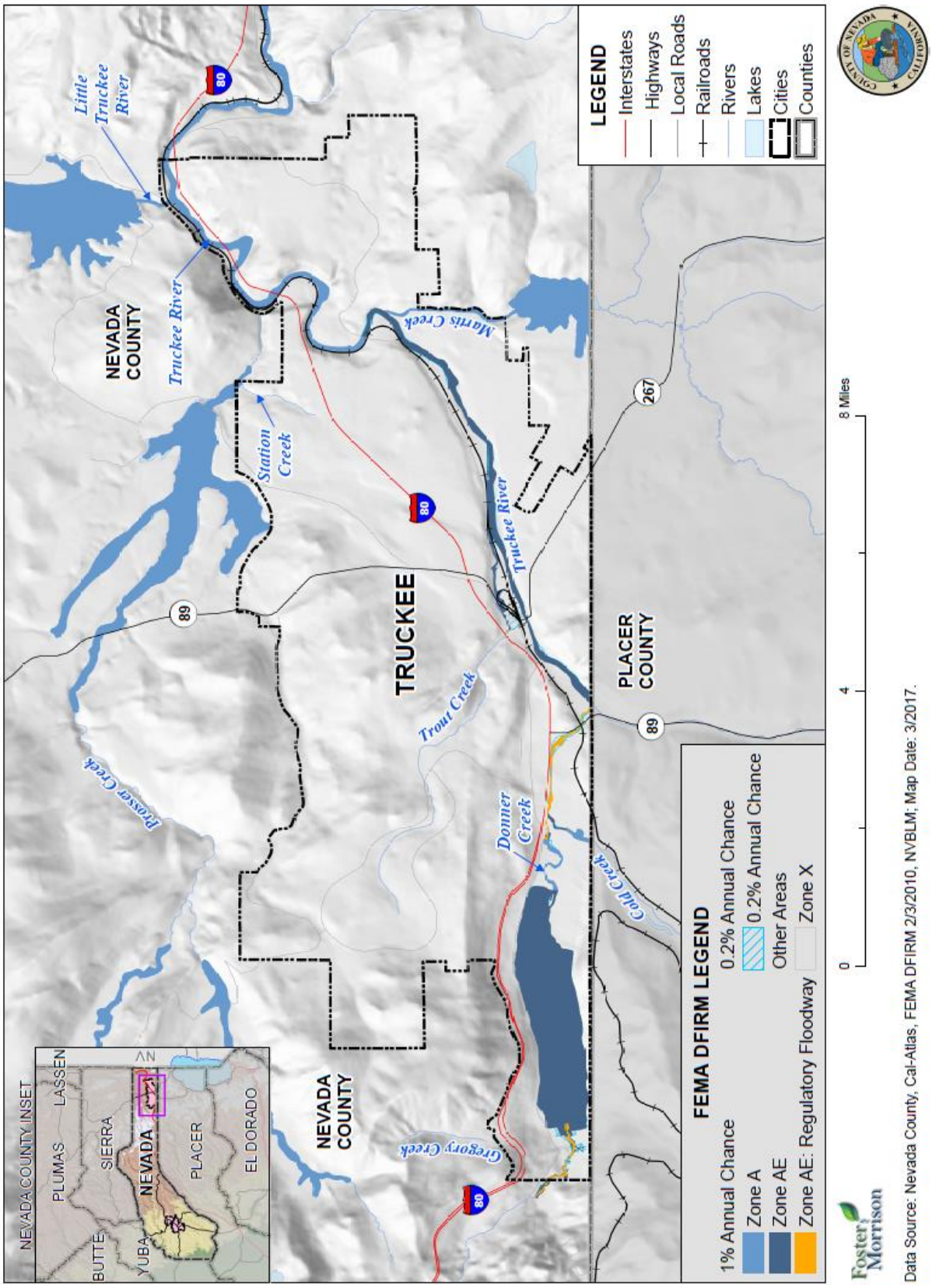
Source: Town of Truckee

Vulnerability to Flooding

FEMA Flood Zones

A portion of the Town is located inside of the 1% annual chance flood zone as defined by the Federal Emergency Management Agency (FEMA). This is seen in Figure C-6.

Figure C-6 Town of Truckee – FEMA DFIRM Flood Zones



Values at Risk

GIS was used to determine the possible impacts of flooding within the Town of Truckee. The methodology described in Section 4.3.8 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table C-13 shows the property use, improved parcel count, improved values, estimated contents (using the method described in Table 4-35 in Section 4.3.1), and total values estimated loss of parcels that fall in a floodplain in the Town.

Table C-13 Town of Truckee – Count and Improved Value by Property Use and Detailed Flood Zone with Contents Replacement Values

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Zone A (1% Annual Chance Floodplain)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	8	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	1	0	$27,754	$0	$0	$0
Residential	4	3	$270,881	$249,773	$124,887	$374,660
Total	**13**	**3**	**$298,635**	**$249,773**	**$124,887**	**$374,660**
Zone AE (1% Annual Chance Floodplain)						
Agricultural	3	1	$262,886	$4,064	$4,064	$8,128
Commercial	7	4	$5,122,129	$1,197,437	$1,197,437	$2,394,874
Government	6	0	$0	$0	$0	$0
Industrial	2	2	$680,791	$419,469	$629,204	$1,048,673
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	4	0	$21,789	$0	$0	$0
Residential	163	139	$34,382,430	$52,036,077	$26,018,039	$78,054,116
Total	**185**	**146**	**$40,470,025**	**$53,657,047**	**$27,848,743**	**$81,505,790**
Zone AE Floodway (1% Annual Chance Floodplain)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	2	1	$1,173,400	$925,000	$925,000	$1,850,000
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	25	15	$1,429,394	$3,108,961	$1,554,481	$4,663,442

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Total	**27**	**16**	**$2,602,794**	**$4,033,961**	**$2,479,481**	**$6,513,442**
1 % Annual Chance Grand Total	**225**	**165**	**$43,371,454**	**$57,940,781**	**$30,453,110**	**$88,393,891**
Shaded X – 0.2% Annual Chance						
Agricultural	0	0	$0	$0	$0	$0
Commercial	12	9	$2,240,364	$4,611,207	$4,611,207	$9,222,414
Government	5	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	2	2	$48,419	$135,634	$135,634	$271,268
Miscellaneous	0	0	$0	$0	$0	$0
Residential	68	59	$3,844,848	$13,574,804	$6,787,402	$20,362,206
Total	**87**	**70**	**$6,133,631**	**$18,321,645**	**$11,534,243**	**$29,855,888**
Zone D – Unmapped						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	6	2	$371,362	$858,193	$429,097	$1,287,290
Total	**6**	**2**	**$371,362**	**$858,193**	**$429,097**	**$1,287,290**
Zone X – Unshaded (No mapped flood zones)						
Agricultural	43	4	$2,823,739	$464,640	$464,640	$929,280
Commercial	364	258	$125,710,705	$215,709,632	$215,709,632	$431,419,264
Government	130	2	$7,434,014	$116,760	$116,760	$233,520
Industrial	32	25	$14,340,631	$16,388,343	$24,582,515	$40,970,858
Institutional	11	7	$632,613	$4,635,057	$4,635,057	$9,270,114
Miscellaneous	59	1	$1,285,321	$27,000	$27,000	$54,000
Residential	15,161	11,898	$1,423,429,227	$3,954,690,393	$1,977,345,197	$5,932,035,590
Total	**15,800**	**12,195**	**$1,575,656,250**	**$4,192,031,825**	**$2,222,880,800**	**$6,414,912,625**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

Table C-14 summarizes Table C-13 above and shows Town of Truckee loss estimates and shows improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table C-14 Town of Truckee – Flood Loss Summary

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	225	165	$57,940,781	$30,453,110	$88,393,891	$17,678,778	0.30%
0.2% Annual Chance	87	70	$18,321,645	$11,534,243	$29,855,888	$5,971,178	0.10%
Grand Total	**312**	**235**	**$76,262,426**	**$41,987,353**	**$118,249,779**	**$23,649,956**	**0.40%**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

According to Table C-13 and Table C-14, the Town of Truckee has 165 improved parcels and $88.4 million of structure and contents value in the 1% annual chance floodplain. The Town has 70 improved parcels and $29.9 million in the 0.2% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.8 of the Base Plan, there is a 1% chance in any given year of a flood event causing roughly $17.7 million in damages, and a 0.2% chance of a flood event causing $6.0 million in damages in the Town of Truckee. A loss ratio of 0.40% indicates that losses in Truckee to flood would be relatively minor, as two fifths of a percent of the total values in the Town would be damaged.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres (both total and improved) in the Town in comparison to total area within the Town limits. The same methodology, as discussed in Section 4.3.7 of the Base Plan, was used for the Town of Truckee as well as for the County as a whole. Table C-15 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the Town.

Table C-15 Town of Truckee – Flooded Acres

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
1% Annual Chance Flood Hazard		
Zone AE		
Agricultural	11	7
Commercial	29	10
Government	209	0
Industrial	11	11
Institutional	0	0
Miscellaneous	7	0
Residential	125	49
Zone AE Total	**393**	**78**
Zone AE Floodway		
Agricultural	2	2
Commercial	5	4

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Government	0	0
Industrial	0	0
Institutional	2	0
Miscellaneous	0	0
Residential	27	10
Zone AE Floodway Total	**36**	**16**
Zone AO		
Agricultural	0	0
Commercial	0	0
Government	0	0
Industrial	0	0
Institutional	0	0
Miscellaneous	0	0
Residential	0	0
Zone AO Total	**0**	**0**
Zone A		
Agricultural	34	33
Commercial	3	0
Government	132	0
Industrial	41	41
Institutional	0	0
Miscellaneous	0	0
Residential	68	4
Zone A Total	**278**	**78**
1% Annual Chance Flood Hazard Total	**707**	**172**
0.2% Annual Chance Flood Hazard		
Agricultural	0	0
Commercial	8	7
Government	28	0
Industrial	1	1
Institutional	3	0
Miscellaneous	9	0
Residential	26	13
0.2% Annual Chance Flood Hazard Total	**75**	**21**
Zone X Unshaded – No Mapped Flooed Hazard		
Agricultural	908	332
Commercial	877	479

Flood Zone / Property Use	Total Flooded Acres	Improved Flooded Acres
Government	5,191	138
Industrial	654	573
Institutional	209	31
Miscellaneous	721	0
Residential	20,928	10,114
Zone X (unshaded) Total	**29,489**	**11,668**
Zone D (unmapped)		
Agricultural	2	0
Commercial	1	0
Government	3	0
Industrial	5	5
Institutional	0	0
Miscellaneous	0	0
Residential	42	8
Zone D (unmapped) Total	**52**	**13**
Grand Total	**30,324**	**11,874**

Source: FEMA 2010 DFIRM, Nevada County 2016/2017 Parcel/Assessor's Data

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Truckee. According to this analysis, there is a total population of 549 residents of the Town at risk to flooding, 399 in the 1% and 150 in the 0.2% annual chance floodplains. This is shown in Table C-16.

Table C-16 Town of Truckee – Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
A	3	8
AE	139	353
AE Floodway	15	38
Total 1% Annual Chance	**157**	**399**
Shaded X (0.2% Annual Chance)	59	150

Source: FEMA DFIRM, Nevada County 2015 Parcel/Assessor's Data, US Census Bureau

* Average household populations from the 2010 US Census were used: Truckee– 2.54.

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Truckee in identified FEMA DFIRMs. GIS was used to determine whether the facility locations intersects a DFIRM flood hazard zone, and if so, which zone it intersects. Details of critical facilities in the floodplain in the Town of Truckee are shown in Figure C-7 and Table C-17. As shown on the table and figure, Truckee has 15 critical facilities located in 1% annual chance and 1 critical facility in the 0.2% annual chance DFIRM flood zones. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis. However, given the number of facilities that use and store hazardous materials in the Town, there are likely some that are present within identified floodplains.

Figure C-7 Town of Truckee – Critical Facilities and Flood Zones

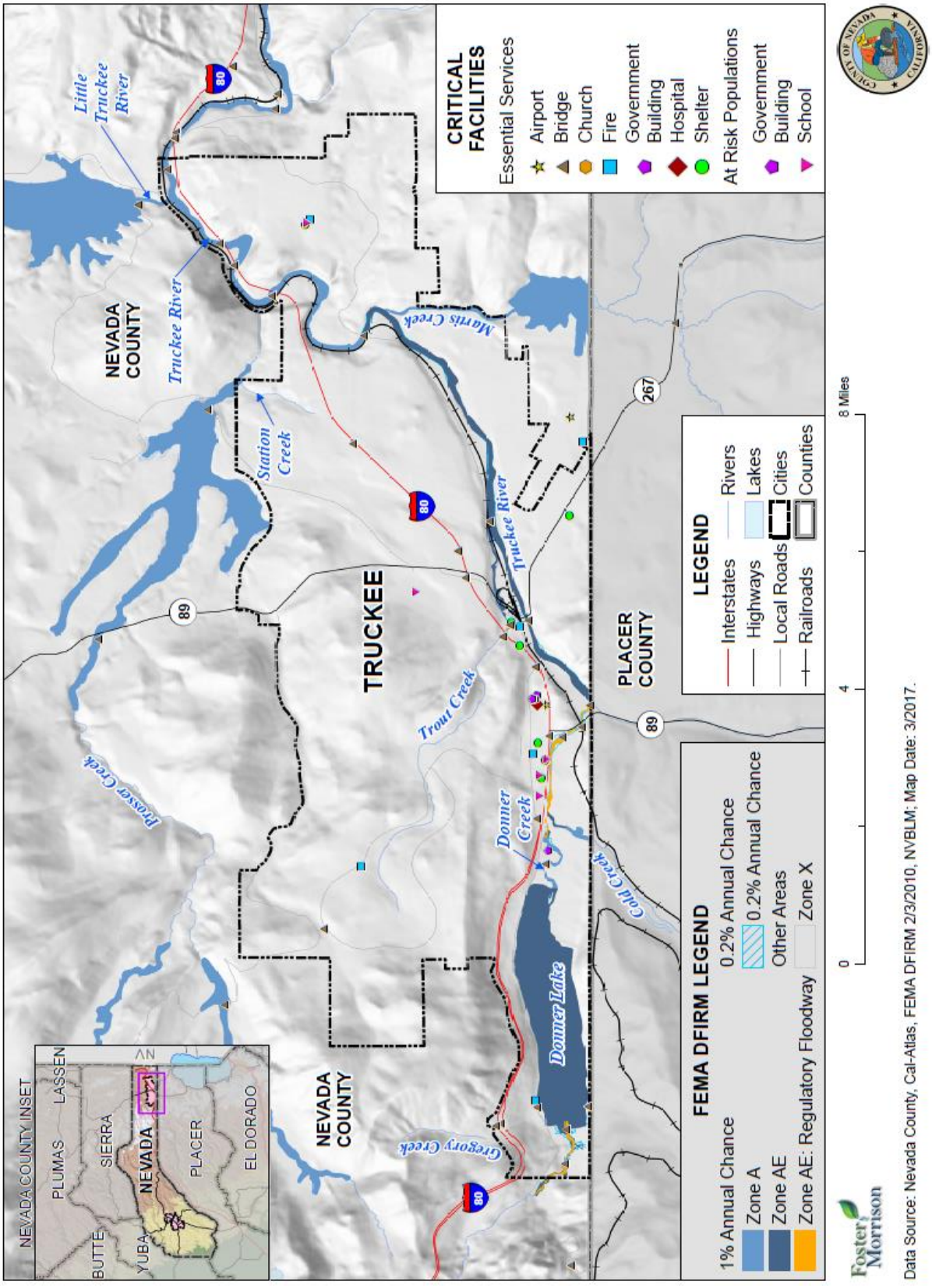


Table C-17 Town of Truckee – Critical Facilities and Flood Zones

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
1% Annual Chance Flood		
Essential Services	Airport	0
	Bridge	15
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	0
	Total	**15**
1% Annual Chance Flood Total		**15**
0.2% Annual Chance Flood		
Essential Services	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0
	School	0
	Shelter	1
	Total	**1**
0.2% Annual Chance Flood Total		**1**
Zone X (unshaded)		
Essential Services	Airport	1
	Bridge	16
	Church	0
	Fire	5
	Government Building	4
	Hospital	1
	School	0
	Shelter	6
	Total	**33**
At Risk Populations	Airport	0
	Bridge	0
	Church	0

Flood Zone / Critical Facility Category	Critical Facility Type	Critical Facility Count
	Fire	0
	Government Building	0
	Hospital	0
	School	5
	Shelter	0
	Total	**5**
Zone X (unshaded) Total		**38**
Grand Total		**54**

Source: FEMA 2010 DFIRM; Nevada County GIS

*This count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood will also include all critical facilities in the 1% annual chance floodplain.

Historical, Cultural, and Natural Resources at Risk

The Town of Truckee has significant historical, cultural, and natural resources located throughout the Town as previously described. Risk analysis of these resources was not possible due to data limitations. However, as previously described, natural areas, such as wetlands and riparian areas within the floodplain, often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the Truckee area.

Insurance Coverage, Claims Paid, and Repetitive Losses

The Town of Truckee joined the National Flood Insurance Program (NFIP) on May 17, 1995. The Town does not participate in CRS program. NFIP data indicates that as of August 19, 2016, there were 50 flood insurance policies in force in the Town, with $15,303,900 of coverage from $44,230 in annual premiums. Of the 50 policies, 45 were residential (single-family homes) and 5 were nonresidential; 18 of the policies were in A zones; the remaining 32 were in B, C, and X zones. The GIS parcel analysis detailed above identified 157 improved parcels in the 100-year flood zone. 18 policies for 157 improved parcels in the 100-year floodplain equates to insurance coverage of 11.5 percent.

There have been no historical claims for flood losses. As such, there have been no substantial damage claims for the Town, and there are no repetitive loss (RL) or severe repetitive loss (SRL) properties.

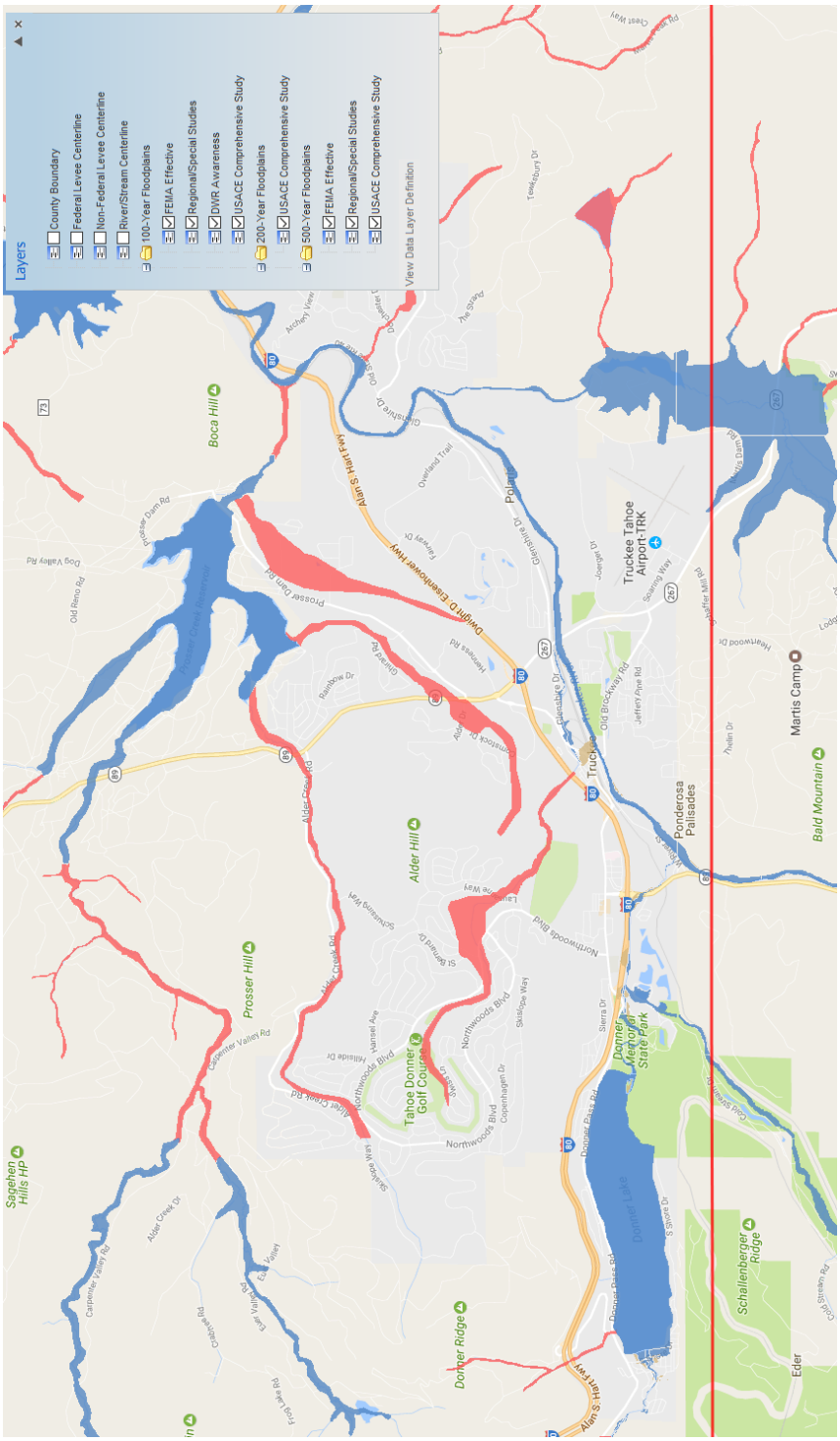
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Nevada County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 1% annual chance flood risk, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance floodplain, it also supports identification of the need and requirement for flood insurance. The BAM map for Truckee is shown in Figure C-8.

Figure C-8 Town of Truckee Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 100-Year (developed from local agencies), Red – DWR 1%r (Awareness floodplains identify the 1% annual chacne flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study)

Future Development

The Town enforces the floodplain ordinance adopted in the General Plan If any development is to occur in the floodplain, it would have to conform to the elevation standards of the floodplain ordinance. No development is expected in the floodplain in the future.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Flooding and other issues caused by severe weather events, primarily heavy rain on snow events and severe storms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community.

Localized flooding problems are often caused by flash flooding, severe weather, or an unusual amount of rainfall on an already present snow pack. Flooding from these intense weather events usually occurs in areas experiencing an increase in runoff from impervious surfaces associated with development and urbanization as well as inadequate storm drainage systems.

The Town of Truckee has numerous small drainages and blue line creeks which are extremely flashy (steep terrain and shallow soils) and are heavily influenced by localized storm activity. Also, the Town experiences extreme winter weather events like rain on snow that often overwhelm these drainages at times when the snow pack and frozen ground diminishes the volume and flow capacity of these water ways. This combination of flashy basins and reduced capacity tends to lead to flooding on the minor tributaries and often overwhelms and damages the Town's storm sewer system. Additionally, many houses are situated in close proximity to these drainages and represent an additional concern surrounding localized flooding.

Past Occurrences

In Winter 2004/2005, Winter 2012 and in Winter 2017 there was localized flooding in Truckee. Town-wide localized flooding occurred due to rain on snow events. Some localized impact to properties near drainages and small creeks occurred. Roads and storm sewer infrastructure had some damage due to these events. Road closures, including I-80, inhibited traffic into Town which may have affected businesses (all events). This was in addition to school closures (10 + days) that occurred in the 04/05 and 17 events. CAL OES and FEMA funding received ('04/'05); CAL OES and FEMA funding applied ('17).

Vulnerability to Localized Flooding

Flooding and other issues caused by severe weather events, primarily heavy rains and thunderstorms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community. Table C-18 identifies known and past occurrences of such areas and the associated problems encountered. This list is an initial inventory of key

problem areas and is not intended to be a complete inventory of all problems and locations associated with severe weather events and localized flooding in the Town of Truckee.

Table C-18 Town of Truckee's Road List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Donner Lake Vicinity	X	X	X			X	X
Trout Creek Area	X	X	X			X	
Old Hwy 40	X	X				X	
Evansham (Glenshire) neighborhood	X	X					
Tahoe Donner Neighborhood	X	X					
Alder Creek Drive	X	X				X	X

Source: Town of Truckee

Future Development

Future development in the Town will add more impervious surfaces that will require additional or improved drainage systems to adequately drain additional flows. The Town will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Hazardous Materials Transportation

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

Hazardous materials include a wide variety of substances commonly used in households and businesses. Used motor oil, paint, solvents, lawn care and gardening products, household cleaners, gasoline and refrigerants are among the diverse range of substances classified as hazardous materials. Nearly all businesses and residences generate some amount of hazardous waste; certain businesses and industries generate larger amounts of such substances, including gas stations, automotive service and repair shops, printers, dry cleaners and photo processors. Hospitals, clinics and laboratories generate medical waste, which is also potentially hazardous.

Use, storage and transportation of hazardous wastes is heavily regulated by federal, State and local agencies, including the California Department of Toxic Substances Control, which is authorized to implement the regulations of the Federal Environmental Protection Agency. The Nevada County

Environmental Health Department monitors commercial storage and use of hazardous materials, including issuing permits for use and storage of significant quantities of hazardous materials or substances

Interstate 80, the Union Pacific Railroad, and the Kinder Morgan petroleum pipeline are the three major transportation routes by which tons of hazardous materials are transported through the County. Interstate 80 weaves in and out of the County from the State Route 20 interchange to the Nevada state line. It is within this corridor that the incident of an accidental release of hazardous material is most likely to occur. Traffic volumes, the winding character of the Interstate, and snow and ice make this corridor especially dangerous during the winter months. In addition to the character of the interstate, the remoteness of the Town from outside help creates even a greater potential for a major incident. Assistance from areas outside the Town would be unavailable for a period of four to eight hours with no weather issues and potentially unreachable in the winter months in the event of a hazardous materials spill.

The production of crude oil in North America has increased by over 500% in the last 7 years - the majority of this product is being transported by rail. Portions of Nevada County are situated in a rail corridor that connects the Sierra Nevada Mountains to the San Francisco Bay area. While according to the UPRR, the owner of the rail line, crude oil is not currently traveling via this route, many believe that when the refineries in the Bay Area are retrofitted to accept Bakken crude, the Sierra Nevada route will be used to bring crude to Bay Area refineries. Nevertheless, a variety of hazardous materials travel this route and comprise 7% of all commodities being transported by the railroad. Crude oil is currently being transported into Nevada County through the Town of Truckee.

Past Occurrences

There have been no federal or state disaster declarations for hazardous materials in Truckee. There have been hazardous materials spills in Truckee. These can be seen on Table C-19. 27 separate events were contained in the database. Incidents where damages or spill amounts were large are discussed after the table.

Table C-19 Town of Truckee – Hazardous Materials Incidents by Date

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
10/12/1973	Truckee	N/A	Highway	N/A	Gasoline	0 Gallons	$0
1/1/1976	Truckee	N/A	Highway	N/A	Gasoline	260 Gallons	$0
11/28/1978	Truckee	N/A	Highway	N/A	Gasoline	2,730 Gallons	$0
7/21/1980	Truckee	N/A	Rail	N/A	Phosphoric Acid Solution	1 Gallons	$0
5/21/1986	Truckee	N/A	Rail	N/A	Benzoyl Chloride	0.12 Gallons	$0
4/15/1987	Truckee	N/A	Highway	N/A	Toluene	1 Gallon	$0
7/1/1992	Truckee	I-80 Eastbound	Highway	In Transit	Nitrogen – Refrigerated	6,000 Gallons	$1,800

Date of Incident	Incident City	Incident Route	Mode of Transportation	Transportation Phase	Commodity Short Name	Quantity Released	Amount of Damages
7/15/1998	Truckee	Westbound I-80	Highway	In Transit	Xylenes	5 Gallons	$100
5/24/2001	Truckee	East of Yuba Gap I-80	Highway	In Transit	Hypochlorite Solutions W	1 Gallon	$1,864
6/19/2003	Truckee	12800 I-80	Highway	In Transit	Hydrochloric Acid	1 Gallon	$10,245
3/29/2005	Truckee	Truckee Agricultural Station	Highway	In Transit	Heptanes	350 Gallons	$1,000
11/12/2014	Truckee	I-80 Milepost 183	Highway	In Transit	Flammable Liquids N.O.S.	10 Gallons	$5,000
Totals							**$20,009**

Source: PHMSA Database – Search dates 01/01/1970 – 03/01/2017

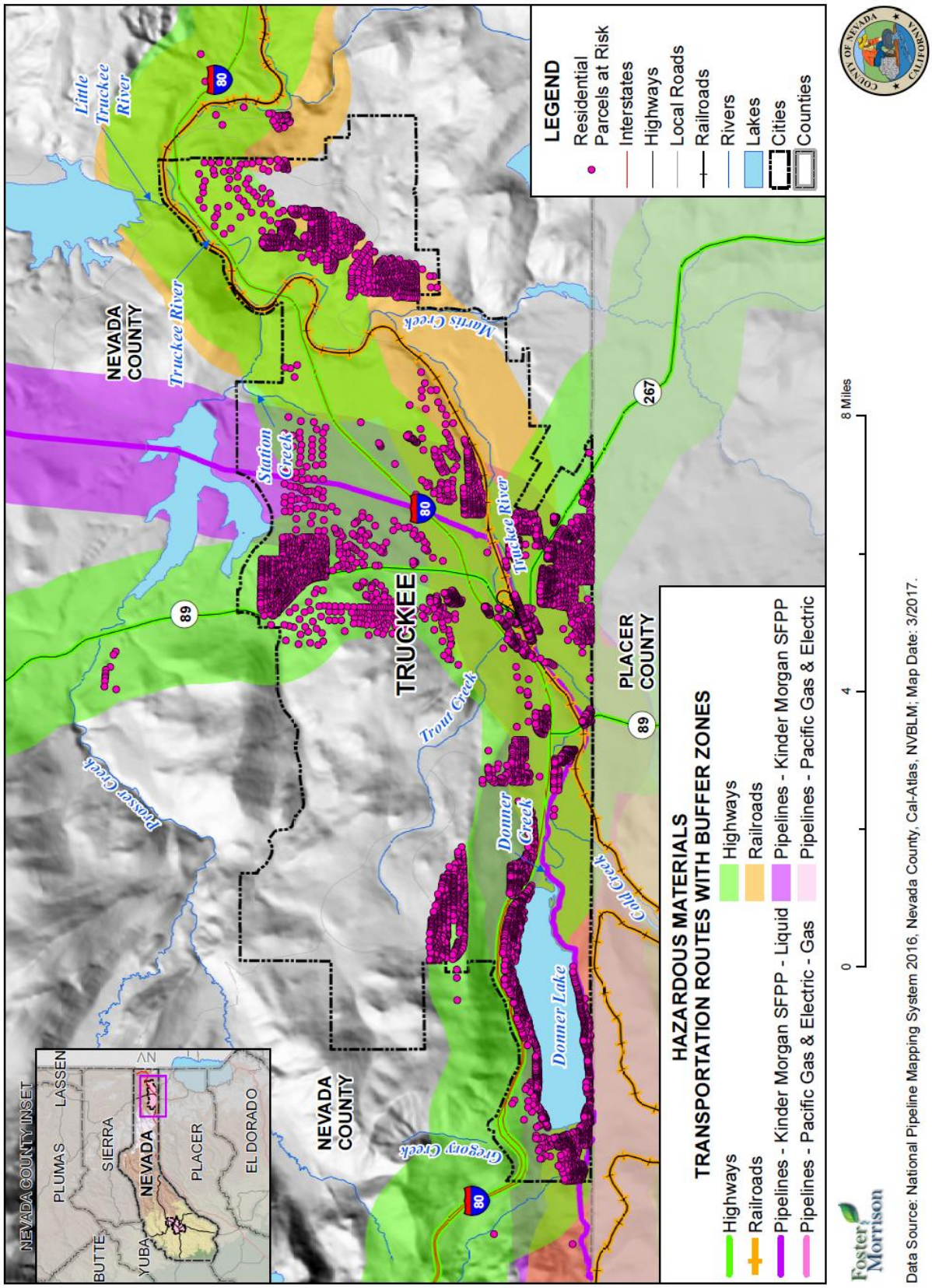
Vulnerability to Hazardous Materials Transportation

Values at Risk

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key Planning Area assets relative to the hazardous materials sites and transportation corridors (highway, rail, and pipeline). It is likely that any large scale release could affect either Donner Lake or the Truckee River corridor, with significant ecological impacts resulting from such a release. In addition, residents and visitors to the area could be at risk to a large scale release.

An analysis of the potential vulnerability of the Planning Area to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable, a one mile buffer was applied to both sides of Interstate 80 and State Routes 20, 49, 89, 174, and 267; the Union Pacific railroad tracks (which roughly parallel I-80) and the Kinder Morgan petroleum pipeline. The result is a two-mile buffer zone around each transportation corridor that is used for risk-analysis. More information on this methodology can be found in Section 4.3.10 of the Base Plan. The buffer zone and residential parcels at risk are shown in Figure C-9.

Figure C-9 Town of Truckee – Residential Parcels in Hazardous Materials Buffer Zones



Populations at Risk

To determine the populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway, railroad, and pipeline corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel data and results tabulated for the Town of Truckee as found in Table C-20. Those parcel centroids that intersect the buffered corridor were counted and multiplied by the 2010 Census Bureau average household factors for the Town. According to this analysis, there is a total population of 15,446 in the buffered corridor.

Table C-20 Town of Truckee – Populations at Risk in Hazardous Materials Corridors

Jurisdiction	Residential Parcels	Population
Truckee	6,081	15,446

Source: Cal Trans, Nevada County GIS, US Census Bureau

* Census Bureau 2010 average household sizes are: Town of Truckee – 2.54

Historical, Cultural, and Natural Resources at Risk

The Town of Truckee has significant cultural and natural resources located throughout the Town as previously described. Vulnerability analysis of these resources was not possible due to data limitations. However, any resources in the buffer zone would potentially be at risk to a hazardous materials spill.

Critical Facilities

To determine the critical facilities at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the facilities located within the two-mile buffer zone of the highway, railroad, and pipeline corridors. Using GIS, the buffered corridor was overlaid on the Nevada County critical facilities layer and results tabulated for the Town, shown in Figure C-10 and detail in Table C-21. There are 52 facilities in the buffered corridor in the City. Note, as previously described, the mapped GIS data for the County's critical facility layer only includes data for Category 1, Essential Services, and Category 2 – At-risk Populations, thus the Category 3, Hazardous Materials facilities, were not included in this analysis.

Figure C-10 Town of Truckee – Critical Facilities in Hazardous Materials Buffer Zones

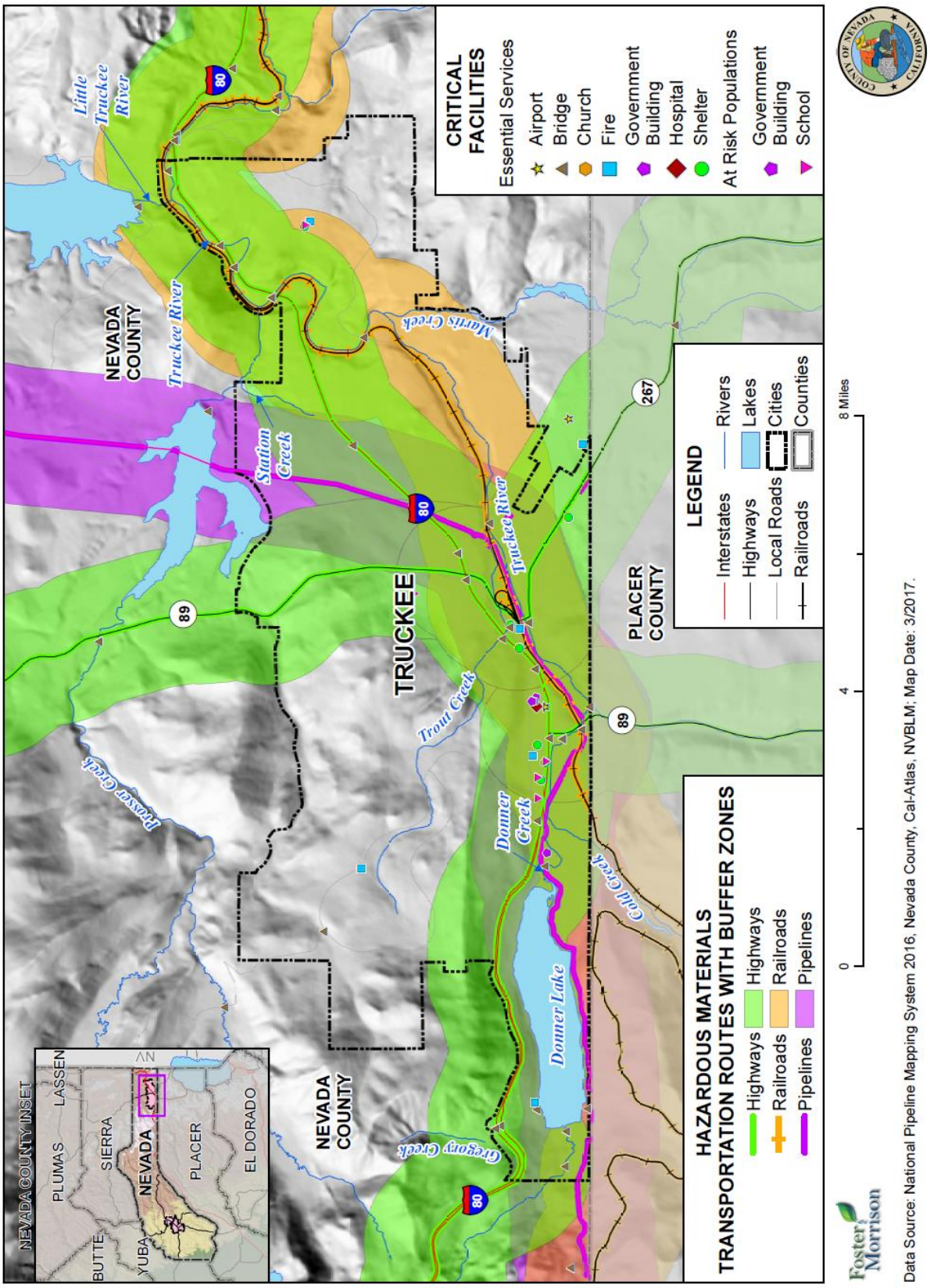


Table C-21 Town of Truckee – Critical Facilities in Hazardous Materials Buffer Zones

Critical Facility Type	Critical Facility Count
Essential Services	
Airport	1 not in Town Limits
Bridge	30
Church	0
Fire	6
Government Building	4
Hospital	1
School	0
Shelter	7
Essential Services Total	**47**
At Risk Populations	
Airport	0
Bridge	0
Church	0
Fire	0
Government Building	0
Hospital	1
School	5
Shelter	0
At Risk Populations Total	**5**
Grand Total	**52**

Source: Cal Trans, National Pipeline Mapping System 2016, Nevada County GIS

*In the At Risk Populations Category, the GIS data shows the hospital in a different area, however the Town states that the hospital is within 500 feet of Intersate 80 and would like it to be added to the Critical Facilities withing the Hazardous Materials Buffer Zone.

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

Landslides, Debris, And Mudflows

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas.

Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

Steep slopes (30% or greater), limit development in several areas of Town, including some places along the Truckee River, the ridges and hillsides north and west of Downtown, the ridges north of Gateway and north and west of Donner Lake, and areas around Alder Hill. These steep slope areas, particularly where they occur in conjunction with weak soils, may present a significant hazard in Truckee.

Past Occurrences

There have been no disaster declarations associated with landslides in the Town of Truckee. The HMPC noted no past occurrences of landslide affecting the Town.

Vulnerability to Landslides, Debris, and Mudflows

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the Town during specific times. Based on the risk assessment in the Base Plan, it is evident that landslides could have potentially large economic impacts to certain areas. However, many of the landslides in the Town and greater County are minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Impact on the overall mental health of the community.

Future Development

Although new growth and development corridors would fall in the area affected by moderate risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide area will continue to occur.

Severe Weather: Extreme Cold, Snow, and Freeze

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

The Town of Truckee has a variety of micro-winter climates scattered throughout the Town depending on elevation and distance from the Sierra Crest. With a base elevation of 5,800' and mountain ranges in excess of 7,500' in the Tahoe Donner subdivision, there can be snow and rain in the same storm. The Town is situated just east of the Sierra Crest, creating optimum storm conditions for heavy snow on the western end of Town (Donner Lake and Tahoe Donner areas). It is not uncommon to have wide temperature swings with lows below zero during the January and February nights, reaching back into the 40's during the day. The average snowfall for the Town area is 189" (measurement taken at the US Forest Service Office near the middle of the Town). The western end of the Town along the south side of Donner Lake is a high hazard area for avalanches with steep slopes and heavy snowfall amounts.

The Donner Summit area, just west of Town, at 7,100' (less than the Town's highest spot) receives an average of 411" of snow a year. The Town is the last the last location on Interstate 80 westbound for services prior to the Donner Pass/Summit area. The interstate carries an average of 2,500 vehicles per hour with estimates of the loss in commerce to the west coast of the U.S. exceeding $1,000,000 per hour when the interstate is closed.

Past Occurrences

A disaster declaration for Nevada County was issued by the state government in 1972 for freeze and severe weather conditions. Disaster declarations for weather alone are unusual, prior disaster declarations for 2017 and 2004/2005 were issued that were realted to weather, but for other inpacts. The Town Planning Team noted that heavy snow is an annual occurrence.

In the 2017 winter, the interstate was closed for several days on end due to high winds and blowing/drifting snow. This causes major traffic congestion, often impeding any movement through Town with gridlocked side streets. There are not enough hotel and motel rooms, leaving people stranded in their vehicle, often improperly clothed and equipped for the harsh winter weather.

Vulnerability to Severe Weather: Extreme Cold, Snow, and Freeze

Truckee receives an abundance of snow, mostly between the months of November through March. Winter snow storms, including strong winds and blizzard conditions can result in localized power and phone outages and closures of streets, highways, schools, businesses, and nonessential government operations. During periods of heavy snow there is usually a closure of the Interstate that caused traffic congestion, with gridlock on side streets and throughout the Town. There is a lack of overnight accomodations for travelers.

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current Town codes provide such provisions for new construction. Vulnerability to extreme cold will increase as the average age of the population in the Town shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the Planning Area as well as people retiring to the area. However, amany of the residents of the Town are self-sufficient and accustomed to rural living.

Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

Storms in Truckee are generally characterized by heavy rain/ snow 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. Winter storms can bring high winds, often in excess of 100 mph at the Sierra crest with winds commonly gusting in the 40-50 mph range in Town. Some of worst weather occurs when the Town experiences a rain on snow event. This occurs when a cold winter storm turns warm, changing from snow over to rain. The rain washes snow off hillsides, clogging drainage and causing localized flooding. The Truckee River will rise past flood stage and the tributaries feeding it will often over top their banks. These events are often the result of atmospheric rivers, commonly referred to as a "Pineapple Express" where sub-tropical moisture streams into the west coast of the United States, mixing with a Polar Jet bringing huge amounts of precipitation. These events are dependent on where the Jet sets up north to south across California.

Nevada County—East (Truckee Ranger Station, Period of Record 1904 to 2016)

According to the WRCC, average annual precipitation in the eastern portion of Nevada County is 30.15 inches per year. The highest recorded annual precipitation is 54.62 inches in 1996; the highest recorded precipitation for a 24-hour period is 5.21 inches on February 1, 1963. The lowest recorded annual precipitation is 16.04 inches in 1976.

Past Occurrences

In January 1997, warm storms pounded the region after a particularly heavy December snowfall. These storms happen on a fairly regular basis, generally every 2-4 years (1997, 2005, 2007, 2011, 2013, 2017).

Vulnerability to Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

According to historical hazard data, severe weather is an annual occurrence in Truckee. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain / snow and thunderstorms are the most frequent type of severe weather occurrences. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact The Town Public Works Department maintains 145 miles of public roadway (surface streets) using over 60 pieces of equipment to remove snow. Even with this impressive amount of equipment, snow removal can take several days to open all the roadways after a significant snow event to remove snow. During snow events it is not uncommon for the Police Department to tow several vehicles that are left buried in the roadways.

The January storms washed out roadways, flooded gas stations and the downtown area, also causing power outages for several days. Flooding from these storms is very localized, however historically flooding occurs in the southwest corner of Donner Lake and in the Glenshire subdivision. Mitigation efforts after the 1997 Floods in the downtown historical district along Trout Creek proved to work very in the storms of 2017, reducing and almost entirely limiting flood issues in this area.

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While minimal damages have occurred to critical facilities in the past due to lightning, hail, or high winds, there still remains future risk. With development occurring in the region, future losses to new development may occur.

Wildfire

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Three types of fires are of concern to the Town of Truckee: wildland, wildland urban interface, and, to a lesser extent, structural fires. According to the Safety Element of Truckee's General Plan, wildland and urban interface fires have occurred close to or encroached into the Town, especially in the heavily fueled areas to the east and south. Urban structural fires have been due largely to human accidents, with are the older buildings in the Town business districts the most vulnerable.

The entire Truckee area is considered to be in a high fire hazard severity zone, as defined by the California Department of Forestry and Fire Protection (Cal FIRE), although risks are particularly pronounced in certain parts of the community, particu- larly where homes are located within areas of dense vegetation and forest land, and where steep slopes and other similar conditions exist. Calculation of threat from wildfire hazard is based on a number of combining factors in- cluding fuel loading (vegetation), topography, and climatic conditions such as winds, humidity and temperature.

Past Occurrences

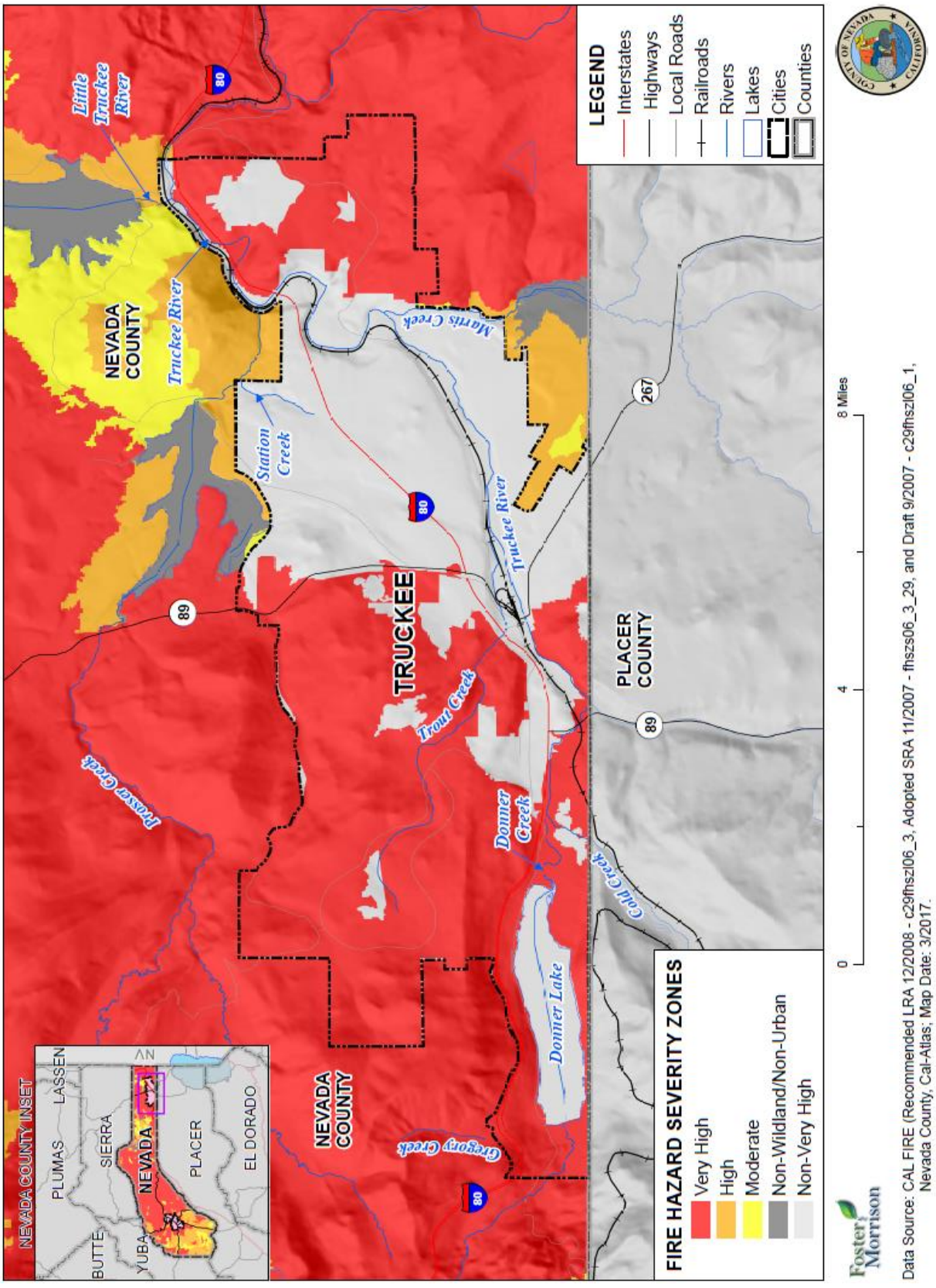
Large damaging and costly fires can occur on the east side of the County Planning Area. Significant in terms of acreage are the Donner Ridge Fire (1960 – 44,812 acres), Cottonwood Fire (1994 - 46,800 acres), and Martis Fire (2001 – 14,126 acres). Fire hazard severity (2007 FHSZ) predicts a high likelihood that such fires will occur again. The balance of normal fire activity is primarily campfires, including homeless fires and party fires started by careless individuals. Other historic problems include freeway related causes from vehicle fires. Overheating of vehicles has caused vehicle fires, which have then ignited wildland fires.

The 2010 railroad fires were a function of workers using fire causing tools and ignition within the locomotive which spread to the vegetation. Prevention is taking place by performing industrial inspections at work sites and providing advice on improving fire fighting ability of workers, by permitting work during fire season with mitigations to prevent fire, and by Union Pacific Railroad activities geared toward vegetation management along the rail line.

Vulnerability to Wildfire

Following the methodology described in Section 4.3.2 Vulnerability of Nevada County to specific hazards, a wildfire map for the Town of Truckee was created (see Figure C-11). Wildfire severity within the Town falls within the Very High or Non-Very High zones. The highest threat occurs along the western edge of the Town.

Figure C-11 Town of Truckee's Fire Severity Zones



Values at Risk

GIS was used to determine the possible impacts of wildfire within the Town of Truckee. The methodology described in Section 4.3.16 of the Base Plan was followed in determining structures and values at risk in CAL FIRE fire hazard severity zones. Analysis results for Truckee are shown in Table C-22, which summarizes total parcel counts, improved parcel counts, land values, structure values, and contents values by occupancy type as well as the percentage of parcels affected by fire. The estimated contents replacement values are based on the CRV factors detailed in Table 4 35 in Section 4.3.1 of the Base Plan.

Table C-22 Town of Truckee – Count and Value of Parcels by Property Use and Fire Severity Zone with Contents Replacement Values

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Very High						
Agricultural	33	2	$587,954	$15,078	$15,078	$618,110
Commercial	125	79	$34,813,517	$61,368,617	$61,368,617	$157,550,751
Government	57	1	$6,215,212	$113,173	$113,173	$6,441,558
Industrial	4	2	$1,026,573	$1,203,027	$1,804,541	$4,034,141
Institutional	4	2	$358,920	$2,852,661	$2,852,661	$6,064,242
Miscellaneous	22	1	$483,637	$27,000	$27,000	$537,637
Residential	11,488	9,271	$1,130,938,768	$3,088,409,993	$1,544,204,997	$5,763,553,758
Total	**11,733**	**9,358**	**$1,174,424,581**	**$3,153,989,549**	**$1,610,386,066**	**$5,938,800,196**
High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0

Fire Hazard Severity Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	**0**	**0**	**$0**	**$0**	**$0**	**$0**
Non-Wildland/Non-Urban						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Government	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Institutional	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Total	0	**0**	**$0**	$0	$0	$0
Non-Very High						
Agricultural	13	3	$2,498,671	$453,626	$453,626	$3,405,923
Commercial	260	193	$99,433,081	$161,074,659	$161,074,659	$421,582,399
Government	92	1	$1,218,802	$3,587	$3,587	$1,225,976
Industrial	30	25	$13,994,849	$15,604,785	$23,407,178	$53,006,812
Institutional	9	7	$322,112	$1,918,030	$1,918,030	$4,158,172
Miscellaneous	42	0	$851,227	$0	$0	$851,227
Residential	3,939	2,845	$332,789,374	$936,108,208	$468,054,104	$1,736,951,686
Total	**4,385**	**3,074**	**$451,108,116**	**$1,115,162,895**	**$654,911,184**	**$2,221,182,195**
Grand Total	**16,118**	**$1,625,532,697**	**12,432**	**$4,269,152,444**	**$2,265,297,250**	**$8,159,982,391**

Source: Nevada County 2016/2017 Parcel/Assessor's Data, CAL FIRE

Population at Risk

The Fire Severity Zone dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for each jurisdiction and unincorporated area. Results were tabulated by jurisdiction. According to this analysis, there is a total population of 23,548 residents of Truckee in the Very High wildfire risk area. This is higher than the number of residents in the Town, most likely due to one of the two following factors: the Census Bureau household size is incorrect, or that there are residential homes in the Town that are second homes and not always occupied. In either instance, it can be assumed that the entire population of the Town is in a moderate or higher fire hazard severity zone. This is shown in Table C-23.

Table C-23 Town of Truckee – Count of Improved Residential Parcels and Population by Fire Severity Zone

Fire Severity Zone	Improved Residential Parcels	Population*
Very High	9,271	23,548
High	0	0
Moderate	0	0
Total	**9,271**	**23,548**

Source: Nevada County 2015 Parcel/Assessor's Data, CAL FIRE

* Average household populations for Truckee (2.54) from the 2010 US Census were used

Critical Facilities at Risk

Wildfire analysis was performed on the critical facility inventory in Nevada County and all jurisdictions. GIS was used to determine whether the facility locations intersect a fire severity zone provided by CAL FIRE, and if so, which zone it intersects. There are 23 facilities in the moderate or higher fire severity zone in the Town. These are shown in Figure C-12 and detailed in Table C-24. Details of critical facility definition, type, name and address and jurisdiction by fire severity zone are listed in Appendix F.

Figure C-12 Town of Truckee – Critical Facilities in the Fire Severity Zone

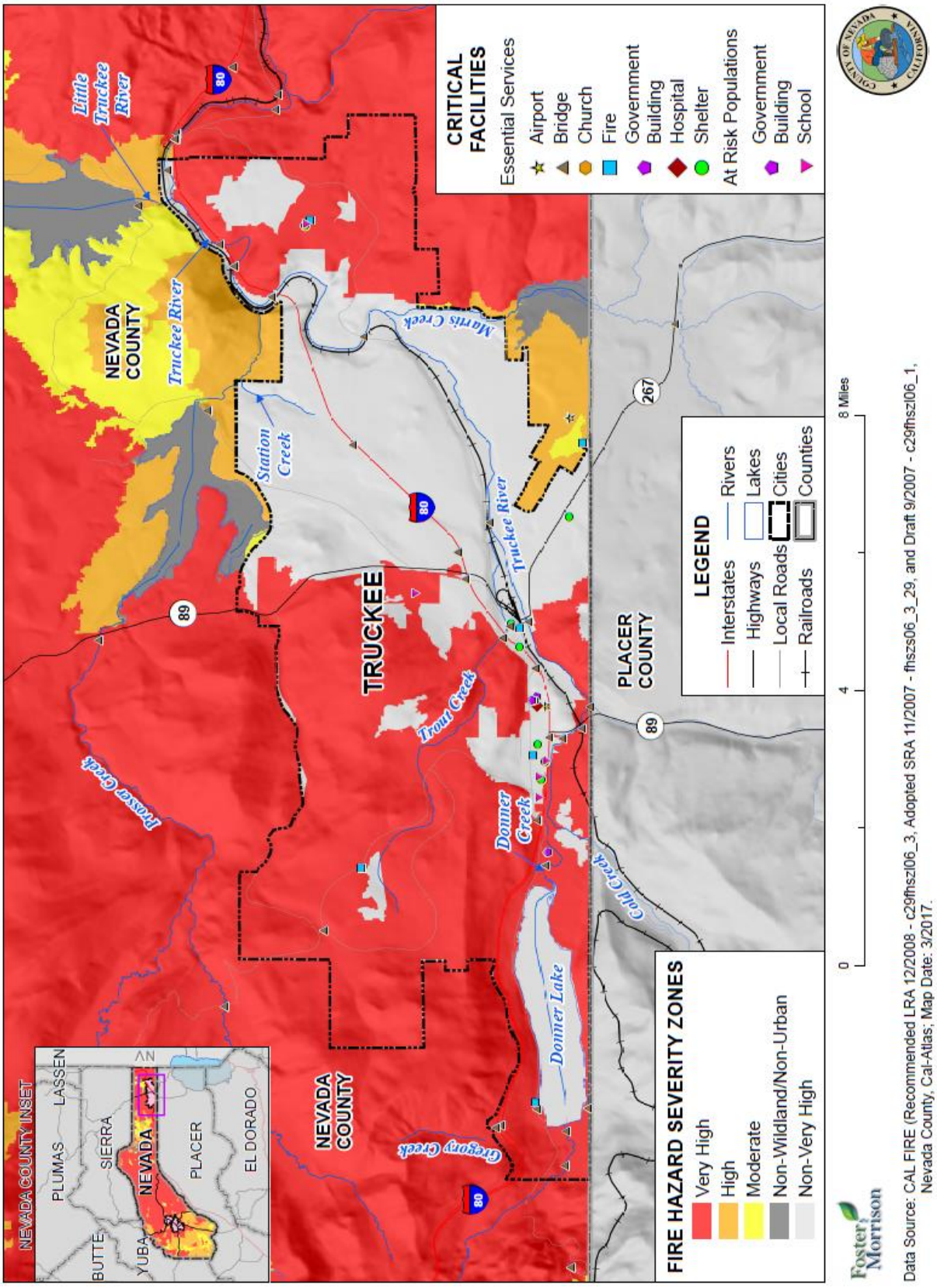


Table C-24 Town of Truckee – Critical Facilities in the Fire Severity Zone

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
Very High		
Essential Services	Airport	1
	Bridge	31
	Church	4
	Fire	6
	Government Building	38
	Hospital	1
	School	8
	Shelter	7
	Total	**97**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	1
	School	8
	Shelter	15
	Total	**5**
Very High Total		**118**
Non-Very High		
Essential Services	Airport	1
	Bridge	15
	Church	0
	Fire	2
	Government Building	3
	Hospital	1
	School	0
	Shelter	6
	Total	**28**
At Risk Populations	Airport	0
	Bridge	0
	Church	0
	Fire	0
	Government Building	0
	Hospital	0

Fire Hazard Severity Zones / Critical Facility Category	Critical Facility Type	Critical Facility Count
	School	3
	Shelter	0
	Total	**3**
Non-Very High Total		**31**
Grand Total		**54**

Source: CAL FIRE, Nevada County GIS

*The town has adjusted this data to reflect that all Critical Facilities are at risk to wildfire.

Historical, Cultural, or Natural Resources at Risk

Truckee has substantial historical, cultural and natural resources located throughout the Town. In addition, there are other natural resources at risk when wildland-urban interface fires occur. One is the watershed and ecosystem losses that occur from wildland fires. This includes impacts to water supplies and water quality as well as air quality. Another is the aesthetic value of the area. Major fires that result in visible damage detract from that value. Other assets at risk include wildland recreation areas, wildlife and habitat areas, and rangeland resources. The loss to these natural resources can be significant.

Future Development

Development may occur in the moderate or higher wildfire severity areas; however, Town ordinances for building in these areas are enforced. The Town has adopted the most current Building Codes and standards related to fire and wildfire issues. In addition, the Town works cooperatively with the Fire District on new construction plans for access, grading, and brush removal.

C.6 Capability Assessment

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

C.6.1. Regulatory Mitigation Capabilities

Table C-25 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 Town of Truckee.

Table C-25 Town of Truckee's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y	Y
Capital Improvements Plan	Y	5-year Plan
Economic Development Plan	Y	Part of the General Plan
Local Emergency Operations Plan	Y	Y
Continuity of Operations Plan	N	N
Transportation Plan	Y	Chapter 4 Circulation Element
Stormwater Management Plan/Program	Y	Part of the statewide MS4 Permit
Engineering Studies for Streams	Y	Trout Creek, Gregory Creek
Community Wildfire Protection Plan	Y	Truckee Fire District
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	Power, Water, Sewer/Treatment plant, TDPUD, T-TSA
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: 2016 Green
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating:
Site plan review requirements	Y	Y
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	Y
Subdivision ordinance	Y	Y
Floodplain ordinance	Y	Y
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y	Y
Flood insurance rate maps	Y	Y
Elevation Certificates	Y	Y (outline in section 18.34.060 of the Town's Development Code
Acquisition of land for open space and public recreation uses	Y	Y General Plan, Chapter 7 Open Space
Erosion or sediment control program	Y	Y
Other		

How can these capabilities be expanded and improved to reduce risk?
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.

Source: Town of Truckee

The Town of Truckee General Plan Program, 2025

The Town of Truckee General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the Town is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Town of Truckee Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and human-caused hazards. Mitigation-related goals, are presented below.

Safety Element Goals	
Goal 1	Reduce the risk of injury, loss of life and property damage from earthquakes, landslides and other geologic hazards.
Goal 2	Reduce hazards associated with flooding.
Goal 3	Protect lives and property from risks associated with wildland and urban fire. .
Goal 4	Protect the community from the harmful effects of hazardous materials. .
Goal 5	Prepare Truckee residents to respond to emergency situations.

The General Plan will be implemented by a number of actions by the Town Council and Planning Commission, including the Development Code, the preparation of Specific Plans and Master Plans, preparation of a Sphere of Influence report for consideration by Nevada County LAFCO, the preparation of Capital Improvement Plans, by review of projects within the Town boundaries, and by consulting with Nevada and Placer Counties on projects outside the Town Boundary but within the sphere and the Planning Area. The General Plan is in the process of being revised with initial scoping occurring at the same time the LHMP is being revised.

Mitigation Related Ordinances

The Truckee Fire Protection District, a bi-county special district, covers 125 square miles both in the Town of Truckee as well as the surrounding area in Nevada and Placer County's. The Truckee Fire Protection District was an active participant in the development of the Nevada County Fire Plan (including the Town of Truckee), which was accepted in May 2005. Truckee Fire again engaged stakeholders to develop a 2016 CWPP encompassing hazards and projects within the entire Nevada County portion of the Truckee Fire Protection District, including areas within the Town. The Fire Plan includes an extensive series of recommendations aimed at reducing wildland fire risk in the County, including fuel management and defensible space enforcement strategies, public education, infrastructure

improvements to increase fire-fighting capacity, and coordination with local fire agencies in ensuring consistent and effective wildland fire mitigation efforts.

Traffic Mitigation Fee Program: A Mitigation Fee Report, containing a capital improvement program, has analyzed the impacts of contemplated future land development on the existing public facilities in the Town, the need for new public facilities, the improvements required by new development, and the relationship between new development, the needed facilities, and the estimated cost of those facilities.

Aquatic and Invasive Species: The purpose of this ordinance is to protect all native and desired aquatic species and aquatic habitat in all water bodies within the Town of Truckee by preventing the introduction and spread of Aquatic Invasive Species. Aquatic Invasive Species include but are not limited to invertebrates (New Zealand Mudsnails, Quagga Mussels, and Asian Clam), plants (Eurasian Watermilfoil, Hydrilla, and Curly Leaf Pondweed), and warm water fishes.

C.6.2. Administrative/Technical Mitigation Capabilities

Table C-26 identifies the Town department(s) responsible for activities related to mitigation and loss prevention in Truckee.

Table C-26 Town of Truckee's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	
Mutual aid agreements	Y	
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	
Floodplain Administrator	Y	
Emergency Manager	Y	
Community Planner	Y	
Civil Engineer	Y	
GIS Coordinator	Y	Three staff members
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Nixle, Reverse 911
Hazard data and information	Y	Y

Grant writing	Y	Y
Hazus analysis	N	N
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Town of Truckee

C.6.3. Fiscal Mitigation Capabilities

Table C-27 identifies financial tools or resources that the Town could potentially use to help fund mitigation activities.

Table C-27 Town of Truckee's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Y (drainage and road improvements)
Authority to levy taxes for specific purposes	Y	Y (TSSA improvements)
Fees for water, sewer, gas, or electric services	N	N (Covered under special districts)
Impact fees for new development	Y	Unk
Storm water utility fee	N	N
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities		
Community Development Block Grant	Y	Y
Other federal funding programs	Y	Y
State funding programs	Y	Y
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Town of Truckee

C.6.4. Mitigation Education, Outreach, and Partnerships

Table C-28 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. More information can be found below the table.

Table C-28 Town of Truckee's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	Watershed Council, SWEP, Land Trust, RCD, Search and Rescue, VIPs (Volunteers in Police Service)
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Town's Clean Water Program, Town's Keep Truckee Green, Sierra Business Council
Natural disaster or safety related school programs	Y	Town of Truckee School Resources Officer, Great Shake Out, Truckee Fire Protection District Kids Corner, CERT (Community Emergency Response Team)
StormReady certification	N	
Firewise Communities certification	N	Through the HOA's (Tahoe Donner is in the process)
Public-private partnership initiatives addressing disaster-related issues	Y	Tahoe Forest Hospital, Senior Center
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Town of Truckee

C.6.5. Other Mitigation Efforts

The Town of Truckee has many other ongoing mitigation efforts that include the following:

- The Town continues with a strong outreach and permitting process that identifies hazards and makes appropriate mitigation recommendations.

C.7 Mitigation Strategy

As part of the overall HMPC for the development of this multi-jurisdictional Nevada County LHMP Update, each jurisdiction followed the mitigation strategy development process detailed in Chapter 5 and Appendix C of the Base Plan, which included the development of plan goals and objectives and the resulting mitigation actions and projects.

C.7.1. Mitigation Goals and Objectives

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

C.7.2. NFIP Mitigation Strategy

The Town of Truckee joined the National Flood Insurance Program (NFIP) on May 17, 1995. As a participant of the NFIP, the Town of Truckee has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the Town. The Town of Truckee will continue to comply with the requirements of the NFIP in the future.

In addition, the Town of Truckee actively participates with the County of Nevada to address local NFIP issues through a regional approach. Many of the program activities are the same for the Town of Truckee as for Nevada County since participation at the County level includes all local jurisdictions.

The Town's regulatory activities apply to existing and new development areas of the Town; implementing flood protection measures for existing structures and new development, and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment. The Town's Municipal Code has a Flood Damage Prevention Section under the Zoning Ordinance that regulates construction in the floodplain. The Town intends to continue to implement the ordinance and participate at the regional level with Nevada County implementing appropriate measures to mitigate exposure and damages within designated flood prone areas.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The Town of Truckee is not a current participant in the CRS program.

More information about the floodplain administration in the Town of Truckee can be found in Table C-29.

Table C-29 Town of Truckee Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	50 policies $44,230 in annual premiums $15,313,900 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	No claims for flood loss in the Town of Truckee.
How many structures are exposed to flood risk within the community?	165(1% annual chance flood) 70 (0.2% annual chance flood)
Describe any areas of flood risk with limited NFIP policy coverage	N
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	N

NFIP Topic	Comments
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Any current development applications go through a rigorous process that includes permit review, mitigation educationa, and inspections
What are the barriers to running an effective NFIP program in the community, if any?	N
Compliance History	
Is the community in good standing with the NFIP?	Yes
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	Not currently listed in the 2016 Community Rating System Eligible Communities
Is a CAV or CAC scheduled or needed?	unknown
Regulation	
When did the community enter the NFIP?	5/17/1995
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Yes
Provide an explanation of the permitting process.	Requirements are within the Development Code 18.38
Community Rating System	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	–
What categories and activities provide CRS points and how can the class be improved?	–
Does the plan include CRS planning requirements?	–

C.7.3. Mitigation Actions

The planning team for the Town of Truckee identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

It should be noted that many of the projects submitted by each jurisdiction in Table 5 2 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 public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each

jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: All hazards

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: Town of Truckee Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Countywide, multi-agency exercises, training

Hazards Addressed: Emergency Services/Multi-hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: Agencies within the county must be able to work together to form a cohesive working environment in the event of large scale, multi-agency hazard events. Nevada County has not completed a multi-agency countywide exercise event in several years (EMI Countywide training event was last countywide event). Different groups within the county have attempted to exercise individual skills, primarily in the medical services groups. Nevada County has two diverse environments within the county separated by a large mountain range and a single exercise is unlikely to be realistic or attainable.

Project Description: Conduct a biennial training exercise that focuses on the east and west sides of the county every other year.

Other Alternatives: Not conduct training exercises that focus on large scale multi-agency response.

Existing Planning Mechanism(s) through which Action Will Be Implemented: County OES and EOC will partner with individual stakeholders as appropriate to develop training exercises.

Responsible Office/Partners: Nevada County OES, Individual City and Town EOC's, Partner NGO's, State and Federal Partners

Project Priority: High

Cost Estimate: $20,000

Benefits (Losses Avoided): Having a trained and exercised staff provides for better response during disaster incidents.

Potential Funding: Homeland Security Grants

Timeline: 2018

Action 3. Brushing and Debris Chipping

Hazards Addressed: Multi-hazard – Roadside debris for fire, drainage, and snow removal mitigation

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The Town of Truckee maintains approximately 150 miles of roadway. Approximately 30 miles of roadway are in need of maintenance to remove debris from the areas adjacent to roadways. The areas requiring this maintenance have been designated as "Fuel Modifications Zones" per the Nevada County and Town of Truckee Standard Specifications.

Project Description: Removal and collection of debris within the ditches and right of way.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Town of Truckee Public Works

Project Priority: Medium

Cost Estimate: 500,000

Benefits (Losses Avoided): Numerous roads throughout the Town of Truckee would be involved, thus providing an additional measure of safety to hundreds of homes. Fire protection from roadside ignition fire to an average of 3 homes @ $350,000 each = $1,050,000

Potential Funding: None identified

Timeline: Ongoing – dependent on funding

Action 4. Conduct URM inventories and identify retrofit projects

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 6

Issue/Background: Unreinforced Masonry (URM) buildings present a hazard during earthquake due to structural failure. While most building in Truckee is wood frame construction or newer concrete commercial buildings, it is possible several URM's could exist in the downtown core historical district area.

Project Description: Conduct survey and inventory of any URM buildings in the Town of Truckee.

Other Alternatives: Not survey and determine need to URM retrofit

Existing Planning Mechanism(s) through which Action Will Be Implemented: Possibly General Plan Update for corrective action

Responsible Office/Partners: Town of Truckee Community Development Division and Engineering

Project Priority: Moderate

Cost Estimate: Survey to be completed to determine needed funding.

Benefits (Losses Avoided): Property loss/loss of business revenue

Potential Funding: General Fund Expenditures

Timeline: By end of 2018

Action 5. Identify solutions to I-80 Gridlock

Hazards Addressed: Freeze, Cold and Snow

Goals Addressed: 1, 2, 3, 6

Issue/Background: The Town of Truckee has long been recognized as one of the coldest spots in the nation with snowfall well over 400" in the upper reaches of the Town. Along with the high snowfall rates come blizzard like conditions at times. Truckee has a major Interstate freeway running through it. It is

estimated well over 2,500 vehicles travel the interstate during peak hours with over $1,000,000.00 an hour in lost commerce when closed. Additionally, once the freeway closes, vehicle traffic quickly stacks up in all directions. Cal-Trans immediately notifies lead dispatchers in all trucking companies to hold truck traffic away from the Town, however independent truckers and small companies continue in to the area creating complete gridlock. Regular vehicle traffic continues to attempt to cross the summit, often using ill-advised side street travel guides resulting in search and rescue operations for stuck travelers.

Project Description: Conduct community surveys and stakeholder meetings to determine potential solutions and work arounds when I-80 closes over Donner Summit.

Other Alternatives: Continue to have a disjointed approach to traffic during winter weather events.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Need to develop community group with interested stakeholders to address the problem from a variety of angles.

Responsible Office/Partners: Truckee PD with at least Cal-Trans and CHP. Identify other groups that could bring resources to these events.

Project Priority: Moderate

Cost Estimate: Unknown cost estimate to conduct the outreach. Potential personnel costs in overtime during the events.

Benefits (Losses Avoided): Long duration Interstate closures affect commerce directly and indirectly in the neighborhood of $1,000,000.00 per hour.

Potential Funding: General Fund

Timeline: Have initial process completed with stakeholders completed by Winter of 2017/2018 with implementation to soon follow.

Action 6. Public Outreach/Preparedness

Hazards Addressed: Freeze, Cold and Snow/ Multi-hazard

Goals Addressed: 1, 2, 3, 6

Issue/Background: The Town of Truckee has long been recognized as one of the coldest spots in the nation. This is primarily due to large temperature swings between day and night. Truckee currently has no full-time shelter and utilizes NGO's and Non-Profits to fund part-time and temporary shelters.

Project Description: Conduct outreach on available sheltering ideas, local options and contacts, and potential out of the area placements. Provide tips and suggestions for full-time and part-time residents to safely live with routine winter weather and to be prepared for extreme winter weather.

Other Alternatives: Continue to have a disjointed approach to public outreach concerning Cold Weather events.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Local faith based organizations and other NGO's that provide alternative shelters.

Cost Estimate: Unknown but minimal costs for initial outreach. Could be additional expenses depending on giveaway's and target audiences.

Benefits (Losses Avoided): Unknown at this time.

Potential Funding: General Fund

Timeline: Have initial process with stakeholders completed by Winter of 2017/2018

Project Priority: High

Action 7. Cold Stream/Donner Creek/Donner Pass Rd Bridge Intersection

Hazards Addressed: Flood

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: The bridge over Donner Creek leading from Donner Pass Rd to the Coldstream area is concrete reinforced metal culvert. The creek is regulated with water flow from Donner Lake and is subject wide variations in flows. In 2011 the bridge partially collapsed from undercutting, cutting off access to 2 gas stations, a medium sized hotel and fast food restaurant. Additionally, there is access to a Cal-Trans sand storage yard and State Parks area. Emergency repairs were completed.

Project Description: Replace bridge and culvert as part of development of lands in this area.

Other Alternatives: Not replace bridge and have potential access problems to this area in the event of a failure of the bridge.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Possibly General Plan Update for corrective action or through development discussions.

Responsible Office/Partners: Town of Truckee Community Development Division and Engineering

Project Priority: Moderate

Cost Estimate: Survey to be completed to determine needed funding.

Benefits (Losses Avoided): Significant impacts to businesses if there is a failure of this bridge.

Potential Funding: Developer Fees/Town Facility Impact Fees

Timeline: 5 years

Action 8. South Shore Drainage

Hazards Addressed: Roadside debris for fire, drainage, and snow removal mitigation

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During heavy rain events, drainage ditches along South Shore Drive in the Donner Lake area become plugged with debris causing water to overtop South Shore Drive causing flooding to homes adjacent to South Shore Drive. Multiple utility lines, including high-pressure gas lines also are exposed to uncontrolled drainage.

Project Description: This project would improve numerous cross culverts and the associated outlet channels between South Shore Drive and a 1900 acre watershed

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Town of Truckee Public Works

Cost Estimate: 500,000

Benefits (Losses Avoided): Dozens of homes would be better protected from flooding related issues, and erosion into Donner Lake would be reduced.

Potential Funding: None identified

Timeline: Dependent upon funding

Project Priority: Medium

Action 9. Trout Creek Restoration, Reach 4 & 5

Hazards Addressed: Flooding, Bank Erosion and Hydromodification

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Trout Creek is a major drainage (blue line stream) through central Truckee. The watershed has been highly developed and the stream channel has been altered and impacted by the development. The alteration has increased flooding potential and decreased the natural ability of the stream system to carry storm event flows.

Project Description: Creek channel restoration would widen and deepen the channel to restore natural function. This would in turn improve: flood protection, water quality, ecological value, recreational opportunities, and aesthetic value of the creek.

Other Alternatives: No Action. The upper reaches have been restored so no action would leave the remaining reaches, confluence with the Truckee River, in an impaired state.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Project, Development Fees/Requirements

Responsible Office/Partners: Town of Truckee Engineering and Community Development Department

Project Priority: High

Cost Estimate: 4,000,000

Benefits (Losses Avoided): Flood protection for town roads and private properties along reach 4/5

Potential Funding: Unidentified grant funding, private development partnership

Timeline: Ongoing; 5-years

Action 10. Donner Lake Area Stormwater Infrastructure Improvements

Hazards Addressed: Localized flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During storm events many areas around Donner Lake experience localized damage including, hillside erosion, minor property from water intrusion into structures, and sediment loading of drainages and transport into Donner Lake.

Project Description: Repair and enhance existing stormwater infrastructure. Improvements will prevent road damage, prevent sediment discharge into Donner Lake, and allow uninterrupted access to homes and businesses.

Other Alternatives: No Action. No action may lead to continued and increase road repair, diminishing water quality, and road closures.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital improvement project, Grant funding

Responsible Office/Partners: Town of Truckee Engineering and Public Works

Project Priority: Medium

Cost Estimate: 1,500,000

Benefits (Losses Avoided): Flood protection for town roads and private properties

Potential Funding: Unidentified grant funding

Timeline: Dependent upon funding

Action 11. Glenshire Area Stormwater Infrastructure Improvements

Hazards Addressed: Localized flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During storm events areas around Glenshire, particularly those around greenbelts, experience localized damage including, minor property damage from water intrusion into structures, and roadway damage.

Project Description: Repair and enhance existing stormwater infrastructure. Improvements will prevent road and private property damage and allow uninterrupted access to homes.

Other Alternatives: No Action. No action may lead to continued and increased road repair and private property damage.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital improvement project, Grant funding

Responsible Office/Partners: Town of Truckee Engineering and Public Works

Project Priority: Medium

Cost Estimate: 1,000,000

Benefits (Losses Avoided): Flood protection for town roads and private properties

Potential Funding: Unidentified grant funding

Timeline: Dependent upon funding

Action 12. Sierra Meadows (Old Mill Rd.) Stormwater Infrastructure Improvements

Hazards Addressed: Localized flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During storm events some areas around Sierra Meadows, particularly those on Old Mill Road, experience localized damage including, minor property damage from water intrusion into structures, and roadway damage.

Project Description: Repair/restore and enhance existing stormwater infrastructure. Improvements will prevent road and private property damage and allow uninterrupted access to homes.

Other Alternatives: No Action. No action may lead to continued and increased road repair and private property damage.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital improvement project, Grant funding

Responsible Office/Partners: Town of Truckee Engineering and Public Works

Project Priority: Medium

Cost Estimate: 1,500,000

Benefits (Losses Avoided): Flood protection for town roads and private properties

Potential Funding: Unidentified grant funding, Facility Impact Fees

Timeline: Within the next 5-years

Action 13. Tahoe Donner Stormwater Infrastructure Improvements

Hazards Addressed: Localized flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: During storm events many areas around Tahoe Donner experience localized damage including, hillside erosion, minor property damage from water intrusion into structures, and roadway damage.

Project Description: Repair and enhance existing stormwater infrastructure. Improvements will prevent road damage, prevent sediment discharge into Trout Creek and Alder Creek, and allow uninterrupted access to homes.

Other Alternatives: No Action. No action may lead to continued and increase road repair, diminishing water quality, and road closures.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital improvement project, Grant funding

Responsible Office/Partners: Town of Truckee Engineering and Public Works

Project Priority: Medium

Cost Estimate: 3,000,000

Benefits (Losses Avoided): Flood protection for town roads and private properties

Potential Funding: Grant funding (Stormwater Prop 1)

Timeline: Dependent upon funding

Action 14. Tahoe Donner Fuel Break Projects

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: High Fire Severity Area

Project Description: TDA has completed numerous fuel break reduction projects, numerous projects area planned

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Tahoe Donner Homeowners Association

Project Priority: High

Cost Estimate: Variable, dependent on the fuels and density per acre, $800-$2,600+ approx..

Benefits (Losses Avoided): Reduced risk to people and property from wildfire.

Potential Funding: TDA Homeowners assoc. /Grants

Timeline: As funding allows

Action 15. Tahoe Truckee Airport Fuel Break Projects (Waddle Ranch Property)

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: High Fire Severity Area

Project Description: TTAD has completed numerous projects for the Waddle Ranch area, Numerous fuel reduction projects are planned and being implemented this year, affecting numerous areas

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: TTAD, Truckee Fire, Cal Fire, USFS TNF

Project Priority: High

Cost Estimate: Unk variable costs dependent on type of fuel reduction used for the areas

Benefits (Losses Avoided): Reduced risk to people and property from wildfire.

Potential Funding: TTAD

Timeline: Ongoing

Action 16. CWPP Project Implementation

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: High Fire Severity area,

Project Description: This plan identifies and prioritizes area for hazardous fuel reductions treatment

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP plan

Responsible Office/Partners: Truckee Fire, Cal Fire NEU, USFS TNF, Town of Truckee, Nevada County OES, Placer County OES, Nevada County Fire Safe Council

Project Priority: High

Cost Estimate: To be determined on a project by project basis.

Benefits (Losses Avoided): Reduced risk to people and property from wildfire.

Potential Funding: To be determined on a project by project basis.

Timeline: Ongoing, planned projects, numerous areas

Action 17. Defensible Space Projects

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Required per Ca. State Public Resources Code 4291

Project Description: Ongoing inspections throughout the district, 1500 inspections completed in 2016

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Truckee Fire/Cal Fire

Project Priority: high

Cost Estimate: Inspector hourly rates

Benefits (Losses Avoided): Reduced risk to people and property from wildfire.

Potential Funding: To be determined.

Timeline: Seasonal dependent on the snow pack

Annex D Nevada Irrigation District

D.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Nevada Irrigation District (NID), a previously participating jurisdiction to the Nevada 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 NID. This Annex provides additional information specific to NID, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

D.2 Planning Process

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

Table D-1 NID Planning Team

Name	Position/Title	How Participated
Greg Jones	Assistant General Manager	Attended Meetings, Organize Resources, Agency Coordination, Public Involvement, Vulnerability Assessment, Asset Identification, Mitigation Strategy & Goals, Draft Plan Review & Comments
Chip Close	Water Operations Manager	Attended Meetings, Organize Resources, Vulnerability Assessment, Asset Identification, Mitigation Strategy
Keane Sommers	Hydroelectric Manager	Organize Resources, Vulnerability Assessment, Asset Identification, Mitigation Strategy

Source: NID

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2011 LHMP through other plans and programs shown in Table D-2.

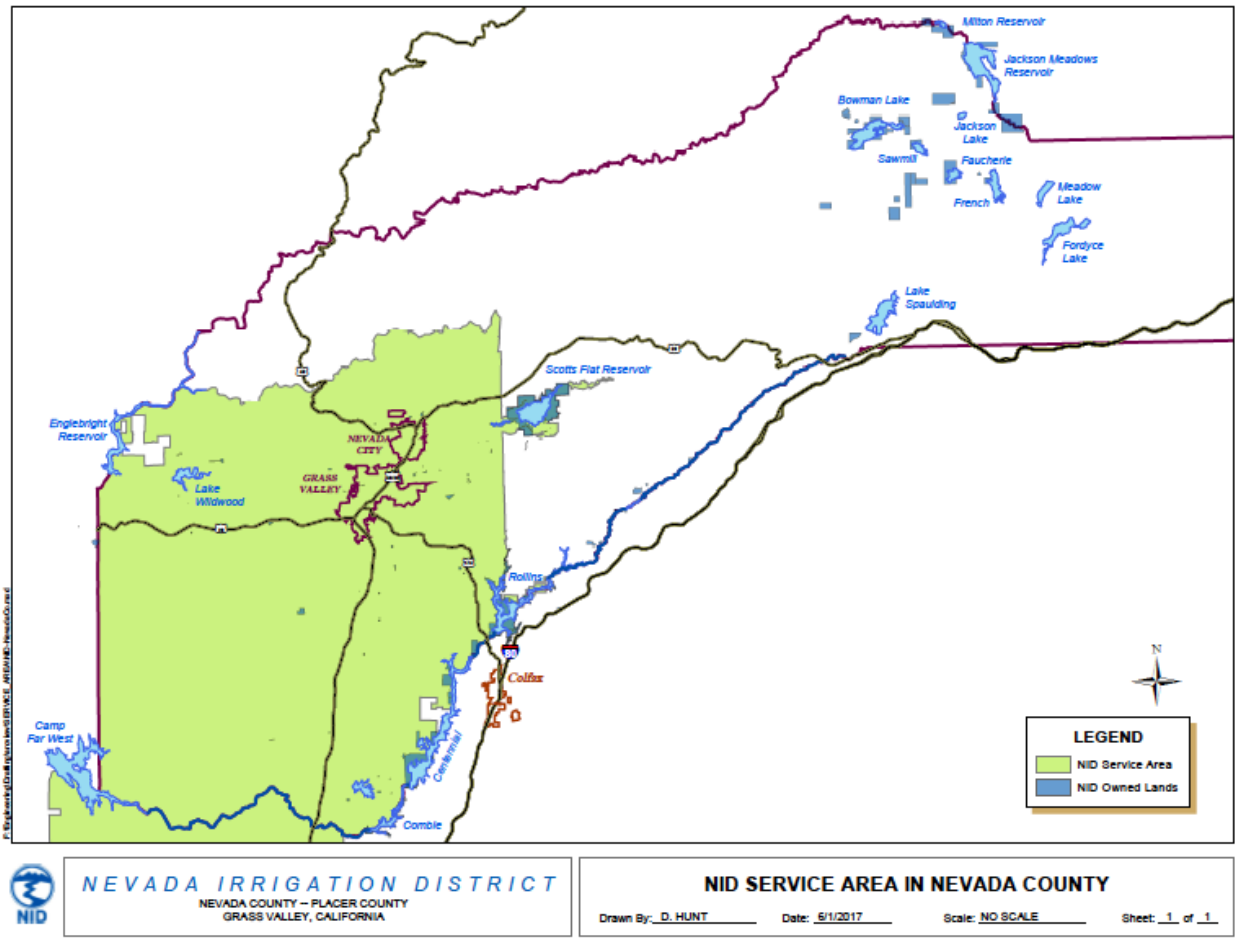
Table D-2 2011 LHMP Incorporation

Planning Mechanism 2011 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
None	Did not integrate the 2011 LHMP into other planning mechanisms

D.3 District Profile

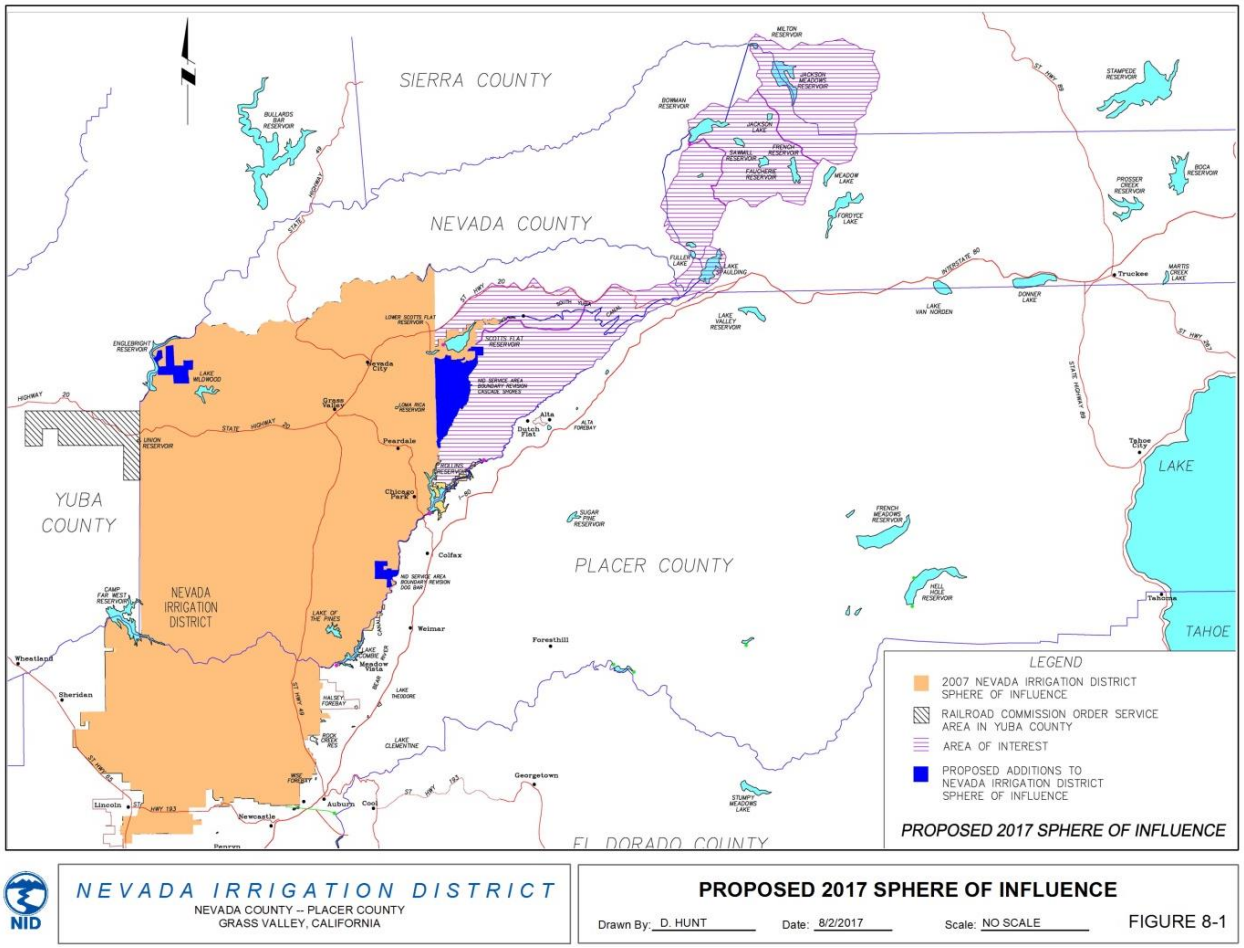
The District profile for NID is detailed in the following sections. Figure D-1 displays a current map and the location of NID current service area and other NID owned lands within Nevada County. Figure D-2 outlines the District's 2017 proposed Sphere of Influence with the addition of an "Area of Interest", a Nevada County LAFCO unique designation indicating upper watershed lands where NID owns and operates critical infrastructure necessary for District operations, including canals, reservoirs, hydroelectric plants, dams, campgrounds, etc. The Area of Interest is outside the District's current delivery service area.

Figure D-1 Current NID Sphere of Influence & Area of Interest Map



Source: NID

Figure D-2 2017 Proposed NID Sphere of Influence & Area of Interest Map



Source: NID

D.3.1. District Overview, History, and Background

Formed in 1921, NID is a diversified water resource agency that supplies over 28,000 homes, farms, and businesses in Nevada, Placer and Yuba Counties in the foothills of Northern California's Sierra Nevada Mountains. NID provides service in an expansive geographic area covering 287,000 acres that makes the District one of the largest in the State of California.

The District is organized primarily to supply water for irrigation, municipal, domestic, industrial, and hydroelectric purposes. The District owns land and/or has water rights over a considerable amount of area in the upper Sierra elevations, including approximately 44,600 acres of high mountain watershed in Nevada and Sierra Counties. NID collects water from the mountain snowpack and stores it in an extensive system of storage reservoirs. NID has seven upper elevation and three lower elevation reservoirs. Water flows to customers in the foothills through approximately 475 miles of raw water canals and approximately 400 miles of distribution pipeline. Along the path, NID utilizes water to generate clean hydroelectric energy and to provide public recreational opportunities at NIDs multiple reservoirs and campgrounds.

The highest elevation on NID mountain watershed is the peak of 8,373-foot English Mountain which rises east of Bowman Reservoir. The District's highest reservoir is French Lake at 6,835 feet. The District's lowest elevation water service is located about 100 miles to the southwest, at 150 feet above sea level, south of Lincoln in Placer County.

NID has precipitation records for Bowman Reservoir (elev. 5,650 ft.) dating back to 1929. The 69.2-inch annual average precipitation at Bowman compares to an annual average of 56 inches at 2,700 feet near Nevada City and 52 inches at 2,400 feet in Grass Valley.

Irrigation Water

Although NID has rights to 450,000 AF/yr., the historical average supply available to NID from all sources is approximately 386,500 AF/yr. This amount can vary significantly from year to year depending on climatic conditions that effect natural runoff and the amount of carry over storage available to NID. Water is provided to the District by four sources: water coming from the watershed, carry-over storage, contract purchases, and recycled water. About 90 percent of this total is used for local agriculture. NID serves approximately 5,400 raw water customers. Most purchase their water on a seasonal basis — the six-month irrigation season normally runs from on or about April 15 through October 14. Some irrigation customers purchase both summer and winter water for year-around service.

Irrigation water is used to irrigate pasture, golf courses, gardens, nurseries, orchards, and vineyards for both commercial and home production. Grapes, apples, peaches, nuts, berries, corn, rice, wheat, and oats are among the many crops grown with NID water.

Many customers realize other benefits from NID Irrigation water including filling ponds and reservoirs for stock watering, fire suppression, and recreation. Availability of irrigation water is an important factor in the preservation of open space, and greenbelt areas. There are an estimated 97,000 irrigable acres in the Nevada Irrigation District, about a third of which are presently in irrigation.

Treated Drinking Water

Through the years, NID service has changed along with the communities it supplies. The District continues to supply irrigation water, as it has since the 1920s, but today's demand is for piped and treated drinking water.

NID's treated water service areas are located in and around Grass Valley and Nevada City, Alta Sierra, Lake of the Pines, Penn Valley, Lake Wildwood, Smartville, and North Auburn areas.

Generally, treated water is available in the more populated areas, as it can be very expensive to extend treated water main lines into rural areas where there are few customers to share the costs. In recent years, the District has been successful in working with local property owners to form local water quality improvement districts.

The transition to treated drinking water began in the late 1960s and early 1970s when NID constructed its first water treatment plants. Today, the District operates a network of six modern water treatment plants in Nevada, Placer, and Yuba counties.

NID presently produces about 3 billion gallons — approximately 9,000 acre-feet — of treated drinking water per year. The district's treatment plants are operated by state-licensed and certified technicians. Water treatment processes include chlorination, coagulation, flocculation, sedimentation, and filtration.

The District operates a state-certified water laboratory where water samples from throughout the district are tested regularly.

NID treated water meets and exceeds standards set by the California State Water Resources Control Board Division of Drinking Water. As required by state law, NID produces an annual water quality report, the Consumer Confidence Report, which is updated each spring to and posted on NID's web site.

NID's flushing program is conducted annually in the winter months and is designed to keep treated water pipelines clean and ensure a fresh, high quality water supply.

D.4 Hazard Identification

NID's planning team identified the hazards that affect the District and summarized their geographic extent, probability of future occurrences, potential magnitude/severity, and significance specific to NID (see Table D-3).

Table D-3 NID—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Significant	Highly Likely	Critical	Low	High
Avalanche	Significant	Highly Likely	Critical	Medium	High
Climate Change	Significant	Highly Likely	Critical	Medium	High
Dam Failure	Significant	Occasional	Critical	High	Low
Drought and Water Shortage	Significant	Highly Likely	Critical	High	High
Earthquake	Extensive	Occasional	Critical	Medium	Low
Flood: 1%/0.2% Annual Chance	Significant	Likely	Critical	Medium	High
Flood: Localized/Stormwater	Significant	Highly Likely	Limited	Medium	High
Hazardous Materials Transportation (interstates, railroads, pipelines)	Significant	Occasional	Critical	High	Low
Landslide, Debris & Mud Flows	Significant	Highly Likely	Critical	Medium	High
Levee Failure	Limited	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Significant	Highly Likely	Limited	Low	High
Severe Weather: Extreme Cold, Snow, and Freeze	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Significant	Highly Likely	Critical	High	High
Subsidence	Limited	Occasional	Limited	Medium	Medium
Volcano	Limited	Unlikely	Critical	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Extensive	Highly Likely	Catastrophic	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

D.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile NID's hazards and assess the District's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 and 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to NID is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

D.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section □, includes a description as to how the hazard affects the NID and information on past occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Planning Area.

D.5.2. Vulnerability Assessment and Assets at Risk

This section identifies NID's assets at risk, including values, critical facilities and infrastructure, natural resources, historic and cultural resources, and growth and development trends. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the District's assets at risk, with a focus on key District assets such as critical facilities, 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:

> *Any facility (a structure, infrastructure, equipment or service), that is adversely affected during a hazardous event may result in interruption of services and operations for the District at any time before, during and after the hazard event. A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, and (3) Hazardous Materials Facilities.*

Table D-4 lists District assets, including their critical facilities, identified by the NID's planning team as important to protect in the event of a disaster. NID's physical assets, valued at over $190 million, consist of the buildings and infrastructure to support the NID operations.

Table D-4 NID's Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Hazard Info
Chicago Park Power House	Critical Facilities	$58,600,000	Earthquake, Flood, Fire
Dutch Flat Power House	Critical Facilities	$36,955,000	Earthquake, Flood, Fire
Rollins Power House	Critical Facilities	$18,325,000	Earthquake, Flood, Fire

Name of Asset	Facility Type	Replacement Value	Hazard Info
Bowman Power House	Critical Facilities	$8,000,000	Earthquake, Flood, Fire
Combie South Power House	Critical Facilities	$5,600,000	Earthquake, Flood, Fire
Combie North Power House	Critical Facilities	$2,500,000	Earthquake, Flood, Fire
Scotts Flate Power House	Critical Facilities	$2,500,000	Earthquake, Flood, Fire
Rollins Reservoir	Critical Facilities	$67,500,000	Earthquake, Flood
Combie Reservoir	Critical Facilities	$5,600,000	Earthquake, Flood
Elizabeth George Water Treatment Plant	Critical Facilities	$12,100,000	Earthquake, Flood, Fire
North Auburn Water Treatment Plant	Critical Facilities	$3,500,000	Earthquake, Flood, Fire
Lake Of The Pines Water Treatment Plant	Critical Facilities	$11,000,000	Earthquake, Flood, Fire
Water Canal System	Critical Facilities	$58,400,000	Earthquake, Flood
Orr Creek Reservoir	Critical Facilities	$10,000	Earthquake, Flood
Pickett Reservoir	Critical Facilities	$3,000	Earthquake, Flood
Buildings and Warehouses	Critical Facilities	$5,750,000	Earthquake, Flood, Fire
Administration buildings	Critical Facilities	$4,300,000	Earthquake, Flood, Fire
Pipelines and tanks	Critical Facilities	$30,000,000	Earthquake, Flood, Fire
Other assets	Critical Facilities	$190,000,000	Earthquake, Flood, Fire

Source: NID

Natural Resources

Several state or federally listed species may be found within the District boundary. These are identified, along with other species of concern found in the District, in Table D-5 and Table D-6.

Table D-5 Plant Species of Concern in the Nevada Irrigation District

Name	Status	Habitat	Potential Occurrence
Dwarf downingia *Downingia pusilla*	CNPS 2.2	Vernal Pools in valley foothill grasslands	Unlikely to occur. No appropriate habitat in the project area. Nearest known occurrence 2.2 air miles northwest of downtown Lincoln, 1.2 road miles south of Wise Road/Hwy. 65 intersection.
Legenere *Legenere limosa*	CNPS 1B.1	Vernal pools and swales, seasonal marshes, artificial ponds, floodplains of intermittent streams, and other seasonally inundated habitats.	May occur in floodplains of intermittent streams in the project area. Known from only two occurrences in the project vicinity. One located north of Pleasant Grove Creek, south of Placer Boulevard, east of Highway 65. The second is at the Orchard Creek Conservation Bank approximately 3 miles southwest of Lincoln (Jones & Stokes 2002).

Name	Status	Habitat	Potential Occurrence
big-scale balsamroot *Balsamorhiza macrolepis var. macrolepis*	CNPS 1B.2	Chaparral, cismontane woodland and valley and foothill grassland, and vernally moist meadows on sandstone, serpentine, or basalt outcrops. From 300 to 4,600 feet in elevation.	Added to table August 2009, no analysis for the project area completed.
Stebbins's morning-glory *Calystegia stebbinsii*	FE, CE, CNPS 1B.1	Chaparral (openings), cismontane woodland, serpentinite or gabbroic. 600–2,400 ft.	Unlikely to occur. No appropriate habitat present in the project area. This plant is known from fewer than 15 occurrences in specific, isolated areas of Nevada and El Dorado counties (CDFG 2004).
Dubious pea *Lathyrus sulphureus var. argillaceus*	CNPS 3	Cismontane woodland, chaparral, lower and upper montane coniferous forest. Usually full sun to part shade, woodland openings. 500–1,000 ft.	May occur in woodland habitats on the project site.
Ahart's Dwarf Rush *Juncus leiospermus var. ahartii*	CNPS 1B.2	Vernal pool margins and mesic valley and foothill grassland areas at elevations of 30–100 meters.	May occur in non-native grassland habitats in the project area. Reported in Placer County only from one occurrence at the Lincoln Airport.
Red Bluff Dwarf Rush *Juncus leiospermus var. leiospermus*	CNPS 1B.1	Meadows and seeps, vernal pools, and vernally mesic areas in chaparral, cismontane woodland, and valley and foothill grassland from 115 to 3,350 feet.	May occur in woodland and non-native grasslands habitats. Known from north of Roseville in 1982, but was relocated in 1997 (CNDDB 2002).
Butte County fritillary *Fritillaria eastwoodiae*	CNPS 3	Chaparral, cismontane woodland, lower montane coniferous forest (openings), wet and dry slopes red clay or sandy loam. 100–5,000 ft.	May occur in woodland habitats on the project site.
Brandegee's clarkia *Clarkia biloba ssp. brandegeae*	CNPS 1B.2	Chaparral, cismontane woodland, often roadcuts. 900–3,000 ft.	May occur in woodland habitats on the project site. The nearest occurrences are in the Lake Combie Quad along the Bear River (CDFG 2004).
Boggs Lake Hedge-hyssop *Gratiola heterosepala*	CE, CNPS 1B.1	Foothill Riparian	May occur in riparian habitat present in the project area. Known from only three occurrences in the project vicinity. Two of these occurrences are located between Rocklin and Roseville; the third is located just north of Lincoln (Placer County 2003).
Pincushion navarretia *Navarretia myersii ssp. myersii*	CNPS 1B.1	Vernal pools, valley and foothill (non-native) grasslands in clay soils. 66–1,083 feet	Northern limits of City of Lincoln. Exact location unknown (needs more fieldwork).

Name	Status	Habitat	Potential Occurrence
Status Codes:			
Federal FE = Federally listed as Endangered FT = Federally listed as Threatened FC = Federal Candidate species	State CE = California listed as Endangered CT = California listed as Threatened CR = California listed as Rare CSC = California Species of Concern CFP = California Fully Protected		California Native Plant Society 1B = rare, threatened or endangered in California and elsewhere. 2 = rare in California but more common elsewhere. 3 = need more information 4 = plants of limited distribution; a watch list. _.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat) _.2 = Fairly endangered in California (20-80% occurrences threatened) _.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

Status and habitat information from California Natural Diversity Database (CDFG 2004), California Native Plant Society Electronic Inventory (CNPS 2003), and USFWS Official Species Lists.

[1]Based on table presented in the Lincoln Area Water Treatment Plant Planning and Site Study (NID 2005). Updated by Robertson-Bryan, Inc. for internal use only by NID (August 2009)

Table D-6 Wildlife Species of Concern in the Nevada Irrigation District

Name	Status	Habitat	Potential Occurrence
Invertebrates			
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Found in vernal pools (seasonal wetlands)	Unlikely to occur. No appropriate habitat present.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE –	Vernal pools containing clear to highly turbid water.	Unlikely to occur. No appropriate habitat present.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT –	Associated with various species of elderberry shrubs (Sambucus spp.); generally occurs along waterways and in floodplains.	May occur if elderberry shrubs are present in the project area. Nearest known occurrences in the vicinity of the Lincoln airport and Lincoln Rodeo Grounds.
Fish			
Delta smelt *Hypomesus transpacificus*	FT CT	Found only in the Sacramento-San Joaquin Estuary and they reside primarily in the interface between salt and freshwater. Decline in population due in large part to reductions in delta water outflow.	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Longfin smelt *Spirinchus thaleichthys*	– CT, CSC	In the Sacramento-San Joaquin estuary adults and juveniles can be found in water ranging from nearly pure sea water to completely fresh water. Adult and juvenile longfin smelt occupy mostly the middle or bottom of the water column in the salt or brackish water portions of the estuary, although larval smelt are concentrated in near-surface brackish waters. Spawning takes place in fresh water, over sandy-gravel substrates, rocks, and aquatic plants.	Unlikely to occur. Project is located outside of species' known distribution.
Central Valley steelhead *Oncorhynchus mykiss irideus*	FT –	Found in tributaries to the San Francisco Bay, including the south Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in small streams and tributaries with cold, clean water flowing over graveled bottoms and deep pools.	Rainbow trout/steelhead adults and fry have been seen in Coon Creek, Auburn Ravine, Dry Creek, Secret Ravine, and Miners Ravine (CALFED Bay-Delta Program 2000).
Central Valley spring-run chinook salmon *Oncorhynchus tshawytscha*	FT CT	Found in tributaries to the San Francisco Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Unlikely to occur. Project is located outside of species' known distribution.
Sacramento winter-run chinook salmon *Oncorhynchus tshawytscha*	FE CE	Found in tributaries to the San Francisco Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	Unlikely to occur. Project is located outside of species' known distribution.
Central Valley fall/late fall-run chinook salmon *Oncorhychus tshawytscha*	– CSC	Found in tributaries to the San Francisco Bay, including the south Bay. Pass through the San Francisco Estuary during migration to streams for spawning, and during outmigration to the ocean. Spawn in well oxygenated water in swift, shallow riffles, or at edges of fast runs with loose gravel.	The Bear River supports an occasional run of adult fall-run chinook salmon in years when flows are sufficient to provide passage (Yoshiyama et al. 1996).
Green sturgeon *Acipenser medirostris*	FT CSC	In the Sacramento River, adult sturgeon are in the river, presumably spawning, when temperatures range between 8 14°C. Preferred spawning substrate likely is large cobble, but can range from clean sand to bedrock.	Unlikely to occur. Project is located outside of species' known distribution.
Amphibians			
California tiger salamander *Ambystoma californiense*	FT CSC	Breeds in freshwater ponds or vernal pools, in association with upland areas with small mammal burrows	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Western spadefoot toad *Spea hammondii*	– CSC	Requires vernal pools and seasonal wetlands below 4,500 feet that lack predators for breeding. Also occurs in grassland habitat and occasionally in valley-foothill oak woodlands and orchards.	Unlikely to occur. Project is located outside of species' known distribution.
California red-legged frog *Rana aurora draytonii*	FT CSC	Breeds in quiet streams and permanent, deep, cool ponds with overhanging and emergent vegetation below 5,200 feet elevation. Known to occur adjacent to breeding habitats in riparian areas, heavily vegetated streamside shorelines, and non-native grasslands. Sierran streams historically supported populations of red-legged frog; however, these populations have been eliminated.	Unlikely to occur. Project supports minimal suitable habitat and species in not known from the project vicinity. Project area is not designated by USFWS as critical habitat or a core recovery unit. However, the project area is in the historical range of the species. Nearest known occurrence is in El Dorado National Forest, near Michigan Bluff (CNDDB 2004).
Foothill yellow-legged frog *Rana boylii*	– CSC	Inhabits valley and foothill oak woodland, riparian forest, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadows. Breeds in rocky streams with cool, clear water from 0 to 4,500 feet.	Appropriate habitat present in intermittent drainages within the proposed project site. Nearest known occurrences are located in Missouri Creek Canyon in Tahoe National Forest and Greenhorn Creek, where two adults were detected in 1999 (CDFG 2004).
Reptiles			
Western pond turtle *Actinemys marmorata*	– CSC	Occurs up to 6,000 feet in perennial wetlands and slow moving creeks and ponds with overhanging vegetation. Requires suitable basking sites such as logs and rocks above the waterline.	Appropriate habitat present in Orr Creek Reservoir and stock ponds located within the project area. Nearest known occurrences are located 4 mi. WNW of Newcastle and on Wolf Creek in Nevada County (CDFG 2004).
California horned lizard *Phrynosoma coronatum frontale*	– CSC	Occurs in riparian woodlands and annual grasslands, exposed sandy-gravelly substrate with scattered shrubs, and clearings from 0 to 6,500 feet.	Appropriate habitat present in the non-native grasslands in the project area. Nearest known occurrences are 2.5 miles west of Highway 49 and 20 Junction in Nevada City and on Alta Vista Road in Grass Valley (CDFG 2004).
Giant garter snake *Thamnophis gigas*	FT CT	Primarily associated with marshes and sloughs, less with slow-moving creeks, and absent from larger rivers. Nocturnal retreat is holes, especially mammal burrows, crevices, and surface objects. During the day the giant garter snake often basks on emergent vegetation such as cattails and tules.	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Birds			
White-tailed (black shouldered) kite *Elanus leucurus*	– CFP	Inhabits herbaceous and open stages of most habitats mostly in cismontane California. Forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands.	Appropriate nesting and foraging habitat present within the project area.
Northern harrier (nesting) *Circus cyaneus*	– CSC	Frequents meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands. Mostly found in flat, or hummocky, open areas of tall, dense grasses, moist or dry shrubs, and edges for nesting, cover, and feeding.	May forage in non-native grasslands and nest in the project area.
Swainson's hawk *Buteo swainsoni*	BCC CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands, suitable grain or alfalfa fields, or livestock pastures.	Unlikely to occur. Project is located outside of species' known distribution.
Ferruginous hawk (wintering) *Buteo regalis*	BCC –	Winter visitor along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County. Prefers open terrain, plains, and foothills. Does not nest in California.	Winter Visitor. May forage in non-native grasslands in the project area.
Bald eagle *Haliaeetus leucocephalus*	FD (Delisted 7/9/07) CE, CFP (nesting and wintering)	Local winter migrant to various California lakes. Most of the breeding population is restricted to northern counties. Regular winter migrants to the region.	Foraging habitat present in Combie Reservoir.
American peregrine falcon *Falco peregrinus anatum*	Former FE (Delisted on 8/20/99), BCC CE, CFP (nesting)	Breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds	Unlikely to occur. No appropriate habitat present in the project area.
California black rail *Laterallus jamaicensis*	BCC CFP, CT	Forages and nests in tidal emergent wetlands dominated by pickleweed or in brackish marshes supporting bulrushes and pickleweed; Usually found in immediate vicinity of tidal sloughs.	Unlikely to occur due to lack of suitable habitat. Previously unknown populations were recently discovered in the foothills of Nevada County (Tecklin 1990). Known to occur in isolated marshes along Garden Bar Road, McCourney Road, and in and near Spenceville Wildlife Area (CDFG 2004).

Name	Status	Habitat	Potential Occurrence
Mountain plover *Charadrius montanus*	BCC CSC	Short grasslands and plowed fields with little vegetation, and open sagebrush areas of the Central Valley from Sutter and Yuba counties southward.	Unlikely to occur. Project is located outside of species' known distribution.
Long-billed curlew *Numenius americanus*	BCC	Found in wet meadow habitat in northeastern California in Siskiyou, Modoc, and Lassen counties. Winter visitor along the California coast and in the Central and Imperial valleys.	Winter Visitor. May forage in wet meadows in the project area.
Yellow-billed cuckoo *Coccyzus americanus*	FC, BCC CE	Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation.	Unlikely to occur. Project is located outside of species' known distribution.
Western burrowing owl *Athene cunicularia*	BCC CSC (Burrow sites.)	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	Unlikely to occur. Project is located outside of species' known distribution.
Vaux's swift *Chaetura vauxi*	– CSC (nesting)	Prefers redwood and Douglas fir habitats with nest sites in large, hollow trees and snags, especially tall, burned-out stubs. Forages over moist terrain and habitats, preferring rivers and lakes.	Unlikely to occur. Project is located outside of species' known distribution.
Black swift *Cypseloides niger*	BCC CSC (nesting)	Breeds locally in Sierra Nevada and Cascades. Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons. Forages widely over many habitats; seems to avoid arid regions.	Unlikely to occur. Project is located outside of species' known distribution.
Lewis' woodpecker *Melanerpes lewis*	BCC (nesting)	Winter resident in open oak savannas, broken deciduous, and coniferous habitats with brushy understory. Uses logged and burned areas. Winters in the Central Valley, Modoc Plateau, and the Transverse and other ranges in Southern California. Breeds locally along eastern slopes of the Coast Ranges, and in Sierra Nevada, Warner Mts., Klamath Mts., and in the Cascade Range.	Winter Visitor. May forage in the project area.
Little willow flycatcher *Empidonax traillii brewsteri*	– CE (nesting)	Wet meadow and montane riparian habitats from 2,000 to 8,000 feet. Breeding seldom occurs below 5,000 feet. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows	Unlikely to occur. Project is located outside of species' known distribution.

Name	Status	Habitat	Potential Occurrence
Bank swallow *Riparia riparia*	– CT (nesting)	Migrant found primarily in riparian and other lowland habitats in California west of the deserts. Requires vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, and the ocean for nesting. Feeds primarily over riparian areas during breeding season and over grassland and cropland during migration.	Unlikely to occur. Project is located outside of species' known distribution.
Yellow warbler (nesting) *Dendroica petechia brewsteri*	– CSC	Uncommon nester over most of California, except the Central Valley, Mojave Desert, and high elevations of the Sierra. Winters along the lower Colorado River and in parts of Imperial and Riverside counties. Nests in riparian habitats dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral. May also use oaks, conifers, and urban areas nears streams.	May occur in woodland and riparian habitats in the project area
Yellow-breasted chat (nesting) *Icteria virens*	– CSC	Uncommon migrant in California. Nests in a few locations such as Sweetwater and Weber Creeks, El Dorado County; Pit River, Shasta County; Russian River, Sonoma County; Little Lake Valley, Mendocino County; and upper Putah Creek, Yolo County. Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry, and grape.	May occur in woodland and riparian habitat in the project area. Documented nesting at Little Wolf Creek, Bear River, Dry Creek, Indian Springs Creek, Deer Creek, and the Middle and South Yuba River (Nevada Co. Planning Dept. 2002).
Modesto song sparrow *Melospiza melodia mailliardi*	– CSC	Found in a variety of habitats including: riparian willow thickets, valley oak riparian with an understory of blackberry, ruderal areas along levees and irrigation canals, and cattail and tule marshes.	May occur in riparian habitats in the project area. Known to occur in western Placer County and adjacent Sierra foothill counties (Grinnell and Miller 1944; Gardali 2002).
Grasshopper sparrow *Ammodramus savannarum*	– CSC	Occurs in dry, dense grasslands, especially those with a variety of grasses and tall forbs and scattered shrubs for singing perches	May occur irregularly in non-native grasslands in the project area. One singing male was found in an annual grassland east of Lincoln; it was only present for a few days (April 1999). A fall migrant was found along Brewer Road (September 1999). (Easterla pers. comm.; Webb 2003.)
Tricolored blackbird *Agelaius tricolor*	BCC CSC (nesting colony)	Breeds near freshwater, preferably in emergent wetland with tall dense cattails or tules, but also in thickets of willow, blackberry, wild rose, and tall herbs. Feeds in grassland and cropland habitats. Found throughout the Central Valley and on the coast.	May forage in non-native grasslands and next in some raw water storage facilities.
Lawrence's goldfinch *Carduelis lawrencei*	BCC	Occurs in valley foothill hardwood and valley foothill hardwood-conifer. Breeds in open oak or other arid woodland and chaparral, near water.	May occur in woodland habitats in the project area.

Name	Status	Habitat	Potential Occurrence
Loggerhead shrike *Lanius ludovicianus*	– CSC (nesting)	Open habitats with sparse shrubs and trees (or other suitable perch sites) and bare ground and/or low, sparse herbaceous cover; oak woodlands for nesting. Found in lowlands and foothills throughout California	May forage in non-native grasslands and nest in woodland habitats in the project area.
Mammals			
Spotted bat *Euderma maculatum*	– CSC	Habitats range from arid deserts and grasslands through mixed conifer forests up to 10,600 feet in southern California. Prefers sites with adequate roosting habitat, such as cliffs. Often limited by the availability of cliff habitat. Feeds over water and along marshes.	May roost or forage in the project area in all habitat types, but project area outside of species' historic range.
Greater western mastiff bat *Eumops perotis californicus*	– CSC	Occurs in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, chaparral, desert scrub, and urban areas in southeastern San Joaquin Valley and Coastal Ranges from Monterey County south. Typically roosts in caves, crevices or other rock formations. Requires open areas for foraging.	Unlikely to occur. Project area is outside of species' known distribution.
Townsend's big-eared bat *Corynorhinus townsendii*	– CSC	Occurs from low desert to mid-elevation montane habitat. Occurs in rural settings, inland deserts, coastal redwoods, oak woodland of the inner Coast Range and Sierra, and low to mid-elevation mixed forest.	May roost or forage in the project area in all habitat types, but project area outside of species' historic range.

Status Codes	
Federal FE = Federally listed as Endangered FT = Federally listed as Threatened = Federal Species of Concern FC = Federal Candidate species FPT = Federally Proposed Threatened BCC = Birds of Conservation Concern	State CE = California listed as Endangered CT = California listed as Threatened CR = California listed as Rare CSC = California Species of Concern CFP = California Fully Protected

Status and habitat information is taken from California Natural Diversity Database (CDFG 2004), Zeiner et al. (1990), and USFWS Official Species List

[1] Based on table presented in the Lincoln Area Water Treatment Plant Planning and Site Study (NID 2005). Updated by Robertson-Bryan, Inc. for internal use only by NID (August 2009).

Growth and Development Trends

There was minimal to no growth within the District during the last planning cycle. There are in-progress plans for growth of District Facilities, as described below.

The District Financed Waterline Extension (DFWLE) program. The DFWLE program was established for small groups up to 40 lots to assist the community by extending financing to participants for the costs of pipeline installation that can be paid back over a 20-year time frame. Current DFWLE projects include:

- Table Meadow Road
- Alderwood Way
- Lodestar/Victoria Drive
- Montclair Court

Development Since 2011 Plan

There has been minimal to no expansion of District facilities since the 2011 LHMP.

D.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table D-3 as medium or high significance hazards. Impacts of past events and vulnerability of the NID to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Nevada County Planning Area). In general, the most vulnerable structures are those located within the floodplain or within dam inundation areas or high risk wildfire areas. Also, older facilities that may be constructed with unreinforced masonry and buildings built prior to the introduction of modern building codes are also more vulnerable to hazard events.

An assessment of the vulnerability of the NID to each identified priority hazard, in addition to the estimate of probability of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Avalanche

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

NID has critical water supply facilities in the high alpine watershed that supply a majority of the District's annual water needs. These facilities are located in remote, steep terrain that is subject to avalanche during

heavy winters. The primary danger with an avalanche is the potential for blockage of canals and damage to the many elevated flumes relied upon for conveyance.

Past Occurrences

Heavy snow in the early 1990's blocked water flow in the South Yuba Canal and created constraints on the District's water delivery system. Emergency pumps were brought in to pump water from Scotts Flat as a backup while the snow was cleared.

Vulnerability to Drought and Water Shortage

Although a permanent emergency pump station was completed in 2016 to bolster water supplies during wintertime outages, full summertime demands cannot be met. A major landslide that causes significant damage to NID water delivery infrastructure would create a water supply shortage for most of Nevada County.

Future Development

The NID has no planned future facilities in avalanche risk areas.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Nevada County, the HMPC noted that each year it seems to get a bit warmer and snow seems to start at higher levels. It was also noted that 2017 was one of the wettest years ever.

Past Occurrences

The winter of 2016/2017 saw an increase in storm water runoff, localized flooding and landslides throughout NID's service territory and source water areas.

Vulnerability to Climate Change

California's Adaptation Planning Guide (APG): Understanding Regional Characteristics has divide California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Nevada County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. The California APG prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change.

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Nevada County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

NID in general could see population fluctuations in the District 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. For example, excessive heat and drought may make wildfires worse for the District. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact the Nevada County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies

Dam Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that

structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

NID owns and operates 15 dams under the jurisdiction of the California Division of Safety of Dams (DSOD). All of these dams, with the exception of Deer Creek Diversion and Loma Rica Airport, are also under the jurisdiction of the Federal Energy Regulatory Commission (FERC). Hydroelectric and Water Operations perform weekly/monthly dam safety inspections and take dam instrumentation readings when the sites are accessible. Displacements of the dams are obtained regularly by District Survey. In addition, the District submits annual dam safety surveillance monitoring reports to DSOD and FERC for their approvals.

Both DSOD and FERC perform their own annual dam safety inspections of these dams. These regulatory agencies also require that the District update Emergency Action Plans and various evaluations, including seismic stabilities, probable maximum flood, operational equipment, etc., on an as-needed basis. Once every 5 years, the FERC-jurisdictional dams are also inspected and evaluated by Independent Consultants.

Past Occurrences

There have been no close calls or past issues related and there have been no disasters declarations related to dam failure in the District.

Vulnerability to Dam Failure

Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the District.

Future Development

Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the NID service area that a dam failure would affect, development in the dam inundation area will continue to occur for communities that receive NID services.

Drought and Water Shortage

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects

different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

The Nevada Irrigation District generally has sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century.

Past Occurrences

Based on historical information, the occurrence of drought in California, including Nevada Irrigation District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. The District has been affected

Vulnerability to Drought and Water Shortage

The vulnerability of NID to drought is districtwide, but impacts may vary and include reduction in water supply, agricultural losses, and an increase in dry forest fuels leading to bark beetle infestation and catastrophic wildfire. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. As such, to ensure efficient water use, permanent water use restrictions include:

- No outdoor watering in the heat of the day (10:00 a.m. to 6 p.m.);
- No outdoor watering during and 48 hours after rain;
- No outdoor watering that causes excess runoff;
- Washing down driveways and sidewalks is prohibited unless for health and safety;
- No washing a motor vehicle with a hose unless the hose is fitted with a shutoff nozzle;
- No use of potable water in a fountain or decorative feature unless the water is recirculated;
- Restaurants can only serve water to customers on request;
- Hotels and Motels must provide guests with the option to not have towels and linens laundered daily;
- Irrigation with potable water of ornamental turf on public street medians;
- Irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

Future Development

According to the HMPC, NID has access to large quantities of water through surface water. However, population growth in the District will add additional pressure to the District during periods of drought and water shortage. NID will need to continue to plan for and add infrastructure capacity for population growth.

Earthquake

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. 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. Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Past Occurrences

There have been no past occurrences of earthquake in the District that have caused damage to District facilities.

Vulnerability to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. NID is subject to some seismic activity, although this risk is relatively low compared to other places in the State.

Future Development

Although new growth and development corridors would fall in the NID services area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the NID service area will continue to occur.

Flood: 1%/0.2% Annual Chance (100/500-year)

Likelihood of Future Occurrence–Occasional/Unlikely
Vulnerability–Medium

Hazard Profile and Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. History highlights floods as one of the most frequent natural hazards impacting Nevada County. Floods are among the most costly natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a

flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Past Occurrences

The most recent flood event to impact the District is the late December floods of 2005. Excessive rain for a prolonged period caused severe flooding in the Sierra foothills, in and around Nevada County. Impacts included damage to the District's canal system as well as damage to roads and properties throughout District boundaries.

Heavy prolong precipitation in late 1996 caused flood damage across much of the District's service area. President Clinton proclaimed the area a disaster area while Governor Wilson followed suit. Many of the Districts main diversion dams and canals were washed out. Over 50 applications for flood damage assistance for the repair of NID facilities were submitted to FEMA and Cal OES.

From 1996 - 2005, NID submitted 12 occurrences of infrastructure damage due to excessive flow rates to Cal OES ranging from diversion structure erosion to reservoir spillway damage.

Vulnerability to Flood 1%/0.2% Annual Chance

Flooding is a significant problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the County swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1%- and 0.2% annual chance floodplains and in other localized areas.

Historically, much of the growth in the County has occurred adjacent to streams, resulting in significant damages to property, and losses from disruption of community activities when the streams overflow. Additional development in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Future Development

If any development is to occur in the floodplain, it would have to conform to the elevation standards of the floodplain ordinance of the jurisdiction in which the development is happening. The NID does not control development, nor does it have a floodplain ordinance as it has no means to enforce it. No District development is expected in floodplains in the future.

Flood: Localized/Stormwater

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Localized, stormwater flooding also occurs throughout the County during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated ground conditions. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff.

Past Occurrences

Past flooding incidents, although minor in scope, have occurred on nearly every District canal. In 2017, the District observed prolonged precipitation resulting in localized flooding occurrences which resulted in canal breaches, culvert flooding, and spill channel flow increases.

Vulnerability to Localized/Stormwater flooding

The District supplies both drinking and irrigation water to portions of Nevada County. The conveyance of water is accomplished through over 400 miles of pipe and over 475 miles of open canal. The Districts treated water system is susceptible to localized flooding damages from concentrated storm water runoff causing erosion of soil and exposing the water main. The exposed water main is then weekened and vulnerable to breakage due to the loss of securing soils. Treated water pipelines also have the potential to cause localized flooding during water main breaks.

The Districts canal system is susceptible to storm water flooding from heavy precipitation events that create heavy runoff that enters District canals and overburdens the system. These high runoff flows can cause overtopping of the canal and erosion of the canal berm potentially causing property damage.

Future Development

The potential for flooding may increase as stormwater is channeled due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on build out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address

these changes on a site-by-site basis, their cumulative effects can have a negative impact on the floodplain.

Hazardous Materials Transportation

Likelihood of Future Occurrence–Occasional
Vulnerability–High

Hazard Profile and Problem Description

Hazardous materials include a wide variety of substances commonly used in households and businesses. Used motor oil, paint, solvents, lawn care and gardening products, household cleaners, gasoline and refrigerants are among the diverse range of substances classified as hazardous materials. Nearly all businesses and residences generate some amount of hazardous waste; certain businesses and industries generate larger amounts of such substances, including gas stations, automotive service and repair shops, printers, dry cleaners and photo processors. Hospitals, clinics and laboratories generate medical waste, which is also potentially hazardous.

Use, storage and transportation of hazardous wastes is heavily regulated by federal, State and local agencies, including the California Department of Toxic Substances Control, which is authorized to implement the regulations of the Federal Environmental Protection Agency. The Nevada County Environmental Health Department monitors commercial storage and use of hazardous materials, including issuing permits for use and storage of significant quantities of hazardous materials or substances.

Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. Much of the hazardous materials transported through Nevada County are carried by truck on the State Highway, railway systems, and underground pipelines. In the District, highways 20 and 49 carry hazardous materials.

Past Occurrences

There have been no past occurrences of hazardous materials in the District.

Vulnerability to Hazardous Materials Transportation

NID storage and conveyance facilities are located along the heavily traveled Interstate 80 corridor. This is the main artery for transportation in and out of Northern CA and includes a major railway. A multitude of hazardous chemicals are transported through this area on a daily basis. A spill along the interstate or railway has the potential to cause contamination to the Districts main water supply.

Future Development

Development will continue to happen within hazardous materials transportation zones. The NID may take this factor into account when choosing to site future facilities.

Landslide, Debris and Mud Flows

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

The susceptibility of an area to landslides depends on many variables including steepness of slope, type of slope material, structure and physical properties of materials, water content, amount of vegetation, and proximity to areas undergoing rapid erosion or changes caused by human activities. These activities include mining, construction, and changes to surface drainage areas.

Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, and forested areas, and can cause injuries and death.

Past Occurrences

There have been no federal or state disaster declarations for Landslides, Debris and Mud flows in the District. However, in February 2017 NID declared a Declaration of Emergency for the South Yuba Canal. In a remote canyon near Bear Valley, a landslide occurred on a steep hillside that the South Yuba Canal traverses. The slide caused a section of elevated canal to break free of its footings creating a breach and interrupting service. The canal is one of the main water conveyance facilities for NID's Nevada County operations. Waters conveyed through the canal supply homes and businesses, including farms and ranches throughout Nevada County. The District used natural flow of Deer Creek and backup pump systems to meet customer demand. The declaration of emergency facilitated immediate repairs to the canal in an attempt to reduce water supply impacts.

Vulnerability to Landslide, Debris Flow and Mud Flows

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the District during specific times. Based on the risk assessment, it is evident that landslides will continue to have potentially large impacts to certain areas. However, many of the landslides in the District are minor, localized events that are more of a nuisance than a disaster.

Future Development

The NID may take this factor into account when choosing to site future facilities. Given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide area will likely continue.

Severe Weather: Extreme Cold, Snow and Freeze

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile and Problem Description

Most of the NID service territory is in the western portion of the County. According to the WRCC, in the western portion of Nevada County, monthly average minimum temperatures from November through April range from the low to mid-30s. The lowest recorded daily extreme was 3°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 72.7 days with no days falling below 0°F. Average snowfall is 10.0 inches. The highest annual snowfall fell in 1972, when 26.7 inches fell. Highest monthly snowfall accumulation came in March of 1974, when 23.0 inches fell. Average snow depths in January through March fall at 1 inches.

Snow accumulation does not directly follow precipitation in the Sierra Nevada. While the greatest total precipitation occurs in the northern part of the range, the greatest snow accumulation occurs in the central and high southern parts of the range, due to higher elevations and colder temperatures which inhibit snow melt. The western slope of the Sierra Nevada acts as trap for winter storms, wringing out the moisture before it can get to the east side. Weather stations located on the west side begin registering measurable snow between 2,500 and 3,000 feet elevation. On the east side, measurable snow accumulation doesn't begin until about 4,000 feet and increases more slowly with altitude. Snow depths drop dramatically on the east side of the range due to the rain shadow effect.

Past Occurrences

A disaster declaration for Nevada County was issued by the state government in 1972 for freeze and severe weather conditions and the District was included.

Vulnerability to Severe Weather: Extreme Cold, Snow and Freeze

NID is subject to multiple hazards during severe freeze events. First, NIDs high sierra facilities are vulnerable to freezing so severe that the waters within the supply canals become solid ice. When this occurs, water deliveries to the system become impossible. NID has experienced multiple events where crews were sent out day and night to break ice to keep water flowing to critical water treatment facilities.

Second, freezing in the lower reaches of NID's service area where customers are not acclimated or prepared for cold temperatures causes freezing of water distribution systems and burst pipes. Once the pipes thaw, water free flows through the broken pipes and creates water demands that NID treatment systems have a tough time keeping up with.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction.

Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightening)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Storms in the District 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.

Past Occurrences

Severe weather in the District is and has historically been an issue for the District. This will continue to be an issue for their customers within the NID service area.

Vulnerability to Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

Often during these events, the raw water distribution system can be impacted. Heavy runoff from storm activity can cause excessive water in District canals resulting in an overtopping of the canal. An overtopping will washout the canal berm resulting in localized flood damage and interruption of the water supply. On an annual basis, the District receives 20 to 40 claims stemming from these overtopping events.

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While minimal damages have occurred to District facilities in the past due to lightning, hail, or high winds and tornadoes, there still remains future risk.

Subsidence

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

Subsidence, the sinking of the ground due to the movement of underground material causing a shift or collapse, is a concern to the Nevada County Planning Area. There are several major sources of subsidence present in Nevada County: water drawdown, abandoned mines, karst and any underground voids caused by a variety of factors including underground utilities and culverts. One of the primary sources for the City, abandoned mines, had data available to conduct additional analysis of possible locations of future mine-related subsidence, and is thus the focus of the remainder of this section. Past mining activities have created surface subsidence in some areas and have created the potential for subsidence in other areas. Nevada County is home to many abandoned mines.

A substantial portion of the District is underlain by a deep, extensive labyrinth of abandoned mine tunnels. The Empire Mine tunnels alone extend some 365 miles beneath the City of Grass Valley.

Dozens of mining claims were worked in the Grass Valley and Nevada City area during the heyday of gold mining. Some were large, mechanized operations. Most were small and more labor-intensive.

Past Occurrences

There have been no disaster declarations related to subsidence in the District. The District noted no past events of subsidence that have affected any District facilities.

Vulnerability to Subsidence

To the extent NID's canals and pipe are above open tunnel mines, there is a vulnerability to these assets. Karst and water drawdown are unlikely to have an effect on the District.

Future Development

Many of the subsidence and mine areas in the District are known, but many still remain unknown and untracked. The risk of subsidence to future development can be minimized by accurate recordkeeping and tracking of previously unknown abandoned mines. Knowing these locations and choosing not to develop in those areas or mitigating against future issues will reduce future risks of losses due to subsidence.

Wildfire

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Over one hundred years of aggressive fire suppression under the national fire suppression policy has rendered wildlands severely overgrown. Much of the private land in the District's area is in the wildland urban interface with increasing residential development.

As more people move into the area and impacts from recreational demands increase, there will be more human-caused wildfire starts each year. And, the increased number of widely scattered homes within the District adds greatly to the danger, complexity, and cost of fighting these fires.

Forest overgrowth due to the efficiency of modern firefighting techniques, and to society's current election to limit forest thinning and harvesting, is a serious problem. If wildfire does not impact the forest first, native insects will eventually kill millions of trees. Explosions in insect populations usually start during a drought, when the lack of water combined with too many trees per acre render the trees too weak to fight off the insect attacks. Without a change in management practices on public lands, there is little hope of avoiding a kill off of trees similar to the kill off experienced by other national forests.

The Scott's Flat Reservoir in Nevada County is within the area ranked by Cal Fire as a Very High Fire Severity Zone based on inputs, such as fuel, slope, brush density (ladder), and tree density (crown cover), prolonged drought and beetle infestation. This means that if a fire were to start on the property, the fire

would most likely crown-out, developing into a conflagration preheated by the understory fuels. On September 13, 2016 the Nevada County Board of Supervisors found that the forgoing conditions and scope of extreme peril warranted and necessitated the proclamation of Local Emergency and, on said date, adopted a Resolution To Proclaim A Local Emergency In Nevada County Due To Extreme Tree Mortality.

Past Occurrences

A search of FEMA and Cal OES disaster declarations turned up multiple events. State disaster declarations occurred in 1961, 1987, and 1988. Federal disaster declarations occurred in 1998 (twice), and the Lowel Hill fire in August of 2015.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern, with some areas of the District being at greater risk than others. High fuel loads, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the District, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

In the case of a catastrophic wildfire in the county, many District assets are at risk. Depending on the location and severity of the fire, any of the District's power houses, reservoirs, canals, pipes, treatment plants, offices and/or campgrounds could be at risk.

Future Development

Population growth and development in the District has recently slowed. However, additional growth and development within the WUI areas of the County would place additional assets at risk to wildfire. The District will take fire risk into account when siting new facilities.

D.6 Capability Assessment

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

D.6.1. Regulatory Mitigation Capabilities

Table D-7 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 NID.

Table D-7 NID's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y	Last update 2011. The plan covers the expected expansion of District facilities over the next 30 years. The hazards covered include the expected flow ranges thus allowing for upsizing of pipes and canals to prevent storm water flooding.
Capital Improvements Plan	Y	Ongoing annually. Projects are initiated based on Master Planning, facility inspection, and available capacity.
Economic Development Plan		N/A
Local Emergency Operations Plan	Y	The District has multiple Emergency Plans that are updated annually. These plans cover emergencies ranging from treated water supply to a major dam failures.
Continuity of Operations Plan		
Transportation Plan		N/A
Stormwater Management Plan/Program	Y	Storm water management is covered by District policy. The policy states all future facilities will be designed in a manner that doesn't allow storms water to infiltrate District canals.
Engineering Studies for Streams	Y	Only for stream health.
Community Wildfire Protection Plan	N	Covered in our Emergency Response Plans.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		The District also maintains a drought contingency plan to assist water management during periods of drought or water supply shortages
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	N/A	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	N/A	Score:
Fire department ISO rating:	N/A	Rating:
Site plan review requirements	N/A	
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	N/A	
Subdivision ordinance	N/A	

Floodplain ordinance	N/A
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N/A
Flood insurance rate maps	N/A
Elevation Certificates	N/A
Acquisition of land for open space and public recreation uses	N/A
Erosion or sediment control program	N/A
Other	N/A
How can these capabilities be expanded and improved to reduce risk?	
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.	

Source: NID

D.6.2. Administrative/Technical Mitigation Capabilities

Table D-8 identifies the department(s) responsible for activities related to mitigation and loss prevention for NID.

Table D-8 NID's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Planning is included through the Districts Engineering Department
Mitigation Planning Committee	Y	Planning is included through the Districts Engineering Department
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	The District has a fully staffed maintenance division with 64 dedicated positions to keep facilities in proper order.
Mutual aid agreements	Y	The District has mutual aid agreements with many neighboring agencies including, PG&E, PCWA, City of Grass Valley, City of Nevada City, and Placer County.
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N/A	
Floodplain Administrator	N/A	
Emergency Manager	Yes	The District has a risk manager that will act as an emergency manager during an emergency. Table top emergency exercises are practiced with multiple agencies every 5 years.
Community Planner		

Civil Engineer	Yes	The District has an in house engineering department with a staff of 5 licensed engineers trained in all aspects of District functions.
GIS Coordinator	Yes	The District has a drafting division that maintains the Districts GIS system. The group has coordinated with outside agencies during emergencies to provide mapping information.
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Yes	The District has electronic warning systems for its dams, water treatment plants and its canals. Facilities are manned or monitored on a 24 hour a day 7 day a week basis. The District also utilizes an answering service as backup.
Hazard data and information	Yes	The District maintains a current SDS data base
Grant writing	Yes	The District has an in house grant writer
Hazardous analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: NID

D.6.3. Fiscal Mitigation Capabilities

Table D-9 identifies financial tools or resources that the NID could potentially use to help fund mitigation activities.

Table D-9 NID's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Yes	Funding source is included in water rates includes pipeline replacement, PRV replacement, raw water system improvement, backbone extension and community investment programs.
Authority to levy taxes for specific purposes	Yes	The District receives a small portion of local government taxes through an agreement with the Counties
Fees for water, sewer, gas, or electric services	Yes	Fees include funding for service operations and maintenance
Impact fees for new development	No	
Storm water utility fee	No	
Incur debt through general obligation bonds and/or special tax bonds	Yes	Bonds and special taxes have both been utilized to fund projects within the District

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Incur debt through private activities	No	
Community Development Block Grant	No	
Other federal funding programs	Yes	The District has been the recipient of Depart. of Water Resources grant funding
State funding programs	Yes	State Revolving Loan Funding
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: NID

D.6.4. Mitigation Education, Outreach, and Partnerships

Table D-10 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 D-10 NID's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Yes	The District works with Multiple NGO's that focus on watershed protection such as: Nevada County Economic Resource Council, The Sierra Fund, SYRCL, Bear Yuba Land Trust and others that could help spread the word during emergency
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	The District has a dedicated Water Efficiency Staff to help spread the water conservation message
Natural disaster or safety related school programs	N/A	
StormReady certification	N/A	The District has a storm water action plan in place that is implemented during forecasted heavy storms
Firewise Communities certification	Yes	The District works with Multiple NGO's that focus on watershed protection such as: Nevada County Economic Resource Council, The Sierra Fund, SYRCL, Bear Yuba Land Trust and others that could help spread the word during emergency
Public-private partnership initiatives addressing disaster-related issues		

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: NID

D.6.5. Other Mitigation Efforts

Heavy rains in early February 2017 created a landslide that caused significant damage to PG&E's South Yuba Canal in the Lowell Hill area east of Nevada City. The canal is owned and operated by PG&E and serves the Deer Creek Powerhouse; in addition it is one of the main water conveyance facilities for NID, supplying homes, businesses, farms and ranches throughout Nevada County. The slide caused a section of the elevated canal to break free of its footings, creating a breach and interrupting service. NID declared a state of emergency to help expedite repairs in the steep and shifting terrain. In order to maintain adequate water supply, NID asked for a voluntary conservation of 25% from the community who responded with overwhelming support. Voluntary reductions eliminated the need for mandatory reduction measures.

During the repair, NID completed a planned Banner Cascade Pipeline Project to facilitate the transport of raw water from Upper Cascade to the raw water canals below the E. George and Loma Rica Treatment Facilities allowing for additional supply during the South Yuba Canal repair. These canals convey raw water to NID's irrigation customers and to both water treatment plants to be converted into drinking water serving residential customers in Grass Valley and Nevada City. A treated water pipeline with fire hydrants has also been included to further serve residents along the alignment.

D.7 Mitigation Strategy

As part of the overall HMPC for the development of this multi-jurisdictional Nevada County LHMP Update, each jurisdiction followed the mitigation strategy development process detailed in Chapter 5 and Appendix C of the Base Plan, which included the development of plan goals and objectives and the resulting mitigation actions and projects.

D.7.1. Mitigation Goals and Objectives

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

D.7.2. Mitigation Actions

The planning team for NID identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

It should be noted that many of the projects submitted by each jurisdiction in Table 5 2 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 public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement

Action 1. NID Headquarters Office & Facilities Generator

Hazards Addressed: Long term power outages and emergency operations

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background: The headquarters office of the District located at 1036 West Main St, Grass Valley, is the main communications hub for day to day operations and acts as the Districts EOC during Emergency events. Emergency backup power is needed to keep all District operations running during an extended power outage.

Other Alternatives: Rental of a power generator, however this would not be timely enough during an emergency event.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Project oversight will be provided by the District's Engineering and Electrical Departments.

Responsible Office/Partners: Nevada Irrigation District

Project Priority: High priority

Cost Estimate: $450,000

Benefits (Losses Avoided): Backup generator power will allow the District to continue functioning in the event of an extended power outage at Headquarters in Grass Valley. This will allow for the continued operation of the Districts emergency command center during a power outage.

Potential Funding: District Funding, Grants,

Timeline: 2017

Action 2. Reservoir Sediment Removal Program

Hazards Addressed: Water Supply Reliability, Drought & Water Shortage, Flood Control

Goals Addressed: 1, 2, 3, 6

Issue/Background: Large reservoirs located within the Sierra foothills are filling with sediment from years of upstream erosion, historic mining activities, and natural sediment transport. Adequate reservoir storage capacity is beneficial during storms and heavy rain. As the reservoir accumulates sediment, water storage capacity is reduced which can result in supply variability for NID raw and treated water customers. Nevada Irrigation District has initiated an ongoing large reservoir sediment removal program to alleviate this problem.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Nevada Irrigation Districts Engineering and Maintenance Departments provide oversite on these projects

Responsible Office/Partners: Nevada Irrigation District

Project Priority: High

Cost Estimate: Approximately $500,000 - $1,000,000 per year

Benefits (Losses Avoided): Water Quality, Water Storage, Drought and Water Shortage

Potential Funding: District Funding, Grants,

Timeline: 1 to 20 years

Action 3. Scotts Flat Spillway Repair

Hazards Addressed: Dam Failure, Drought & Water Shortage

Goals Addressed: 1, 2, 3, 6

Issue/Background: Early February 2017 storms caused damage to the Scotts Flat spillway. NID is repairing the damage.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Project oversight will be provided by the District's Engineering and Hydroelectric Departments.

Responsible Office/Partners: Nevada Irrigation District

Project Priority: High priority

Cost Estimate: $450,000

Benefits (Losses Avoided): Repairs enhance spillway integrity

Potential Funding: District Funding

Timeline: Summer 2017

Action 4. Small Reservoir Cleaning

Hazards Addressed: Water Supply Reliability, Drought & Water Shortage, Flood Control

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Small reservoirs located within the canal system are filling with sediment from continued years of use. Adequate reservoir storage is very beneficial during storms and heavy rain. As the reservoir accumulates sediment, water storage is reduced and the ability to regulate water efficiency is diminished. Reduced reservoir storage can result in upstream canal overtopping and property damage. Nevada Irrigation District has initiated a small reservoir cleaning program to alleviate this problem.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Nevada Irrigation Districts Engineering and Maintenance Departments provide oversite on these projects

Responsible Office/Partners: Nevada Irrigation District

Project Priority: Medium

Cost Estimate: Approximately $20,000 per reservoir

Benefits (Losses Avoided): Water Quality, Water storage and prevention of property damage

Potential Funding: District Funding, Grants,

Timeline: 1 to 5 years

Action 5. Community Investment Projects

Hazards Addressed: Drought & Water Shortage, Wildfire, Climate Change

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Ongoing program to install fire hydrants and to extend water & pipelines for existing neighborhoods within the NID boundary.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Project oversight will be provided by the District's Engineering Department.

Responsible Office/Partners: Nevada Irrigation District

Project Priority: High priority

Cost Estimate: >$2,000,000 annually

Benefits (Losses Avoided): Extension of water lines and installation of fire hydrants increases wildfire resiliency for communities in the district.

Potential Funding: District Funding

Timeline: Ongoing

Action 6. Canal Culvert Replacement Program

Hazards Addressed: Water Supply Reliability, Climate Change, Flood Localized,

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Canal Crossings are facilitated with numerous culverts throughout the Placer County area. These culverts are often undersized, aged, and failing. During heavy rain events these culverts backup water causing flooding and overtopping of the canal upstream of the culvert. Overtopping often results in erosion of the canal berm and presents possible property damage. Nevada Irrigation District is currently engaged in a culvert replacement project aimed at resolving these issues.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Nevada Irrigation Districts Engineering and Encroachment Departments provide oversite on these projects

Responsible Office/Partners: Nevada Irrigation District and associated property owners

Project Priority: Medium

Cost Estimate: Costs vary for each culvert replacement; however, the estimated cost to replace the average large culvert is about $12,000.

Benefits (Losses Avoided): Life, Safety, and the reduction of property loss

Potential Funding: District Funding, Grants

Timeline: 1 to 5 years

Action 7. Hazard Tree & Fire Fuel Removal

Hazards Addressed: Multi-Hazard, Wildfire, Climate Change, Landslide

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Data collected by state and federal agencies demonstrate that tree mortality has reached epidemic levels across the entire western slope of the Sierra Nevada range, which includes a large portion of the NID sphere. This data predicts further tree mortality increases in the very near future, resulting in stands of dead/dying trees that constitute extremely dangerous levels of combustible fuels, directly contributing to the severity and scale of wildfires. The hazard trees within the area pose a significant threat to public health and safety threatening power lines, roads, evacuation corridors, infrastructure, and other existing structures. Forest conditions adjacent to Scotts Flat Reservoir and other NID reservoirs, camping facilities, operations & hydro facilities are rapidly worsening as persistent drought stress and bark beetle infestations have created increased pockets of diseased, dying and dead tree stands.

Other Alternatives:

Existing Planning Mechanism(s) through which Action Will Be Implemented: Project oversight will be provided by the District's Watershed and Recreation departments.

Responsible Office/Partners: Nevada Irrigation District

Project Priority: High priority

Cost Estimate: >$1,000,000

Benefits (Losses Avoided): Reduction in catastrophic wildfire potential, loss to property and life avoided

Potential Funding: District Funding, Grants,

Timeline: 1 - 15 years

Annex E Truckee Donner Public Utility District

E.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Truckee Donner Public Utility District (TDPUD), a previously participating jurisdiction to the Nevada 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 TDPUD. This Annex provides additional information specific to TDPUD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

E.2 Planning Process

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

Table E-1 Truckee Donner PUD Planning Team

Name	Position/Title	How Participated
Kathy Neus	Special Projects Administrator	Attend meetings and identified hazards specific to the TDPUD; reviewed and provided input on draft documents.
Dennis Mazzini	Facilities Maintenance Technician	Attend meetings and identified hazards specific to the TDPUD, reviewed and provided input on draft documents.

Source: Truckee Donner PUD

Coordination with other community planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2011 LHMP through other plans and programs shown in Table E-2.

Table E-2 2011 LHMP Incorporation

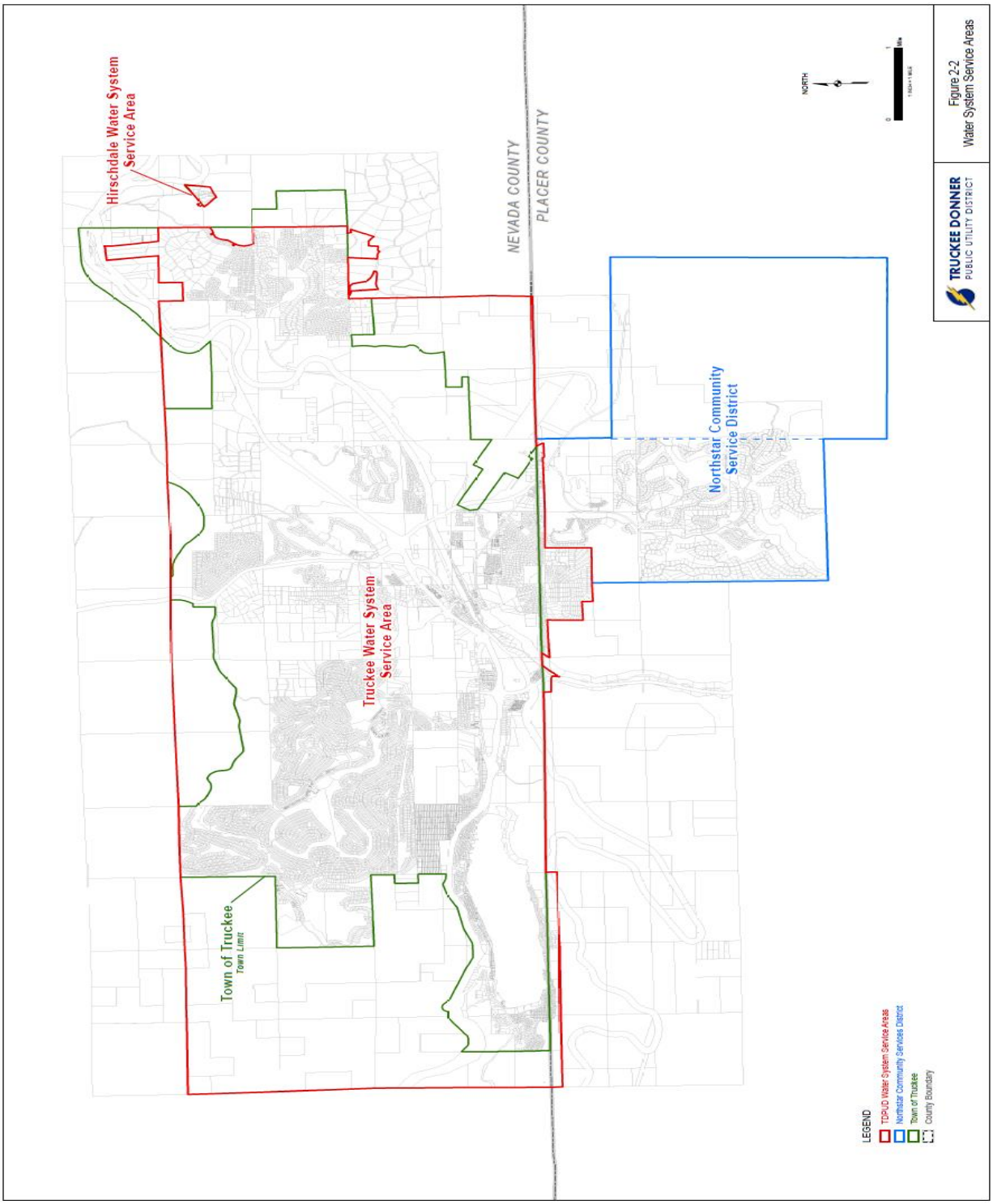
Planning Mechanism 2011 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
None	Did not integrate the 2011 LHMP into other planning mechanisms

E.3 District Profile

The district profile for TDPUD is detailed in the following sections. Figure E-1 and Figure E-2 displays a map and the location of TDPUD boundaries within Nevada and Placer Counties. TDPUD is one of 6,000 special districts in California. It occupies 45.5 square miles beginning four miles from the northern border just beyond Alder Creek Road south to the Placer County line, and 11 miles from the western shore of Donner Lake eastward to the rim of Boca Dam, and includes the community of Hirschdale.

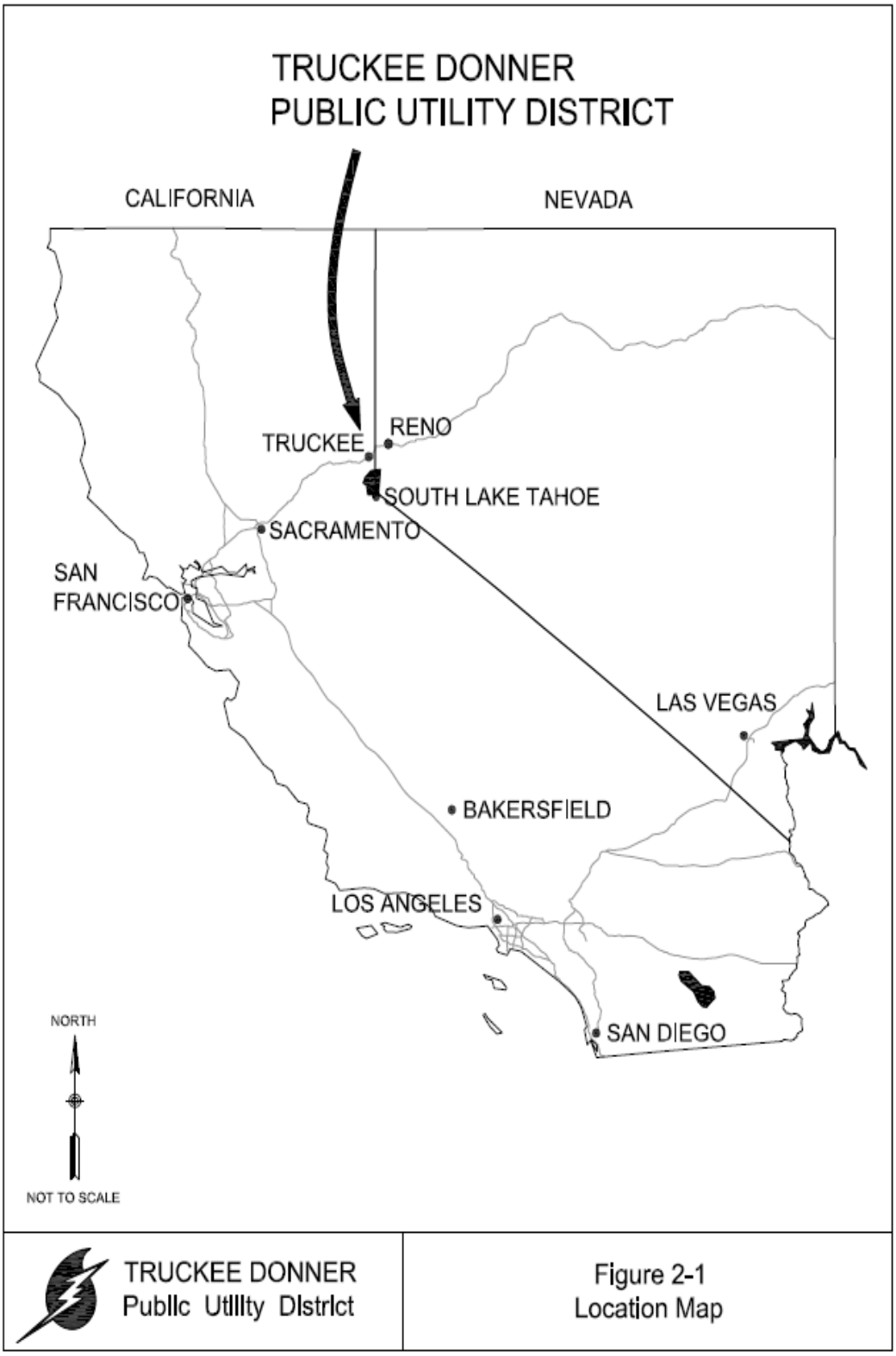
The TDPUD has approximately 225 miles of water mains, 381 miles of overhead electric lines, and 153 miles of underground electric lines.

Figure E-1 Tahoe Donner PUD Map



Source: Truckee Donner PUD

Figure E-2 Location of Truckee Donner PUD in Nevada County



Source: Truckee Donner PUD

E.3.1. District Overview, History, and Background

Truckee Donner PUD has been serving Truckee for over 80 years. In 1927, after a five year drought, the Truckee River wasn't able to turn the water wheel for Truckee Electric Company's private generator. Registered voters of the area drew up a petition calling for the formation of a special district to buy electricity from the downstream generators of Sierra Pacific Power Company and sell it to local residents.

For the first 20 years the Truckee Public Utility District's (TPUD) four or five part time employees served only a few dozen houses and shops in the downtown area. Among the employees were a general manager and a secretary who each earned $10 a month. Sierra Pacific maintained the electric lines on a contract basis.

As Truckee grew, community members began to see the TPUD as a means to meet other local needs. During the 1940s the District began buying some of the private water companies that provided the town with fresh water from the surrounding underground springs. Much of the land that was acquired with the water companies was sold to encourage development. This brought a whole new generation of young families with growing needs for water and power. The TPUD provided the public school sites and used the proceeds of the sale to drill wells, install more power lines and hire maintenance crews.

In the late 1950s the District helped to develop organized recreation for the community. The Manager, several Board members and local volunteers planned and built a golf course on property south of the river; a few years later, it was sold to private parties and is now known as the Ponderosa Golf Course. The residents voted to form a separate recreation and park district in the early 1960s.

Interstate 80 was completed in 1964 and resulted in an avalanche of tourists and many new Truckee residents. A new agricultural inspection station was built on the freeway and the TPUD purchased the old station for its headquarters.

The District borrowed money from the Rural Electrification Administration during the 1960s to expand the electric system and to build the Truckee substation. It then purchased the Donner Lake distribution facilities from Sierra Pacific Power Company and changed its name to the Truckee Donner Public Utility District (TDPUD). Around the same time, an engineering firm was hired to develop a comprehensive water plan for Truckee.

The Tahoe Donner Subdivision, originally called Lake World, was developed by Dart Industries, Inc. during the 1970's. When the District acquired Dart Industries electric and water facilities in 1973, its water and electric lines amounted to five times the amount within the rest of the District. The number of customers nearly doubled.

Since 1980, the District has sought out alternate energy sources and pursued development of hydroelectric plants at Boca, Prosser and Stampede Dams, as well as negotiating for delivery of two megawatts of power from the Central Valley Project. The community of Hirschdale was annexed into the District and a grant obtained to upgrade and develop a new water source. A new office/warehouse complex was constructed, and many electric and water system improvements were accomplished.

The District purchases its energy through bilateral contracts with entities outside the Truckee area. Power is brought to the District's four substations and one metering point over NV Energy's transmission system. It is then distributed over the District's sixteen individual circuits to approximately 13,700 electric customers.

The electric operations department is responsible for operating, maintaining, repairing. And expanding our electric distribution system. The department has a responsibility to provide effective and efficient maintenance and replacement programs and to provide effective, efficient and safer operations.

The District acquires its water from aquifers hundreds of feet deep all within the Martis Valley groundwater basin area. The water is transported to Truckee's higher elevations through a series of pump stations and is stored in water tanks strategically placed throughout the community. There are approximately 12,900 water customers served by the District.

Truckee water is pure and of a higher quality than most bottled drinking water. The District's water system has been elaborately designed with pump stations and storage reservoirs at different elevations to maintain high pressure for fighting urban fires and for all domestic water uses.

The TDPUD has a program for annual pipeline replacement and rebuild of pump station buildings as needed. As a small community, we spread our costs over a smaller customer base. The entire picture means that water service in Truckee is more expensive than in many other areas. We do our best to control costs, yet provide excellent quality water at the right pressure with minimal service disruption.

TDPUD is one of 6,000 special districts in California. It occupies 45.5 square miles beginning four miles from the northern border just beyond Alder Creek Road south to the Placer County line, and 11 miles from the western shore of Donner Lake eastward to the rim of Boca Dam, and includes the community of Hirschdale. The registered voters within the District own and control the TDPUD, and elect five directors to serve on the board in staggered four-year terms.

Today, the District maintains a staff of 70 full-time employees, and serves approximately 13,700 electric customers and 12,900 water customers. Its mission has always been: to provide reliable, high quality water and electrical power services while meeting customer demand, and to manage District resources in a safe, open, responsible, environmentally sound manner at the lowest practical cost.

Since 1927, the TDPUD has been providing the greater Truckee area with reliable and high quality water and electric services while guiding the community to conserve resources. TDPUD is a non-profit, publicly owned utility governed by locally elected Board of Directors of the District. All the benefits of public power remain in the District in the form of reliable electric service and high quality water at fair, reasonable prices.

E.4 Hazard Identification

TDPUD's planning team identified the hazards that affect the District and summarized their geographic extent, probability of future occurrences, potential magnitude/severity, and significance specific to TDPUD (see Table E-3).

Table E-3 Truckee Donner PUD—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	NA	NA	NA	NA	NA
Avalanche	NA	NA	NA	NA	NA
Climate Change	Limited	Likely	Negligible	Low	Low
Dam Failure	NA	NA	NA	NA	NA
Drought and Water Shortage	Limited	Unlikely	Negligible	Low	Low
Earthquake	Limited	Occasional	Limited	Medium	Medium
Flood: 1%/0.2% Annual Chance	NA	NA	NA	NA	NA
Flood: Localized/Stormwater	Limited	Occasional	Negligible	Low	Low
Hazardous Materials Transportation (interstates, railroads, pipelines)	Limited	Occasional	Negligible	Low	Low
Landslide, Debris & Mud Flows	Limited	Likely	Negligible	Low	Low
Levee Failure	NA	NA	NA	NA	NA
Severe Weather: Extreme Heat	Limited	Unlikely	Negligible	Low	Low
Severe Weather: Extreme Cold, Snow, and Freeze	Limited	Likely	Negligible	Low	Low
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Limited	Occasional	Negligible	Low	Low
Subsidence	NA	NA	NA	NA	NA
Volcano	NA	NA	NA	NA	NA
Wildfire (smoke, tree mortality, conflagration)	Significan	Occasional	Critical	Medium	Medium

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

E.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile TDPUD's hazards and assess the District's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 and 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to TDPUD is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

E.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section E.5.3, includes a description as to how the hazard affects the TDPUD and information on past occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Planning Area.

E.5.2. Vulnerability Assessment and Assets at Risk

This section identifies TDPUD's assets at risk, including values, critical facilities and infrastructure, natural resources, historic and cultural resources, and growth and development trends. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the District's assets at risk, with a focus on key District assets such as critical facilities, 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:

> *Any facility (a structure, infrastructure, equipment or service), that is adversely affected during a hazardous event may result in interruption of services and operations for the District at any time before, during and after the hazard event. A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, and (3) Hazardous Materials Facilities.*

Table E-4 lists District assets, including their critical facilities, identified by the TDPUD's planning team as important to protect in the event of a disaster. TDPUD's physical assets, valued at over $94 million, consist of the buildings and infrastructure to support the TDPUD operations.

Table E-4 Truckee Donner PUD's Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
District Complex	Office/Yard	11570 Donner Pass Rd	$26,000,000	Fire, earthquake
District Complex(Vehicles, equipment, tools, inventory)	Garages/Yard	11570 Donner Pass Rd	$6,600,000	Fire, earthquake
Truckee Substation	Electric Substation	Jibboom Street	$3,900,000	Fire, earthquake
Donner Lake Substation	Electric Substation	Cedar Point Dr	$3,600,000	Fire, earthquake
Tahoe Donner Substation	Electric Substation	Bermgarten Rd	$4,100,000	Fire, earthquake
Martis Valley Substation	Electric Substation	Riverview Dr	$4,100,000	Fire, earthquake
A & B Well	Water Facility	Skislope Way	$650,000	Fire, earthquake
Airport Well & Booster	Water Facility	Airport Rd	$3,000,000	Fire, earthquake
Airport Tank	Water Facility	Airport Rd	$900,000	Fire, earthquake
Alder Creek Boosters	Water Facility	Slalom Way	$200,000	Fire, earthquake
Armstrong Tank	Water Facility	Sierra Dr - West	$160,000	Fire, earthquake
Bridge St – 6170 Tank	Water Facility	Trails End Rd	$2,250,000	Fire, earthquake
Donner Creek Well	Water Facility	Deerfield Rd	$500,000	Fire, earthquake
Donner Lake Tank	Water Facility	Donner Lake Rd	$450,000	Fire, earthquake
Donner Trails Booster & Tanks	Water Facility	Bull Pine Trail	$825,000	Fire, earthquake
Donner View Booster & Tank	Water Facility	Skislope Way	$650,000	Fire, earthquake
Falcon Point Booster	Water Facility	Falcon Point	$660,000	Fire, earthquake
Fibreboard Well	Water Facility	Caleb Circle	$2,441,000	Fire, earthquake
Gateway Tank	Water Facility	Valley Rd	$450,000	Fire, earthquake
Glacier Tank (Glacier Way)	Water Facility	Skislope Way	$150,000	Fire, earthquake
Glenshire Booster	Water Facility	Glenshire Dr	$405,000	Fire, earthquake

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
Glenshire Lower Tanks	Water Facility	The Strand	$1,135,000	Fire, earthquake
Glenshire Upper Tanks	Water Facility	Tewksbury Dr	$765,000	Fire, earthquake
Glenshire Well	Water Facility	Glenshire Dr	$2,416,000	Fire, earthquake
Glenshire Well #20	Water Facility	Somerset Dr	$725,000	Fire, earthquake
Herringbone Booster & Tank	Water Facility	Herringbone Way	$700,000	Fire, earthquake
Hirschdale Well, Tank & Treatment	Water Facility	Juniper Way	$835,000	Fire, earthquake
Innsbrook Booster & Tank	Water Facility	Innsbrook Ave	$600,000	Fire, earthquake
Martis Valley Well #1	Water Facility	Joerger Rd	$3,000,000	Fire, earthquake
Martis Woods Tanks & Boosters	Water Facility	Rocky Ridge Ct	$650,000	Fire, earthquake
Northside Booster & Tank	Water Facility	Indian Jack Rd	$916,000	Fire, earthquake
Northside Well	Water Facility	Indian Jack Rd	$1,100,000	Fire, earthquake
Old Greenwood Well	Water Facility	Fairway Dr	$2,500,000	Fire, earthquake
Pinnacle Loop Tank	Water Facility	Pinnacle Loop	$530,000	Fire, earthquake
Ponderosa Palisades Booster	Water Facility	Rainbow Ct	$560,000	Fire, earthquake
Ponderosa Palisades West Booster	Water Facility	Rio Vista	$60,000	Fire, earthquake
Prosser Annex Well	Water Facility	No Other Way	$1,750,000	Fire, earthquake
Prosser Heights Hydro & Tank	Water Facility	Beacon Rd	$582,500	Fire, earthquake
Prosser Heights Well	Water Facility	Alder Dr	$1,250,000	Fire, earthquake
Prosser Lakeview Tank	Water Facility	Pine Forest Rd	$375,000	Fire, earthquake
Prosser Village Well	Water Facility	Fairway Dr	$2,500,000	Fire, earthquake
Red Mountain Hydro Boosters	Water Facility	Devils Peak Rd	$246,000	Fire, earthquake
Richards Blvd Booster	Water Facility	Richards Blvd	$390,000	Fire, earthquake

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
Roundhill Boosters & Tank	Water Facility	Roundhill Dr	$710,000	Fire, earthquake
Sanders Well	Water Facility	Pioneer Trail	$1,000,000	Fire, earthquake
Sierra Meadow Boosters & Tank	Water Facility	Pine Cone Rd	$655,000	Fire, earthquake
Sitzmark Booster & Tank	Water Facility	Sitzmark Way	$560,000	Fire, earthquake
Ski Lodge Booster & Tank	Water Facility	Skislope Way	$805,000	Fire, earthquake
Ski Run Booster & Tank	Water Facility	Skislope Way	$430,000	Fire, earthquake
Soma Sierra Booster & Tank	Water Facility	Cedar Trail	$675,000	Fire, earthquake
Southside Well #1	Water Facility	Brockway Rd	$280,000	Fire, earthquake
Southside Well #2 & Booster	Water Facility	Brockway Rd	$1,500,000	Fire, earthquake
Stockholm Booster & Tank	Water Facility	Stockholm Way	$826,000	Fire, earthquake
Wolfe Estates Booster	Water Facility	Bingham Ct	$300,000	Fire, earthquake
Wolf Estates Tank	Water Facility	Cinnamon Ridge Place	$345,000	Fire, earthquake
Glenshire Control Valve	Water Facility	Glenshire Dr	$40,000	Fire, earthquake
Roxy Ridge Pump Station	Water Facility	Donner Pass Rd	$75,000	Fire, earthquake

Source: Truckee Donner PUD

Natural Resources

Truckee's landscape can be conceptualized as a series of distinct terrain areas, defined both by topography and vegetation. This includes high mountain peaks and ridges of the Sierra Nevada and Carson Range that are visible from many places within Truckee-Tahoe area; the forested uplands lying within and bordering the area; meadowlands; and the valleys of the Truckee River and Martis Creek watersheds.

A key element of the area's physical character is its abundance of undeveloped open space areas and natural features including Donner Lake in the western part of the Town, and the Truckee River, which drains from Lake Tahoe to the south all the way to Pyramid Lake in the State of Nevada. Additionally, there are many important creeks and streams that flow through and into the area.

The Truckee Donner PUD has ownership of a few natural springs within the Truckee-Tahoe Basin.

Historic and Cultural Resources

The Truckee area is rich in historic sites, reflecting its rich historic legacy. The Washoe, Maidu and Paiute people were the earliest occupants of the Truckee and Lake Tahoe Area, relying on the rich supply of fish, game and edible plants for food and sustenance.

The earliest history of Truckee relates primarily to emigration from the east. The California gold rush of 1849 brought increased traffic through the Truckee area. In 1868, the Central Pacific Railroad established a railway through the area. This in turn allowed the lumber and ice harvest industries to boom.

Winter sports began to be a major source of economic activity at the turn of the century, increasing greatly with the 1960 Winter Olympics at Squaw Valley Ski Resort. Today, the Truckee-Tahoe area continues to be a center for outdoor sports, both in the summer and in the winter, and is considered to be the gateway to the Lake Tahoe Region from the north. There are many historic facilities in Truckee, which are detailed in their annex.

Growth and Development Trends

The Truckee area is located within the Lake Tahoe region of the Sierra Nevada mountain range. Truckee is located is the eastern portion of Nevada County within 15 miles of Lake Tahoe, 40 miles from Reno Tahoe International Airport, 100 miles from Sacramento and three hours from San Francisco Bay area all with easy access off on Interstate 80. Making the areas easily accessible from large metropolitan areas and a desirable place to live.

Growth and development is contingent on the number of permits generated through the Community Development Departments of both the Town of Truckee and County of Placer. The District provides services to both Nevada and Placer counties.

Development Since 2011 Plan

There has been no development or expansion of District facilities since the 2011 LHMP.

E.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table E-3 as medium or high significance hazards. Impacts of past events and vulnerability of the TDPUD to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Nevada County Planning Area). In general, the most vulnerable structures are those located within the floodplain or within dam inundation areas or high risk wildfire areas. Also, older facilities that may be constructed with unreinforced masonry and buildings built prior to the introduction of modern building codes are also more vulnerable to hazard events.

An assessment of the vulnerability of the TDPUD to each identified priority hazard, in addition to the estimate of probability of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact

based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Earthquakes

Likelihood of Future Occurrence - Likely
Vulnerability - Medium

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. 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. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. A 1986 study by the California Bureau of Reclamation concluded that the Dog Valley Fault and Mohawk Valley Faults could result in a maximum credible earthquake of 6.75 and 7.0 magnitude respectively. There has been recent earthquake activity throughout the eastern side of the county and in the Tahoe area.

Past Occurrences

The area has experienced earthquakes in the past but damage has been negligible.

Vulnerability to Earthquakes

Electric Utility: The earthquake could damage a substation due to shaking and poles falling into the substation. An earthquake could cause poles to fall disrupting service to specific areas of the TDPUD territory.

Water Utility: An earthquake event has the potential to cause a well to have reduced flow at a minimum but could also cause the well to go "dry". At the same time an earthquake, depending on magnitude, may cause the water within a tank to create a wave that would cause the tank to collapse. Should a tank collapse, the chances are it will also destroy the nearby building.

Future Development

Electric and Water Utilities' redundancies are and have been built into the system. Should an earthquake damage any structure beyond use only isolated sections will be without service until the facility can be repaired. All structures are built or are being built to new seismic building codes. Most water facilities have back-up generators encase of power supply disruption.

Wildfire (Smoke, Tree Mortality, Conflagration)

Likelihood of Future Occurrence - Likely
Vulnerability - Medium

Hazard Profile and Problem Description

Over one hundred years of aggressive fire suppression under the national fire suppression policy has rendered wildlands severely overgrown. Much of the private land in the District's area is in the wildland urban interface with increasing residential development.

As more people move into the area and impacts from recreational demands increase, there will be more human-caused wildfire starts each year. And, the increased number of widely scattered homes within the District adds greatly to the danger, complexity, and cost of fighting these fires.

Forest overgrowth due to the efficiency of modern firefighting techniques, and to society's current election to limit forest thinning and harvesting, is a serious problem. If wildfire does not impact the forest first, native insects will eventually kill millions of trees. Explosions in insect populations usually start during a drought, when the lack of water combined with too many trees per acre render the trees too weak to fight off the insect attacks. Without a change in management practices on public lands, there is little hope of avoiding a kill off of trees similar to the kill off experienced by other national forests.

The Truckee-Donner PUD is considered to be in areas of moderate to very high fire hazard severity zones, as defined by the Cal Fire, although risks are particularly pronounced in certain parts of the District, particularly where District are located within areas of dense vegetation and forest land, and where steep slopes and other similar conditions exist. Calculation of threat from wildfire hazard is based on a number of combining factors in- cluding fuel loading (vegetation), topography, and climatic conditions such as winds, humidity and temperature.

Past Occurrences

The District Planning team noted the following:

- Electric Utility: A substation transformer caught fire causing extensive damage to the transformer and controls with the substation.
- Water Utility: Has not experienced any effects from wildfire at this time.

Vulnerability to Wildfire (smoke, tree mortality, conflagration)

A wildfire is a natural part of the forest ecosystem but due decades of wild fire suppression forests in areas have become unnaturally dense and have not been exposed to the fires that would burn small brush and trees. The District Planning Team noted the following:

- Electric Utility: a wild land fire or fire could damage a substation minimally or catastrophically depending on where the fire originates.
- Water Utility: Whether it be a wild fire or a fire within the structure, all ability to pump water to different zones would be destroyed.

Future Development

For both the Electric and Water Utilities redundancies are and have been built into the system to alleviate widespread disruption in service. The TDPUD continues to create and maintain defensible space at all its facilities and properties. Most water facilities have back-up generators encase of power supply disruption.

E.6 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 capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

E.6.1. Regulatory Mitigation Capabilities

Table E-5 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 Truckee Donner PUD.

Table E-5 Truckee Donner PUD s Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y	Addresses deficiencies within both utilities systems
Capital Improvements Plan	Y	Addresses deficiencies within both utilities systems
Economic Development Plan		
Local Emergency Operations Plan	Y	Have a plan on file with the Town of Truckee
Continuity of Operations Plan	Y	Part of master plan
Transportation Plan		
Stormwater Management Plan/Program		Follow the State's and Town of Truckee
Engineering Studies for Streams		
Community Wildfire Protection Plan		

Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	NA	Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score	NA	Score:
Fire department ISO rating:	NA	Rating:
Site plan review requirements	NA	
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?**
Zoning ordinance	NA	
Subdivision ordinance	NA	
Floodplain ordinance	NA	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	NA	
Flood insurance rate maps	NA	
Elevation Certificates	NA	
Acquisition of land for open space and public recreation uses	NA	
Erosion or sediment control program	NA	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Most of these programs fall under the auspice of the Town of Truckee and the District is required to follow all applicable laws and regulations		

Source: Truckee Donner PUD

E.6.2. Administrative/Technical Mitigation Capabilities

Table E-6 identifies the department(s) responsible for activities related to mitigation and loss prevention for TDPUD.

Table E-6 Truckee Donner PUD's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee		
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	District has had a tree trimming in place for 10 years.
Mutual aid agreements	Y	Yes with electric utilities throughout California

Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	NA	
Floodplain Administrator	NA	
Emergency Manager		
Community Planner	NA	
Civil Engineer	NA	
GIS Coordinator	Y/FT	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)		
Hazard data and information		
Grant writing		
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Truckee Donner PUD

E.6.3. Fiscal Mitigation Capabilities

Table E-7 identifies financial tools or resources that the Truckee Donner PUD could potentially use to help fund mitigation activities.

Table E-7 Truckee Donner PUD's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	Y	Rates have been used for tree trimming in electric lines
Impact fees for new development	N	Development fees are project specific
Storm water utility fee	N	
Incur debt through general obligation bonds and/or special tax bonds	Y	System improvements
Incur debt through private activities	N	

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Community Development Block Grant	N	
Other federal funding programs	N	
State funding programs	N	
Other	N	
How can these capabilities be expanded and improved to reduce risk?		
The District is a non-profit utility that requires all rates be approved through a public review process. Any rate increases require justification to AB218		

Source: Truckee Donner PUD

E.6.4. Mitigation Education, Outreach, and Partnerships

Table E-8 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table E-8 Truckee Donner PUD's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Public outreach, website, local affiliates
Natural disaster or safety related school programs	Y	Learn & Burn Program
Storm Ready certification	N	
Fire wise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Truckee Donner PUD

E.6.5. Other Mitigation Efforts

The District has a Water Shortage Contingency plan and Water Conservation Plan located on the District's website. Master Plans for both utilities can be acquired by request.

E.7 Mitigation Strategy

As part of the overall HMPC for the development of this multi-jurisdictional Nevada County LHMP Update, each jurisdiction followed the mitigation strategy development process detailed in Chapter 5 and Appendix C of the Base Plan, which included the development of plan goals and objectives and the resulting mitigation actions and projects.

E.7.1. Mitigation Goals and Objectives

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

E.7.2. Mitigation Actions

The planning team for TDPUD identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

It should be noted that many of the projects submitted by each jurisdiction in Table 5 2 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 public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Action 1. Fuel Reduction Plan – Trout Creek Trail Area

Hazards Addressed: Native growth needs clean-up and thinning

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Property has minimal maintenance of native growth in years

Project Description: Have Washington Ridge Camp #44 fire crew come in and cleanup ladder fuel, remove brush, small trees. Areas where a chipper will not be accessible will lob and scatter debris.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently working with the California Department of Corrections, Washington Ridge Camp #44 for the project

Responsible Office/Partners: Truckee Donner Public Utility District

Project Priority: High

Cost Estimate: $5,000

Benefits (Losses Avoided): To prevent the severity of wild land fires and the potential loss of homes, business and watershed

Potential Funding: Rates

Timeline: Summer/Fall 2017

Action 2. Fuel Reduction Plan - Hilltop

Hazards Addressed: Native growth needs clean-up and thinning

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: Property has minimal maintenance of native growth in years

Project Description: Have Washington Ridge Camp #44 fire crew come in and cleanup ladder fuel, remove brush, small trees. Areas where a chipper will not be accessible will lob and scatter debris.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently working with the California Department of Corrections, Washington Ridge Camp #44 for the project

Responsible Office/Partners: Truckee Donner Public Utility District

Project Priority: High

Cost Estimate: $5,000

Benefits (Losses Avoided): To prevent the severity of wild land fires and the potential loss of homes, business and watershed

Potential Funding: Rates

Timeline: Summer/Fall 2017

Annex F Washington County Water District

F.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Washington County Water District (WCWD) a new participating jurisdiction to the Nevada 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 WCWD. This Annex provides additional information specific to Washington County Water District, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this District.

F.2 Planning Process

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

Table F-1 Washington County Water District Planning Team

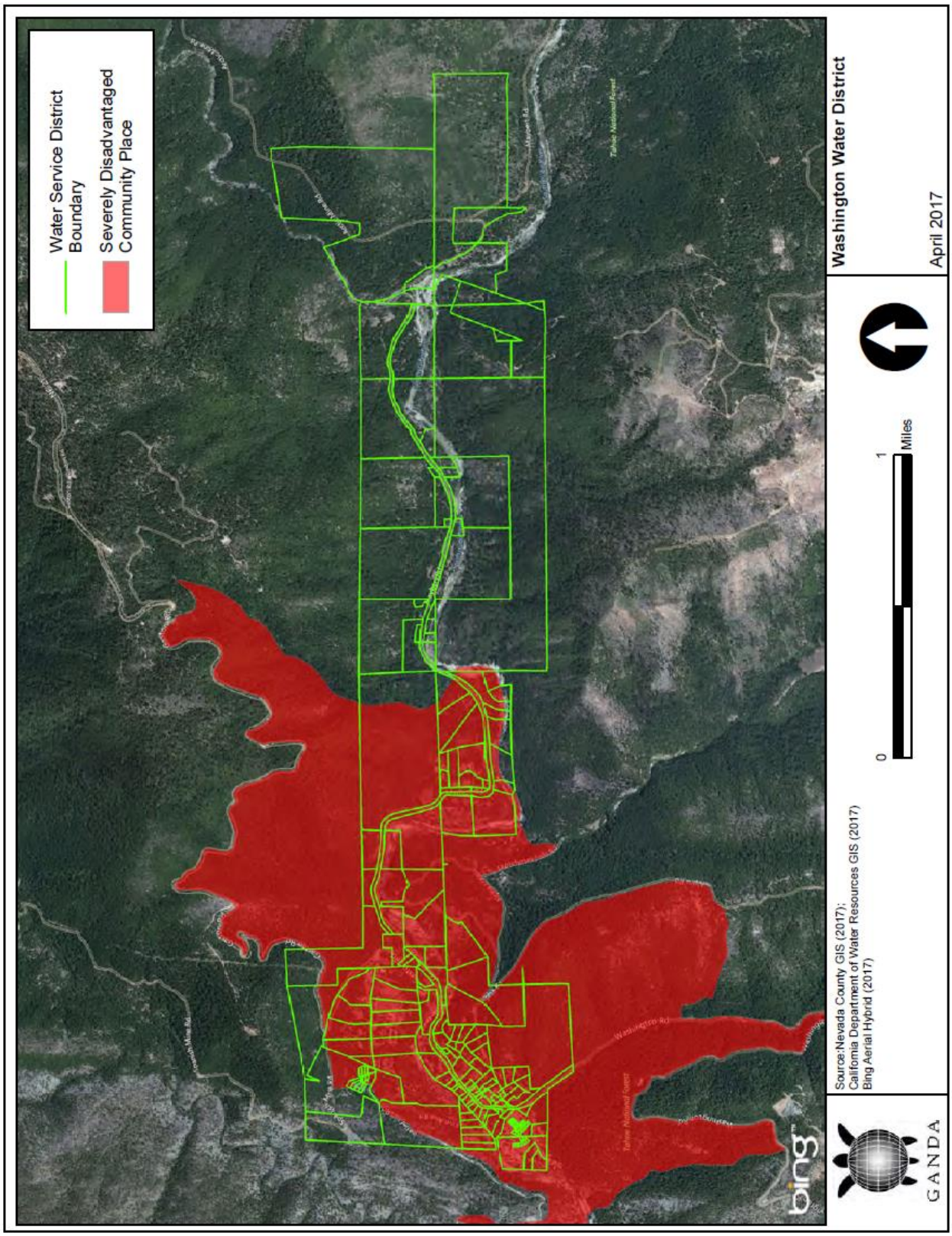
Name	Position/Title	How Participated
Paul Rose	Contract Operator	All aspects – attended meetings, provided mitigation actions, provided feedback on annex.

Source: Washington County Water District

F.3 District Profile

The District profile for WCWD is detailed in the following sections. Figure F-1 and Figure F-2 displays a map and the location of WCWD boundaries within Nevada County.

Figure F-1 Washington County Water District Map



Source: Washington County Water District

Figure F-2 Location of Washington County Water District in Nevada County

Source: Washington County Water District

F.3.1. District Overview, History, and Background

Washington is an unincorporated community located in Nevada County, approximately 13 miles east of Nevada City, on the South Fork of the Yuba River. The community is small and isolated, with few opportunities for expansion due to wild and rugged watershed lands, and additionally surrounded entirely by Tahoe National Forest property.

The (WCWD is the only water agency serving the community. The Dprovides water through 122 hook-ups that serve approximately 140 residents and businesses, including a campground and a bar/hotel. Washington is also a popular recreation destination, which results in considerable spikes in summertime water use.

Washington was initially settled as an active gold mining community in the 1850s. The basic water collection and delivery system designed during that era served as the basis for the subsequent infrastructure design. The Washington water treatment and distribution system are very basic, utilizing gravity flow and a sand-filter/chlorination treatment to provide treated water.

The current system collects water from Canyon Creek via a small impoundment created by a diversion dam located near the creek's convergence with the South Fork of the Yuba River. Water is piped through a 4"-diameter PVC line to the slow-sand filter and chlorination system housed on Maybert Road. Treated water is then piped three miles to a storage tank. The three-mile section of pipe running from the treatment plant to the storage tank serves 17 residences. This system operates entirely via gravity flow. Water is distributed from the storage tank, both to the town of Washington and residences on Relief Hill Road. This is the only storage tank in the entire system. The lack of sufficient local/on-site water storage is especially problematic during peak water use. The storage tank currently spills considerable amounts of water during high-demand summer months, due to outdated technology. The main and lateral connections

in the town of Washington are currently poorly mapped and the loss through undetected leaks is likely to be considerable, though currently undocumented.

Washington is a Disadvantaged Community (DAC) with an annual median income of $21,667 (according to 2000 Census data). The infrastructure that serves the district is aging and was installed prior to development of modern conservation standards. As a disadvantaged community, Washington has not had the resources to map its infrastructure system, conduct systematic leak detection and repair activities on its aging pipelines, upgrade water storage and distribution systems, engage in community level water conservation, or meter any portion of its system. The District has almost no capacity to adapt to low-flow scenarios. Additionally, residents are not financially able to retrofit aging plumbing.

The District currently lacks a method for monitoring actual water use, as opposed to the amount of water treated, so WCWD has no way to locate or repair either small scale or large scale system leaks. There is no effective program in place for the detection of leaks, nor the ability to conduct residential water audits. In addition, the absence of a high headwater storage facility and/or pump-supported water distribution system has resulted in below-standard water pressure across the higher elevation portions of the system. During the summer months, tourist traffic and activities in the community greatly increase water demands, as do the landscaping irrigation practices in the community. Irrigation efficiency strategies and hardware have not been provided to the community, leaving local residents unable to improve the peak summer water demands.

F.4 Hazard Identification

WCWD's planning team identified the hazards that affect the District and summarized their geographic extent, probability of future occurrences, potential magnitude/severity, and significance specific to WCWD (see Table F-2).

Table F-2 Washington County Water District —Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Limited	Unlikely	Negligible	Low	Low
Avalanche	Limited	Unlikely	Negligible	Low	Low
Climate Change	Significant	Occasional	Negligible	Medium	?
Dam Failure	Limited	Unlikely	Limited	High	Medium
Drought and Water Shortage	Extensive	Likely	Catastrophic	High	High
Earthquake	Extensive	Likely	Critical	High	Low
Flood: 100/500–year	Extensive	Occasional/ Unlikely	Critical	High	Medium
Flood: Localized/Stormwater	Extensive	Likely	Critical	High	Medium
Hazardous Materials Transportation (interstates, railroads, pipelines)	Limited	Unlikely	Negligible	Low	Low
Landslide, Debris & Mud Flows	Limited	Occasional	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Negligible	Low	Low
Severe Weather: Extreme Heat	Limited	Likely	Negligible	Low	Medium
Severe Weather: Extreme Cold, Snow, and Freeze	Extensive	Occasional	Limited	Medium	Low
Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightning)	Extensive	High	Limited	High	Medium
Subsidence	Limited	Unlikely	Negligible	Low	Low
Volcano	Limited	Unlikely	Negligible	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Limited	Unlikely	Negligible	Low	Low

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

F.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile WCWD's hazards and to assess the District's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 and 4.3 Hazard Profiles and Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to WCWD is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

F.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section F.5.3, includes a description as to how the hazard affects the WCWD and information on past occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

F.5.2. Vulnerability Assessment and Assets at Risk

This section identifies WCWD's assets at risk, including values, critical facilities and infrastructure, natural resources, historic and cultural resources, and growth and development trends. This data is not hazard specific, but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the District's assets at risk, with a focus on key District assets such as critical facilities, 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:

> *Any facility (a structure, infrastructure, equipment or service), that is adversely affected during a hazardous event may result in interruption of services and operations for the District at any time before, during and after the hazard event. A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, and (3) Hazardous Materials Facilities.*

Table F-3 lists District assets, including their critical facilities, identified by the WCWD's planning team as important to protect in the event of a disaster. WCWD's physical assets, valued at over $165 million, consist of the buildings and infrastructure to support the WCWD operations.

Table F-3 Washington County Water District's Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Address	Replacement Value	Hazard Info
Impound dam	Water	Maybert Road 39° 21' 40.31 N BY 120° 45' 09.70" W	Unknown	Flooding, earthquake
Filtration plant	Water	Maybert Road 39° 21' 41.42" N BY 120° 45' 00.38" W	Unknown	Fire, earthquake
Storage tank	Water	Relief Hill and Gaston 39° 21' 51.46" N BY 120° 47' 24.22" W	$500,000	Earthquake
Distribution piping	Water	Throughout town	Unknown	Earthquake, freezing, landslides.

Source: Washington County Water District

Natural Resources

The District noted no natural resources of concern exist in the District. However, see the listing of natural resources included in Section 4.3.1 of the Base Plan that may be present and at risk to natural hazard events within District boundaries.

Historic and Cultural Resources

The District noted no historic or cultural resources of concern exist in the District. However, see the listing of historic and cultural resources included in Section 4.3.1 of the Base Plan that may be present and at risk to natural hazard events within District boundaries.

Growth and Development Trends

This community is severely disadvantaged. Building will be limited to a small number of single family dwellings. No commercial development is planned. Further, there are currently no planned expansion of District facilities.

F.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table F-2 as medium or high significance hazards. Impacts of past events and vulnerability of the WCWD to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Nevada County Planning Area). In general, the most vulnerable structures are those located within dam inundation areas or high risk wildfire areas. The impound dam and filter plant would be most vulnerable.

An assessment of the vulnerability of the WCWD to each identified priority hazard, in addition to the estimate of probability of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Climate Change

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

Climate change adaptation is a key priority of the State of California. The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Nevada County, the HMPC noted that each year it seems to get a bit warmer and snow seems to start at higher levels. It was also noted that 2017 was one of the wettest years ever. California's Adaptation Planning Guide: Understanding Regional Characteristics has divide California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Nevada County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state.

Past Occurrences

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

Vulnerability to Climate Change

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

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra region in which the Nevada County Planning Area is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increased wildfire

Future Development

WCWD in general could see population fluctuations in the District 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. For example, excessive heat and drought may make wildfires worse for the District. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact the Nevada County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–High

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States. The Washington Co. Water District receives its drinking water exclusively from a diversion dam at the mouth of Canyon Creek, which is fed from Bowman Reservoir, operated by the Nevada Irrigation District. During times of high influx into Bowman Reservoir, the release rates, coupled with natural runoff, create flows that can exceed 3000CFS. Flow rates of this size impact the dam

structure, as well as the intake structures for the Washington Filtration plant. These flows also bring down rock, sand, and other debris that cause damage to the dam, intake box and transmission line.

Past Occurrences

There have been no disasters declarations related to dam failure in the District. The District noted no past occurrences of dam failure.

Vulnerability to Dam Failure

Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the District, including District-owned assets.

Future Development

WCWD will take dam failure into account when siting new facilities.

Drought and Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Past Occurrences

Based on historical information, the occurrence of drought in California, including Nevada County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. There has been two state disaster related to drought and water shortage in Nevada County issued in 1976 and 2014.

Vulnerability to Drought and Water Shortage

The vulnerability of WCWD to drought is districtwide, but impacts may vary and include reduction in water supply, agricultural losses, and an increase in dry fuels. Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult.

Future Development

According to the HMPC, WCWD has access to large quantities of water through surface water as well as groundwater. Any population growth in the District will add additional pressure to the District during periods of drought and water shortage. WCWD will need to evaluate their infrastructure capacity for any future population growth that may occur in the community.

Earthquake

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile and Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. 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. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. A 1986 study by the California Bureau of Reclamation concluded that the Dog Valley Fault and Mohawk Valley Faults could result in a maximum credible earthquake of 6.75 and 7.0 magnitude respectively.

Past Occurrences

There have been no past occurrences of Earthquake in the District.

Vulnerability to Earthquake

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while less developed areas are less vulnerable. WCWD is potentially subject to future seismic activity, as described in Section 4.2.10 of the Base Plan.

Assets a Risk

The district does not have a G.I.S layer for these facilities however, all district assets are at risk and are as follows:

- 200K Water Storage Tank
- Filter Plant
- Canyon Creek Dam

Future Development

The WCWD will take earthquake into account when siting and constructing any new facilities.

Flood: 1%/0.2% Annual Chance (100/500-year)

Likelihood of Future Occurrence–Occasional/Unlikely
Vulnerability–High

Hazard Profile and Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. History clearly highlights floods as one of the most frequent natural hazards impacting Nevada County. Floods are among the most costly natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues.

Past Occurrences

The most recent flood event to impact the District is the January 2017 floods. Excessive rain for a prolonged period caused severe flooding in the Sierra foothills, in and around Nevada County. Impacts included damage to the District's water intake structure.

Heavy prolong precipitation in late 1996 caused flood damage across much of the District's service area. President Clinton proclaimed the area a disaster area while Governor Wilson followed suit. Many of the Districts main diversion dams and canals were washed out.

The District applied for a FEMA grant, and was awarded a grant, to rebuild the impound dam.

Vulnerability to Flood 1%/0.2% Annual Chance

Flooding is a problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the District swell with heavy rainfall and snowmelt runoff. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas. During times of high influx into Bowman Reservoir, the release rates, coupled with natural runoff, create flows that can exceed 3000 CFS. Flow rates of this size impact the intake structures for the Washington Filtration plant. These flows also bring down rock, sand, and other debris that cause damage to the dam, intake box and transmission line.

Historically, the growth in the District has occurred adjacent to streams, resulting in significant damages to property, and losses from when the streams overflow.

Future Development

If any development is to occur in the floodplain, it would have to conform to the elevation standards of the floodplain ordinance. No development is expected in the floodplain in the future.

Flood: Localized/Stormwater

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

Localized, stormwater flooding also occurs throughout the District during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated ground conditions.

In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff.

Past Occurrences

Maybert Road which leads to the filter plant has washed out during several past floods. The bridge spanning the Yuba River on Washington Road washed out in the New Year's flood of 1996-1997. Both structures belong to the County of Nevada but affect the ability of the district to supply water to its customers.

Vulnerability to Localized/Stormwater flooding

The impound dam and filter plant intake structures are most vulnerable to this type of flooding.

Future Development

The potential for flooding may increase as stormwater is channeled due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. The WCWD will take localized flooding into account when siting new facilities.

Severe Weather: Extreme Cold, Snow and Freeze

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile and Problem Description

According to the WRCC, in the western portion of Nevada County, monthly average minimum temperatures from November through April range from the low to mid-30s. The lowest recorded daily extreme was 3°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 72.7 days with no days falling below 0°F. Average snowfall is 10.0 inches. The highest annual snowfall fell in 1972, when 26.7 inches fell. Highest monthly snowfall accumulation came in March of 1974, when 23.0 inches fell. Average snow depths in January through March fall at 1 inches.

Snow accumulation does not directly follow precipitation in the Sierra Nevada. While the greatest total precipitation occurs in the northern part of the range, the greatest snow accumulation occurs in the central and high southern parts of the range, due to higher elevations and colder temperatures which inhibit snow melt.

Past Occurrences

A disaster declaration for Nevada County was issued by the state government in 1972 for freeze and severe weather conditions. The District has had no past declarations but has suffered extreme cold, freeze and snow events over the years that has affected pipes and other District infrastructure.

Vulnerability to Severe Weather: Extreme Cold, Snow and Freeze

Some water piping is at or near the surface. These facilities may be impacted by prolonged freezing.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Current County codes provide such provisions for new construction.

Severe Weather: Heavy Rains and Storms (wind/tornado, hail, lightening)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile and Problem Description

Storms in the District 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.

Past Occurrences

A search of FEMA and Cal OES disaster declarations turned up multiple events. 11 state disaster declarations have occurred in the County – 1950, 1955, 1958 (twice), 1963, 1982, 1986, 1990, 1995, 1997, and 2008. 9 federal disaster declarations have occurred in the County – 1955, 1958, 1963, 1964, 1983, 1986, 1995, 1997, and twice in 2006, January 2017. These storms have affected the District with downed trees, loss of power and services cut off to the residents that live within the District boundaries.

Vulnerability to Severe Weather: Heavy Rains and Storms (Hail, Lightning/Wind/Tornadoes)

The filter plant may be vulnerable to high winds if a tree or trees were to fall on the facility.

Future Development

No future development is planned for this community. However, should that change, new District facilities should be built to withstand hail damage, lightning, and thunderstorm winds.

F.6 Capability Assessment

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

F.6.1. Regulatory Mitigation Capabilities

Table F-4 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 WCWD.

Table F-4 Washington County Water District's Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	No	Nevada County
Capital Improvements Plan	No	
Economic Development Plan	No	Nevada County
Local Emergency Operations Plan	Yes	For drinking water system only
Continuity of Operations Plan	No	
Transportation Plan	No	Nevada County
Stormwater Management Plan/Program	No	Nevada County
Engineering Studies for Streams	No	
Community Wildfire Protection Plan	Maybe	Washington Fire District
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	No	
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code		Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:		Rating:
Site plan review requirements		

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning ordinance	N/A	
Subdivision ordinance	N/A	
Floodplain ordinance	No	Nevada County
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	?	
Flood insurance rate maps	No	Nevada County
Elevation Certificates		
Acquisition of land for open space and public recreation uses		
Erosion or sediment control program	No	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Little or no local participation can be solicited.		

Source: Washington County Water District

F.6.2. Administrative/Technical Mitigation Capabilities

Table F-5 identifies the department(s) responsible for activities related to mitigation and loss prevention for Washington County Water District.

Table F-5 Washington County Water District's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	No	Nevada County
Mitigation Planning Committee	No	Nevada County
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Yes	Limited maintenance performed by contract work.
Mutual aid agreements	No	No other district in proximity to provide water wheeling.
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N/N	Nevada County
Floodplain Administrator	N/N	Nevada County
Emergency Manager	N/N	Nevada County
Community Planner	N/N	Nevada County
Civil Engineer	N/N	Contracted

GIS Coordinator	N/N	
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Outdoor signage and phone calls. Informational only, not designed for mitigation.
Hazard data and information	N	
Grant writing	Y	No
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Washington County Water District

F.6.3. Fiscal Mitigation Capabilities

Table F-6 identifies financial tools or resources that the Washington County Water District could potentially use to help fund mitigation activities.

Table F-6 Washington County Water District's Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	Residents are severely disadvantaged
Impact fees for new development	N/A	
Storm water utility fee	N/A	
Incur debt through general obligation bonds and/or special tax bonds	Y	Residents are severely disadvantaged
Incur debt through private activities	N	
Community Development Block Grant	?	
Other federal funding programs	Y	Grants/loans have been used for system improvements
State funding programs	Y	Grants/loans have been used for system improvements
Other		
How can these capabilities be expanded and improved to reduce risk?		
Expand search and effort to find grants specific to district's needs.		

Source: Washington County Water District

F.6.4. Mitigation Education, Outreach, and Partnerships

Table F-7 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table F-7 Washington County Water District's Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	No
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	No	No
Natural disaster or safety related school programs	No	No
StormReady certification	No	No
Firewise Communities certification	?	?
Public-private partnership initiatives addressing disaster-related issues	No	No
Other		
How can these capabilities be expanded and improved to reduce risk?		
Increase capacity through staffing, training, and enhanced coordination among all department and jurisdictions; emergency management/hazard specific program enhancements, training, and exercising; increased funding opportunities and capacity; and implementation of mitigation actions and projects.		

Source: Washington County Water District

F.6.5. Other Mitigation Efforts

The district is currently working with the California Rural Water Association on assessment, engineering, and possible California Proposition 1 funding to strengthen the intakebox and piping at the impoundment dam.

F.7 Mitigation Strategy

As part of the overall HMPC for the development of this multi-jurisdictional Nevada County LHMP Update, each jurisdiction followed the mitigation strategy development process detailed in Chapter 5 and Appendix C of the Base Plan, which included the development of plan goals and objectives and the resulting mitigation actions and projects.

F.7.1. Mitigation Goals and Objectives

Washington County Water District adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

F.7.2. Mitigation Actions

The planning team for Washington County Water District identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included.

It should be noted that many of the projects submitted by each jurisdiction in Table 5 2 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 public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Action 1. Impound Dam Intake Upgrade

Hazards Addressed: Flood Mitigation

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: Current intake structure and associated piping to capture and bring raw water to the filter plant are damaged and/or become unusable during flood events.

Project Description: Rebuild intake gate with self-shedding diverter. Rebuild collection box with metal lid. Remove approximately 100 ft. of existing 12” plastic piping and replace with restrained ductile iron pipe. Add anchor tie down for pipe.

Other Alternatives: Explore the possibility of alternate intake pipe at a right angle to creek flow. Consider a shallow well system adjacent to creek.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Proposition 1 is being considered for access to funding to perform a preliminary engineering report on the subject.

Responsible Office/Partners: Washington County Water District/ California Rural Water Association

Project Priority: High

Cost Estimate: Unknown

Benefits (Losses Avoided): Strengthen reliability of drinking water to the community, especially during prolonged flooding.

Potential Funding: Possibly California Proposition 1

Timeline: 24 months

Action 2. Yuba River Waterline Replacement

Hazards Addressed: Stormwater Flooding

Goals Addressed: 1, 2, 3, 5, 6

Issue/Background: The majority of customers served by the Washington County Water District's storage tank are served through an 8" water line that is suspended under the Washington Road bridge, crossing the Yuba River. Prior to the flood of 1997 the water system had an additional crossing across the river, behind the Washington Hotel. This crossing was washed out during the New Year's flood of 1996-1997. An additional river crossing would allow the water system to continue to function should the Washington Bridge crossing be washed out.

Project Description: Engineering, permits, and replacement of a 6" water line across the Yuba River behind the Washington Hotel.

Other Alternatives: Construction of additional storage on the south side of the Yuba River.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Washington County Water District

Project Priority: Medium

Cost Estimate: Unknown

Benefits (Losses Avoided): Avoids a prolonged water outage causing a public health hazard or ability to suppress a fire.

Potential Funding: Unknown

Timeline: Unknown

Action 3. Filter Plant Wildfire Mitigation and Upgrade

Hazards Addressed: Wildfire Mitigation, Earthquake

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background: The existing filter plant building for the Washington County Water District is constructed of wood siding with a metal roof. Additionally, forest growth is directly adjacent to the structure.

Project Description: Replace the existing wood frame structure with concrete block construction. Rebuild the roof with new metal roofing material. Remove vegetation and trees adjacent to the structure.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Washington County Water District

Project Priority: Extremely High

Cost Estimate: $100,000 - $125,000

Benefits (Losses Avoided): Loss of structure would cause a long term water outage in the community. The project would greatly strengthen the district's ability to withstand destruction of a crucial asset to the drinking water system.

Potential Funding: Unknown

Timeline: Unknown

Appendix A Planning Process

A.1 Lists of HMPC Invites/Stakeholders

Table A-1 Initial LHMP Invite List

Name	Jurisdiction	Agency	Phone	Email
John Gulserian	Nevada County	OES	265-1515	john.gulserian@co.nevada.ca.us
Sebastian Roberts	Nevada County	GIS	265-1578	Sebastian.Roberts@co.nevada.ca.us
Sarah Deal	Nevada County	GIS	265-1789	Sarah.Deal@co.nevada.ca.us
Hank Weston	Nevada County	Chair - BOS		hank.weston@co.nevada.ca.us
Steve Monaghan	Nevada County	Director Emergency Services		Steve.Monaghan@co.nevada.ca.us
Daniel Chatigny	Nevada County	Ag Commissioner	470-2690	Daniel.Chatigny@co.nevada.ca.us
Lee Ocker	Nevada County	Airport Manager	273-3374	Lee.Ocker@co.nevada.ca.us
Sue Horne	Nevada County	Assessor	265-1232	Sue.Horne@co.nevada.ca.us
Craig Griesbach	Nevada County	Building Department	265-1222	craig.griesbach@co.nevada.ca.us
Sean Powers	Nevada County	Community Development Agency	265-1576	Sean.Powers@co.nevada.ca.us
Amy Irani	Nevada County	Environmental Health	265-1222	amy.irani@co.nevada.ca.us
Jim Turner	NCCFD	Nevada County Consolidated Fire		jimturner@nccfire.com
Patti Carter	Nevada County	Public Health	265-7174	Patti.Carter@co.nevada.ca.us
Jill Blake	Nevada County	Public Health Director	265-1450	Jill.Blake@co.nevada.ca.us
Grant Eisen	Nevada County	EH	265-1469	grant.eisen@co.nevada.ca.us
Brian Foss	Nevada County	Planning Department	265-1222	brian.foss@co.nevada.ca.us
Trisha Tillotson	Nevada County	Public Works	265-1411	trisha.tillotson@co.nevada.ca.us
Brad Torres	Nevada County	Waste Water Operations Manager	265-7103	brad.torres@co.nevada.ca.us
Keith Royal	Nevada County	Sheriff		keith.royal@co.nevada.ca.us
Joe Salivar	Nevada County	Under Sheriff		Joseph.Salivar@co.nevada.ca.us
Paul Schmidt	Nevada County	NCSO	265-1328	Paul.Schmidt@co.nevada.ca.us
Matt Furtado	NC/CalFire	Fire Prevention Planner		Matt.Furtado@co.nevada.ca.us

Name	Jurisdiction	Agency	Phone	Email
Sam Goodspeed	Nevada City	Fire Department	265-2351 ext 11	sam.goodspeed@nevadacityca.gov
Mark Prestwich	Nevada City	City Manager	265-2496 ext 119	mark.prestwich@nevadacityca.gov
Rob Leftwich	Town of Truckee	Police Department	582-2344	
Tony Lashbrook	Town of Truckee	Town Manager	582-2901	
Robert Womack	Town of Truckee	Police Department	550-2335	rwomack@townoftruckee.com
Dan Wilkins	Town of Truckee	Public Works	582-2902	dwilkins@townoftruckee.com
Todd Landry	Town of Truckee			TLandry@townoftruckee.com
Drew Jack	Town of Truckee			djack@townoftruckee.com
Bill Seline	Truckee Fire	Chief	582-7850	billseline@truckeefire.org
Mark Buttron	Grass Valley	Fire Department	274-4371	markb@cityofgrassvalley.com
Robert Richardson	Grass Valley	City Manager	274-4312	r.richardson@cityofgrassvalley.com
Tim Kiser	Grass Valley	Public Works	274-4351	timk@cityofgrassvalley.com
Keane Sommers	NID	Hydro Manager	273-8571	sommers@nidwater.com
Chip Close	NID	Water Operations		close@NIDwater.com
Greg Jones	NID	Assistant General Manager	273-6185 ext 266	jonesg@nidwater.com
Karen Sueram	Nevada Joint Union High School	Assistant Superintendent	273-7351	ksuenram@njuhsd.com
Kathy Neus	Truckee Donner Public Utility District		582-3922	kathyneus@tdpud.org
Joanne Drummond	Fire Safe Council	Executive Director		joanne@areyoufiresafe.com
Monte Kawahara	BLM			mkawahara@blm.gov
Karen Hayden	USFS		478-6253 ext 230	khayden@fs.fed.us
Eric Rice	USFS	Yuba Ranger District	478-6253 ext 239	erice@fs.fed.us
Daryl White	Red Cross			daryl.white3@redcross.org
George Morris	CalFire	NEU		george.morrisIII@fire.ca.gov
Kim Nielson	Cal OES	ESC		kim.nielsen@caloes.ca.gov
Victoria La Mar-Haas	Cal OES	Hazard Mitigation Unit		victoria.lamar-haas@caloes.ca.gov
Shelli Pangman	Cal Trans	District Manager		shelley.pangman@dot.ca.gov
Michelle Mead	NWS		916-979-3041 ext223	michelle.mead@noaa.gov
Brandon Sanders	PG&E	Sierra Div Public Affairs	916-472-2241	brandon.sanders@pge.com
Rich Adams	State Parks			Rich.Adams@parks.ca.gov

Name	Jurisdiction	Agency	Phone	Email
Gary Lippner	Cal DWR	Supervising Engineer		Gary.Lippner@water.ca.gov
	State Fish & Game			
Matt Wallen	Battalion Chief	CalFire		matt.wallen@fire.ca.gov
Jerry Good	Chief	Higgins Fire District	277-6200	jgood@higginsfire.org
Jason Flores	Chief	North San Juan Fire	292-9159	chief61@nsjfire.org
Robb Rothenberger	Chief	Ophir Hill Fire	273-8351	ophirhill@sbcglobal.net
Jim Bierwagen	Chief	Peardale Chicago Park Fire		pcpfpdchief@gmail.com
Don Wagner	Chief	Penn Valley Fire	432-2630	dwagner@pennvalleyfire.com
Bob Vaughn	Chief	Rough & Ready Fire	432-1140	bobv@telestream.net
Doug Cole	Captain (Volunteer)	Washington Water District	265-4720	station60wfr@gmail.com
Paul Rose	Water Operator	Washington Water District	775-530-7266	rosewatersystem@gmail.com
Matt Green	Chief Ranger Sierra District	State Parks		Matt.Green@parks.ca.gov
Jeanine Foster	Foster Morrison Consulting	–	303-717-7171	Jeanine.foster@fostermorrison.com
Brenna Howell	Howell Consulting	–		brenna@brennahowell.com

Table A-2 HMPC Participant List

Name	Jurisdiction	Agency	Phone	Email
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Sarah Deal	Nevada County	GIS	265-1789	Sarah.Deal@co.nevada.ca.us
Lee Ocker	Nevada County	Airport Manager	273-3374	Lee.Ocker@co.nevada.ca.us
Jill Blake	Nevada County	Public Health Director	265-1450	Jill.Blake@co.nevada.ca.us
Grant Eisen	Nevada County	EH	265-1469	grant.eisen@co.nevada.ca.us
Brian Foss	Nevada County	Planning Department	265-1222	brian.foss@co.nevada.ca.us
Trisha Tillotson	Nevada County	Public Works	265-1411	trisha.tillotson@co.nevada.ca.us
Paul Schmidt	Nevada County	NCSO	265-1328	Paul.Schmidt@co.nevada.ca.us
Matt Furtado	NC/CalFire	Fire Prevention Planner		Matt.Furtado@co.nevada.ca.us
Sam Goodspeed	Nevada City	Fire Department	265-2351 ext 11	sam.goodspeed@nevadacityca.gov
Mark Prestwich	Nevada City	City Manager	265-2496 ext 119	mark.prestwich@nevadacityca.gov
Robert Womack	Town of Truckee	Police Department	550-2335	rwomack@townoftruckee.com
Todd Landry	Town of Truckee			TLandry@townoftruckee.com

Name	Jurisdiction	Agency	Phone	Email
Drew Jack	Town of Truckee			djack@townoftruckee.com
Mark Buttron	Grass Valley	Fire Department	274-4371	markb@cityofgrassvalley.com
Keane Sommers	NID	Hydro Manager	273-8571	sommers@nidwater.com
Chip Close	NID	Water Operations		close@NIDwater.com
Greg Jones	NID	Assistant General Manager	273-6185 ext 266	jonesg@nidwater.com
Kathy Neus	Truckee Donner Public Utility District		582-3922	kathyneus@tdpud.org
Joanne Drummond	Fire Safe Council	Executive Director		joanne@areyoufiresafe.com
Kim Nielson	Cal OES	ESC		kim.nielsen@caloes.ca.gov
Brandon Sanders	PG&E	Sierra Div Public Affairs	916-472-2241	brandon.sanders@pge.com
Don Wagner	Chief	Penn Valley Fire	432-2630	dwagner@pennvalleyfire.com
Doug Cole	Captain (Volunteer)	Washington Water District	265-4720	station60wfr@gmail.com
Paul Rose	Water Operator	Washington Water District	775-530-7266	rosewatersystem@gmail.com
Richard Herrera Jr.	USFS		530 428-6264	rherrara01@fs.fed.us
Rod Brock	Battalion Chief	Truckee Fire District	530 414-3857	rodbrock@truckeefire.us
Larry Peabody	USFS		530 288-3231	lpeabody@fs.fed.us
Craig Griesbach	Nevada County CDA			craig.griesbach@co.nevada.ca.us
Paul Palmer	Director Facilities	NFUHSD	530 273-3351	ppalmer@njuhsd
Ken Cutler	Nevada County Public Health	530 265-7154		ken.cutler@co.nevada.ca.us
Jeff Pettitt Captain	Nevada County Sheriff's Office		530 265-7128	jeff.tettitt@co.nevada.ca.us
Tim Foley	NCPD			tim.foley@nevadacityca.gov 530 265-4700
Dennis Mazzini	Truckee Conner PUD		530 448-3024	dennismazzini@tdpud.org
Matt Furtado	Cal Fire		530 265-1714	matt.furtado@co.nevada.ca.us
Ken Cufler	Public Health		530 265-7154	ken.curfler@co.nevada.ca.us
Donn Thane	Fire Safe Council		530 575-0566	6dthane@gmail.com
Bryan McAlister	City of Nevada City			bryan.mcalister@nevadacityca.gov

Name	Jurisdiction	Agency	Phone	Email
Chris deNijs	Nevada County Ag		530-470-2690	chris.denijs@co.nevada.ca.us
Dave Huff	Nevada County Environmental Health			dave.huff@co.nevada.ca.us
Sara Rowland	Washington County Water District		530 265-4720	washingtoncowtr@gmail.com

A.2 Website for Hazard Mitigation Plan

A.3 Kickoff Meeting

A.3.1. Kickoff Meeting Invite to Stakeholders

From: John Gulserian
Sent: Wednesday, February 22, 2017 4:06 PM
To: Steve Monaghan <Steve.Monaghan@co.nevada.ca.us>; Daniel Chatigny <Daniel.Chatigny@co.nevada.ca.us>; Lee Ocker <Lee.Ocker@co.nevada.ca.us>; Sue Horne <Sue.Horne@co.nevada.ca.us>; Craig Griesbach <craig.griesbach@co.nevada.ca.us>; Sean Powers <Sean.Powers@co.nevada.ca.us>; Amy Irani <amy.irani@co.nevada.ca.us>; 'jimturner@nccfire.com' <jimturner@nccfire.com>; Patti Carter <Patti.Carter@co.nevada.ca.us>; Jill Blake <Jill.Blake@co.nevada.ca.us>; Brian Foss <Brian.Foss@co.nevada.ca.us>; Trisha Tillotson <Trisha.Tillotson@co.nevada.ca.us>; Brad Torres <Brad.Torres@co.nevada.ca.us>; Keith Royal <Keith.Royal@co.nevada.ca.us>; Joseph Salivar <Joseph.Salivar@co.nevada.ca.us>; Paul Schmidt <Paul.Schmidt@co.nevada.ca.us>; Matt Furtado <Matt.Furtado@co.nevada.ca.us>; Sam Goodspeed <Sam.Goodspeed@nevadacityca.gov>; Mark Prestwich <Mark.Prestwich@nevadacityca.gov>; 'rleftwich@townoftruckee.com' <rleftwich@townoftruckee.com>; 'tlashbrook@townoftruckee.com' <tlashbrook@townoftruckee.com>; 'rwomack@townoftruckee.com' <rwomack@townoftruckee.com>; 'dwilkins@townoftruckee.com' <dwilkins@townoftruckee.com>; 'TLandry@townoftruckee.com' <TLandry@townoftruckee.com>; 'djack@townoftruckee.com' <djack@townoftruckee.com>; 'markb@cityofgrassvalley.com' <markb@cityofgrassvalley.com>; 'r.richardson@cityofgrassvalley.com' <r.richardson@cityofgrassvalley.com>; 'timk@cityofgrassvalley.com' <timk@cityofgrassvalley.com>; 'sommers@nidwater.com' <sommers@nidwater.com>; 'close@NIDwater.com' <close@NIDwater.com>; 'jonesg@nidwater.com' <jonesg@nidwater.com>; 'ksuenram@njuhsd.com' <ksuenram@njuhsd.com>; 'kathyneus@tdpud.org' <kathyneus@tdpud.org>; 'joanne@areyoufiresafe.com' <joanne@areyoufiresafe.com>; 'mkawahara@blm.gov' <mkawahara@blm.gov>; 'khayden@fs.fed.us' <khayden@fs.fed.us>; 'erice@fs.fed.us' <erice@fs.fed.us>; 'daryl.white3@redcross.org' <daryl.white3@redcross.org>; 'george.morrisIII@fire.ca.gov' <george.morrisIII@fire.ca.gov>; 'kim.nielsen@caloes.ca.gov' <kim.nielsen@caloes.ca.gov>; 'victoria.lamar-haas@caloes.ca.gov' <victoria.lamar-haas@caloes.ca.gov>; 'shelley.pangman@dot.ca.gov' <shelley.pangman@dot.ca.gov>; 'michelle.mead@noaa.gov' <michelle.mead@noaa.gov>; 'brandon.sanders@pge.com' <brandon.sanders@pge.com>; 'Rich.Adams@parks.ca.gov' <Rich.Adams@parks.ca.gov>; 'Gary.Lippner@water.ca.gov' <Gary.Lippner@water.ca.gov>; 'matt.wallen@fire.ca.gov' <matt.wallen@fire.ca.gov>; 'jgood@higginsfire.org' <jgood@higginsfire.org>; 'chief61@nsjfire.org' <chief61@nsjfire.org>; 'ophirhill@sbcglobal.net' <ophirhill@sbcglobal.net>; 'pcpfpdchief@gmail.com' <pcpfpdchief@gmail.com>; 'dwagner@pennvalleyfire.com' <dwagner@pennvalleyfire.com>; 'bobv@telestream.net' <bobv@telestream.net>; 'station60wfr@gmail.com' <station60wfr@gmail.com>; 'rosewatersystem@gmail.com' <rosewatersystem@gmail.com>; 'Matt.Green@parks.ca.gov' <Matt.Green@parks.ca.gov>
Cc: Hank Weston <Hank.Weston@co.nevada.ca.us>; 'reginawise@tdpud.org' <reginawise@tdpud.org>
Subject: LHMP Update: Kickoff Meeting Follow-up

All,

Thanks to everyone that attended the kickoff meeting for the 2017 City of Nevada County Local Hazard Mitigation Plan (LHMP). This email is to provide follow up to the meetings and to get everyone on board moving forward. All Participating Jurisdictions to this 2017 Update need to assist by completing the following items listed below

1. The existing **2011 Nevada County LHMP** can be accessed at the following link: https://www.mynevadacounty.com/nc/igs/oes/docs/Multi%20Jurisdiction,%20Multi-Hazard%20Mitigation%20Plan%20for%20Nevada%20County/2011%20Local%20Hazard%20Mitigation%20Plan%20DraftRev8.pdf. Please take a look; this is what we are updating. The 2017 LHMP Update will also be enhanced to ensure compliance with new FEMA requirements. Also, each participating jurisdiction will have an Annex to the Base Plan document.

2. **Please confirm your intent to participate as a participating jurisdiction**. Remember, a Participating Jurisdiction are those jurisdictions who are participating in this plan update process to obtain FEMA approval of the plan for their jurisdiction. Jurisdictions with a FEMA-approved plan are able to pursue FEMA pre-and post-disaster mitigation grants. They will need to participate in the plan update process and provide information as necessary to support develop of their annex to the plan. The following jurisdictions have been identified to date as participating jurisdictions: Nevada County, City of Grass Valley, City of Nevada City, Town of Truckee, Nevada Irrigation District, Nevada Joint Union High School District, and Truckee Donner Public Utility District.

Are there others that will be participating? And even if you are listed here, please confirm your intent to participate in this LHMP Update.

All other jurisdictions and public and private stakeholders are welcome to participate in the overall plan development process and to be part of the umbrella county plan.

3. The first attachment, **Hazard ID Table**: Each Participating Jurisdiction needs to complete this table specific to their jurisdiction. **It is important that you complete this and return as soon as possible, but no later than 3/3.**

3. The second attachment, **Historic Hazard Worksheet**: This worksheet is to assist in obtaining information for the risk assessment addressing past hazard occurrences for each identified hazard. Please complete this specific to past hazard occurrences and impacts to the Nevada County planning area and any of the other participating jurisdictions. For all hazards, we would like to go back and document past notable occurrences over the last 50 years or so. Anyone (the planning team, the public and other Stakeholders) can complete this worksheet. Remember, If you have information such as emails, after action reports, or other source documents, we will take those in lieu of a completed worksheet. **Please return Worksheets and any supporting information by: 3/10.**

4. The third attachment, the **Vulnerability/Capability Worksheet**: This also needs to be completed by each participating jurisdiction. This includes tables and questions that are required to meet DMA planning requirements. **Please return Worksheets and any supporting information by: 3/10.**

5. The fourth attachment, the **Mitigation Strategy Update:** This needs to be completed by the lead jurisdiction that had a mitigation action item/project in the last plan. If you are identified as the lead jurisdiction for any of the projects, please complete both the table and include text detailing the "progress to date" specific to that project in the sections that follow the table. **Please return Worksheets and any supporting information by: 3/17.**

Thanks for everyone's participation and input! Please feel free to call me if you have questions or would like to discuss anything further. Our next meeting detailing the updated risk assessment is targeted for the first part of April. We will follow up with a specific date and time.

Thanks for everyone's efforts!
Jeanine

Jeanine Foster, J.D.
Principal/Senior Project Manager
Foster Morrison Consulting, Ltd.
(303) 717-7171
jeanine.foster@fostermorrison.com

A.3.2. Kickoff Meeting Agenda

NEVADA COUNTY
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
HMPC (KICKOFF) MEETING #1
FEBRUARY 15, 2017

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC)
4. Planning for Public Input
5. Coordinating with other Agencies
6. Hazard Identification
7. Schedule
8. Data Needs
9. Questions and Answers

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Kickoff Meeting #1
February 15, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Jeanine Foster	jeanine.foster@fostermorrison.com	303 717 7171	Foster Morrison Consulting
RICHARD HERRERA Jr.	rherrera01@fs.fed.us	530 478-6264	USFS
ROD BROCK BATTALION CHIEF	RODBROCK@TRUCKEEFIRE.ORG	530-414-3857	TRUCKEE FIRE DISTRICT
LARRY PEABODY	lpeabody@fs.fed.us	530 288 3231	US Forest Service
MARK PRESTWICH	MARK.PRESTWICH@NEVADACITYCA.GOV	530-265-2496	City of Nevada City
Doug CoLe	STATION60WFR@gmail.com	530-265-4720	Washington Fire & Rescue
PAUL ROSE - PRINCIPAL	ROSEWATERSYSTEM@GMAIL.COM	775-530-7266	WASHINGTON WTR. DIST.
Trisha Tillotson	trisha.tillotson@co.nevada.ca.us	530-265-1718	Nevada County Public Works
Robert Womack	RWOMACK@TOWNOFTRUCKEE.COM	530 308-0654	TOWN OF TRUCKEE
Greg Griesbach	GREG.GRIESBACH@CO.NEVADA.CA.US	530-265-1583	Nev. County CDA
KEANE SOMMERS - ASSISTANT ENGINEER MGR	SOMMERS@NIDWATER.COM	530 273-8571 x101	NID
MARK BUTTZON	MARKB@CITYOFGRASSVALLEY.COM	530-274-4371	Grass Valley Fire
Chip Close	Close@NIDwater.com	530 273-6185	NID

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Kickoff Meeting #1
February 15, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Joanne Drummond Exec Director	joanne@areyoufiresafe.org	(530) 272-1122	Fire Safe Council
PAUL PALMER DIRECTOR FACILITIES NJUHSD	ppalmer@njuhsd.com	(530) 273-3351	NJUHSD
GRANT ERSEN, ENV. HEALTH REHS	GRANT.ERSEN@CO.NEVADA.CA.US	530 265-1467	EH
GREG JONES, AGM	jonesg@nidwater.com	530-273-6185	NID
Todd Landry / SR. Engineer	tlandry@townoftruckee.com	530 414 3243	TOT
Drew Jack	djack@townoftruckee.com	530 413 2687	TOT
JILL BLAKE PH DIRECTOR		265-1732	PUBLIC HEALTH
BRAD TORRES WASTEWATER OPERATIONS MGR	brad.torres@co.nevada.ca.us	265-7103	PUBLIC WORKS
MATT FURTADO - CAL FIRE	MATT.FURTADO@CO.NEVADA.CA.US	277-2324	CAL FIRE - FIRE MARSHAL
KEN CUTLER	Ken.Cutler@co.nevada.ca.us	265-7154	Public Health

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Kickoff Meeting #1
February 15, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Brandon Sanders Public Affairs	BLSY@PGE.COM	916.531.0230	PG+E
JEFF PETTITT/CAPTAIN	JEFF.PETTITT@CO.NEVADA.CA.US	(530) 265-7128	NCSO
SarahDeal/GIS/	Sarah.deal@co.nevada.ca.us	1789	IGS
John Gulserian	john.gulserian@co.Nevada.CA.US	530-265-1514	OES
TIM FOLEY	TIM.FOLEY@NEVADACITYCA.GOV	530 265-4700	NCPD

A.4 Risk Assessment Meetings

A.4.1. Emailed Invites to Risk Assessment Meetings

From: John Gulserian [mailto:John.Gulserian@co.nevada.ca.us]
Sent: Friday, March 10, 2017 11:13 AM
To: John Gulserian; Sebastian Roberts; Sarah Deal; Hank Weston; Steve Monaghan; Daniel Chatigny; Lee Ocker; Sue Horne; Craig Griesbach; Sean Powers; Amy Irani; jimturner@nccfire.com; Patti Carter; Jill Blake; Brian Foss; Trisha Tillotson; Brad Torres; Keith Royal; Joseph Salivar; Paul Schmidt; Matt Furtado; Sam Goodspeed; Mark Prestwich; rleftwich@townoftruckee.com; tlashbrook@townoftruckee.com; rwomack@townoftruckee.com; dwilkins@townoftruckee.com; TLandry@townoftruckee.com; djack@townoftruckee.com; billseline@truckeefire.org; markb@cityofgrassvalley.com; r.richardson@cityofgrassvalley.com; timk@cityofgrassvalley.com; sommers@nidwater.com; close@NIDwater.com; jonesg@nidwater.com; ksuenram@njuhsd.com; kathyneus@tdpud.org; joanne@areyoufiresafe.com; mkawahara@blm.gov; khayden@fs.fed.us; erice@fs.fed.us; daryl.white3@redcross.org; george.morrisIII@fire.ca.gov; kim.nielsen@caloes.ca.gov; victoria.lamar-haas@caloes.ca.gov; shelley.pangman@dot.ca.gov; michelle.mead@noaa.gov; brandon.sanders@pge.com; Rich.Adams@parks.ca.gov; Gary.Lippner@water.ca.gov; matt.wallen@fire.ca.gov; jgood@higginsfire.org; chief61@nsjfire.org; ophirhill@sbcglobal.net; pcpfpdchief@gmail.com; dwagner@pennvalleyfire.com; bobv@telestream.net; station60wfr@gmail.com; rosewatersystem@gmail.com; Matt.Green@parks.ca.gov; Jeanine Foster
Subject: Risk Assessment Mtg - Mitigation Plan Update
When: Wednesday, April 12, 2017 9:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: 950 Maidu Ave, Nevada City - Rood Center Empire Room

A.4.2. Risk Assessment Meeting Agenda

Nevada County
Local Hazard Mitigation Plan (LHMP) Update
Risk Assessment Meeting
April 12, 2017

1. Introductions
2. Status of the DMA Planning Process
3. Review (and discussions/input) of the Risk Assessment
4. Review of Data Needs
5. Questions
6. Next Steps

SIGN-. SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Risk Assessment Meeting #2
April 12, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Doug Cole Captain/Fire/R.	STATION60WFR@gmail.com	530-265-4720	Washington Fire + Rescue
Robert Womack - Sgt	RWomack@townoftruckee.com	530 550 2335	Truckee PD
Kathy Neus	kathyneus@tdpud.org	(530) 582-3922	Truckee Donner PUD
Dennis Mazzini	dennismazzini@tdpud.org	530 448 3024	Truckee Donner PUD
Mark Buttizon	MarkB@cityofgrassvalley.com	530 274 4371	Grass Valley
SAM GOODSPEED	sam.goodspeed@nevadacityca.gov	530 957-9892	Nevada City
Jeanine Foster	Jeanine.foster@fostermorrison.com	303 717 7171	foster Morrison
RICHARD HERRERA Jr.	rherrera01@fs.fed.us	530 478 6264	USFS
MATT FURTADO CAL FIRE	MATT.FURTADO@CO.NEVADA.CA.US	530 265 1714	CAL FIRE
Paul Schmidt, Captain	paul.schmidt@co.nevada.ca.us	265-1328	SHERIFF
Ken Cutler	ken.cutler@co.nevada.ca.us	265-7154	Public Health
GRANT EISEN	GRANT.EISEN@CO.NEVADA.CA.US	265-1469	ENV. HEALTH
DON WAGNER	dwagner@pennvalleyfire.org	432-2630	PENN VALLEY FIRE

SIGN-I SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Risk Assessment Meeting #2
April 12, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
PAUL ROSÉ - OPERATOR	ROSEWATERSYSTEM@GMAIL.COM	775-530-7266	WASHINGTON WATER
Sarah Deal - GIS	sarah.deal@co.nevada.ca.us	530 265-1784	Nevada County GIS
John Gulserian	johngulserian@co.nevada.ca.us	265-1515	Nevada County OES

A.5 Mitigation Strategy Meetings

A.5.1. Email Invites to Mitigation Strategy Meetings

-----Original Appointment-----
From: John Gulserian [mailto:John.Gulserian@co.nevada.ca.us]
Sent: Thursday, March 16, 2017 3:36 PM
To: Sebastian Roberts; Sarah Deal; Hank Weston; Steve Monaghan; Daniel Chatigny; Lee Ocker; Sue Horne; Craig Griesbach; Sean Powers; Amy Irani; jimturner@nccfire.com; Patti Carter; Jill Blake; Brian Foss; Trisha Tillotson; Brad Torres; Keith Royal; Joseph Salivar; Paul Schmidt; Matt Furtado; Sam Goodspeed; Mark Prestwich; rwomack@townoftruckee.com; dwilkins@townoftruckee.com; TLandry@townoftruckee.com; djack@townoftruckee.com; billseline@truckeefire.org; markb@cityofgrassvalley.com; r.richardson@cityofgrassvalley.com; timk@cityofgrassvalley.com; sommers@nidwater.com; close@NIDwater.com; jonesg@nidwater.com; ksuenram@njuhsd.com; kathyneus@tdpud.org; joanne@areyoufiresafe.com; mkawahara@blm.gov; khayden@fs.fed.us; erice@fs.fed.us; daryl.white3@redcross.org; george.morrisIII@fire.ca.gov; kim.nielsen@caloes.ca.gov; victoria.lamar-haas@caloes.ca.gov; shelley.pangman@dot.ca.gov; michelle.mead@noaa.gov; brandon.sanders@pge.com; Rich.Adams@parks.ca.gov; Gary.Lippner@water.ca.gov; matt.wallen@fire.ca.gov; jgood@higginsfire.org; chief61@nsjfire.org; ophirhill@sbcglobal.net; pcpfpdchief@gmail.com; dwagner@pennvalleyfire.com; bobv@telestream.net; station60wfr@gmail.com; Jeanine Foster; Chris Morrison
Subject: Mitigation Strategy Meeting 1
When: Tuesday, April 25, 2017 1:00 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Rood Center, Empire Room, 950 Maidu Ave, Nevada City

This is a two part meeting:
April 25th – 1:00 PM to 4:00PM
April 26th – 9:00 AM to Noon

From: John Gulserian [mailto:John.Gulserian@co.nevada.ca.us]
Sent: Thursday, April 20, 2017 4:43 PM
To: John Gulserian <John.Gulserian@co.nevada.ca.us>; Sebastian Roberts <Sebastian.Roberts@co.nevada.ca.us>; Sarah Deal <Sarah.Deal@co.nevada.ca.us>; Hank Weston <Hank.Weston@co.nevada.ca.us>; Steve Monaghan <Steve.Monaghan@co.nevada.ca.us>; Daniel Chatigny <Daniel.Chatigny@co.nevada.ca.us>; Lee Ocker <Lee.Ocker@co.nevada.ca.us>; Sue Horne <Sue.Horne@co.nevada.ca.us>; Craig Griesbach <Craig.Griesbach@co.nevada.ca.us>; Sean Powers <Sean.Powers@co.nevada.ca.us>; Amy Irani <Amy.Irani@co.nevada.ca.us>; jimturner@nccfire.com; Patti Carter <Patti.Carter@co.nevada.ca.us>; Jill Blake <Jill.Blake@co.nevada.ca.us>; Grant Eisen <Grant.Eisen@co.nevada.ca.us>; Brian Foss <Brian.Foss@co.nevada.ca.us>; Trisha Tillotson <Trisha.Tillotson@co.nevada.ca.us>; Brad Torres <Brad.Torres@co.nevada.ca.us>; Keith Royal <Keith.Royal@co.nevada.ca.us>; Joseph Salivar <Joseph.Salivar@co.nevada.ca.us>; Paul Schmidt <Paul.Schmidt@co.nevada.ca.us>; Matt Furtado <Matt.Furtado@co.nevada.ca.us>; Sam Goodspeed <Sam.Goodspeed@nevadacityca.gov>; Mark Prestwich <Mark.Prestwich@nevadacityca.gov>; rwomack@townoftruckee.com; dwilkins@townoftruckee.com; TLandry@townoftruckee.com; djack@townoftruckee.com; billseline@truckeefire.org; markb@cityofgrassvalley.com; r.richardson@cityofgrassvalley.com; timk@cityofgrassvalley.com; sommers@nidwater.com; close@NIDwater.com; jonesg@nidwater.com; ksuenram@njuhsd.com; kathyneus@tdpud.org; joanne@areyoufiresafe.com; mkawahara@blm.gov; khayden@fs.fed.us; erice@fs.fed.us; daryl.white3@redcross.org; george.morrisIII@fire.ca.gov; kim.nielsen@caloes.ca.gov; victoria.lamar-haas@caloes.ca.gov; shelley.pangman@dot.ca.gov; michelle.mead@noaa.gov; brandon.sanders@pge.com; Rich.Adams@parks.ca.gov; Gary.Lippner@water.ca.gov; matt.wallen@fire.ca.gov; jgood@higginsfire.org; chief61@nsjfire.org; ophirhill@sbcglobal.net; pcpfpdchief@gmail.com; dwagner@pennvalleyfire.com; bobv@telestream.net; station60wfr@gmail.com; rosewatersystem@gmail.com; Matt.Green@parks.ca.gov
Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>; Chris Morrison <chris.morrison@fostermorrison.com>
Subject: FW: Nevada County LHMP: Mitigation Strategy Meetings

All,

I just wanted to touch base before our meetings next week.

Chapter 4 – Risk Assessment. First, see below link to access the first draft of the Chapter 4 Risk Assessment document in advance of the meetings. There are still a few holes. Anything highlighted in yellow are areas where we need some local input; the green is for us to do. Please take some time to review in advance of next week.

It has been placed on the Dropbox here:
https://www.dropbox.com/sh/zasyecsz0srfjv4/AADzOI74waVOKuxWN4ihKna7a?dl=0

Jurisdictional Annexes. For other participating jurisdictions, your jurisdictional annexes will also be placed in a folder on the same dropbox link. This will allow you to see what information we have and where we still need your input. A first cut of the in-process City Annexes should be there by Friday morning. The District annexes are running a bit behind the City annexes; we will let you know when we have a first cut. The Annexes still have areas that we are working on and areas where we need you input. Again this is an iterative process.

Prep for next week's meetings. These are the two most important meetings for this plan: Tuesday April 25 (1-4pm) and Wednesday April 26 (9-12).
(and there will only be one more meeting after these in a couple of months!)

Please make sure you have anyone attend that has mitigation projects to include in the LHMP. Often it is helpful to have public works/ building/facilities/roads type people there as well as Fire. I am attaching a FEMA publication – Mitigation Ideas that has mitigation ideas organized by hazard – take a look – it is easy to read. I am also attaching the Mitigation Action Worksheet in case you want to complete for any projects and bring to the meeting.

Please let me know if anyone has questions. Thanks very much.

Jeanine Foster
Foster Morrison Consulting
(303) 717-7171

A.5.2. Mitigation Strategy Meeting Agenda

Nevada County
Local Hazard Mitigation Plan (LHMP) Update
Mitigation Strategy Meetings
April 26 & 27, 2017

HMPC Meeting #3:

1. Introductions
2. Status of the DMA Planning Process
3. Risk Assessment Update
4. Outstanding Items
5. Develop Updated Plan Goals and Objectives
6. Identify and Review Mitigation Alternatives/Projects

HMPC Meeting #4:

1. Introductions
2. Identify and discuss Mitigation Alternatives/Projects
3. Review Mitigation Selection Criteria
4. Prioritize Mitigation Projects
5. Mitigation Action Worksheet
6. Review of Schedule/Next Steps

A.5.3. Mitigation Strategy Meeting Sign in Sheets

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Mitigation Strategy Meeting #3
April 25, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Robert Weinheimer - GIS	Rweinheimer@truckee.com	530 308-0654	Town of Truckee
Joanne Drummond Exec. Director	Joanne@aregoodfiresafe.com	530 272-1122	Fire Safe
Don Thane FSC	Colthane@gmail.com	575-0566	Fire Safe
Paul Rosé	ROSEWATER SYSTEM@GMAIL.COM	775-530-9266	WASHington WTP
John Gulsetzian	john.gulsetzian@co.nevada.ca.us	530-265-1515	Nevada County OES
Kim Nielsen	Kim.Nielsen@calOES.ca.gov	916-646-1403	CalOES
GRANT Eisen	Grant.Eisen@co.placer.ca.us	265-4467	SVRL / HEARTH
SAM GOODSPEED	SAM.GOODSPEED@NEVADACITYCA.GOV	530 957-9892	Nevada City
LEE OCKER	LEE.OCKER@CO.NEVADA.CA.US	530 802 3188	NC OES & FACILITIES & AIRPORT
Jim BLAKEE		365-1733	Pubs. Health
Paul Schmidt		265-1328	SHERIFF
Misha Tillotson	misha.hillsbm@co.nevada.ca.us	265-1718	Nev Co PW
Kathy News	kathynews@tdpud.org	582-3922	TDPUD

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Mitigation Strategy Meeting #3
April 25, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Dennis Mazzini	dennis.mazzini@tdpud.org	530 448 3024	Forester
Tim Foley/NCPD Chief	TIM.FOLEY@NEVADACITYCA.GOV	530-265-4700	NCPD/CNIBF
Dan Jack	djack@townoftruckee.com	530-550-2483	TOT Engineering
Sarah Deal/GIS	Sarah.deal@conevada.ca.us	265-1789	Nev Co
MATT FURTADO	MATT.FURTADO@CO.NEVADA.CO.US	265 1714	NEV CO/CAL FIRE
Mark Buttron	Markb@cityofgrassvalley.com	530-362-0050	Grass Valley Fire
Dan Wagner	dwagner@pcanvalleyfire.com	530.432.2630	PenneValley Fire
Bryan McAlister	bryan.mcalister@nevadacityca.gov ~~bryan@stand~~	(530) 265-2498 x126	City of N.C.
Chris deNijs	chris.denijs@co.nevada.ca.us	530-470-2690	Nevada Co Ag

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Mitigation Strategy Meeting #4
April 26, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
John Gulsetian		265-1515	Nevada OES
Paul Rose		775-530-7266	Washington Co. WTR.
Doug Colle		530-265-4720	Washington Fire & Rescue
Dennis Mazzini		530-448-2024	Truckee P.U.D
Jill Blake		265-1732	N.C. Public Health
Grant Eisen		265-1467	EH
Dave Huff		1767	EH
Kathy News		(530) 582-3922	Truckee Donner PUD
Sam Goodspeed		530 957-9892	Nevada City
Matt Furtado		530 265 1714	Nev Co / Cal Fire
Lee Ocker		5308023188	Nevco OES
Paul Schmidt		530-265 1328	Sheriff
Trisha Tillotson		530-265-1718	Nev Co. PW

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Mitigation Strategy Meeting #4
April 26, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
DON WAGNER			PENN VALLEY FIRE
Kim Nielsen			CalFES
Joanne Drummond			Fire Safe Council
Brenna Howell	brenna@brennahowell.com	916 202 [illegible]	Foothill Associates - Howell Consulting
Todd Landry		530-414-3343	Truckee
Marc Buttron	marcb@cityofgrassvalley.com	530.274.4370	Grass Valley

A.6 Final Team Meeting

A.6.1. Final Team Meeting Invite

From: John Gulserian [mailto:John.Gulserian@co.nevada.ca.us]
Sent: Monday, July 17, 2017 9:22 AM
To: John Gulserian <John.Gulserian@co.nevada.ca.us>; Sebastian Roberts <Sebastian.Roberts@co.nevada.ca.us>; Sarah Deal <Sarah.Deal@co.nevada.ca.us>; Hank Weston <Hank.Weston@co.nevada.ca.us>; Steve Monaghan <Steve.Monaghan@co.nevada.ca.us>; Daniel Chatigny <Daniel.Chatigny@co.nevada.ca.us>; Lee Ocker <Lee.Ocker@co.nevada.ca.us>; Sue Horne <Sue.Horne@co.nevada.ca.us>; Craig Griesbach <Craig.Griesbach@co.nevada.ca.us>; Sean Powers <Sean.Powers@co.nevada.ca.us>; Amy Irani <Amy.Irani@co.nevada.ca.us>; jimturner@nccfire.com; Patti Carter <Patti.Carter@co.nevada.ca.us>; Jill Blake <Jill.Blake@co.nevada.ca.us>; Grant Eisen <Grant.Eisen@co.nevada.ca.us>; Brian Foss <Brian.Foss@co.nevada.ca.us>; Trisha Tillotson <Trisha.Tillotson@co.nevada.ca.us>; Brad Torres <Brad.Torres@co.nevada.ca.us>; Keith Royal <Keith.Royal@co.nevada.ca.us>; Joseph Salivar <Joseph.Salivar@co.nevada.ca.us>; Paul Schmidt <Paul.Schmidt@co.nevada.ca.us>; Matt Furtado <Matt.Furtado@co.nevada.ca.us>; Sam Goodspeed <Sam.Goodspeed@nevadacityca.gov>; Mark Prestwich <Mark.Prestwich@nevadacityca.gov>; rwomack@townoftruckee.com; dwilkins@townoftruckee.com; TLandry@townoftruckee.com; djack@townoftruckee.com; billseline@truckeefire.org; markb@cityofgrassvalley.com; r.richardson@cityofgrassvalley.com; timk@cityofgrassvalley.com; sommers@nidwater.com; close@NIDwater.com; jonesg@nidwater.com; ksuenram@njuhsd.com; kathyneus@tdpud.org; joanne@areyoufiresafe.com; mkawahara@blm.gov; khayden@fs.fed.us; erice@fs.fed.us; daryl.white3@redcross.org; george.morrisIII@fire.ca.gov; kim.nielsen@caloes.ca.gov; victoria.lamar-haas@caloes.ca.gov; shelley.pangman@dot.ca.gov; michelle.mead@noaa.gov; brandon.sanders@pge.com; Rich.Adams@parks.ca.gov; Gary.Lippner@water.ca.gov; matt.wallen@fire.ca.gov; jgood@higginsfire.org; chief61@nsjfire.org; ophirhill@sbcglobal.net; pcpfpdchief@gmail.com; dwagner@pennvalleyfire.com; bobv@telestream.net; station60wfr@gmail.com; rosewatersystem@gmail.com; Matt.Green@parks.ca.gov
Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>; Chris Morrison <chris.morrison@fostermorrison.com>
Subject: Final Hazard Mitigation Planning Team Meeting

Hello all,

The final Mitigation Plan Update meeting will be July 27, 2017 at Grass Valley Fire Station #2.

Date & Time: July 27, 2017 at 9:00 to 11:00 am. May be a bit longer for some jurisdictions. We want to ensure we capture last minute details.
Location: GV Fire Station #2, 213 Sierra College Drive, Community Classrooms

Thanks,
John

John Gulserian
Nevada County OES
Program Manager
10014 North Bloomfield Rd
Nevada City, CA 95959

530-265-1515
Cell: 530-913-0191

A.6.2. Final Team Meeting Agenda

AGENDA
Nevada
Local Hazard Mitigation Plan (LHMP) Update
Final Public Meeting
July 27, 2017

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Summary of Changes in Nevada County Planning Area Vulnerabilities/ Mitigation Priorities
5. Public Input: Data/Projects
6. Next Steps

A.6.3. Final Team Meeting Sign in Sheet

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Final Meeting #5
July 27, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Gabriel Eisen / REHS	Gabriel.Eisen@dph.nevadaca.us	530 265-1469	Nev Co. Environ. Health
Woodrow, Robert	Rwoodrow@tahoeforestfirecouncil.com	530 308-0654	Truckee FD
Jeanine Foster, PIM	jeanine.foster@fostermorrison.com	303 717 7171	Foster Morrison Soil
Joanne Drummond, PD	joanne@arcyourfiresafe.com	530-272-1122	Five Safe Council.
Leslie Jones, Atty	joness@midwater.com	530-273-6185	NID
Sara Rowland	washingtonco.wtr@gmail	530 265 4730	WCWD
John Gilsenan		530-265-1515	Nevada County OES
Tishan Hilton	tishan.hilton@co.nevada.ca.us	265-1718	Dept. of PW Nev Co
Wm Falconi	BFALCONI@Nevadacity.ca.us	265-7496	
Kathy News (TDPUD)	kathy news @ tdpud.org	5882-3922	TDPUD
Dennis Mazzini	dennis mazzini @ tdpud		TDPUD
Matt Fuentes	MATT.FUENTES@CO.NEVADA.CA.US	265 1714	CAL FIRE / NEV CO

A.7 Public Involvement

A.7.1. Invite to Kickoff Meeting – Public

From:
Sent: Friday, January 20, 2017 9:00 AM
To: John Gulserian; Sebastian Roberts; Hank Weston; Steve Monaghan; Daniel Chatigny; Lee Ocker; Sue Horne; Craig Griesbach; Sean Powers; Amy Irani; jimturner@nccfire.com; Patti Carter; Jill Blake; Brian Foss; Trisha Tillotson; Brad Torres; Keith Royal; Joseph Salivar; Matt Furtado; Sam Goodspeed; Mark Prestwich; rleftwich@townoftruckee.com; tlashbrook@townoftruckee.com; rwomack@townoftruckee.com; dwilkins@townoftruckee.com; markb@cityofgrassvalley.com; r.richardson@cityofgrassvalley.com; timk@cityofgrassvalley.com; sommers@nidwater.com; close@NIDwater.com; ksuenram@njuhsd.com; kathyneus@tdpud.org; rosewatersystems@gmail.com; joanne@areyoufiresafe.com; mkawahara@blm.gov; khayden@fs.fed.us; daryl.white3@redcross.org; george.morrisIII@fire.ca.gov; kim.nielsen@caloes.ca.gov; victoria.lamar-haas@caloes.ca.gov; shelley.pangman@dot.ca.gov; michelle.mead@noaa.gov; brandon.sanders@pge.com; Rich.Adams@parks.ca.gov; Gary.Lippner@water.ca.gov; matt.wallen@fire.ca.gov; jgood@higginsfire.org; chief61@nsjfire.org; ophirhill@sbcglobal.net; pcpfpdchief@gmail.com; dwagner@pennvalleyfire.com; bobv@telestream.net; station60wfr@gmail.com; rosewatersystem@gmail.com; Jeanine Foster
Cc: Sanders, Brandon; Sarah Deal
Subject: Hazard Mitigation Plan Update Kickoff Meeting
When: Wednesday, February 15, 2017 1:00 PM-4:00 PM (UTC-08:00) Pacific Time (US & Canada).
Where: BOS Chambers

Nevada County LHMP Update: Kickoff meeting email invite

Greetings:
Nevada County is kicking off efforts to develop a Local Hazard Mitigation Plan (LHMP) Update for the County and participating jurisdictions. The purpose of the LHMP Update process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in the County. The Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments have a FEMA-approved LHMP in place in order to be eligible for certain pre- and post-disaster mitigation funding utilized to protect communities from future disaster-related losses. You are receiving this notice because we would like to invite you to take part in this plan update as a member of the Hazard Mitigation Planning Committee (HMPC).
County, city, district and other agency participation and coordination is a requirement of an approved plan, as is the inclusion of any hazard data, information, and mitigation projects your department or agency may want to see included in the plan. Thus, your participation in this process is important and encouraged. Your input will be critical to the success of this project. Participation includes:

Attending and participating in the HMPC meetings (5 anticipated over the next 6 months)
Providing available data/information requested of the HMPC

Reviewing and providing comments on the plan drafts

Nevada County, Office of Emergency Services (OES) is taking the lead on coordinating this planning project. A project kickoff meeting will be held at the following location and time:
ruary 15th, 2017, 1pm-4pm
rd of Supervisors Chambers, Eric Rood Administration Center
Maidu Avenue, Nevada City, CA 95959
The kickoff meeting will explain the process and how you can be involved. A public stakeholder meeting will also be held the evening of the same day of the kickoff meeting. Details on the public meetings will be forthcoming.
Please RSVP and plan on attending or delegating attendance to this important meeting.
Regards,
John Gulserian
Nevada County OES
Program Manager
530-265-1515

A.7.2. Kickoff Meeting Articles

Difficulty reading this in email? View the Friday Memo on www.MyNevadaCounty.com

Contact Us | CEO Website

Published 2/3/2017

Articles:

- **Help Your Community Be Hazard-Ready**
- **Tentative Resolution for Nevada County LAMP**
- **Gold Country Stage Free Fare Day on Tuesday February 14th**
- **Vacancy on Library's Citizens' Oversight Committee**
- **Upcoming Library Programs**

Help Your Community Be Hazard-Ready

Nevada County is partnering with local cities and districts to develop an update to their 201 Local Hazard Mitigation Plan. Floods, drough wildfires, earthquakes, and severe weather are just a few of the hazards of concern to Nevada County. While natural hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through hazard mitigation planning.

The people most aware of potential hazards are the people that live and work in the affected communi In addition to plan participation by local, state and federal agencies, the community is seeking enthusiastic, community-minded residents to be part of our Local Hazard Mitigation Planning project We encourage attendance and participation from the general public at our upcoming public meeting t kick off the project:

LAURA ELLIOTT/LMAHAFFY@THEUNION.COM

Yuba River in Nevada City Tuesday afternoon.

Troxel explained visiting his mother in a nursing home where she

ence as a caregiver to her

ALZHEIMER'S, A6

Officials: Storm damage between $4-5 million

By Alan Riquelmy
Staff Writer

Nevada County officials say they're weeks from learning if the state will release funding for damage caused by severe storms that swept through the area last month.

State and federal officials have toured damaged areas in the county and received repair estimates of between $4 million and $5 million. They're now examining those estimates before Gov. Jerry Brown decides whether the area will receive funding under the California Disaster Assistance Act, said John Gulserian, program manager of the county's Office

KNOW & GO
What: Public meeting about Local Hazard Mitigation Plan
Where: Grass Valley Veterans Memorial Building, 255 S. Auburn St.
When: 6 to 7:30 p.m. Feb. 15

DAMAGE, A6

LOCAL, STATE & NATION

DAMAGE

From page A1

of Emergency Services.

Over 30 counties, cities and special districts declared a state of emergency after the storms, said Shawn Boyd, an information officer with the Governor's Office of Emergency Services, in an email.

State funding could open the door to federal dollars, the latter of which would significantly decrease Nevada County's share of the repair costs, Gulserian said.

"I'm hoping for both," he added.

January's storms dropped 25.93 inches on Grass Valley. They swelled rivers and streams, flooding some areas and causing major damage to Maybert Road in Washington. Trees and power lines were felled across the county, and sinkholes opened in Grass Valley and Nevada City.

If Nevada County secured state funding, it would receive 75 percent of the repair costs. That would leave the county with a $1 million bill, if repairs totaled $4 million.

Federal funds would further reduce the county's costs. In that case, the county would pay only $240,000 — 6 percent of $4 million, Gulserian said.

A key component to state and federal funding is the county's Local Hazard Mitigation Plan. That document is what Gulserian called the community's plan to mitigate the impacts of natural disasters. It also makes a community eligible for funding.

Nevada County residents can participate this month in the creation of a new Local Hazard Mitigation Plan. Gulserian's office is holding a public meeting about the new plan from 6 to 7:30 p.m. Feb. 15 at the Grass Valley Veterans

Supreme Co
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By Nicholas Riccardi
Associated Press

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Neil Gorsuch, named Tuesday as President Donald Trump's nominee for the U.S. Supreme Court, is known for his clear, colloquial writing, advocacy for court review of government regulations, defense of religious freedom and skepticism toward law enforcement.

Neil Gorsuch

Gorsuch is a Colorado native who earned his bachelor's degree from Columbia University in three years, then earned a law degree from Harvard. He clerked for Supreme Court Justices Byron White, a fellow Coloradan, and Anthony Kennedy before earning a philosophy degree at Oxford University and working for a prominent Washington, D.C., law firm.

He served for two years in President George W. Bush's
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ALZHEIMER'S

From page A1

husband, Lou Bartolucci, who died from Alzheimer's last month.

"The key things were to pay attention to Lou's special interests, including classical music," Bartolucci said. "We moved him and created an environment that had his books, classical music, good caregivers, could look out the window and see trees and deer. When Lou was sick they

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A.7.3. Kickoff Meeting – Public Agenda

NEVADA COUNTY
LOCAL HAZARD MITIGATION PLAN (LHMP)
PUBLIC MEETING #1
FEBRUARY 15, 2017

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. Hazard Identification and Profiles
4. Opportunities for Public Participation and Input
5. Schedule
6. Questions and Answers

A.7.4. Kickoff Meeting – Public Sign in Sheets

SIGN-I. . SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #1
February 15, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Jeanine Foster	jeanine.foster@fosterwellness.com	303 717-7171	Foster Morrison
Hope Sigloh	hopelight6@att.net	—	Community Member
John Gulsetin	john.gulsetin@co.nevada.ca.us	530-265-1575	Nevada OES
Martin Roche	wmroche@ussmedia.tv	530-271-0381	Consultant
Jeff Wagner DFM	jeffw@cityofgrassvalley.com	530 274-4375	Grass Valley Fire Dept.

A.7.5. Press Release for Final Review of Plan – Public (YubaNet.com)

Regional

Nevada County Invites Comments on their Hazard Mitigation Plan

By **Nevada County Office of Emergency Services** - July 17, 2017, 10:20:40 AM

Tweet

Nevada County, Calif. July 17, 2017 – Nevada County is partnering with incorporated communities and districts to develop an update to their 2011 Local Hazard Mitigation Plan. Flood, drought, fire, earthquakes, and severe weather are just a few of the hazards to Nevada County. While natural hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

The process began in February 2017 with an initial public and planning meeting and the establishment of a planning committee comprised of representatives from the County, Cities and Town, special districts, and other key stakeholders. The plan is scheduled to be finalized and submitted to Cal OES and FEMA in August 2017.

Public Review Draft

The Public Review Draft of the LHMP Update is available online (pdf format) at: http://www.mynevadacounty.com/nc/igs/oes/Pages/LocalHazardMitigation.aspx It is also available (in printed copy) at the following Nevada County locations:

Madelyn Helling Library
980 Helling Way
Nevada City, CA 95959

Truckee Library
10031 Levon Avenue
Truckee, CA 96161

Open Public Meeting

A final public meeting to review and provide comments on the Public Review draft LHMP is scheduled as follows:

July 26, 2017 at 6:00pm
Nevada County Board of Supervisor Chambers
950 Maidu Avenue
Nevada City, CA. 95959

We encourage attendance and input from the public and other interested stakeholders at this upcoming meeting.

Comments on the Public Review Draft

There are several options for providing comments on the LHMP Update Public Review Draft:
– Email comments to Jeanine.foster@fostermorrison.com or
John Gulserian@co.nevada.ca.us

OUR REGIONAL ADVERTISERS

OUR REGIONAL ADVERTISERS

OUR REGIONAL ADVERTISERS

A.7.6. Advertisement to Public for Final Plan Review

THE UNION

Tuesday, July 18, 2017

FOUNDED IN 1864 TO PRESERVE THE UNION ... ONE AND INSEPARABLE

RURAL HEALTH
Silver State confronts possible Medicaid cuts

HEALTHY TUESDAY | B2

bones found near the lake

"Basically, the family

snow, Sullivan said.

or call 530-477-4239.

County seeks input on hazard mitigation plan

Submitted to The Union

Nevada County is partnering with incorporated communities and districts to develop an update to their 2011 Local Hazard Mitigation Plan.

Flood, drought, fire, earthquakes and severe weather are just a few of the hazards to Nevada County. While natural hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction.

Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

The process began in February 2017 with an initial public and planning meeting and the establishment of a planning committee comprised of representatives from the County, Cities and Town, special districts, and other key stakeholders. The plan is scheduled to be finalized and submitted to Cal OES and FEMA in August 2017.

PUBLIC REVIEW DRAFT

The Public Review Draft of the update is available online at:

http://www.mynevadacounty.com/nc/igs/oes/Pages/LocalHazardMitigation.aspx

Printed copies are available at the Madelyn Helling Library, 980 Helling Way, Nevada City, and the Truckee Library, 10031 Levon Ave., Truckee.

OPEN PUBLIC MEETING

A final public meeting to review and provide comments on the Public Review Draft if the update is set for 6 p.m., July 26, at the Nevada County Board of Supervisor Chambers, 950 Maidu Ave., Nevada City.

COMMENT ON THE DRAFT

There are several options for providing comments on the update Public Review Draft:

- Email comments to Jeanine.foster@fostermorrison.com or John.Gulserian@co.nevada.ca.us
- Drop off written comments or send by mail to: Nevada County OES, Attn. John Gulserian, 10014 North Bloomfield Road, Nevada City.
- Bring comments to the meeting.

Contact Gulserian at 530-265-1515 or email at John.Gulserian@co.nevada.ca.us for more information.

ley City Attorney Michael Colantuono will serve as State Bar presid according to a n release.

"I look forwar to working with Board of Truste and all our hard Bar staff membe tect Californians access to justice a diverse profess our diverse state no said in the re

Colantuono, a with Colantuono Whatley, PC, als serves as city att the city of Aubur

According to t website, he also agency or gener for the Auburn velopment Agen sor Agency, the Redevelopment Successor Agenc Yuba and Calave LAFCOs, the Fi Yuba Commissio Tree Park and R District, the Gar Higgins, Rough Penn Valley, and Fire Districts an

State climate law touted as global model faces key test

By Jonathan J. Cooper
Associated Press

SACRAMENTO — California lawmakers are nearing a high-stakes decision that will decide the fate of a climate initiative that Gov. Jerry Brown holds up as a model to be replicated around the world to confront rising global temperatures.

The vote Monday on whether to give another

struggled to line up support from two-thirds of lawmakers that he will need.

The program expires in 2020 if lawmakers don't renew it. The Assembly needs 54 votes to pass the bill, but Democrats will have only 53 members present Monday due to one lawmaker's longstanding absence and a fresh vacancy from another who went to Congress. That

A.7.7. Final Review of Plan – Public Agenda

AGENDA
Nevada County
Local Hazard Mitigation Plan (LHMP) Update
Final Public Meeting
July 27, 2017

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Summary of Changes in Nevada County Planning Area Vulnerabilities/ Mitigation Priorities
5. Final HMPC Input: Data/Projects
6. Next Steps

A.7.8. Final Review of Plan – Public Sign in Sheets

SIGN-IN SHEET
Nevada County
LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #2
July 26, 2017

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Jeanine Foster, PM	Jeanine.foster@fostermillison.com	303 717-7171	Foster Miller/Ilson
MARTY MAIN	MARTYNMAIN@USA.NET	530-228-6388	HIGGINS FIRE # RIVER RANCH FD
John Gulsetian		530-265-1515	Nevada County OES

A.8 Meeting Handouts

Below are the handouts for each meeting. Handouts specific to the Risk Assessment Meeting can be found in Appendix C.

Nevada County Hazard Identification and Profiles – 2017

Nevada County Historic Hazard Occurrences

Table A-3 NCDC Severe Weather Events for Nevada County 1950–12/31/2016

Event Type	Number of Events	Deaths	Deaths (indirect	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Astronomical Low Tide	1	0	0	0	0	$0	$0
Avalanche	10	7	0	5	0	$0	$0
Blizzard	2	0	0	0	0	$30,000	$0
Cold/Wind Chill	3	0	0	0	0	$0	$2,400,000
Debris Flows	5	0	0	0	0	$62,000	$0
Dense Fog	8	0	2	0	0	$200,000	$0
Dense Smoke	2	0	0	0	0	$0	$0
Drought	33	0	0	0	0	$0	$0
Dust Devil	1	0	0	0	0	$0	$0
Flash Flood	1	0	0	0	0	$0	$0
Flood	22	2	0	1	0	$1,065,000	$0
Frost/Freeze	5	0	0	0	0	$0	$0
Hail	15	0	0	0	0	$0	$0
Heat	9	1	0	0	0	$0	$0
Heavy Rain	14	0	0	0	0	$0	$0
Heavy Snow	529	1	3	6	1	$575,000	$0
High Surf	1	0	0	0	0	$0	$0
High Wind	96	2	1	3	0	$11,744,000	$30,011,000
Landslide	1	0	0	0	0	$0	$0
Lightning	3	1	0	0	0	$15,000	$0
Strong Wind	18	1	0	0	0	$1,521,600	$0
Thunderstorm Wind	3	0	0	0	0	$0	$0
Tornado	1	0	0	0	0	$0	$0
Wildfire	24	2	0	35	12	$500,025,000	$0
Winter Storm	143	3	1	3	1	$115,000	$0
Winter Weather	43	3	1	0	0	$10,000	$0
Total	**993**	**23**	**8**	**53**	**14**	**$515,362,600**	**$32,411,000**

Source: NCDC

Table A-4 Nevada County Disaster Declaration History 1950-2015

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2017	Severe Winter Storms, Flooding, Mudslides	Storms	Storms	DR-4308	–	4/3/2017
2017	Severe Winter Storms, Flooding, and Mudslides	Storms	Storms	DR-4031	–	2/14/2017
2014	California Drought	Drought	Drought	GP 2014-13	1/17/2014	–
2009	Yuba Fire	Wildfire	Wildfire	FM 2825	–	8/15/2009
2008	2008 January Storms	Flood	Storms	GP 2008-01	1/5/2008	–
2006	2006 June Storms	Flood	Storms	DR-1646	–	6/5/2006
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	-	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	-	9/13/2005
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97-1/31/97	1/4/1997
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95-3/14/95	1/13/1995
1990	1990 Severe Storms	Flood	Storms	GP 989-06	2/22/1990	–
1988	Forty-Niner Fire	Fire	Fire	FM-2071	–	9/13/1998
1988	Forty-Niner Fire	Fire	Fire	DR 815	9/11-9/20/1988	9/13/1998
1987	1987 Wildland Fires	Fire	Fire	GP	9/3/1987, 6/10/1987	–
1986	1986 Storms	Flood	Storms	DR-758	2/18-86-3/12/86	2/18/1986
1983	Winter Storms	Flood	Flood	DR-677	12/8/82-3/21/83	2/9/1983
1976	1976 Drought	Drought	Drought	EM-3023	2/9/1976, 2/13/1976, 2/24/1976, 3/26/1976, 7/6/1976	–

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1972	1972 Freeze	Freeze	Freeze	–	4/17/1972, 5/22/1972, 5/31/1972	–
1964	1964 Late Winter Storms	Flood	Storms	DR-183	-	12/24/1964
1963	1963 Floods	Flood	Storms	DR 145	2/7/1963, 2/26/1963, 2/29/1963, 4/22/1963	2/25/1963
1961	1961 Widespread Fires	Fire	Fire	–	9/28/1961	–
1958	1958 April Storms and Floods	Flood	Storms	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	OCD 50-01	11/21/1950	–

Table A-5 Hazards Comparison List

2011 Nevada County Plan	2013 State of California Plan Applicable Hazards	Proposed 2017 Hazards
Agricultural Hazard	Agriculture Pests and Diseases	Ag Hazards: Severe Weather/Insect Pests
Airborne Hazards	Air Pollution	------
Avalanche	Avalanche	Avalanche
------	Climate Change & Related Hazards	Climate Change
Dam Failures	Dam Failure	Dam Failure
------	Droughts and Water Shortage	Drought and Water Shortage
Earthquake	Earthquake	Earthquake
Human Health Hazards	Epidemic/Pandemic/Vector Borne Disease Hazards	------
Floods	Flood	Flood: 100/500–year
------	Flood	Flood: Localized/Stormwater
Landslides	Landslide	Landslide and Debris Flows
---------	Levee Failure	Levee Failure
Mine Related Hazards	-------	(Include with Subsidence)
Pandemic Flu	Epidemic/Pandemic/Vector Borne Disease Hazards	-------
		Severe Extreme Heat
Severe Weather: (Wind, Lightning, Snow, Freezing, Heavy Rains)	Severe Weather and Storms	Severe Weather: Extreme Cold, Snow and Freeze (Inversion)
		Severe Weather: Heavy Rains and Storms (winds, hail, lightning)
Subsidence	------	Subsidence
Volcano	Volcano	Volcano
Urban Interface Wildland Fires	Wildfire	Wildfire (smoke)
Man-made Risk – Hazardous Materials	Hazardous Materials Release	---------
Man-Mad Risk – Arson and Commercial Fires	Wildfire	(Include with Wildfire to the extent part of wildland fires?)

Table A-6 Nevada County Hazard Identification Table

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Significant	Highly Likely	Critical	High	High
Avalanche	Limited	Highly likely	Negligible	Low	Low
Climate Change	Extensive	Likely	Critical	Medium	High
Dam Failure	Significant	Occasional	Catastrophic	High	Low
Drought and Water Shortage	Extensive	Likely/ Occasional	Critical	Medium	Low
Earthquake	Extensive	Unlikely	Critical	Medium	Low
Flood: 100/500–year	Extensive	Occasional/Unlikely	Critical	High	Medium
Flood: Localized/Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Hazardous Materials Transportation (interstates, railroads, pipelines)	Limited	Likely	Limited	Medium	Low
Landslide, Debris & Mud Flows	Significant	Likely	Critical	Medium	Low
Levee Failure	Limited	Unlikely	Limited	Low	Low
Severe Weather: Extreme Cold, Snow, and Freeze	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Significant	Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms (wind/tornado/hail, lightning)	Significant	Highly Likely	Critical	Medium	High
Subsidence	Significant	Likely	Negligible	Medium	Medium
Volcano	Significant	Unlikely	Limited	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Extensive	Highly Likely	Catastrophic	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

Nevada County
2017 Local Hazard Mitigation Plan Update
Participating Jurisdiction: Vulnerability & Capability Worksheets

Risk and Vulnerability Questions

Localized/Stormwater Flooding

1. Please describe the localized/stormwater flood issue specific to your jurisdiction in paragraph form. In addition, please complete a table similar to the below example detailing types and location of localized/stormwater flooding problems. If available, also attach a map of problem areas.

Text Description:

Table 7 Localized Flooding Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees

Earthquake Vulnerability

1. Number of unreinforced masonry buildings. If available, please provide an inventory of URM buildings specific to your jurisdiction. Include any tables and/or maps. Is this a layer available in GIS?

Special Populations

1. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.

Development Trends

1. Describe development trends and expected growth areas and how they relate to hazard areas and vulnerability concerns/issues. Please provide zoning maps and maps and tables detailing areas targeted for future development within your jurisdiction.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

The following planning and land management tools are typically used by local jurisdictions to implement hazard mitigation activities. Please indicate which of the following your jurisdiction has in place. If your jurisdiction does not have this capability or authority, please indicate in the comments column if a higher level of government has the authority.

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
General Plan		
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan		
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program		
Engineering Studies for Streams		
Community Wildfire Protection Plan		
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)		
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code		
Building Code Effectiveness Grading Schedule (BCEGS) Score		
Fire department ISO rating:		
Site plan review requirements		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts?** **Is the ordinance adequately administered and enforced?**
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		

Natural hazard specific ordinance (stormwater, steep slope, wildfire)
Flood insurance rate maps
Elevation Certificates
Acquisition of land for open space and public recreation uses
Erosion or sediment control program
Other
How can these capabilities be expanded and improved to reduce risk?

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, please indicate so in the comments column.

Administration	**Y/N**	**Describe capability Is coordination effective?**
Planning Commission		
Mitigation Planning Committee		
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)		
Mutual aid agreements		
Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official		
Floodplain Administrator		
Emergency Manager		
Community Planner		
Civil Engineer		
GIS Coordinator		
Other		
Technical	**Y/N**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)		

Hazard data and information
Grant writing
Hazus analysis
Other
How can these capabilities be expanded and improved to reduce risk?

Fiscal

Identify whether your jurisdiction has access to or is eligible to use the following financial resources for hazard mitigation

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Storm water utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs		
State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

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

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.		
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)		
Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		

National Flood Insurance Program (NFIP) Worksheet

Use this worksheet to collect information on your community's participation in and continued compliance with the NFIP, as well as identify areas for improvement that could be potential mitigation actions.

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	FM to complete
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	FM to complete
How many structures are exposed to flood risk within the community?	FM to complete
Describe any areas of flood risk with limited NFIP policy coverage	
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	
What are the barriers to running an effective NFIP program in the community, if any?	
Compliance History	
Is the community in good standing with the NFIP?	
Are there any outstanding compliance issues (i.e., current violations)?	
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	
Is a CAV or CAC scheduled or needed?	
Regulation	
When did the community enter the NFIP?	FM to complete
Are the FIRMs digital or paper?	FM to complete
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	
Provide an explanation of the permitting process.	
Community Rating System	
Does the community participate in CRS?	
What is the community's CRS Class Ranking?	
What categories and activities provide CRS points and how can the class be improved?	
Does the plan include CRS planning requirements?	

Prepared by:	Date	Email	Phone

HISTORIC HAZARD EVENTS WORKSHEET

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

	Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 5628 West Long Place Littleton, CO 80123 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

Appendix B References

2013 State of California Multi-Hazard Mitigation Plan

ArkStorm at Tahoe - Stakeholder Perspectives on Vulnerabilities and Preparedness for an Extreme Storm Event in the Greater Lake Tahoe, Reno and Carson City Region. 2014.

CAL FIRE GIS datasets

CAL FIRE Wildfire History Database

Cal-Adapt

California Adaptation Planning Guide

California Climate Adaptation Strategy

California Department of Finance, E-1 Report

California Department of Finance, E-4 Report

California Department of Finance, P-1 Report

California Department of Fish and Wildlife's Natural Diversity Database

California Department of Food and Agriculture

California Department of Water Resources Best Available Maps

California Department of Water Resources Division of Safety of Dams

California Division of Mines and Geology

California Native Plant Society

California Natural Diversity Database

California Office of Historic Preservation

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

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Climate Change and Health Profile Report – Madera County

Climate Change Impacts in the United States

County staff

Draft Environmental Impact Report for the California State Prison Madera County

Enhanced Fujita Scale. National Oceanic and Atmospheric Administration Storm Prediction Center.

Existing plans and studies

Federal Emergency Management Agency – Wind Zones in the United States

Federal Emergency Management Agency: Building Performance Assessment: Oklahoma and Kansas Tornadoes

Federal Emergency Management Agency: Multi-Hazard Identification and Risk Assessment.

FEMA Digital Flood Insurance Rate Map.

FEMA Disaster Declaration Database

FEMA Madera County Flood Insurance Study.

FEMA's HAZUS-MH 2.2 GIS-based inventory data

Galloway, Jr Dr. Gerald E. Levees in History: The Levee Challenge. Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.

Intergovernmental Panel on Climate Change

Johnstone, J. and Dawson, T. Climatic context and ecological implications of summer fog decline in the coast redwood region. Proceedings of the National Academy of Sciences, January 7, 2010.

Kenward, Alyson PhD, Adams-Smith, Dennis, and Raja, Urooj. Wildfires and Air Pollution – The Hidden Health Hazards of Climate Change. Climate Central. 2013.

Liu, J.C., Mickley, L.J., Sulprizio, M.P. et al. Climatic Change. 138: 655. doi:10.1007/s10584-016-1762-6. 2016.

Madera County Building Department

Madera County Community Wildfire Protection Plan

Madera County Emergency Operations Plan

Madera County General Plan

Madera County General Plan Environmental Impact Report

Madera County GIS data

Madera County Housing Element

Madera-Mariposa-Merced Fire Plan

National Aeronautics and Space Administration

National Climate Assessment

National Climatic Data Center Storm Events Database.

National Drought Mitigation Center

National Drought Mitigation Center – Drought Impact Reporter

National Flood Insurance Program

National Integrated Drought Information System

National Oceanic and Atmospheric Administration Storm Prediction Center

National Oceanic and Atmospheric Administration's National Climatic Data Center

National Park Service

National Park Service – Historic American Buildings Survey and Historic American Engineering Record

National Performance of Dams Program

National Weather Service Heat Index

North Sierra Precipitation Index

Personal interviews and discussions with planning team members and staff from the County and participating jurisdictions

Personal interviews with planning team members and staff from the County and participating jurisdictions

Public Health Alliance of Southern California

Public Policy Institute of California. If drought continues: Environment and poor rural communities most likely to suffer. [press release].

Sacramento Bee

State of California Department of Conservation Farmland Mapping and Monitoring Program

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United State Geologic Survey. Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

United States Geological Survey Open File Report 2015-3009

United States Geological Survey Publication 2014-3120

US Army Corps of Engineers

US Bureau of Reclamation

US Census Bureau 2010 Household Population Estimates

US Department of Agriculture Secretarial Disasters Declarations

US Department of Transportation Pipeline and Hazardous Materials Safety Administration

US Drought Monitor

US Fish and Wildlife Service

US Fish and Wildlife Service's National Wetlands Inventory maps

USA Today

USFS GIS datasets

Western Regional Climate Center

Written descriptions of inventory and risks provided by Madera County

Appendix C Mitigation Strategy

Nevada County
Local Hazard Mitigation Plan Update
Mitigation Strategy Meetings
April 25 & 26, 2017

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AGENDA

Nevada County
Local Hazard Mitigation Plan (LHMP) Update
Mitigation Strategy Meetings
April 25 & 26, 2017

HMPC Meeting #3:

1. Introductions
2. Status of the DMA Planning Process
3. Risk Assessment Update
4. Develop Updated Plan Goals and Objectives
5. Identify and Review Mitigation Alternatives/Projects

HMPC Meeting #4:

1. Introductions
2. Identify and Review Mitigation Alternatives/Projects
3. Review Mitigation Selection Criteria
4. Prioritize Mitigation Projects
5. Review of Schedule/Next Steps

Risk Assessment & Mitigation Strategy Meetings
Day 1

Hazard Identification & Profiles

Table 1 San Rafael Hazard Identification Table

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Ag Hazards: Severe Weather/Insect Pests	Significant	Highly Likely	Critical	High	High
Avalanche	Limited	Highly likely	Negligible	Low	Low
Climate Change	Extensive	Likely	Critical	Medium	High
Dam Failure	Significant	Occasional	Catastrophic	High	Low
Drought and Water Shortage	Extensive	Likely/ Occasional	Critical	Medium	Low
Earthquake	Extensive	Unlikely	Critical	Medium	Low
Flood: 100/500–year	Extensive	Occasional/Unlikely	Critical	High	Medium
Flood: Localized/Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Hazardous Materials Transportation	Limited	Likely	Limited	Medium	Low
Landslide, Debris & Mud Flows	Significant	Likely	Critical	Medium	Low
Levee Failure	Limited	Unlikely	Limited	Low	Low
Severe Weather: Extreme Cold, Snow, and Freeze	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Significant	Likely	Critical	Medium	Medium
Severe Weather: Heavy Rains and Storms	Significant	Highly Likely	Critical	Medium	High
Subsidence	Significant	Likely	Negligible	Medium	Medium
Volcano	Significant	Unlikely	Limited	Low	Low
Wildfire (smoke, tree mortality, conflagration)	Extensive	Highly Likely	Catastrophic	High	High

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

Probability 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 Impact:
Low: Climate change is not likely to increase the probability of this hazard.
Medium: Climate change is likely to increase the probability of this hazard.
High: Climate change is very likely to increase the probability of this hazard.

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

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

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

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

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Nevada County Planning Area

Agricultural Hazard

- Most agricultural disasters in Nevada County associated with severe weather events, including heavy rains, floods, heat, freeze, and drought; insects and noxious weeds also a concern
- Numerous USDA events from 2012-2014 all related to drought. We are getting additional USDA events back to 2009?
- HMPC – WHAT ARE THE BIGGEST AG ISSUES?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Avalanche

- Identified high hazard areas within Nevada County include portions of Donner Lake, Tahoe-Donner and the Soda Springs areas. A few moderate hazard areas are also found in the County. Most of the County is outside of an Avalanche hazard area.
- The NCDC database shows 10 avalanche events in Nevada County since 1993, including 7 fatalities and 5 injuries. 1 documented as occurring in Nevada County
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Low
- Non-Priority Hazard

Climate Change

- The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Non-Priority Hazard??

Dam failure

- According to data provided by Nevada County, Cal DWR, and Cal OES, there are 48 dams in Nevada County constructed for flood control, storage, electrical generation, and recreational purposes. Of the 48 dams, 6 are rated as High Hazard, 7 as Significant Hazard, 29 as Low Hazard, and 6 were not rated.
- High Hazard Dams include: Nevada County - Bowman, Jackson Meadows, Lake Fordyce, Lake Spaulding, Rollins, and Scotts Flat. Sierra County – Stampede Reservoir.
- Failure of any of the 7 High Hazard Dams of Concern to the County would flood downstream areas and could cause loss of life and property.

- 1 historic Dam failure in the County: In 1883 the "English Dam" on the Middle Fork of the Yuba River broke and unleashed 650 million cubic feet of water. A wave 60 feet high went downstream at 10 miles per hour. Eight or nine men are thought to have been killed.
- Likelihood of Future Occurrence: Occasional
- Vulnerability: High
- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Nevada County Planning Area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels are the highest they've been in 22 years!
- 2 disaster declarations (1976 and 2014) for Nevada County since 1950. There have been 33 NCDC drought events in Nevada County. All of these were for the 2014-2016 drought, but no damages, injuries, or losses were reported in the NCDC database.
- HMPC – CAN YOU PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED IN THE COUNTY RECENTLY DUE TO THE MOST RECENT DROUGHT.
- Likelihood of Future Occurrence: Likely
- Vulnerability: High
- Priority Hazard

Earthquake

- According to the U.S. Geological Service, Nevada County falls within all three "Maximum Expectable Earthquake Intensity" severity zones. The western half of the County is in the low intensity zone, the middle quarter is in the moderate zone and the eastern quarter is in the highest intensity zone.
- There have been no disaster declarations in the County. No major earthquakes have been recorded within the County; although the County has felt ground shaking from earthquakes with epicenters located elsewhere.
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: Medium
- Priority Hazard

Flood Hazards

100/500 year

- Historically, portions of Nevada County have always been at risk to flooding because of its annual percentage of rainfall, heavy snowfall in the winter, and the number of watercourses that traverse the County.
- Of the 18 state and 14 federal declarations from 1950-present– 11 state and 10 federal declarations were for severe winter weather, storms, heavy rains, or flooding. Flooding is an ongoing issue for the planning area.

- HMPC - REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- CAN THE HMPC PROVIDE DETAILS ON THESE AREAS? PICTURES/DESCRIPTIONS
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Landslides and Debris Flows

- There have been no disaster declarations associated with landslides in Nevada County. The NCDC contains no records of landslides in the County. Based on information reviewed to date, no notable landslide events have occurred in the County.
- WHAT AREAS ARE AT RISK TO LANDSLIDES? CAN THE COUNTY PROVIDE INFORMATION ON LANDSLIDE EVENTS?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: Low
- Non-Priority Hazard

Subsidence

- In Nevada County, the type of subsidence of greatest concern is the settling of the ground over abandoned mine workings. A substantial portion of the Grass Valley and Nevada City area is underlain by a deep, extensive labyrinth of abandoned mine tunnels. The Empire Mine tunnels alone extend some 365 miles beneath the City of Grass Valley.
- In addition to mines, the Planning Area is at risk to subsidence from karst. Distinctive surficial and subterranean features developed by solution of carbonate and other rocks and characterized by closed depressions, sinking streams, and cavern openings are commonly referred to as karst.
- ARE THERE SPECIFIC KNOWN AREAS PRONE TO SUBSIDENCE? CAN THE COUNTY PROVIDE INFORMATION ON PAST SUBSIDENCE EVENTS? WE HAVE DOCUMENTED EVENTS IN 1986, 1998, AND 2017.
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Levee Failure

- Searched FIS, National Levee Database, LFPZ, DWR BAM and found no levees in the County. Thus no past occurrences of levee failures.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Low

- Non-Priority Hazard

Severe weather

Extreme Cold, Snow and Freeze

- Annual occurrences of winter weather
- 725 severe winter weather and freeze events (NCDC) from 1993-2014
- A state disaster declaration for Nevada County in 1972 for freeze and severe weather conditions.
- HMPC TO REVIEW RISK ASSESSMENT TO PROVIDE DETAILS ON MAJOR COLD, FREEZE AND SNOW EVENTS IN THE COUNTY.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Extreme Heat

- Annual occurrences of hot weather
- 9 extreme heat events (NCDC) from since 1993
- No disaster declarations
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Low
- Priority Hazard?

Heavy rains and storms (Thunderstorms, Hail, Lightning, Wind, Tornados)

- Significant County history: annual occurrences
- The NCDC data recorded 150 hail, heavy rain, wind, and tornado incidents for Nevada County since 1950.
- There have been 11 state declarations and 10 federal declarations since 1950.
- HMPC TO REVIEW RISK ASSESSMENT TO PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS IN THE COUNTY.
- Severe storms/heavy rains are the primary cause of most major flooding
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Volcano

- Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Long Valley Caldera and Lassen Peak are the closest to Nevada County.
- During the past 1,000 years, there have been at least 12 volcanic eruptions in the Long Valley area. This activity is likely to continue long into the future. However, the probability of such an eruption occurring in any given year is less than 1 percent.
- Given the location of Nevada County relative to potentially active volcanoes, ashfall would be the likely concern. However, due to the location of the Planning Area relative to the active volcanoes, the State Plan does not consider Nevada County to be vulnerable to eruption and/or ash from these volcanoes.

- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Low
- Non-Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Nevada County Planning Area
- Numerous named fires causing a variety of damages.
- Any ignition has the potential to become an out of control wildfire.
- 3 state and federal disaster declarations for Wildfire since 1950 in the County
- The County's #1 Natural Hazard with potentially catastrophic outcomes
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Hazardous Materials Transport

- Most of the hazardous materials transported through Nevada County is carried by truck on the State Highway or by railway systems. Pipeline Systems also carry hazardous materials.
- Interstate 80 and State Routes 49, 20, 89 174,267 are areas of concern, as are the railroads and pipelines. NEED KINDER MORGAN PIPELINE DATA.
- The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety tracks transportation incidents: 27 rail and roadway incidents have occurred since 1970.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Nevada County Priority Hazards

- Agricultural Hazards
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Flood: 100/500–year
- Flood: Localized/Stormwater
- Hazardous Materials Transportation
- Landslide, Debris & Mud Flows
- Severe Weather: Extreme Heat
- Severe Weather: Extreme Cold, Snow, and Freeze
- Severe Weather: Heavy rains and Storms
- Subsidence
- Wildfire (Smoke, Tree Mortality, Conflagration)

Non-Priority Hazards:

- Avalanche
- Volcano

Mitigation Strategy: Goals

The most important element of the LHMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

1. Mitigation Goals
2. Mitigation Actions
3. Action (Implementation) Plan

Mitigation Goals

Up to now, the HMPC has been involved in collecting and providing data for the Modoc County Local Hazard Mitigation Plan Update. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of the Modoc County planning area to identified hazards and includes an assessment of the area's current capabilities for countering these threats through existing policies, regulations, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals will lead us to incorporating these improvements into the Mitigation Strategy portion of the plan. Our planning goals should provide direction for what loss reduction activities can be undertaken to make the planning area more disaster resistant.

Mitigation Goals are general guidelines that represent the community's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation cost, schedule, and means are not considered. Goals are public policy statements that:

- Represent basic desires of the jurisdiction;
- Encompass all aspects of planning area, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.

Goals statements will form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.

The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.

Finally, before we formulate our goals, we should discuss other planning area goals from other regional/county/city programs and priorities. This keeps us from "reinventing the wheel," as well as being consistent with Multi-Objective Management --- or "MOM" --- where communities strive for efficiency by combining projects/needs that are similar in nature or location. Utilizing "MOM" effectively can result in

identifying multiple sources of funding that can be "packaged" and broadening the supporting constituency base by including "outcomes" desired by various stakeholder groups.

Types/Sources of other area mitigation plans and programs include:

- Emergency Operations Plans
- General Plans
- Stormwater Program and Plans
- Flood/Watershed Management Plans and Studies
- Drought Plans
- Community Wildfire Protection Plans
- Dam Failure Plans
- Other?

Sample Goals from other Plans

Goals from the 2013 California State Hazard Mitigation Plan

1. Significantly reduce life loss and injuries
2. Minimize damage to structures and property, as well as minimizing interruption of essential services and activities
3. Protect the environment
4. Promote hazard mitigation as an integrated public policy and as a standard business practice

Goals from the Nevada County General Plan, 2013

Goal EP-10.1 Provide a coordinated approach to hazard and disaster response preparedness.

Goal GH-10.2 Minimize injury and property damage due to geologic and seismic hazards.

Goal FH-10.3 Reduce the potential for injury, property damage, and environmental damage from flooding.

Goal HM-10.5 Protect public health, safety, natural resources, and property through regulation of use, storage, transport, and disposal of hazardous materials.

Goal SF-10.6 Ensure adequate public safety services and facilities through development standards, development fees, and land use patterns.

Goal FP-10.7 Enhance fire safety and improve fire protection effectiveness through infrastructure and service improvements.

Goal FP-10.8 Reduce fire risk to life and property through land use planning, ordinances, and compliance programs.

Goal FP-10.9 Encourage fire safety education and support programs to promote participation, voluntary compliance, and community awareness of fire safety issues.

Goal FP-10.10 Involve all stakeholders in collaborating on countywide fire safety goals and plans to consistently and efficiently implement fire safety-related best management practices.

Goal FP-10.11 Reduce fire severity and intensity through fuels management.

Goal WH-10.13 Minimize injury and property damage due to severe weather hazards (rain, snow, lightning, and high winds).

Goals from the Nevada County Community Wildfire Protection Plan

The primary goal of the CWPP is to protect human life, private property, and essential infrastructure and natural resources through the implementation of fire prevention projects that work to increase public awareness, improve forest health, sustain local wildlife and preserve the natural beauty of the area.

Goals Development

You will each be given 3 sticky notes. On each note you will write what you think the goals for this mitigation planning effort should be. To get you started, provided below are possible goals for this mitigation plan. You may reword these or develop your own. These goal statements should serve as examples. It is vital that our Hazard Mitigation Planning Committee establish its own goals. Use one note for each goal. The purpose of the goal development is to reach a consensus on plan goals.

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 200/500-year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of technology

When done, we will:

- Pin/tape them to the wall/easel-chart and arrange them by category
- Combine and reword them into 3-4 goals for the plan.

Risk Assessment and Mitigation Strategy Meetings
Day 2

Mitigation Strategy: Actions

Mitigation actions are specific projects and activities that help achieve the goals and accomplish risk reduction in the community.

Categories of Mitigation Measures

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
  - ✓ Subdivision regulations
  - ✓ Building Codes
    - Fire-Wise Construction
  - ✓ Floodplain development regulations
  - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
  - ✓ NOAA Weather Radio
  - ✓ Sirens
  - ✓ "Reverse 911" (Emergency Notification System)
- Emergency Response
  - ✓ Evacuation & Sheltering
  - ✓ Communications
  - ✓ Emergency Planning
    - Activating the EOC (emergency management)
    - Closing streets or bridges (police or public works)
    - Shutting off power to threatened areas (utility company)
    - Holding/releasing children at school (school district)
    - Ordering an evacuation (mayor)
    - Opening emergency shelters (Red Cross)
    - Monitoring water levels (engineering)
    - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)

- ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
- ✓ Lifeline Utilities Protection

➢ Post-Disaster Mitigation

➢ Building Inspections
- ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

➢ Retrofitting/disaster proofing
- ✓ Floods
  - Wet/Dry floodproofing (barriers, shields, backflow valves)
  - Relocation/Elevation
  - Acquisition
  - Retrofitting
- ✓ High Winds/Tornadoes
  - Safe Rooms
  - Securing roofs and foundations with fasteners and tie-downs
  - Strengthening garage doors and other large openings
- ✓ Winter Storms
  - Immediate snow/ice removal from roofs, tree limbs
  - "Living" snow fences
- ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
  - Anchoring, bracing, shear walls
  - Dewatering sites, agricultural practices
  - Catch basins
- ✓ Drought
  - Improve water supply (transport/storage/conservation)
  - Remove moisture competitive plants (Tamarisk/Salt Cedar)
  - Water Restrictions/Water Saver Sprinklers/Appliances
  - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
  - Create incentives to consolidate/connect water services
  - Recycled wastewater on golf courses
- ✓ Wildfire, Grassfires
  - Replacing building components with fireproof materials
  - Roofing, screening
  - Create "Defensible Space"
  - Installing spark arrestors
  - Fuels Modification

- ✓ Noxious Weeds/Insects
  - Mowing
  - Spraying
  - Replacement planting
  - Stop overgrazing
  - Introduce natural predators
- Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the naturally beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices

Best management practices ("BMPs") are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project's design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

5. Avoidance: setting construction projects back from the stream.
6. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
7. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained

- Dumping Regulations
- Set-back regulations/buffers

- Fuels Management
- Water Use Restrictions
- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they "stop" flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Strategy: Action Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation actions and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Tem Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- Does measure address area with highest risk?
- Does measure protect …
  - ✓ The largest # of people exposed to risk?
  - ✓ The largest # of buildings?
  - ✓ The largest # of jobs?
  - ✓ The largest tax income?
  - ✓ The largest average annual loss potential?
  - ✓ The area impacted most frequently?

- ✓ Critical Infrastructure (access, power, water, gas, telecommunications)
- Timing of Available funding
- Visibility of Project
- Community Credibility

Mitigation Action Prioritization Instructions

Our Team recommendations are listed on flip-chart paper around the room.

You each have 3 sets of colored dots:

- 3 red dots
- 3 blue dots
- 3 green dots

The red dots are for high priority (5 points each)

The blue dots are for medium priority (3 points each)

The green dots are for low priority (1 point each)

Place your dots on the recommendations, using the different colors to indicate your priority. You may use as many of your dots, of any color, on any recommendation --- or you may spread them out using as few of your dots as you wish. The dots will indicate the consensus of the team.

Use your list of criteria to help you make your determinations.

After the totals are counted, we will discuss them further to confirm or change any of the results as we see fit.

Mitigation Action Worksheet

Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background:	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Cost Estimate:	
Benefits (Losses Avoided):	
Potential Funding:	
Timeline:	
Project Priority:	

Worksheet completed by:	
Name and Title:	
Phone:	

Nevada County
Local Hazard Mitigation Plan Update
Mitigation Strategy Meeting: Mitigation Actions v/1
April 25th and 26th, 2017

Initial Goals

- **Goal 1: Minimize risk and vulnerability of Nevada County to natural hazards and protect lives and prevent losses to property, public heath, economy, and the environment.**
  - ✓ Objective 1.1: Provide protection for existing and future development.
  - ✓ Objective 1.2: Provide protection for critical facilities, utilities, and services.
  - ✓ Objective 1.3: Provide protection for natural resources and the environment.

- **Goal 2: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote participation and voluntary compliance to reduce hazard-related losses.**
  - ✓ Objective 2.1: Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.
  - ✓ Objective 2.2: Emphasize preparedness and self-responsibility to residents.

- **Goal 3: Improve communities' capabilities to prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event.**
  - ✓ Objective 3.1: Continued improvements to emergency services and management capabilities.
  - ✓ Objective 3.2: Develop/improve warning, evacuation, and sheltering procedures and information for residents and businesses.
  - ✓ Objective 3.3: Continue to coordinate jurisdictional responsibilities for various hazards through County and community disaster/emergency response plans and exercises.
  - ✓ Objective 3.4: Improve interagency communications; Ensure functionality and redundancy of communications, information technology, and other critical systems.
  - ✓ Objective 3.5: Promote/maintain coordination, interoperability, and use of shared resources among agencies operating in Nevada County.
  - ✓ Objective 3.6: Increase use of technologies.
  - ✓ Objective 3.7: Improvements to safety-related infrastructure, services, and effectiveness – numbers, locations, levels, and responses.
  - ✓ Objective 3.8: Increase response capabilities for hazardous materials incidents.

- **Goal 4: Reduce fire severity and intensity in Nevada County**
  - ✓ Objective 4.1: Reduce the wildfire risk and vulnerability in Nevada County
  - ✓ Objective 4.2: Reduce life safety issues, property loss, and damages associated with wilfires.
  - ✓ Objective 4.3: Develop a fuels management implementation strategy focusing on fuels reduction, education, and assistance
  - ✓ Objective 4.4: Promote implementation of fuels management activities by all landowners on both public and private lands.
  - ✓ Objective 4.5: Promote Tree Mortality mitigation activities

- ✓ Objective 4.6: Continued enhancement and implementation of wildfire awareness, education, and outreach program(s).

- **Goa1 5: Improve community resiliency to flooding in Nevada County**
  - ✓ Objective 5.1: Reduce the flood risk and vulnerability in Nevada County
  - ✓ Objective 5.2: Reduce life safety issues, property loss, and damages associated with flooding.
  - ✓ Objective 5.3: Review appropriate flood protection infrastructure improvements and implement where feasible and economically viable.
  - ✓ Objective 5.4: Promote public awareness and education concerning the risks associated with creek, stream and river flooding.

- **Goal 6: Maintain FEMA eligibility for grant funding**
  - ✓ Objective 6.1: Assure conformance to federal and state hazard mitigation initiatives and maximize potential for mitigation implementation.
  - ✓ Objective 6.2: Monitor and communicate available grant programs, timelines, and processes to all communities.
  - ✓ Objective 6.3: Implement and complete identified high priority projects listed in the plan.
  - ✓ Objective 6.4: Consider environment as part of mitigation strategy implementation.

Initial Mitigation Action Ratings and Prioritization

Responsible Department/ Staff	Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
All	Public awareness, education, outreach, and preparedness program enhancements: Improve/Enhance public education, engagement, and preparedness, response, and recovery program for all hazards (simplify, multi-media, educate and clarify various emergency systems, messaging and training; promote self-responsibility)	Multi-hazard	20
Fire Safe Council	Leveraging Firewise community outreach efforts for multi-hazards	Multi-hazard	3
Planning	Incorporate LHMP Update by reference through board adoption into the safety element of the General Plan Update	Multi-hazard	N/A*
IT/OES	Conduct Countywide evaluation of technology improvements for disaster preparedness, prevention, mitigation, response, and recovery	Emergency Services/Multi-hazard	N/A*
	Add additional repeater sites in strategic areas	Emergency Services/Multi-hazard	6
	Road improvements to address access issues with Hwy. 49 and other areas due to washouts and other issues	Emergency Services/Multi-hazard	4
	Ingress/Egress Projects	Emergency Services/Multi-hazard	50

Responsible Department/ Staff	Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
	Bridge replacements for emergency access	Emergency Services/Multi-hazard	13
	Countywide, multi-agency exercises, training	Emergency Services/Multi-hazard	15
	Fire safety classes	Emergency Services/Multi-hazard	0
	Conduct evacuation and shelter planning for all communities and populations (to include all critical hazards, at risk populations, medical, ADA, animals, and an outreach component)	Emergency Services/Multi-hazard	23
	Recovery planning	Emergency Services/Multi-hazard	0
	S. Yuba Canyon: warning system	Emergency Services/Multi-hazard	1
	Establish redundancy with critical facilities	Emergency Services/Multi-hazard	5
	IPAWS: Countywide	Emergency Services/Multi-hazard	7
	Radio repeater for Yuba Canyon area	Emergency Services/Multi-hazard	4
IT/OES	Update and maintain critical facility GIS layer	Emergency Services/Multi-hazard	3
	Community radio systems	Emergency Services/Multi-hazard	1
	Develop a more robust inter-operable communications systems	Emergency Services/Multi-hazard	19
OES	Update Emergency Operations Plan	Emergency Services/Multi-hazard	N/A*
	Honey Bees?	Agriculture	6
	Tree Mortality: Build biomass plant	Agriculture/ Wildfire	2
	Tree Mortality: Chipping/Grinding Program	Agriculture/ Wildfire	13

Responsible Department/ Staff	Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
	Invasive species management: removal/control	Agriculture/ Wildfire	2
	Lost Lake Superfund cleanup	Dam Failure	1
	Bureau of Reclamation Dams: projects on Stampede, Boca, others	Dam Failure	1
NID	Scotts Flat spillway evaluation and improvements	Dam Failure	4
USACE	Martis Dam evaluation and improvements	Dam Failure	15
NID	New Centennial Dam on Bear River	Dam Failure	5
	All Dams: Spillway evaluation	Dam Failure	5
	Continue Conservation Measures	Drought & Water Supply	6
Cities	Conduct URM inventories and identify retrofit projects	Earthquake	11
	Critical facility retrofits	Earthquake	0
	Develop Climate Adaptation Plan and implement resulting climate adaptation strategies	Climate Change	N/A*
Tahoe Donner	Cold Stream/Donner Creek bridge intersection	Flood	4
	Surface water and high turbidity solution: study/implementation (prevent interruption of services)	Flood	6
NID	Flood projects	Flood	0
	Tahoe Donner Area drainage improvements	Flood	3
	Glenshire/Devonshire drainage improvements	Flood	3
Truckee	Various Town wide drainage improvements	Flood	8
	Donner Pass – old 40, just west of town limits, culvert projects	Flood	3
	Stream bank erosion and restoration projects	Flood	4
	Bridgeport covered bridge improvements	Flood	0
County	Maybert Road improvements	Flood	15
	Trout Creek restoration: 5 reaches, widen and deepen creek (CLOMR); relocate utilities	Flood	17
	Wastewater plants improvement projects (to manage heavy flows, eliminate infiltration)	Flood	23
	Implement Sewer Master Plans	Flood	1
	Backup power for critical infrastructure (lift stations, water treatment plants, other wastewater)	Flood	15
NCWA	Assess current water infrastructure to capture raw water (long term solution)	Flood	19
	Implement local stormwater projects	Flood	11
	Structure elevation	Flood	0
	Flood proofing	Flood	1

Responsible Department/ Staff	Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
	Conveyance improvement projects (creek, ravine, storm drain: studies, projects)	Flood	9
Grass Valley	Improve (relocate) sewer pipes in creeks at problem areas	Flood	0
Nevada City	Improve (relocate) sewer pipes in creeks at problem areas	Flood	0
		Propane tank retrofits (at tank)	Freeze, Cold and Snow
	Natural gas retrofits (at house)	Freeze, Cold and Snow	0
	Public outreach/preparedness	Freeze, Cold and Snow/ Multi-hazard	17
	Develop Cold Weather Annex to EOP	Freeze, Cold and Snow/ Emergency Services	0
	Identify solutions to I-80 Gridlock	Freeze, Cold and Snow	22
	Establish warming shelters/MOUs	Freeze, Cold and Snow/ Emergency Services	2
	Undergrounding of utilities	Heavy Rains and Storms	0
	Pole replacement	Heavy Rains and Storms	3
	Tree maintenance projects	Heavy Rains and Storms	12
	Continue mutual aid agreements	Hazardous Materials Transportation/ Emergency Services	9
	Establish Haz Mat Task Force to identify/fulfill needs (equipment, trailers, training, exercises, etc.)	Hazardous Materials Transportation	37
	Identify and fix problem areas	Landslides, Mudflows, Debris Flows	3
	Inventory potential subsidence areas, develop better mapping, and create awareness	Subsidence	7
	Tree Mortality/Bark Beetle Mitigation & Management	Agriculture Drought & Water Supply/ Wildfire	57
	Fuel break projects	Wildfire	16

Responsible Department/ Staff	Mitigation Action Title	Hazards Addressed	Points/ Worksheet Status
	Fuel modification projects	Wildfire	13
	Promote additional Firewise Communities: 20 in place, 18 more in process	Wildfire	39
	CWPP project implementation	Wildfire	11
	Promote wildfire public information & engagement	Wildfire	37
	Infrastructure and water source establishment projects	Wildfire	1
	Defensible space projects	Wildfire	8
	Roadside vegetation management – multi-owner	Wildfire	27
	Lookout tower infrastructure improvements and staffing	Wildfire	15
	Maintain and Improve air attack base at airport	Wildfire	39
	Sprinkler retrofit projects	Wildfire	0
	Pipe replacement for fire suppression	Wildfire	5
	Western Nevada County Community Defense Project – Deer Creek	Wildfire	5
	Increase fire-fighting staff	Wildfire	23
	Tahoe Truckee Airport fuel break projects	Wildfire	5
	Tahoe Donner fuel break projects	Wildfire	5
	Empire State Park wildfire projects	Wildfire	6
	Reforestation projects	Wildfire	0
NID	Infrastructure improvement projects (delivery systems, intertie projects, fuels reduction projects	Wildfire	5
	Fuel Break – Town of Washington/S Yuba Canyon	Wildfire	10

Appendix D Adoption Resolution

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by the participating jurisdictions and added to this appendix. Two model resolutions are provided below. The first resolution should be used by the County and all incorporated communities as it also includes language to adopt the 2017 LHMP Update into the Safety Element of the General Plan. The second resolution should be used by all participating Districts to this LHMP Update.

Sample Resolution for Nevada County and Incorporated Communities

Resolution # _____

Adopting the Nevada County Local Hazard Mitigation Plan

Whereas, (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, (Name of Government/District/Organization) fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Nevada County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Nevada County Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the (Name of Government/District/Organization), demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Nevada County Local Hazard Mitigation Plan as an official plan; and

Be it resolved, that the (Name of Government/District/Organization) adopts the Nevada County Local Hazard Mitigation Plan by reference into the safety element of their general plan in accordance with the requirements of AB 2140, and

Be it further resolved, (Name of Government/District/Organization) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirements of AB 2140.

Passed:_____
(date)

_____
Certifying Official

Sample Resolution for Participating Districts

Resolution # _____

Adopting the Nevada County Local Hazard Mitigation Plan

Whereas, (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, (Name of Government/District/Organization) fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Nevada County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Nevada County Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the (Name of Government/District/Organization), demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Nevada County Local Hazard Mitigation Plan as an official plan; and

Be it further resolved, (Name of Government/District/Organization) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

Passed:_____
(date)

_____
Certifying Official

Appendix E Wildfire History

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1908			169.7	Unknown / Unidentified	Nevada County
1909			513.8	Unknown / Unidentified	Nevada County
1910			4411.6	Unknown / Unidentified	Nevada County
1910			943.6	Unknown / Unidentified	Nevada County
1910			187.2	Unknown / Unidentified	Nevada County
1910			2852.0	Unknown / Unidentified	Nevada County
1910			946.6	Unknown / Unidentified	Nevada County
1911			425.8	Unknown / Unidentified	Nevada County
1911			379.8	Unknown / Unidentified	Nevada County
1911			249.8	Unknown / Unidentified	Nevada County
1911			380.8	Unknown / Unidentified	Nevada County
1913			145.1	Unknown / Unidentified	Nevada County
1914			109.8	Unknown / Unidentified	Nevada County
1915			604.8	Unknown / Unidentified	Nevada County
1915			191.7	Lightning	Nevada County
1916			171.5	Unknown / Unidentified	Nevada County
1916			1506.7	Unknown / Unidentified	Nevada County
1916			3923.4	Unknown / Unidentified	Nevada County
1917			407.1	Unknown / Unidentified	Nevada County
1917			142.5	Unknown / Unidentified	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1917			184.8	Unknown / Unidentified	Nevada County
1917			300.3	Unknown / Unidentified	Nevada County
1917			2036.4	Unknown / Unidentified	Nevada County
1917			6269.0	Unknown / Unidentified	Nevada County
1917			188.1	Unknown / Unidentified	Nevada County
1917			304.7	Unknown / Unidentified	Nevada County
1918			104.2	Unknown / Unidentified	Nevada County
1918			496.2	Unknown / Unidentified	Nevada County
1918			303.4	Unknown / Unidentified	Nevada County
1918			178.1	Miscellaneous	Truckee
1918			316.8	Unknown / Unidentified	Nevada County
1918			409.8	Unknown / Unidentified	Nevada County
1918			561.7	Unknown / Unidentified	Nevada County
1918			360.6	Unknown / Unidentified	Nevada County
1918			879.6	Unknown / Unidentified	Nevada County
1918			562.2	Unknown / Unidentified	Nevada County
1918			394.3	Unknown / Unidentified	Nevada County
1919			460.5	Unknown / Unidentified	Nevada County
1919			257.7	Unknown / Unidentified	Nevada County
1919			130.7	Unknown / Unidentified	Nevada County
1919			1113.3	Unknown / Unidentified	Nevada County
1919			131.3	Unknown / Unidentified	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1919			177.6	Unknown / Unidentified	Nevada County
1920			308.7	Unknown / Unidentified	Nevada County
1921			292.9	Unknown / Unidentified	Nevada County
1923			445.1	Unknown / Unidentified	Nevada County
1924			248.1	Unknown / Unidentified	Nevada County
1924			1770.0	Unknown / Unidentified	Nevada County
1924			14670.6	Miscellaneous	Nevada County
1924			1582.0	Unknown / Unidentified	Nevada County
1924			207.0	Unknown / Unidentified	Nevada County
1924			245.5	Unknown / Unidentified	Nevada County
1924			1759.2	Unknown / Unidentified	Nevada County
1924			135.6	Unknown / Unidentified	Nevada County
1924			1401.4	Unknown / Unidentified	Nevada County
1924			181.1	Unknown / Unidentified	Nevada County
1924			16266.5	Miscellaneous	Nevada County
1926			5243.8	Unknown / Unidentified	Nevada County
1926			283.7	Unknown / Unidentified	Nevada County
1926			2996.6	Unknown / Unidentified	Nevada County
1926			239.3	Unknown / Unidentified	Nevada County
1926			376.1	Unknown / Unidentified	Nevada County
1926			963.6	Miscellaneous	Nevada County and Truckee
1926			3953.4	Unknown / Unidentified	Nevada County
1926			453.4	Unknown / Unidentified	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1926			428.5	Miscellaneous	Nevada County and Truckee
1926			5245.4	Unknown / Unidentified	Nevada County
1926			40.6	Unknown / Unidentified	Nevada County
1928			97.5	Unknown / Unidentified	Nevada County
1928			97.4	Unknown / Unidentified	Nevada County
1928			259.5	Unknown / Unidentified	Nevada County
1928			1412.1	Unknown / Unidentified	Nevada County
1929			3212.9	Unknown / Unidentified	Nevada County
1930			989.2	Unknown / Unidentified	Nevada County
1931			1884.4	Unknown / Unidentified	Nevada County
1931			79.4	Unknown / Unidentified	Nevada County
1931			172.2	Unknown / Unidentified	Nevada County
1932			141.5	Lightning	Nevada County
1934			194.3	Unknown / Unidentified	Nevada County
1934			105.9	Unknown / Unidentified	Nevada County
1935			187.5	Miscellaneous	Nevada County
1935			267.3	Miscellaneous	Nevada County
1935			85.2	Miscellaneous	Nevada County and Truckee
1936			152.2	Miscellaneous	Nevada County
1936			1970.0	Miscellaneous	Nevada County
1939			628.3	Unknown / Unidentified	Nevada County
1939			135.7	Unknown / Unidentified	Nevada County
1941			13.8	Miscellaneous	Nevada County
1943			287.6	Miscellaneous	Nevada County
1943			323.3	Unknown / Unidentified	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1943			369.3	Miscellaneous	Truckee
1944			60.8	Miscellaneous	Nevada County
1944			60.8	Miscellaneous	Nevada County
1946			9.0	Miscellaneous	Nevada County
1946			13.1	Miscellaneous	Nevada County
1947			1313.5	Miscellaneous	Nevada County
1947			4512.9	Smoking	Nevada County
1947			9005.1	Miscellaneous	Nevada County and Truckee
1948			50.6	Miscellaneous	Nevada County
1949	Cox-Delaney		214.7	Smoking	Nevada County
1949	Nigger Jack		67.5	Lightning	Nevada County
1950	Bobo		264.4	Unknown / Unidentified	Nevada County
1950	Camp Beale		669.5	Unknown / Unidentified	Nevada County
1950	Hampshire Rock		201.4	Miscellaneous	Nevada County
1950	Euer		29.7	Smoking	Nevada County
1950	Union Mill		89.7	Railroad	Truckee
1951	Rattlesnake		585.5	Unknown / Unidentified	Nevada County
1951	Camp Beale #1		585.3	Unknown / Unidentified	Nevada County
1951			6.2	Miscellaneous	Nevada County
1952	Deniz		297.9	Unknown / Unidentified	Nevada County
1953	Camp Beale #5		881.0	Unknown / Unidentified	Nevada County
1953	Sunshine Valley		336.2	Unknown / Unidentified	Nevada County
1953			797.4	Lightning	Nevada County
1955			60.6	Miscellaneous	Nevada County and Truckee
1955	Snow Tent		1486.2	Miscellaneous	Nevada County
1957	Nielson		332.8	Unknown / Unidentified	Nevada County
1959			4277.5	Miscellaneous	Nevada County
1959			37.7	Miscellaneous	Nevada County
1959			34.5	Miscellaneous	Nevada County
1960			4502.2	Lightning	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1960	MILL CREEK		41.6	Debris	Nevada County
1960			82.8	Lightning	Nevada County
1960	Donner Ridge		43374.0	Debris	Nevada County and Truckee
1960	Newnan Lightning #9		739.3	Unknown / Unidentified	Nevada County
1960			17.2	Lightning	Nevada County
1960			18.4	Miscellaneous	Nevada County
1960			15.6	Lightning	Nevada County
1960	North San Juan		5839.6	Miscellaneous	Nevada County
1960			8.8	Lightning	Nevada County
1960			8.8	Lightning	Nevada County
1960			1311.9	Lightning	Sierra County
1961	Mays		711.0	Unknown / Unidentified	Nevada County
1961	Selby #2		863.7	Unknown / Unidentified	Nevada County
1961	Bilderback		925.6	Unknown / Unidentified	Nevada County
1967			35.5	Miscellaneous	Nevada County
1968	Sagehen		151.8	Smoking	Nevada County
1973			492.6	Unknown / Unidentified	Nevada County
1976	Steep		59.2	Campfire	Nevada County
1976	Keystone		896.7	Unknown / Unidentified	Nevada County
1976	Oaktree		885.0	Unknown / Unidentified	Nevada County
1977	Meadow		12.1	Lightning	Nevada County
1977	Freeway		1305.3	Miscellaneous	Nevada County and Truckee
1978	Polaris		386.6	Arson	Truckee
1979	Flash		30.1	Arson	Truckee
1980	Dog Bar		347.1	Unknown / Unidentified	Nevada County
1980	R.S.#31		281.4	Unknown / Unidentified	Nevada County
1980	Roadside 82		23.9	Arson	Nevada County
1985	Dog Bar		186.9	Smoking	Nevada County
1986	Relief		53.2	Lightning	Nevada County
1987	Palmer		1971.5	Lightning	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
1988	Relief		34.0	Debris	Nevada County
1988	49'er		36343.1	Debris	Nevada County
1989	Chalk		25.9	Miscellaneous	Nevada County
1990	Eagle		13.0	Lightning	Nevada County
1990			328.0	Railroad	Nevada County
1992			18.7	Miscellaneous	Nevada County
1992			18.5	Miscellaneous	Nevada County
1994	Hirschdale		1068.9	Equipment Use	Nevada County
1994	Wall		40.1	Campfire	Nevada County
1994	Trauner		536.2	Powerline	Nevada County
1994	Bridgeport		301.3	Unknown / Unidentified	Nevada County
1996	Gold		41.8	Lightning	Nevada County
1996	Martin Ranch #1		40.7	Debris	Nevada County
1996	Shields Camp		51.0	Debris	Nevada County
1996	Columbia Hill		1517.4	Debris	Nevada County
1997	Maybert		470.7	Debris	Nevada County
1999	Floriston		283.3	Arson	Nevada County
2001	Gap		2447.4	Campfire	Nevada County
2001	Martis		14126.8	Campfire	Nevada County
2001	Floriston		142.3	Miscellaneous	Nevada County
2002	Granite Ii		355.8	Debris	Nevada County
2002	Black		215.9	Arson	Nevada County
2002	Halcon		20.1	Equipment Use	Nevada County
2003	Garden		60.7	Lightning	Nevada County
2003	Donner		85.2	Arson	Nevada County
2003	Mccloud		12.0	Arson	Nevada County
2004	Lowell		17.0	Debris	Nevada County
2004	Ananda		34.5	Unknown / Unidentified	Nevada County
2004	Floriston		35.4	Unknown / Unidentified	Nevada County
2005	Ziebright		7.7	Debris	Nevada County
2005	Garden		110.1	Vehicle	Nevada County
2006	Boca Reservoir		33.7	Miscellaneous	Nevada County
2006	Rollins		42.6	Playing with fire	Nevada County
2006	Purdon		7.2	Unknown / Unidentified	Nevada County

Year	Fire Name	Comments	Acres Burned	Cause	Jurisdiction
2007	Eighty		78.0	Equipment Use	Nevada County and Truckee
2007	Peterson		14.5	Arson	Nevada County
2007	Mooney		49.4	Unknown / Unidentified	Nevada County
2007	Garden		146.0	Equipment Use	Nevada County
2007	Spenceville		31.4	Unknown / Unidentified	Nevada County
2007	Lindsey		23.7	Campfire	Nevada County
2008	Del		14.4	Powerline	Nevada County
2008	Fall	Yuba River Complex	2416.8	Lightning	Nevada County
2008	Scotchman	Yuba River Complex	1165.4	Lightning	Nevada County
2009	Magnolia		21.3	Powerline	Nevada County
2009	Yuba	Cal Fire ICT 10	3828.6	Powerline	Nevada County
2011	Chalk Fire	SPI prescribed fire escape	16.6	Escaped Prescribed Burn	Nevada County
2013	Mcdaniel		9.2	Smoking	Nevada County
2013	Tyler		47.9	Unknown / Unidentified	Nevada County
2014	Hirschdale		81.9	Miscellaneous	Nevada County
2014	Dogbar	2 Res Destroyed 3 Outbuildings Destroyed	248.1	Unknown / Unidentified	Nevada County
2014	Perimerter		9.6	Debris	Nevada County
2014	Hutto	3 Outbuildings Destroyed	48.7	Unknown / Unidentified	Nevada County
2015	Lowell		2315.7	Unknown	Nevada County

Source: CAL FIRE, Nevada County GIS

Appendix F Critical Facilities Inventory

Table F-1 Nevada County Critical Facilities and Flood, Fire, Landslide, and Haz-Mat

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	At Risk Populations	Government Building	Crown Point Facility	500 Crown Point Circle, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	No
Grass Valley	At Risk Populations	School	Silver Springs High School	12338 Mc Courtney Road, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Park Avenue Alternative Education Center	140 Park Avenue, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Sierra Academy Of Expeditionary Learning	340 Buena Vista, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Mount Saint Marys Academy	400 S Church Street, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Grass Valley Charter School	225 South Auburn Street, Grass Valley	Zone X (Shaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Bell Hill Academy	342 South School Street, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Charis Youth Center	714 West Main Street, Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	At Risk Populations	School	Lyman Gilmore Middle School	10837 Rough and Ready Highway, Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	Yes
Grass Valley	At Risk Populations	School	Margaret G. Scotten Elementary School	10821 Squirrel Creek Road, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	At Risk Populations	School	Bitney College Preparatory High School	135 Joerschke Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	At Risk Populations	School	Sierra College	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	At Risk Populations	School	William & Marian Ghidotti High School	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	At Risk Populations	School	Nevada Union Technical High School	11761 Ridge Road, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	At Risk Populations	School	Nevada Union High School	11761 Ridge Road, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	At Risk Populations	School	North Point Academy	11761 Ridge Road, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Airport	Grass Valley Service Center Heliport		Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Airport	Nevada County Air Park		Zone X (Unshaded)	Very High	Low	No	No	No
Grass Valley	Essential Services	Airport	Shaws Hill Heliport		Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Bridge	South Grass Valley Oc	S. Auburn Street	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Route 20/49 Separation	Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Wolf Creek	State Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Brighton Street Oc	Brighton St	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Mill Street Uc	Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Wolf Creek	State Route 174	Zone X (Shaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Route 20/174 Separation	State Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Bank Street Uc	State Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Grass Valley	Essential Services	Bridge	Bennett Street Uc	State Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Wolf Creek	Bennett St	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Wolf Creek	State Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Idaho-Maryland Road Uc	Idaho-Maryland-E20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Bridge	Idaho-Maryland Road Uc	State Route 20	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge		Squirrel Creek Rd	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Bridge	Wolf Creek	Rail Road Avenue	Zone Ae	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Wolf Creek	Idaho Maryland Rd	Zone Ae	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge	Dorsey Drive Oc	Dorsey Dr	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Bridge	Brunswick Road Oc	Brunswick Road	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Bridge			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Fire	Ncc Station 91	11329 Mccourtney Rd	Zone X (Unshaded)	Very High	Low	Yes	No	No
Grass Valley	Essential Services	Fire	Grass Valley City Station 1	472 Brighton St	Zone X (Unshaded)	Very High	Low	Yes	No	No
Grass Valley	Essential Services	Fire	Ncc Station 87	13103 Ridge Rd	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Fire	Grass Valley City Station 2	213 Sierra College Dr	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Grass Valley Veterans Building	255 S. Auburn St., Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	Grass Valley Library	207 Mill Street, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	Love Building	660 Minnie Street , Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Government Building	Dot Shop	12548 Loma Rica Drive, Grass Valley	Zone X (Unshaded)	High	Low	No	No	No
Grass Valley	Essential Services	Government Building	Grass Valley School District	10840 Gilmore Way, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Government Building	Airport Hangar	13308 Nevada City Ave, Grass Valley	Zone X (Unshaded)	High	Low	No	No	No
Grass Valley	Essential Services	Government Building	Laura Wilcox Memorial	208 Sutton Way, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	H.S.A. W.I.C.	471 Sutton Way, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	Nevada Co Horsemens Club	10600 Bubbling Wells Road, Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	H.S.A. Calworks	715 Maltman Way, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	Sierra College Building N10	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N12	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N11	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N21	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N13	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Government Building	Sierra College Building N7	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N8	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N9	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N15	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N14	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N6	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N1	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N2	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N19	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Government Building	Sierra College Building N4	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Government Building	Sierra College Building N5	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N3	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Government Building	Sierra College Building N17	250 Sierra College Drive, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Hospital	Crystal Ridge Care Center	396 Dorsey Dr, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Hospital	Sierra Nevada Memorial Hospital	155 Glasson Way, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Hospital	Golden Empire Nursing And Rehab Center	121 Dorsey Dr, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Hospital	Grass Valley Convalescent Hospital	107 Catherine Ln, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Hospital	Spring Hill Manor Rehab And Convalescent Hospital	355 Joerschke Dr, Grass Valley	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Shelter	COURT HOUSE ATHLETIC CLUB Γçôvendor AGREEMENT	722 Freeman Lane, Grass Valley, CA 95945	Zone X (Unshaded)	Very High	Low	Yes	No	No
Grass Valley	Essential Services	Shelter	Nevada County Fairgrounds	11228 McCourtney Rd., Grass Valley, CA 95945	Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Grass Valley	Essential Services	Shelter	Grass Valley Veterans Memorial Building	255 So. Auburn St., Grass Valley, CA 95945	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Shelter	Grass Valley United Methodist Church	236 Church Street, Grass Valley, CA 95945	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Grass Valley	Essential Services	Shelter	Lyman Gilmore School	10837 Rough & Ready Hwy., Grass Valley, CA 95945	Zone X (Unshaded)	Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Shelter	Peace Lutheran Church	828 W. Main St, Grass Valley, CA 95945	Zone X (Unshaded)	Very High	Low	Yes	No	Yes
Grass Valley	Essential Services	Shelter	Nevada Union High School	11761 Ridge Rd., Grass Valley, CA 95945	Zone X (Unshaded)	Very High	Low	No	No	Yes
Grass Valley	Essential Services	Shelter	First Baptist Church	1866 Ridge Road, Grass Valley, CA 95945	Zone X (Unshaded)	Very High	Low	No	No	Yes
Nevada City	At Risk Populations	Government Building	Progress House	145 Bost Ave, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	Government Building	Carl F. Bryant Ii J.H.	15434 Highway 49, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	Government Building	Wayne Brown Correctional Facility	925 Maidu Ave., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	Government Building	Odyssey House	995 Helling Way, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Echo Ridge Seventh Day Adventist	15504 Liberty Circle, Nevada City	Zone X (Unshaded)	Very High	Low	No	No	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada City	At Risk Populations	School	Twin Ridges Home Study Charter	111 New Mohawk Road, North San Juan	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Sierra Christian School	175 Ridge Road, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Deer Creek Elementary School	805 Lindley Avenue, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Terence K. Mcateer Family Resource Center	400 Hoover Lane, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Earle Jamieson Educational Options	112 Nevada City Highway, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Seven Hills Intermediate School	700 Hoover Lane, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Nevada City Home Study Charter School	750 Hoover Lane, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Forest Charter School	470 Searls Avenue, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Yuba River Charter School	505 Main Street, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	At Risk Populations	School	Sugarloaf Mountain Juvenile Hall Program	15434 State Highway 49, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Pittsburg Mine Rd		Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Banner Ridge Road Oc	Banner Ridge Road	Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada City	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada City	Essential Services	Bridge	Gold Flat Road Oc	Gold Flat Road	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Sactramento Street Oc	Sacramento St	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Deer Creek	South Pine Street	Zone A	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Deer Creek	State Route 20	Zone A	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Deer Creek	Broad St	Zone A	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Broad Street Oc	Broad St	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Deer Creek	Nevada Street	Zone A	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge	Washington Street Oc	WASHINGTON ST	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Fire	Cdf Station 20 - Nevada City	10242 Ridge Rd	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Fire	Nevada City Station 54	201 Providence Mine Rd	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Fire	Ncc Station 84	10135 Coyote St	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Nevada Co Supt Of Schools	112 Nevada City Highway, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Seamans Lodge Pioneer Bd A, Bd B	425 Nimrod Street, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Da Office	201 Commercial Street, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada City	Essential Services	Government Building	Probation	109 1/2 Pine Street, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Public Defender	224 Main St., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Historical Library	211 North Pine St., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Courthouse	201 Church Street	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Nevada City Veterans Building	415 N. Pine St., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Nevada City Elks Lodge 518 Bd A, Bd B	518 State Highway 49, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Sheriff's Property Unit	15076 Highway 49, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Warehouse Facility	10020 E. Broad St, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Facilities Service Center	10014 N. Bloomfield Rd., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Facilities Service Center Shop	10014 N. Bloomfield Rd., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Madelyn Helling Library	980 Helling Way, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Government Building	Eric Rood Government Center	950 Maidu Ave., Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada City	Essential Services	Shelter	SOUTH YUBA CLUB Γçôvendor AGREEMENT	555 Searls Ave., Nevada City, CA 95959	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada City	Essential Services	Shelter	Nevada City Veterans Memorial Building	415 Pine St., Nevada City, CA 95959	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	At Risk Populations	Government Building	The "Ranch"	16782 State Hwy. 49, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	At Risk Populations	School	Forest Lake Christian School	12515 Combie Road, Auburn	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	At Risk Populations	School	Bear River High School	11130 Magnolia Road, Grass Valley	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	At Risk Populations	School	Cottage Hill Elementary School	22600 Kingston Lane, Grass Valley	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	At Risk Populations	School	Magnolia Intermediate School	22431 Kingston Lane, Grass Valley	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	At Risk Populations	School	Sierra Montessori Academy	16229 Duggans Road, Grass Valley	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	At Risk Populations	School	Christian Encounter High School	17183 Retrac Way, Grass Valley	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	At Risk Populations	School	Alta Sierra Elementary School	16607 Annie Drive, Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	At Risk Populations	School	Clear Creek Elementary School	17700 McCourtney Road, Grass Valley	Zone X (Unshaded)	High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	At Risk Populations	School	Chicago Park Elementary School	15725 Mount Olive Road, Grass Valley	Zone X (Unshaded)	Moderate	Low	Yes	No	No
Nevada County	At Risk Populations	School	Chicago Park Community Charter School	15725 Mount Olive Road, Grass Valley	Zone X (Unshaded)	Moderate	Low	Yes	No	No
Nevada County	At Risk Populations	School	Ready Springs Elementary School	10862 Spenceville Road, Penn Valley	Zone X (Unshaded)	Moderate	Low	Yes	No	Yes
Nevada County	At Risk Populations	School	Vantage Point Charter School	10862 Spenceville Road, Penn Valley	Zone X (Unshaded)	Moderate	Low	Yes	No	Yes
Nevada County	At Risk Populations	School	Nevada Union Adult Education	12338 McCourtney Road, Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	At Risk Populations	School	Union Hill Middle School 7 - 8	11638 Colfax Highway, Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	At Risk Populations	School	Union Hill Elementary Charter School K - 6	11638 Colfax Highway, Grass Valley	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	At Risk Populations	School	Pleasant Valley Elementary School	14685 Pleasant Valley Road, Penn Valley	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	At Risk Populations	School	Nevada City School Of The Arts	13032 Bitney Springs Road, Nevada City	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	At Risk Populations	School	Williams Ranch Elementary School	14804 Pleasant Valley Road, Penn Valley	Zone X (Unshaded)	High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	At Risk Populations	School	The Woolman Semester At Sierra Friends Center	13075 Woolman Lane, Nevada City	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	At Risk Populations	School	Mountain Valley Child And Family Services	10591 Milhous Road, Nevada City	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	At Risk Populations	School	Donner Trail Elementary School	52775 Donner Pass Road, Kingvale	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	At Risk Populations	School	Washington Elementary School	1 School Road, Washington	Zone D (Unmapped)	Very High	Moderate	No	No	No
Nevada County	At Risk Populations	School	Ananda Living Wisdom School	14618 Tyler Foote Crossing Road, Nevada City	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	At Risk Populations	School	Grizzly Hill School	16661 Old Mill Road, Nevada City	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Airport	Alta Sierra Airport		Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Airport	Limberlost Ranch Airport		Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Airport	Milhous Ranch Airport		Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Airport	Truckee - Tahoe Airport		Zone D (Unmapped)	High	Low	Yes	No	No
Nevada County	Essential Services	Airport	Jackson Lake Heliport		Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge		Combie Road	Zone X (Unshaded)	Moderate	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Little Wolf Creek	Garden Bar Road	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge	Little Wolf Creek	Garden Bar Road	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Wolf Creek	Wolf Road (Cr 10)	Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Garden Bar Road	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge	Rock Creek	Mccourtney Road	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge	South Wolf Creek	State Route 49	Zone A	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Bear River	Dog Bar Road	Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge		CREEK	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Wolf Creek	Limekiln Road	Zone A	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge		CREEK NEAR BROOK END	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Dry Creek	Mccourtney Road	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge	South Wolf Creek	Wolf Creek Road	Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	Yes
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Wolf Creek	Retrac Way	Zone A	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	Yes
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	Yes
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Dog Bar Road	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Bear River	State Route 174	Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	South Wolf Creek	Dog Bar Road	Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Auburn Rd	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Wolf Creek	Auburn Road	Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge		Dog Bar Road	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Wolf Creek	Allison Ranch Road	Zone Ae	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge		Dog Bar Road	Zone X (Unshaded)	High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Greenhorn Creek	You Bet Road	Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Clear Creek	Penn Valley Drive	Zone X (Unshaded)	Moderate	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge		Burma Road	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone Ae	Moderate	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge	Squirrel Creek	State Route 20	Zone Ae	High	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge	Slacks Ravine	Sr 20	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Squirrel Creek	State Route 20	Zone X (Unshaded)	High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Deadman Flat Oc	South Ponderosa Wy	Zone X (Unshaded)	Very High	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge	Slacks Ravine	Sr 20	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge	Rex Reservoir Rd Uc	State Route 20	Zone X (Unshaded)	High	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge	Squirrel Creek	Pleasant Valley Rd	Zone Ae	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Squirrel Creek	Valley Drive	Zone X (Unshaded)	High	Low	Yes	No	Yes
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Slacks Ravine	Mooney Flat Road	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Greenhord Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge	Deer Creek	Mooney Flat Road	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Rough And Ready Hwy	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Rough And Ready Hwy	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge		Rough And Ready Hwy	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Anthony House Dam	Pleasant Valley Rd	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Deer Creek	Bitney Springs Rd	Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Bitney Springs Road		Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge		Bitney Springs Road	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge		Bitney Springs Road	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge		Pleasant Valley Road	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	South Yuba River	Pleasant Valley Rd	Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Bridgeport Covered Bridge		Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Excelsior Ditch Puc	State Route 49	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	South Yuba River	State Route 49	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge		Pleasant Valley Road	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Rock Creek	Rector Rd	Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Rock Creek	Rock Creek Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge		Pleasant Valley Road	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Yuba Gap Oc	Lake Valley Road	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	Shady Creek	Old Hwy 49	Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	South Yuba River	Interstate 80	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	Indian Springs Uc	Interstate 80	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	Indian Springs Uc	Interstate 80	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Eagle Lake Road	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	Yuba Pass Soh	I 80 Wb	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	Yuba Pass Soh	I 80 Eb	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Purdon Road	Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Donner Summit	Donner Pass Rd	Zone D (Unmapped)	Very High	Low	No	Yes	Yes
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Soda Springs Rd	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Bloomfield Rd	Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Soda Springs Creek	Donner Pass Rd	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Donner Pass Rd	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	Soda Springs Oc	Donner Pass Rd	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Interstate 80 Eb	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Interstate 80 Eb	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge	South Yuba River	Eagle Lake Road	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Bridge		Pleasant Valley Road	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Moderate	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Castle Peak Uc	Interstate 80	Zone D (Unmapped)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Castle Peak Uc	Interstate 80	Zone D (Unmapped)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Shady Creek	Purdon Rd	Zone A	High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	South Yuba River	Washington Rd	Zone A	Very High	Moderate	No	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Canyon Creek	Maybert Road	Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Humbug Creek	Relief Hill Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Hinton Overhead	Hirschdale Rd	Zone X (Unshaded)	Very High	Low	Yes	Yes	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Truckee River	Hirschdale Rd	Zone A	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Hinton Road Uc	Interstate 80	Zone X (Unshaded)	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge			Zone A	High	Low	No	No	Yes
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Middle Yuba River	State Route 49	Zone D (Unmapped)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge	Boca Br & Oh	Interstate 80 Eb	Zone X (Unshaded)	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Non-Wildland/Non-Urban	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Prosser Creek	State Route 89	Zone A	Very High	Low	Yes	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Moderate	No	No	No
Nevada County	Essential Services	Bridge	Truckee River	Floriston Way	Zone A	Very High	Low	Yes	Yes	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Bridge	Truckee River	Interstate 80	Zone A	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge	Truckee River	Is 80	Zone A	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge	Truckee River	Is 80	Zone A	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Bridge	Middle Yuba River	Tyler Foote Xing	Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge	Farad Uc	Interstate 80	Zone X (Unshaded)	Very High	Moderate Susceptibility	Yes	Yes	No
Nevada County	Essential Services	Bridge	Poorman Creek	Graniteville Rd	Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Bridge		Dog Valley Road	Zone A	Moderate	Low	No	No	No
Nevada County	Essential Services	Bridge			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	Yes
Nevada County	Essential Services	Church			Zone X (Unshaded)	Moderate	Low	No	No	Yes
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone D (Unmapped)	Very High	Moderate	Yes	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Church			Zone X (Unshaded)	Very High	Low	Yes	Yes	No
Nevada County	Essential Services	Church			Zone D (Unmapped)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Higgins Station 21	10106 Combie Rd	Zone X (Unshaded)	Moderate	Low	Yes	No	No
Nevada County	Essential Services	Fire	Higgins Station 22	20223 Morning Sun Ln	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Higgins Station 23	20604 Mccourtney Rd	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Ncc Station 90	10095 E Lime Kiln Rd	Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Fire	Ncc Station 89	11883 Tammy Way	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Peardale-Chicago Park Stn 57	18934 Hwy 174	Zone X (Unshaded)	High	Low	Yes	No	No
Nevada County	Essential Services	Fire	Ncc Station 88	14518 Hwy 49	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Fire	Ncc Station 92	14811 Mccourtney Rd	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Peardale-Chicago Park Stn 257	15057 Hwy 174	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Fire	Penn Valley Station 43	10513 Spenceville Rd	Zone X (Unshaded)	Moderate	Low	Yes	No	Yes
Nevada County	Essential Services	Fire	Ophir Hill Station 52	12668 Hwy 174	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Fire	Penn Valley Station 44	18989 Lake Forest Dr	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Rough & Ready Station 59	14506 Rough And Ready Hwy	Zone X (Unshaded)	High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Fire	Ncc Station 86	12337 Banner Lava Cap Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Penn Valley Station 45	12370 Bitney Springs Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Ncc Station 80	13376 Quaker Hill Cross Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Ncc Station 81	16528 Pasquale Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Ncc Station 82	18969 Scotts Flat Rd	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Fire	North San Juan Station 2	20399 Pleasant Valley Rd	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Ncc Station 83	14700 N Bloomfield Graniteville Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Truckee - Airport	10277 Tahoe Truckee Airport Rd	Zone D (Unmapped)	Moderate	Low	Yes	No	No
Nevada County	Essential Services	Fire	Truckee - Soda Springs	53823 Sherritt Lane	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Fire	North San Juan Station 3	13200 Tyler Foote Crossing Rd	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Fire	Washington Station 1	15406 Washington Rd	Zone D (Unmapped)	Very High	Moderate	No	No	No
Nevada County	Essential Services	Fire	North San Juan Station 1	10057 Reservoir St	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Fire	Cdf Station 42 - Columbia Hill	19076 Tyler Foote Crossing Rd	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Fire	Graniteville	35401 Graniteville Rd	Zone D (Unmapped)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Government Building	Elegant Salvage	16282 Mount Olive Road, Grass Valley	Zone X (Unshaded)	Moderate	Low	Yes	No	No
Nevada County	Essential Services	Government Building	Animal Shelter	14679 McCourtney Rd., Grass Valley	Zone X (Unshaded)	Very High	Low	No	No	No
Nevada County	Essential Services	Government Building	Lake Wildwood Comm Ctr Oak Rm, Bd A, Bd B, Bd C	18955 Wildflower Drive, Penn Valley	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Government Building	Truckee - Soda Springs	53823 Sherritt Lane, Soda Springs	Zone D (Unmapped)	Very High	Low	Yes	Yes	Yes
Nevada County	Essential Services	Government Building	North San Juan Center	29190 State Highway 49, North San Juan	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Shelter	Bear River High School	11130 Magnolia Rd., Grass Valley, CA 94949	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Shelter	Cottage Hill School	22600 Kingston Lane, Grass Valley, CA 95949	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Shelter	Higgins Lions Club - Roy Peterson Building	22490 East Hacienda Dr., Grass Valley, CA 95949	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Shelter	Magnolia Intermediate School	22431 Kingston Lane, Grass Valley, CA 95949	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Shelter	Chicago Park School	15725 Mt. Olive Rd., Grass Valley, 95945	Zone X (Unshaded)	Moderate	Low	Yes	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Nevada County	Essential Services	Shelter	Penn Valley Community Church Agreed - Pending	11739 Spenceville Rd., Penn Valley, CA 95946	Zone X (Unshaded)	High	Low	No	No	Yes
Nevada County	Essential Services	Shelter	Ready Springs Elementary School	10862 Spenceville Road	Zone X (Unshaded)	Moderate	Low	Yes	No	Yes
Nevada County	Essential Services	Shelter	Calvary Bible Church - Pending	11481 State Hwy. 174, Grass Valley, 95945	Zone X (Unshaded)	Very High	Low	Yes	No	No
Nevada County	Essential Services	Shelter	Pleasant Valley School	14685 Pleasant Valley Rd., Penn Valley, CA 95946	Zone X (Unshaded)	Moderate	Low	No	No	No
Nevada County	Essential Services	Shelter	Ananda Church Community Center	14618 Tyler Foote Crossing Rd, Nevada City, CA 95959	Zone X (Unshaded)	High	Low	No	No	No
Nevada County	Essential Services	Shelter	North San Juan Senior Center	29190 State Highway 49, North San Juan, CA	Zone X (Unshaded)	Very High	Low	Yes	No	No
Placer County	Essential Services	Bridge	Bear River Canal	Placer Hills Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Bear River Canal Drain	Meadow Vista Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Bear River Canal	Meadow Gate Rd	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Wooley Creek	Combie Road	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Crother Road Oc	Crother Road	N/A	FHSZ Not Available	Low	Yes	Yes	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Placer County	Essential Services	Bridge	Gautier Bridge		N/A	FHSZ Not Available	Low	Yes	No	No
Placer County	Essential Services	Bridge	Wooley Creek	Placer Hill Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Bear River Canal	Crother Rd	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Wooley Creek	Crother Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Heather Glen Oc	Heather Glen	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Bear River Canal	Dog Bar Road	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Pipeline Overcrossing	Rollins Lake Rd	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	North Long Ravine Up	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Long Ravine	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Long Ravine Up	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Cape Horn Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Magra Oc	Magra Road	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Magra Oh	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Fanny Bridge		N/A	FHSZ Not Available	High	Yes	No	No
Placer County	Essential Services	Bridge	Bear Creek	Chalet Dr	N/A	FHSZ Not Available	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Placer County	Essential Services	Bridge	Bear Creek	John Scott Trail	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Bear Creek	Alpine Meadows Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Truckee River	Alpine Meadows Rd	N/A	FHSZ Not Available	High	Yes	No	No
Placer County	Essential Services	Bridge	Squaw Creek	Squaw Peak Road	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Truckee River	State Route 89	N/A	FHSZ Not Available	High	Yes	No	No
Placer County	Essential Services	Bridge	Squaw Creek	Squaw Valley Road	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Squaw Creek	Squaw Valley Rd	N/A	FHSZ Not Available	Low	Yes	No	No
Placer County	Essential Services	Bridge	Squaw Creek	State Route 89	N/A	FHSZ Not Available	High	Yes	No	No
Placer County	Essential Services	Bridge	North Fork American River	Soda Springs Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Onion Creek	Soda Springs Rd	N/A	FHSZ Not Available	Low	No	No	No
Placer County	Essential Services	Bridge	Blue Canyon Road Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	No	No
Placer County	Essential Services	Bridge	Blue Canyon Road Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	No	No
Placer County	Essential Services	Bridge	Putts Lake Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Putts Lake Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Emigrnt Gap Oh	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Placer County	Essential Services	Bridge	Carpenter Flat Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Bear Valley Flume	Route 20	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Bear River	State Route 20	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Hampshire Rocks Rd	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River (Big Bend)	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	East Cisco Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Big Bend Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Martis Creek	State Route 267	N/A	FHSZ Not Available	Low	Yes	No	No
Placer County	Essential Services	Bridge	Big Bend Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Cisco Oc	Cisco Oc	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Hampshire Rocks Rd	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Cisco Rd	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Hampshire Rocks Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Hampshire Rocks Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Placer County	Essential Services	Bridge	South Yuba River	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	Yes
Placer County	Essential Services	Bridge	Kingvale Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	Yes
Placer County	Essential Services	Bridge	South Yuba River	South Yuba Dr	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Kingvale Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	Yes
Placer County	Essential Services	Bridge	Troy Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	Troy Uc	Interstate 80	N/A	FHSZ Not Available	Low	Yes	Yes	No
Placer County	Essential Services	Bridge	South Yuba River	Donner Pass Road	N/A	FHSZ Not Available	Low	Yes	Yes	No
Sierra County	Essential Services	Bridge	Little Truckee River	State Route 89	N/A	FHSZ Not Available	Low	Yes	No	No
Sierra County	Essential Services	Bridge	Little Truckee River	Henness Pass Road	N/A	FHSZ Not Available	Low	No	No	No
Sierra County	Essential Services	Bridge	Little Truckee River	Old Fibreboard Rd	N/A	FHSZ Not Available	Low	No	No	No
Truckee	At Risk Populations	School	Sierra High School	11661 Donner Pass Road, Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	At Risk Populations	School	Truckee Elementary School	11911 Donner Pass Road, Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Truckee	At Risk Populations	School	Tahoe Truckee High School	11725 Donner Pass Road, Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	At Risk Populations	School	Alder Creek Middle School	10931 Alder Drive, Truckee	Zone X (Unshaded)	Very High	Low	Yes	No	No
Truckee	At Risk Populations	School	Glenshire Elementary School	10990 Dorchester Drive, Truckee	Zone X (Unshaded)	Very High	Low	No	Yes	No
Truckee	Essential Services	Airport	Tahoe Forest Hospital Heliport		Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Lakeview Canyon	South Shore Dr	Zone X (Unshaded)	Very High	Low	No	Yes	Yes
Truckee	Essential Services	Bridge	Donner Creek	West River St	Zone Ae	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Donner Creek Up	State Route 89	Zone X (Unshaded)	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Summit Creek	South Shore Dr	Zone Ae	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Summit Creek	Old Highway Dr	Zone X (Unshaded)	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Donner Creek	State Route 89	Zone Ae	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Donner Creek	State Route 89	Zone Ae	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Route 80/89 Separation	I 80	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge		Donner Pass Road	Zone X (Unshaded)	Very High	Low	Yes	No	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Truckee	Essential Services	Bridge	Donner Park Oc	Donner Pass Road	Zone X (Unshaded)	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	West Truckee Uc	Interstate 80	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Truckee River	State Route 267	Zone Ae	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Donner Lake Uc	Interstate 80	Zone X (Unshaded)	Very High	Low	Yes	No	No
Truckee	Essential Services	Bridge	Trout Creek	E Jibboom St	Zone Ae	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Donner Lake Uc	Interstate 80	Zone X (Unshaded)	Very High	Low	Yes	No	No
Truckee	Essential Services	Bridge	Trout Creek Undercrossing	Interstate 80	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Truckee River Bridge & Oh	State Route 267	Zone Ae	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Route 89/80 Separation	State Route 89	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Route Eb I 80 / 267-89 Separation	Eb Interstate 80	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Route Wb I 80 / 267-89 Separation	Wb Interstate 80	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Bridge	Fibreboard Uc	Interstate 80	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Truckee	Essential Services	Bridge	Truckee River Boh	Glenshire Dr	Zone A	Non-Very High	Low	Yes	Yes	No
Truckee	Essential Services	Bridge	Polaris Uc	Interstate 80	Zone X (Unshaded)	Non-Very High	Low	Yes	No	Yes
Truckee	Essential Services	Bridge	Alder Creek	Fjord Rd	Zone X (Unshaded)	Very High	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Truckee	Essential Services	Bridge	Union Mills Boh	Interstate 80 Eb	Zone A	Non-Very High	Low	Yes	Yes	No
Truckee	Essential Services	Bridge	Union Mills Boh	Interstate 80 Wb	Zone A	Non-Very High	Low	Yes	Yes	No
Truckee	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	No
Truckee	Essential Services	Bridge			Zone A	Very High	Low	Yes	Yes	No
Truckee	Essential Services	Bridge	Truckee River	Interstate 80	Zone A	Very High	Low	Yes	Yes	No
Truckee	Essential Services	Bridge	Truckee River	Stampede Meadows R	Zone A	Non-Very High	Low	Yes	Yes	No
Truckee	Essential Services	Fire	Truckee - Donner Lake	15572 Donner Pass Rd	Zone X (Unshaded)	Very High	Low	Yes	No	Yes
Truckee	Essential Services	Fire	Truckee - Gateway	11473 Donner Pass Rd	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Fire	Truckee - Downtown	10049 Donner Pass Rd	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Fire	Truckee - Tahoe Donner	12986 Northwoods Blvd	Zone X (Unshaded)	Very High	Low	No	No	No
Truckee	Essential Services	Fire	Truckee - Glenshire	10900 Manchester Dr	Zone X (Unshaded)	Very High	Low	No	Yes	No
Truckee	Essential Services	Government Building	Emigrant Trail Museum	12593 Donner Pass Road, Truckee	Zone X (Unshaded)	Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Government Building	Truckee Joseph Building	10075 Levone Ave., Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Government Building	Truckee Library	10031 Levon Ave., Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Truckee	Essential Services	Government Building	Truckee Government Center	10879 Donner Pass Rd., Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Hospital	Tahoe Forest Hospital	10121 Pine Avenue, Truckee	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Shelter	Sierra Bible Church	11460 Brockway Road (P.O. Box 612) Truckee,CA 96160	Zone X (Unshaded)	Non-Very High	Low	Yes	No	No
Truckee	Essential Services	Shelter	Sierra High School	11661 Donner Pass Road, Truckee, CA 96161	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Shelter	Truckee High School	11725 Donner Pass Road, Truckee CA 96161	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Shelter	Tahoe Truckee Unified School District: Administrative Office	1160 Donner Pass Road, Truckee, CA 96161	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Shelter	Veteran Hall	10214 High Street, Truckee, CA 96161	Zone X (Unshaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Shelter	Truckee Community Center	10046 Church Street, Truckee CA 96161	Zone X (Shaded)	Non-Very High	Low	Yes	Yes	Yes
Truckee	Essential Services	Shelter	Glenshire Elementary School	10990 Dorchester, Truckee, CA 96161	Zone X (Unshaded)	Very High	Low	No	Yes	No
Yuba County	Essential Services	Bridge	Bear River Camp Farwest Weir	BLACKFORD RD	N/A	FHSZ Not Available	Low	No	No	No

Jurisdiction	Critical Facility Category	Facility Type	Name	Address	Flood Zone	Fire Hazard Severity Zone	Landslide Susceptibility	Haz Mat Road	Haz Mat Railroad	Haz Mat Pipeline
Yuba County	Essential Services	Bridge	Dry Creek	SPENCEVILLE RD	N/A	FHSZ Not Available	Low	No	No	Yes
Yuba County	Essential Services	Bridge	Dry Creek	WALDO RD	N/A	FHSZ Not Available	Low	No	No	No
Yuba County	Essential Services	Bridge	Vineyard Creek	SMARTSVILLE RD	N/A	FHSZ Not Available	Low	No	No	No
Yuba County	Essential Services	Bridge	Deep Ravine No 2	TIMBUCTOO RD	N/A	FHSZ Not Available	Low	Yes	No	No
Yuba County	Essential Services	Bridge	Deep Ravine No 1	TIMBUCTOO RD	N/A	FHSZ Not Available	Low	Yes	No	No
Yuba County	Essential Services	Bridge	Dobbins Creek	MARYSVILLE RD	N/A	FHSZ Not Available	Low	No	No	No

Source: Nevada County GIS

Table F-2 Nevada County Hazardous Materials Critical Facilities

Facility Name	Street	City
Caltrans - 20/80 Junction	Hwy 20 & I-80 Junction, c/o Whitmore Mtce.(4 miles E. of Baxter), Alt	Alta
PG&E: Higgins Substation	10194 COMBIE ROAD	Auburn
Bear River Auto Tech	10062 Streeter Rd Ste 2	Auburn
Forest Lake Christian School	12515 Combie Rd	Auburn
Higgins Village Chevron	10021 Combie Rd	Auburn
Streeter Industrial Plaza	10074 Streeter Rd	Auburn
Brace Muffler and Welding	10062 Streeter Rd Ste 3	Auburn
Auburn Euro Motors, Inc.	10068 Streeter Rd Ste 14	Auburn
Lake of the Pines Association Pool - 2025	11665 Lakeshore	Auburn
Lake of the Pines Maintenance Shop - 2022	23246 Hazel Way	Auburn
Darkhorse Golf Club	24150 Darkhorse Dr	Auburn
WFO Concepts	10076 Streeter Rd Ste 7	Auburn
Lake of the Pines WWTP	10803 Riata Wy	Auburn
NID Lake of the Pines WTP	12818 Torrey Pines Dr	Auburn
CVS Pharmacy # 3947	10045 Combie Rd	Auburn
M & M Machine	10074 Streeter Rd Ste B	Auburn
Precision Fluid Controls, Inc.	10062 Streeter Rd Ste 1	Auburn
MOMIC	21770 State Highway 20	Big Oak Valley
Arts Cedar Rdge Gas and Auto Repair	12685 Colfax Hwy	Cedar Ridge
AT&T California - TB520	Signal Peak	Cisco Grove
PG&E: Bear Valley General Construction Yard	Bowman Lake Road, .5 mi. n/o Hwy. 20	Emigrant Gap
Snowflower	41776 Yuba Gap Dr	Emigrant Gap
Verizon Wireless Floriston	22258 Juniper St	Floriston
Verizon Business: FSTNCA	Union Pacific Railroad Row	Floriston
T-MOBILE WEST CORPORATION SC09379A	22258 Juniper St	Floriston

Facility Name	Street	City
American Towers - Hirschdale CA #49047	16774 Hinton Road	Floriston
Van's Auto Body and Paint	717 S Auburn St	Grass Valley
O'Reilly Auto Parts #2601	121 Olympia Park Rd	Grass Valley
QF Incorporated	901 La Barr Meadows Rd Ste G	Grass Valley
Flyers #41	2001 Nevada City Hwy	Grass Valley
Diamond Pacific	124 E McKnight Wy	Grass Valley
Verizon Wireless Grass Valley	302 Railroad Ave	Grass Valley
PG&E: Brunswick Substation	11321 Sutton Way	Grass Valley
Verizon Wireless Grass Valley South	119 East McKnight Way	Grass Valley
Verizon Wireless Schindlers Peak (Higgins Corner)	22591 Wild Canary Rd	Grass Valley
Kmart #9746	111 W McKnight Way	Grass Valley
Flyers #31	1008 Plaza Dr.	Grass Valley
AutoZone #5516	412 Brunswick Rd	Grass Valley
Verizon Wireless Alta Hill	11761 Ridge Rd	Grass Valley
PG&E: Grass Valley Service Center	788 Taylorville Rd	Grass Valley
Verizon Wireless Wolf Mountain	17713 Wolf Mountain Rd	Grass Valley
49er Fun Park	314 Railroad Ave	Grass Valley
Amerigas Little Valley Road	15433 Little Valley Rd	Grass Valley
Chapel of the Angels Mortuary	250 Race St	Grass Valley
Countis Laboratories	12295 Charles Dr	Grass Valley
DeMartini RV Sales	625 Idaho Maryland Rd	Grass Valley
Empire Mine State Historic Park	10556 E Empire St	Grass Valley
Gins Little Valley Auto Care	15898 Little Valley Rd # 1	Grass Valley
Gold N Green Equipment Rentals	302 Railroad Ave	Grass Valley
Goldenwest Manufacturing, Inc.	13100 Grass Valley Ave Unit A & B	Grass Valley
Alta Hill WTP	11808 Alta Vista Ave	Grass Valley

Facility Name	Street	City
Import Auto Service	250 S Auburn St	Grass Valley
Kilroys Auto Dismantling	12077 State Highway 49	Grass Valley
Grass Valley, A Belden Brand	125 Crown Point Ct	Grass Valley
Miwall Corporation	13235 Grass Valley Ave	Grass Valley
Nevada County Airport	13083 John Bauer Ave	Grass Valley
Alta Sierra Golf and Country Club	11897 Tammy Wy	Grass Valley
American Tower Corp No. 8635	17800 Wolf Mountain Rd	Grass Valley
Arch's Automotive	1355 Main St	Grass Valley
ARCO 02077	1913 Nevada City Hwy	Grass Valley
Best Trailer, Inc.	500 Idaho Maryland Rd	Grass Valley
Certified Automotive Repair Service	780 S Auburn St B	Grass Valley
Da Boys LLC dba The Auto Shop	11311 McCourtney Rd	Grass Valley
Datum Precision	345 Crown Point Cir Ste 800	Grass Valley
Electronic Carbide Inc.	13005 Loma Rica Dr	Grass Valley
Grass Valley Express Mart	234 South Auburn St	Grass Valley
Fischers Firestone	548 Sutton Way	Grass Valley
Gold Country Kubota	418 E Main St	Grass Valley
Grass Valley Steelcast	145 E Main St	Grass Valley
Grass Valley WWTP/ Corp Yard	556 Freeman Ln	Grass Valley
Hennessy School	225 S Auburn St	Grass Valley
Huntington Mechanical Labs	13355 Nevada City Ave	Grass Valley
NID Headquarters	1036 W Main St	Grass Valley
NID Hydro Rollins Powerhouse	15531 Arrowhead Ln	Grass Valley
iGraphics Precision Printing	165 Spring Hill Dr	Grass Valley
J Manufacturing Inc	12799 Loma Rica Dr	Grass Valley
North Star Trucking	124 Sutton Wy	Grass Valley

Facility Name	Street	City
Peters Drilling and Pump Service	1005 Idaho Maryland Rd	Grass Valley
AT&T California - TB729	530 Freeman Ln	Grass Valley
Riebes Automotive Supply	126 Idaho Maryland Rd	Grass Valley
Rollys Body Shop	1317 Sutton Wy	Grass Valley
Sierra Nevada Memorial Hospital	155 Glasson Wy	Grass Valley
Wound Healing and Hyperbaric Medicine Center	300 Sierra College Dr Ste 270	Grass Valley
Marks Cycle Store	144 Idaho Maryland Rd	Grass Valley
Merrill & Sons	12619 Loma Rica Dr	Grass Valley
Mountain Auto Service	11209 La Barr Meadows Rd	Grass Valley
Alpine Aviation	13310 Nevada City Ave	Grass Valley
Alta Sierra Family Automotive	15563 State Highway 49	Grass Valley
Apria Healthcare	12981 Loma Rica Dr	Grass Valley
SKS Automotive	1317 Sutton Wy A	Grass Valley
Best Gas Bear River Market	10021 Wolf Rd	Grass Valley
Alta Sierra Station	10032 Alta Sierra Dr	Grass Valley
Amerigas Nevada City Avenue	13390 Nevada City Ave	Grass Valley
Celestial Valley Ventures, Inc. dba Celestial Valley Towing	865 Idaho Maryland	Grass Valley
United # 5428	133 S Auburn St	Grass Valley
TriContinent Scientific	12555 Loma Rica Dr	Grass Valley
CVS Pharmacy #9155	1005 Sutton Wy	Grass Valley
Durham School Services, LP	10701 E Bennett Rd	Grass Valley
Featherlite	13317 State Highway 49	Grass Valley
Franza Enterprises	16016 McCourtney Rd	Grass Valley
Gold Country Automotive	175 Joerschke Dr Ste J	Grass Valley
Gold Country Express Lube & Car Wash	712 S Auburn St	Grass Valley
Grass Valley Auto and Truck Dismantling	647 Main St	Grass Valley

Facility Name	Street	City
Hansen Brothers Enterprises Greenhorn Gravel Plant	12865 Mule Canyon Rd	Grass Valley
House of Print and Copy, LLC	1501 Main St	Grass Valley
Hunt & Sons	335 Railroad Ave	Grass Valley
J & M Offroad	125 Springhill Dr Ste 8	Grass Valley
McCourtney Road Transfer Station HHW Facility - 1457	14741 Wolf Mountain Rd	Grass Valley
Main Street 76	451 E Main St	Grass Valley
Grass Valley Chevron	107 E McKnight Wy	Grass Valley
Mels Transmission	124 Scandling Ave	Grass Valley
Memorial Park Pool	350 Race St	Grass Valley
Motor Electric Service Company	744 Maltman Dr	Grass Valley
Nevada County Fairgrounds	11228 McCourtney Rd	Grass Valley
Nevada Union High School	11645 Ridge Rd	Grass Valley
NID Loma Rica WTP	13786 Loma Rica Dr	Grass Valley
Nugget Premium Auto Body	140 Scandling Ave	Grass Valley
AT&T California - TB184	17480 Wolf Mountain Rd	Grass Valley
Rare Earth	11750 La Barr Meadows Rd	Grass Valley
Robinson Enterprises, Inc. at Grass Valley Shell	892 E Main St	Grass Valley
Sierra Motor Sports	2121 Nevada City Hwy	Grass Valley
Measurement Specialties, Inc.	424 Crown Point Cir	Grass Valley
Sutherland Oil, Inc.	720 Auburn St	Grass Valley
Vulcan Materials Company	11825 La Barr Meadows Rd	Grass Valley
Air Attack Base/Service Center	13120 Loma Rica Dr	Grass Valley
PG&E: Grass Valley Substation	531 S Auburn St	Grass Valley
Ray's Radiator	824 S Auburn St	Grass Valley
Ace Propane	12805 Loma Rica Drive	Grass Valley
Ace Welding, Inc.	12819 Loma Rica Dr	Grass Valley

Facility Name	Street	City
Amerigas Loma Rica Drive	12550 Loma Rica Dr	Grass Valley
Amerigas Grass Valley Road	13045 Grass Valley Ave	Grass Valley
Auto Body Unlimited	22013 Cottage Hill Dr	Grass Valley
Automotive City	13326 Brunswick Rd	Grass Valley
Bear River High School	11130 Magnolia Rd	Grass Valley
Bell Automotive	780 S Auburn St	Grass Valley
Cranmer Engineering, Inc.	1188 E Main St	Grass Valley
Geared Up Drive Train	900 Golden Gate Terr Ste B	Grass Valley
Double Eagle Equipment Service	540 Packard Dr	Grass Valley
Farlows Scientific Glassblowing Inc.	962 Golden Gate Terrace, Suite B	Grass Valley
Fortyniner Auto Repair	140 E McKnight Wy Ste 16	Grass Valley
Foster & Son Trucking	780 Whispering Pines Ln	Grass Valley
Gold Center Automotive Inc dba Grass Valley Goodyear	960 Plaza Dr	Grass Valley
Grande Wood Designs	12802 Loma Rica Dr Ste I	Grass Valley
Grass Valley Mobil	1912 Nevada City Hwy	Grass Valley
Hansen Brothers Enterprises	11727 La Barr Meadows Rd	Grass Valley
Hills Flat Lumber Co.	380 Railroad Ave	Grass Valley
Knights Paint	1219 Sutton Way	Grass Valley
Kubich Forest Products	10972 Mountaineer Trl	Grass Valley
Litton Engineering Laboratories	200 Litton Dr	Grass Valley
Nevada County Consolidated Fire No. 88	14400 Golden Star Rd	Grass Valley
Nevada County Country Club	1040 E Main St	Grass Valley
Northern Sierra Propane	12619 Loma Rica Dr	Grass Valley
Palmer Enterprises	11352 Bennett Rd	Grass Valley
Pearsons Small Engine Repair	142 Idaho Maryland Rd	Grass Valley
AT&T California - TBR01	23337 State Highway 49	Grass Valley

Facility Name	Street	City
Quackenbushs Production Goldsmith	240 Mill St	Grass Valley
R & H Motorsports	12160 McCourtney Rd	Grass Valley
Robert Snell Casting Specialist	110 Spring Hill Dr Ste 20	Grass Valley
Sierra Pacific Industries	900 Whispering Pines Ln	Grass Valley
Sierra Performance	140 McKnight Way	Grass Valley
Suburban Propane - 3921	12575 Charles Dr	Grass Valley
Tom's Car Care Center	13473 Colfax Hwy	Grass Valley
Tripp's Auto Body and Paint Shop	127 Stewart St	Grass Valley
Waste Management of Nevada County - 2088	14741 Wolf Mountain Rd	Grass Valley
Waste Management of Nevada County - 2089	13083 Grass Valley Ave	Grass Valley
Wolf Mountain Conference Association	16555 Jericho Rd	Grass Valley
Safeway 0111	105 Neal St	Grass Valley
Safeway 2842	867 Sutton Way	Grass Valley
AT&T California - TB035	315 Colfax Ave	Grass Valley
Quik Stop Market #107	148 Hughes Rd	Grass Valley
R G B Corporation	22525 Kingston Ln	Grass Valley
Robinson Enterprises, Inc. at Robinson Petroleum	201 E Main St	Grass Valley
Save Mart #608	2054 Nevada City Hwy	Grass Valley
Sierra Auto Body of Nevada County, Inc.	654 Maltman Dr Ste A	Grass Valley
Top Tech Automotive	10849 Rough & Ready Hwy	Grass Valley
The Union Newspaper	464 Sutton Wy	Grass Valley
Volz Brothers Automotive	12048 Charles Dr Ste 2	Grass Valley
Werner's Mercedes Repair	21104 Spring Ranches Rd	Grass Valley
UPS - Grass Valley	12025 Charles Drive	Grass Valley
Airgas USA, LLC	720 Maltman Dr	Grass Valley
T-MOBILE WEST CORPORATION SC14051Z	175 Spring Hill Dr	Grass Valley

Facility Name	Street	City
T-MOBILE WEST CORPORATION SC09054A	22591 Wild Canary Rd	Grass Valley
Caseywood Corporation	12249 Charles Dr	Grass Valley
T-MOBILE WEST CORPORATION SC09618A	12753 S Ponderosa Way	Grass Valley
T-MOBILE WEST CORPORATION SC09624A	11808 Alta Vista Ave	Grass Valley
T-MOBILE WEST CORPORATION SC09621A	13248 Noel Ln	GRASS Valley
AT&T Mobility- Wolf Mountain (USID9909)	17713 Wolf Mountain Lookout Rd	Grass Valley
Rite Aid #6089	720 Sutton Wy	Grass Valley
JC Penney	732 Freeman Ln	Grass Valley
T-MOBILE WEST CORPORATION SC09053A	10175 Joerschke Dr	Grass Valley
T-MOBILE WEST CORPORATION SC09605A	17713 Wolf Mountain Rd	Grass Valley
AT&T Mobility - BITNEY SPRINGS (USID9915)	13024 Bitney Springs Rd	Grass Valley
Grass Valley Maintenance Yard	12548 Loma Rica Dr	Grass Valley
Walgreens #10881	880 Sutton Way	Grass Valley
DaVita Grass Valley Dialysis	360 Crown Point Cir # 210	Grass Valley
Les Schwab Tire Center #628	570 Freeman Ln	Grass Valley
California Highway Patrol (Grass Valley)	11363 McCourtney Rd	Grass Valley
Verizon Wireless Hwy 174	14516 You Bet Rd	Grass Valley
AMERICAN TOWERS - LAST CHANCE, CA - SITE #301209	12979 S PONDEROSA WAY	GRASS VALLEY
Dollar Tree #02260	762A Freeman Ln	Grass Valley
Comcast Grass Valley Hub	136 Upper Slate Creek Rd	Grass Valley
Petco #1336	672 Freeman Ln	Grass Valley
Foothill Car Care	716 E Main St	Grass Valley
XPCamper	180 Clydesdale Ct # A	Grass Valley
All Star Automotive	10141 Evening Star Dr Ste 9	Grass Valley
Roadrunner Automotive	1050 Whispering Pines Ln Ste I	Grass Valley
AT&T Mobility- GRASS VALLEY (USID9914)	302 Railroad Ave	Grass Valley

Facility Name	Street	City
AT&T Mobility- ALTA HILL - GRASS VALLEY (USID82201)	11808 Alta Vista Ave	Grass Valley
Dollar General #15010	2033 Nevada City Hwy	Grass Valley
AT&T Mobility- RIDGE ROAD - FORSMAN PL (47616)	175 Joerschke Dr	Grass Valley
Eagle Automotive	125 Springhill Dr Ste 2	Grass Valley
Staples the Office Superstore #1097	646 Sutton Way	Grass Valley
Peterson Hybrid Auto Service	12528 Loma Rica Dr	Grass Valley
A & A Concrete Supply Sacramento	270 Railroad Ave	Grass Valley
Closed Facility	462 E Main St	Grass Valley
Insulation Solutions	13113 John Bauer Ave	Grass Valley
Sierra Woods	12250 Charles Dr	Grass Valley
Caliber Collision Centers - Grass Valley	470 Idaho Maryland Rd	Grass Valley
Verizon Wireless Alta Sierra	14410 Dog Bar Rd	Grass Valley
SIERRA COLLEGE (GRASS VALLEY)	250 Sierra College Dr	Grass Valley
Verizon Wireless Grass Valley Airport	12740 Loma Rica Dr	Grass Valley
Stan & Marlene 133, Inc.	1983 Nevada City Hwy	Grass Valley
Pro Lube Inc.	582 E Main St	Grass Valley
Chardon Corp. B & C True Value Home Center	2032 Nevada City Hwy	Grass Valley
Sierra Insulation Co., Inc.	880 Whispering Pines Ln	Grass Valley
Grass Valley DMS	12503 Brunswick Rd	Grass Valley
Verizon Wireless Lime Kiln	10434 Bethel Glen Ct	Grass Valley
PSB Auto Center	653 Maltman Dr	Grass Valley
Gold Country Tow Service	1025 Idaho Maryland Rd	Grass Valley
Sierra Mountain Aviation Inc.	13308 Nevada City Ave	Grass Valley
Verizon Wireless Brunswick Bowl	142 Olympia Park Rd	Grass Valley
CHAPEL OF THE ANGELS CREMATORY	330 Railroad Ave	Grass Valley
Northern Sierra Propane Business Office	13121 John Bauer Ave	Grass Valley

Facility Name	Street	City
Verizon Wireless Kingvale	51488 Jeffrey Pine Rd	Kingvale
T-MOBILE WEST CORPORATION SC09372A	51488 Jeffery Pine Dr	KINGVALE
Caltrans - Nevada City	10057 Gold Flat Rd	Nevada City
Verizon Wireless Nevada City	980 Helling Way	Nevada City
Verizon Wireless Rough & Ready	13030 Bitney Springs Rd	Nevada City
Verizon Wireless Banner Mountain	11385 Caroline Lane	Nevada City
Bitney Springs Center Water System	13030 Bitney Springs Rd	Nevada City
CalFire Ridge Road Station	10242 Ridge Rd	Nevada City
Cascade Shores WWTP	14326 Gas Canyon Rd	Nevada City
Charles Hilkey Construction	16281 Sages Rd	Nevada City
Daves Auto Repair	747 Zion St	Nevada City
Extasia Inc.	15203 Tyler Foote Rd	Nevada City
Camp Rucker Lake	18061 Bowman Lake Rd	Nevada City
Bear Ridge Youth Camp	18076 Marsh Mill Rd	Nevada City
Burney's Auto Repair	10364 Willow Valley Rd	Nevada City
City of Nevada City WTP	11297 Banner Mountain Tr	Nevada City
City of Nevada City WWTP	650 Jordan St	Nevada City
Express Mart food & liquor	301 Sacramento St	Nevada City
FerrellGas	364 Lower Grass Valley Rd	Nevada City
Gold Flat Station	407 Hollow Way	Nevada City
NID Elizabeth George WTP	11258 Banner Lava Cap Rd	Nevada City
Milhous School	10595 Milhous Dr	Nevada City
Ananda Village	14618 Tyler Foote Crossing Rd	Nevada City
Thomas L Peterson	37003 Thundershower Retreat	Nevada City
City of Nevada City Pioneer Park Pool	423 Nimrod St	Nevada City
City of Nevada City Public Works Corporation Yard	255 Boulder St	Nevada City

Facility Name	Street	City
Douglas Automotive	420 Gold Flat Rd	Nevada City
Malakoff Diggins State Historic Park	23579 N Bloomfield Rd	Nevada City
Grass Valley USA, LLC	400 Providence Mine Rd	Nevada City
NID Hydro Chicago Park Powerhouse	24199 Lowell Hill Rd	Nevada City
NID Scotts Flat Lake Reservoir - 0523	23333 Scotts Flat Rd	Nevada City
Twin Ridge School District Oak Tree	18847 Oak Tree Rd	Nevada City
NID Cascade Shores WTP	13118 Sargent Jacobs Dr	Nevada City
NID Hydro Dutch Flat No. 2 Powerhouse	33199 Diggins Rd	Nevada City
NID Hydro Fuller Lake Building	13151 Bowman Lake Rd	Nevada City
Plaza Tire - 2064	531 Searls Ave	Nevada City
Rainbow Market	16797 State Highway 49	Nevada City
Robinson Enterprises, Inc. at Bulk Plant	198 Lower Grass Valley Rd	Nevada City
Sierra Metal Fabrication	529 Searls Ave	Nevada City
White Cloud Administration/Campground	26533 State Highway 20	Nevada City
Black Barts Welding and Harris Industrial Gas	10481 Gold Flat Rd	Nevada City
Camp Ross Relles	25001 N Bloomfield Rd	Nevada City
High Country Tek	208 Gold Flat Ct	Nevada City
Nevada City Gas Company	435 S Pine St	Nevada City
NID Hydro Bear Valley House	11151 Bowman Lake Rd	Nevada City
NID Hydro Bowman Powerhouse	18400 Bowman Lake Rd	Nevada City
NID Lake Wildwood WTP	14149 Beitler Rd	Nevada City
Pete's Welding	521 Searls Ave	Nevada City
AT&T California - TBR80	15831 Airport Rd	Nevada City
Robinson Enterprises, Inc. at Cardlock	133 Lower Grass Valley Rd	Nevada City
SPD Saw Shop, Inc.	120 Argall Way	Nevada City
Triano Auto Repair	333 Long St	Nevada City

Facility Name	Street	City
Pac Bell dba AT&T TB057	305 Spring St	Nevada City
R C D Engineering	17100 Salmon Mine Rd	Nevada City
Robinson Enterprises, Inc.at Shops	250 Lower Grass Valley Rd	Nevada City
Sierra Family Medical Clinic	15301 Tyler Foote Crossing Rd	Nevada City
Aqua Vitae Natural, Inc.	178 Lower Grass Valley Rd # A	Nevada City
T-MOBILE WEST CORPORATION SC09610A	15102 Manzanita Diggins Dr	Nevada City
Pump House at ERAC	950 Maidu Ave	Nevada City
CalFire Washington Ridge Camp	11425 Conservation Camp Rd	Nevada City
UNION PACIFIC RAILROAD - I80/20	39.32212° 120.60377°	Nevada City
CVIN - Nevada County Center	950 Maidu Ave	Nevada City
Diamond Arrow Christain Conference Center	15742 N Bloomfield Rd	Nevada City
AT&T Mobility- NEVADA CITY (USID9913)	400 Providence Mine Rd	Nevada City
AT&T Mobiilty- BANNER MOUNTAIN (USID9908)	13933 Banner Mtn Lookout Rd (4.2MILES N Northeast Pearldale)	NEVADA CITY
Riebes Auto Parts/Nevada City	535 Searls Ave	Nevada City
Gold Flat Express Lube & Car Wash	421 Hollow Way	Nevada City
Sierra Friends Center	13075 Woolman Ln	Nevada City
country store	19008 Tyler Foote Crossing Rd	nevada city
Camp Bountiful	19386 Holly Ravine Rd	Nevada City
Camp Augusta, Incorporated	17530 Lake Vera Purdon Rd	Nevada City
Nevada City Auto Service	345 Railroad Ave	Nevada City
PG&E: Narrows 1 Powerhouse	Englebright Road	Nevada County
PG&E: Deer Creek Powerhouse	12 mi. ne/o Nevada City	Nevada County
PG&E: Signal Peak Telecom Site	Cisco Grove (39.3390, -120.5358)	Nevada County
Verizon Wireless Donner Ski Ranch	19320 Donner Pass Rd	Norden
T-MOBILE WEST CORPORATION SC14330Z	10244 Soda Springs Rd	NORDEN
T-MOBILE WEST CORPORATION SC09374A	19500 Donner Pass Rd	NORDEN

Facility Name	Street	City
Donner Ski Ranch	19320 Donner Pass Rd	Norden
Donner Ski Ranch Shop	19433 Donner Pass Rd	Norden
Union Pacific - Norden Snowshed	Snow Shed Complex	Norden
Sprint Cell Site SF03UB791	19320 Donner Pass Rd	Norden
AT&T Mobility- DONNER SUMMIT (USID9912)	19320 Donner Pass Rd	NORDEN
Ridge Rock Quarry	22800 Pleasant Valley Rd	North San Juan
PG&E: Columbia Hill Substation	10577 Tyler Foote Crossing	North San Juan
North San Juan Transfer Station	10125 Flume St	North San Juan
Twin Ridges School District Grizzly Hill	16661 Old Mill Road	North San Juan
AT&T California - TB059	29468 State Highway 49	North San Juan
Sierra Superstop No. 3	29405 49 Hwy	North San Juan
Verizon Wireless Lake Wildwood	14050 Pleasant Valley Rd	Penn Valley
Penn Valley True Vallue Hardware	17387 Penn Valley Dr	Penn Valley
Lake Wildwood WWTP	12622 Pleasant Valley Rd	Penn Valley
Lake Wildwood Clubhouse	11255 Cottontail Way	Penn Valley
Heausers Plaza Tire - 2065	17317 Penn Valley Dr	Penn Valley
Ready Springs Union School	10862 Spenceville Rd	Penn Valley
Williams Ranch School	14804 Pleasant Valley Rd	Penn Valley
HP Automotive	17145 Apache Ct	Penn Valley
Pleasant Valley School	14685 Pleasant Valley Rd	Penn Valley
Penn Valley Mini Mart	17562 Penn Valley Dr	Penn Valley
Penn Valley Shell	16978 Penn Valley Dr	Penn Valley
Sean Ingram's Auto Body	10183 Commercial Ave	Penn Valley
Penn Valley Auto Service Inc.	10165 Commercial Ave	Penn Valley
Phil Young Automotive	13728 Smith Ln	Penn Valley
Sierra Superstop No. 16	10067 Pleasant Valley Rd	Penn Valley

Facility Name	Street	City
Eagle Quick Lube	17548 Penn Valley Dr	Penn Valley
T-MOBILE WEST CORPORATION SC09611A	18960 Penn Valley Dr	Penn Valley
AT&T California - TBR36	18960 Penn Valley Dr	Penn Valley
Community Center	18955 Wildflower Dr	Penn Valley
Gold Country Automotive	17272 Cattle Dr	Rough And Ready
Verizon Wireless Penn Valley	17212 Cattle Dr	Rough Ready
Skippers Cove Marina	13104 Marina Dr	Smartsville
Englebright Lake - U.S. Army Corps of Engineers	12896 Englebright Dam Road	Smartsville
PG&E: Narrows Substation	3 mi. n/o Hwy. 20 off Mooney Flat Road	Smartville
Caltrans-Kingvale	51121 Donner Pass Rd	Soda Springs
PG&E: Spaulding 3 Powerhouse	Longitude: -120.635676 Latitude: 39.337658	Soda Springs
Auburn Ski Club	19959 Boreal Ridge Rd	Soda Springs
Sugar Bowl Fuel	22082 Donner Pass Rd	Soda Springs
PG&E: Spaulding 1 & 2 Powerhouses	11028 Lake Spaulding Rd	Soda Springs
PG&E: Summit Substation	Soda Springs Road, .3 mi. from Donner Pass Road	Soda Springs
Soda Springs Ski Area	10244 Soda Springs Rd	Soda Springs
Pla Vada Woodlands Homeowners	5000 Pla Vada Dr	Soda Springs
Serene Lakes Enterprises	21760 Donner Pass Rd	Soda Springs
Donner Summit PUD WTP	10113 Lake Angela Dr	Soda Springs
Donner Summit Public Utility District WWTP	53823 Sherritt Ln	Soda Springs
Verizon Business: NRDNCA	10071 Soda Springs Rd	Soda Springs
AT&T California - TB069	21908 Donner Pass Rd	Soda Springs
AT&T Mobility - Signal Peak (9911)	I-80 & Rattlesnake Road Signal Peak	Soda Springs
T-MOBILE WEST CORPORATION SC09365A	HIGHWAY 80 & SIGNAL PEAK	SODA SPRINGS
Central Sierra Snow Lab	10162 Bunnyhill Rd	Soda Springs
CenturyLink Communications LLC	190.9 Upmp	Soda Springs

Facility Name	Street	City
Verizon Wireless Yuba Pass	End Of Fordyce Rd	Soda Springs
Donner Spitz	21455 Donner Pass Rd	Soda Springs
Caltrans-Truckee	10152 Keiser Ave	Truckee
AT&T CORP - CA9749	10065 DONNER LAKE RD	TRUCKEE
Flyers #3003	10250 W River St	Truckee
Verizon Wireless Tahoe Donner (Alder Hill)	12744 Brookstone Dr	Truckee
Verizon Wireless Boca	16774 Hinton Road I-80 E of Truckee W of Florist	Truckee
AT&T CORP - CAQ675	10136 Hirschdale Rd	Truckee
Verizon Wireless Truckee	Indian Jack Road	Truckee
Al Pombo	10765 River St	Truckee
The Auto and Tire Doctor Inc.	12000 Pioneer Tr	Truckee
Coachland MHP	10100 Pioneer Tr	Truckee
Grays Crossing Natural Resource Management Center	10874 Henness Dr	Truckee
Martis Creek-US Army Corps of Engineers	11989 Martis Dam Rd	Truckee
Barry's Auto Repair	10855 West River St	Truckee
California Highway Patrol - Truckee	10077 State Hwy 89 S	Truckee
CA Highway Patrol Donner Pass C.V.E.F.	12800 Interstate 80	Truckee
Donner Lake Watersports	12593 Donner Pass Rd	Truckee
Donner Park Auto Repair & Exhaust	12373 Donner Pass Rd	Truckee
Heavy Equipment Construction	10928 Glenshire Dr	Truckee
Mountain Hardware And Sports	11320 Donner Pass Rd	Truckee
LEVEL 3 COMMUNICATIONS - TRUCKEE - TRUCCADH	10136 Hirschdale Rd	Truckee
Pac Bell dba AT&T TB746	11012 West River Street	Truckee
Robert E. Sutton Company, Inc.	10531 E River St	Truckee
Shepherds Auto Body	10960 W River St	Truckee
Mountain Classic Truck Service	11084 W River St	Truckee

Facility Name	Street	City
Advanced Body & Frame	10745 W River St Ste K	Truckee
Stewart's Marine Service, Inc.	10939B Industrial Wy # 102	Truckee
Tahoe Donner Maintenance	14514 Northwoods Blvd	Truckee
Boreal Ridge Ski Area	19749 Boreal Ridge Rd	Truckee
Tahoe Donner Vehicle Maint Bldg	12850 Northwoods Blvd	Truckee
Town of Truckee Corporation Yard No. 2 - 4091	10969 Stevens Ln	Truckee
Airport Well	10305 Airport Rd	Truckee
Truckee Rents, Inc.	10410 River Park Pl	Truckee
Truckee Sanitary District Alder Creek Lift Station	13797 Alder Creek Rd	Truckee
CVS Pharmacy No. 9174	11411 Deerfield Dr	Truckee
Donner Gate Enterprises Inc.	12353 Deerfield Dr	Truckee
Truckee Shell	10278 State Highway 89	Truckee
Truckee River RV Park	10068 Hirschdale Rd	Truckee
Waltman Construction, Inc.	10414 Panamint Dr	Truckee
AT&T California - TB082	10022 Spring St	Truckee
R-1 Snow Removal Inc.	11183 Trails End	Truckee
Tahoe Donner Association-Golf Course Maintenance	13000 Northwoods Blvd	Truckee
Town of Truckee Corporation Yard - 0235	14528 Northwoods Blvd	Truckee
Town of Truckee Maintenance Yard - 0234	10720 Riverview Dr	Truckee
TDPUD Maintenance	11570 Donner Pass Rd	Truckee
Martis Valley Well	12180 Joerger Dr	Truckee
Truckee North Tahoe Materials	12275 Pioneer Trl	Truckee
UNION PACIFIC TRUCKEE YARD	10205 Church St	Truckee
State of California Agricultural Inspection Station	12750 Interstate 80	Truckee
Al Pombo Inc. (Shop)	10599 River St	Truckee
CalFire Martis Valley Station	10277 Truckee Tahoe Airport Rd	Truckee

Facility Name	Street	City
Coyote Moon Golf Course	10685 Northwoods Blvd	Truckee
Donner Memorial State Park	12593 Donner Pass Rd	Truckee
Fast and Pleasant Automotive Repair	10855 West River St	Truckee
Glenshire/Devonshire Res Association	15726 Glenshire Dr	Truckee
Halls Excavating	10911 Glenshire Dr	Truckee
Donner Park 76	12373 Donner Pass Rd	Truckee
Truckee 76	10041 Donner Pass Rd	Truckee
Curves Building, Tahoe Forest Hospital	10054 Pine Ave	Truckee
J & L Food Mart	12105 Donner Pass Rd	Truckee
Quality Automotive and Smog	11357 Deerfield Dr Ste A	Truckee
Sherwin-Williams #8197	11025 Pioneer Tr Ste 106	Truckee
Snowtech Inc.	17356 Northwoods Blvd	Truckee
Southwest Gas - 4007	10682 Pioneer Tr	Truckee
Trout Creek Recreation Center	12790 Northwoods Blvd	Truckee
Tahoe Forest Hospital	10121 Pine Ave	Truckee
Truckee Tahoe Propane	10816 West River St	Truckee
Truckee Tahoe Propane - 0796	10383 River Park Pl	Truckee
Village Green MHP	11070 Brockway Rd Ste A	Truckee
East River Development	10689 River St	Truckee
Save Mart #627	11399 Deerfield Dr	Truckee
Summit Builders	11050 Pioneer Tr Ste 100	Truckee
Tahoe Instant Press	12177 Business Park Dr # 9	Truckee
Tahoe Timber Trails	16021 Hobart Mills Rd	Truckee
Truckee Beacon	10021 State Highway 267	Truckee
Truckee Fire Protection District - 0059	11479 Donner Pass Rd	Truckee
Al Pombo Inc. (Hobart)	14825 Old Highway 89 North	Truckee

Facility Name	Street	City
Old Greenwood Golf Course	12646 Caleb Cir	Truckee
Old Greenwood Pavillion	13051 Fairway Dr	Truckee
Tahoe Donner Top Shop	11509 Northwoods Blvd	Truckee
Tahoe Truckee Sanitation Agency	13720 Butterfield Dr	Truckee
D R Automotive	10855 W River St	Truckee
Rite Aid No. 6108	11230 Donner Pass Rd	Truckee
Truckee Sanitary District	12304 Joerger Dr	Truckee
Tahoe Truckee Unified School District	12485 Joerger Dr	Truckee
T-MOBILE WEST CORPORATION SC09373A	19795 Boreal Ridge Rd	TRUCKEE
Martis Valley Plant - Teichert Materials	13879 Joerger Dr	Truckee
T-MOBILE WEST CORPORATION SC09375A	10570 State Highway 267	TRUCKEE
T-MOBILE WEST CORPORATION SC09808A	16774 Hircshdale Rd	TRUCKEE
T-MOBILE WEST CORPORATION SC09520A	11280 Valley Rd	TRUCKEE
T-MOBILE WEST CORPORATION SC14309A-CHP EAST	Highway 80 & Union Mills Road	TRUCKEE
Sagehen Creek Field Station	11616 Sagehen Rd	Truckee
Truckee Donner Parks & Rec	10500 Brockway Rd	Truckee
Old Greenwood Well	12701 Fairway Dr	Truckee
AT&T Mobility - WEST TRUCKEE (15998)	11280 Valley Rd	Truckee
Bobs Auto Works	10855 W River St	Truckee
Truckee Tahoe Airport	10356 Truckee Airport Rd	Truckee
Prosser Well	Lot A Overland Trail	Truckee
Glenshire Drive Well	Lot H Glenshire Dr	Truckee
Safeway 1266	11290 Donner Pass Rd	Truckee
Truckee Tahoe Propane	10685 W River St	Truckee
O'Reilly Auto Parts #4426	11359 Deerfield Dr	Truckee
Verizon Business: TRUBCA	East River St	TRUCKEE

Facility Name	Street	City
Fast Lane #4	11991 Highway 267	Truckee
Hy-Tech Auto and Smog Inc.	10745 W River St Ste H	Truckee
California Highway Patrol Ski Tow Hill Radio SIte	39-19-11.0 120-10-59.0 Off Blue Berry Rd	Truckee
Daniels auto repair	11084 W River St	Truckee
Avant Werks	11050 Pioneer Trl Trlr 102	Truckee
FirstElement Fuel	12105 Donner Pass Rd	Truckee
Ruppert Inc.	11168 W River St	Truckee
Truckee Community Swimming Pool	8924 Donner Pass Rd	Truckee
Genes Pineaire Campground	31041 Relief Hill Rd	Washington
Twin Ridges School District Washington	1 School Rd	Washington
PG&E: Washington Diesel Plant	Relief Hill Road Off Washington Road	Washington
Red Ledge Mining Company, LLC	13245 Washington Road	Washington
Washington Transfer Station	15886 Gaston Rd	Washington

Source: Nevada County

Appendix G Historic Facilities Inventory

Site Number	Name	Description
NEV 95-07	Canyon Creek Bridge	The Canyon Creek Bridge was built in 1895 by Cotton Brothers and Co. of Oakland, California, for $1,725. Completed two years earlier than the Old Auburn Bridge (NEV 95-06), it is of similar construction and design. Underneath it is the reservoir that supplies water to the residents of the town of Washington. Canyon Creek is a major tributary of the South Yuba River, and the scenic view of the rapids and falls above the bridge is outstanding.
NEV 96-01	Edward Coleman House	The Edward Coleman House. Edward Coleman built this house in 1866. While residing here, Coleman was President/Superintendent of the Idaho Mine, Director of the Nevada County Narrow Gauge Railroad, and had interests in the Mohawk Lumber Company. Coleman sold this house in 1893.
NEV 10-01	Anthony House	Anthony House and Ranch. In 1849 a Mr. Anthony staked out 160 acres on the north side of Deer Creek on the road which would become part of the Marysville-Henness Pass-Virginia City trade route, and built a house and out-buildings. While further details about Mr. Anthony are unknown, the name Anthony House prevailed through a succession of owners. The property was up for sale in 1852 and purchased by Mr. S. P. French. By that time it was a flourishing stage stop, serving as a hotel, restaurant, livery stable and post office. The original house burned down in 1876 but was quickly rebuilt. Subsequent owners included William Henry Davey, Nevada County Supervisor 1908-1916 and later his son, Frank Davey. Stage stop and post office operations continued to 1906 when the post office was moved to Smartsville. Thereafter, declining traffic on the trade route led to farming and cattle raising as the main use of the property. By 1970 when Boise-Cascade began development of this area, the property had fallen into disrepair and the house was burned down as a training exercise by the Penn Valley Fire Protection District. Construction of Anthony Dam here on Deer Creek submerged any remains of this historic site under Lake Wildwood.
NEV 05-01	The Glasson House	This Victorian/Greek Revival house was built in 1866 for Miles P. O'Connor, who came to California in 1849 and to Nevada County in 1852. He served as justice of the peace for Little York township in 1852-53 and for Grass Valley 1862-69. He served one term in the state assembly and two in the state senate. He earned a fortune from the famous Idaho gold mine and was instrumental in creation of the Nevada County Narrow Gauge Railroad. After selling this house to John Polglase in 1873, he moved to San Jose and funded various institutions, including a sanitarium later known as O'Connor Hospital. John Polglase, a hard-rock miner from Cornwall, came to Grass Valley in 1864. In 1875 Polglase bought an interest in John Glasson's grocery and provisions store while continuing to work underground in the Idaho mine. In 1882 he sold the house to his partner, and Glasson and his heirs owned it from then until 1973. John Glasson, like Polglase, came here in 1864 from England, and like O'Connor he played a prominent role in Nevada County history. He bought the local gas company in 1885-86 and in 1888 merged it with the Grass Valley Electric Light and Motor Co. He built the county's first hydroelectric plant at Deer Creek Falls and was a director and treasurer of the Narrow Gauge railroad. His daughter Bernice was a major benefactor to the Sierra Nevada Memorial Hospital, and she lived in this house until her death in 1966.

Site Number	Name	Description
NEV 10	Gilmore Flying Field	Lyman Gilmore, Jr. 1874-1951. Lyman Gilmore, Jr. established the first commercial airport on this site in 1907. To him and his memory the people of this community dedicate this school as the Lyman Gilmore School. Landmark registered 1971. Plaque dedicated 1972. Text of plaque: "Gilmore Flying Field. This windsock marks the site of one of the first flying fields in the United States. Here Lyman Gilmore, a contemporary of the Wright Brothers, pioneered in aviation by designing and building his own planes and gliders as early as 1898." Note: This pole was used originally at Gilmore Field, but Gilmore did not use this field until the winter of 1911-12. The CETA mural on the north wall of multipurpose building was painted in 1978.
NEV 12	Emmanuel Episcopal Church	Historic Emmanuel Episcopal Church. Oldest Episcopal edifice in California. First services April 23, 1854 by Rt. Rev. William I. Kip, Bishop of Calif. This building opened for worship Aug. 1856. Landmark registered 1972. The church was declared eligible for National Landmark status in 1982, but the vestry declined to have the church registered. Note: The first services mentioned above were held in "a public hall" according to an account by Bishop Kip. On December 11, 1856, the Gold Hill Mining Company donated land to the parish that was bounded by Church, Walsh and Mill streets. The present church opened for worship in 1858. It is the oldest existing Episcopal Church in continuous use in California.
CHL 292	Lola Montez House	Lola Montez 1819-1861 Countess of Landsfeld. In her home which occupied this site, Lola's social salons 1853-1855 attracted men of vision whose investments and technology founded Nevada County's gold quartz mining industry. She brought culture and refinement to this rude mining camp. A mistress of international intrigue and a feminist before her time she is one of history's most recognizable women and a founder of today's cosmetic industry. Note: Lola's house had been the office of Grass Valley Quartz Mining Co., first consolidated effort at deep underground mining. Also site of first school in Grass Valley.
NEV 28	Caroline Mead Hanson House	Caroline Hanson House. Home of the originator of Grass Valley's 'Donation Day' that began In 1883. Mrs. Hansen, an invalid, sat in the bay window of her home and watched the children troupe to school. Hearing of the Ladies Relief Society's shortage of funds she suggested a plan to help the needy share the Feast of Christmas. Each child would bring a stick of wood and a potato to school on the same day named by the school superintendent. The potatoes would be put in a sack provided by the janitor; the wood would be piled in the school yard. On the following day these donations would be removed by the Relief Society and dispensed as needed. Mrs. Hansen conveyed her plan in a letter to the Grass Valley Daily Union that was published November 20, 1883. Since that date thousands of Grass Valley school children and citizens have marched in the Donation Day parade. Plaque dedicated 1995 by Daughters of the Golden West and Native Sons of the Golden West. Text of plaque: "Homesite of Caroline Mead Hanson. Whose idea sparked the annual Donation Day sponsored by Grass Valley Ladies Relief Society since 1883."
NEV 29	Dr. W. C. Jones Home Site	Dr. W. C. Jones came to Grass Valley in 1874 after serving as physician and surgeon for the Central Pacific Railroad Co. during construction of the railroad between Colfax and Reno. He had three sons, Will, John, and Carl, who along with their father served the community as doctors until the last son died in 1944. In 1904 Dr. John Jones opened the first private hospital in Nevada County-the W. C. Jones Memorial Hospital, Grass Valley. A fourth son, George, became Superior Court Judge of Nevada County, serving from 1908 until 1925 and again from 1938 until he retired in 1947. Note: The city removed the historic house to make room for the police department.
CHL 293	Crabtree House	Lotta Crabtree was born in New York in 1847. In 1852 the gold fever brought Mr. Crabtree to California, and a year later his wife and Lotta followed. Several months after arriving in San Francisco Mrs. Crabtree and Lotta went to Grass Valley and started a boarding house for miners with Mr. Crabtree. It was here that Lotta met Lola Montez, who taught her to sing and dance. Lotta made her first public appearance in Plumas County, which led to a successful career on stage, both here and abroad.

Site Number	Name	Description
CHL 297	Gold Quartz Discovery	This tablet commemorates the discovery of gold-bearing quartz and the beginning of quartz mining in California. The discovery was made on Gold Hill by George Knight October, 1850 The occurrence of gold-bearing quartz was undoubtedly noted here and elsewhere about the same time, or previously, but the above discovery created the great excitement that started the development of quartz mining into a great industry. The Gold Hill Mine from 1850 to 1857 is credited with a total production of $4,000,000. Landmark registered by State. Note: Name of discoverer should be George McKnight.
CHL 855	Mount Saint Mary's Convent and Academy	Mt. St. Mary's School. To this spot Father Thomas J. Dalton brought the Sisters of Mercy in 1863. The Sisters of Mercy have taught here since that date. Landmark registered by State 1972. Second plaque dedicated 1972. Text of second plaque: "Built by the Reverend Thomas J. Dalton and dedicated May 2, 1865 by Bishop Eugene O'Connell as Sacred Heart Convent and Holy Angels Orphanage. Under the Sisters of Mercy it served from 1866 to 1932 as the first orphanage of the Northern Mines. It functioned as an academy (1868-1965) and a convent (1866-1968)." Designated a National Historical Landmark on May 3, 1974. Reference No. 74000543.
CHL 914	The Holbrooke Hotel	California's oldest hotel in continuous operation. Among its century-old archives are names of such notables as Presidents Grant, Harrison, Cleveland; authors Mark Twain, Bret Harte; boxers Corbett, Fitzsimmons; actor Gilbert Barry, and highwayman Black Bart. Present structure built in 1862 following infamous fire. Grass Valley-Sept. 25,1965. Landmark registered by State 1978. Second plaque dedicated 1978. Text of second plaque: "The present bar of the hotel has been in continuous operation since 1852, when it was known as the Golden Gate Saloon. The wooden building had a rear extension called The Exchange Hotel and offered food and lodging by January 1853. The saloon was destroyed in the fire of 1855 and rebuilt out of fieldstone with a brick front. The Holbrooke, built in 1862, had the adjacent Golden Gate Saloon incorporated in the hotel building." Third plaque dedicated. Text of third plaque: "Presidential Square. These Presidents of the United States have visited this site: Ulysses S. Grant, James A. Garfield, Benjamin Harrison, Grover Cleveland, Herbert Hoover." Note: No evidence exists that Bret Harte or Black Bart visited Grass Valley.
ECM 69	Chinatown Grass Valley (Site)	Chinatown, Grass Valley 1850-1938. Of the many gold rush Immigrants the Chinese were noted for their honest, sober and industrious characteristics. Each mining camp had its Chinatown and Grass Valley was second only to San Francisco's. Former residents Duck Egg, Georgie Bow, Ah Louie, and the pioneer Yuen, Gon and Tinloy families are an integral part of Nevada County's history. Note: Georgie Bow went to China, where he was in the diplomatic service. Chinatown was torn down in 1939 to make way for a truck terminal. Now the site is occupied by a hotel and parking lot.
ECM 72B	Washington Brewery	Founded 1858 by John Frank, the brewery operated until prohibition. The ownership remains in the Frank family to the present time. Note: The Frank family sold the building in 1973.
ECM 73A	Hard Rock Gold Mining	Hard Rock Gold Mining 1850-1957. Within a one-mile radius of this spot more than 500 million dollars worth of gold was produced by deep mines, including the Empire, North Star and the Idaho-Maryland. During that time this was the world's most concentrated, efficient and innovative gold mining region.
ECM 77A	Nevada County Narrow Gauge Railroad	Nevada County Narrow Gauge Railroad ran from here 5 miles N to Nevada City and 17 miles S to Colfax. Built 1874-76 by John F. Kidder whose home is NE corner. Depot and shops were 50 yards N, rails removed 1942. Sarah, widow of builder, was first woman R.R. president. Note: The Kidder home burned twice and had to be removed.

Site Number	Name	Description
ECM 90A	Binkelmann Brewery	Born in Wurtemberg, Germany on January 2, 1828, David Binkelmann came to Grass Valley in 1853 after only a year as a new immigrant in New York. He . . . bought a half-interest in a brewery with John Frank, operating in the rear of the Western Hotel which burned in 1856. The brick brewery was constructed in 1861, replacing a smaller 1856 frame building on North Auburn Street. Frank Richard bought out the partner in 1861 and was in turn bought out by Binkelmann shortly later. He ran the brewery until his death on May 23, 1894, leaving his wife Sophie to carry on until her death in 1915, when the brewery was bequeathed to her son, David J. Binkelmann.
ECM 91	Empire House	This site at the lower end of Boston Ravine on the old main road from Grass Valley to Auburn has been the location of a public house since 1851. Charles Behrisch was the owner from 1851 to 1885. Ownership changed hands many times through the years. Purchased by Dominic Pajnich on August 1,1933, and was burned in 1934. Replaced with a 14 room hotel, named Empire Inn. Upstairs closed off in 1964, but remains a popular food and beverage stop today.
NEV 33	Site of Idaho-Maryland Mine	The Idaho quartz mine was discovered in 1863. It prospered under the Coleman brothers from 1867-93, then consolidated with the Maryland and other small mines. Eventually it became one of the 'Big Three' of the Northern Mines, the other two being the Empire and the North Star. Its final years under the management of Errol MacBoyle were very productive. He developed a revolutionary method of shaft sinking, using a huge core drill called the Newsom drilling machine. World War II and government order L208 brought about final closing.
NEV 05-02	North Star House	This 1905 structure was built for Arthur D. Foote, manager of the North Star mine from 1895 to 1913, and his wife, Mary Hallock Foote, a noted 19th century author and illustrator. The structure was designed by Julia Morgan, California's first licensed female architect and designer of the Hearst properties at San Simeon, Asilomar in Pacific Grove and numerous buildings on the U. C. Berkeley campus, and in total, over 700 buildings. The property is representative of the era that brought Nevada County to the forefront of gold production in California.
NGW 69	Grass Valley Hardware	Through the years of prospecting hydraulic and hardrock mining this hardware business, one of California's oldest, has served the community. In continuous operation at this site since 1854. Note: After 1989 this pair of buildings no longer contained a hardware business.
NGW 76B	Grass Valley's Famed Maple	This beautiful, Brandywine Maple, subject for artists and photographers, was brought from the fields of Gettysburg, and planted in 1876 by the widow of the poet and editor of the Grass Valley National newspaper, John Rollin Ridge. Surviving the fire which leveled the home, it now adorns the lovely Victorian home built by Mr. and Mrs. Charles Edward Clinch in 1900. Roy Clinch Tremoureux, grandson, notes proudly that many trees which beautify our town have come from this famed maple.
NGW 84	Saint Patrick's Cemetery	St. Patrick's Cemetery 1853. In memory of the pioneers buried here. A sign nearby contains this information: "Site of the first Catholic Church in Grass Valley. Dedicated on October 25,1853. Rev. John Shanahan, 1st Pastor. Served as church till December 5, 1858. Served as the first Catholic School (1859-1879)."
NGW 85C	Bell Hill School Bell	The Bell Hill School Bell 1877. This school bell is lovingly dedicated to the children and teachers of the Grass Valley School District who daily answered its melodious tone. The bell was cast at the Buckeye Bell Foundry in Cincinnati by Vanduzen and Tift, and the rotary yoke was patented in 1868. The bell was placed in this beautiful monument by Harold J. Perry, a member of the Grass Valley Host Lions Club. Dedicated March 30,1985 as a part of the 100th Anniversary Celebration of Quartz Parlor No. 58.
NGW 88A	Reliance Hose Company No. 3	This Building, Housing Reliance Hose Company No. 3 since 1891, is hereby marked for preservation, thus honoring The Volunteer Fire Department of Grass Valley March 26, 1988 100th Anniversary of Manzanita Parlor #29, Native Daughters of the Golden West.

Site Number	Name	Description
NGW 91	Dow Alexander Park	Formerly known as the City Square, this park was established by the Grass Valley Women's Improvement Club in 1911, as a place of rest for patrons of the Nevada County Narrow Gauge Railroad. It was dedicated to the pioneers and veterans of the Spanish American War. Second plaque dedicated 2004. Text of second plaque: "Columbiad Cannon - 1850. Last on duty at Fort Point on San Francisco Bay. Grass Valley Women's Improvement Club arranged with the US War Department for donation to be placed in City Square, now Dow Alexander Park. Transferred from Benicia Arsenal to here in 1911. Only known example of its type to exist. Weight: 9100 pounds." Note: The beautiful red maple in the park was given by Mrs. Alice Beatty, daughter of John Rollin Ridge (see NGW 76B).
NGW 2000	Williams Stationery Store	This building is known as "The Brick Store of Silvester and Salaman, it was built in 1854 and completed in 1855 by Henry Silvester and Abraham Salaman. It is both the first and oldest original brick (& stone) building in Grass Valley and the second oldest brick building in Nevada County. There have only been three owners of this building, Henry Sylvester, Paul Wesley Michell, and Elton and Helen Williams. Only five businesses have occupied the store in 145 years, H. Silvester Grocery, H. J. Fuchs Grocery, C. W. Jenkin Variety Store, Tresize Brothers Stationery Store, Williams Brothers, later changed to Williams Stationery Store."
NHL 92	Grass Valley Public Library (Josiah Royce Library)	1854-Himalayan Fir-1916. Planted In Memory of Dr. Josiah Royce One of America's greatest scholars whose birthplace is the site of this Library. Note: The fir tree is now gone. Second plaque dedicated 1933 by the Harvard Club of San Francisco. Text of second plaque: "1855-Josiah Royce-1916. Born in Grass Valley Alumnus of the University of California. Renowned Harvard teacher and eminent American philosopher." Third plaque and maple tree dedicated behind library ca. 1955 by the Harvard Club of San Francisco. Text of third plaque: "Royce Centennial, to the memory of Josiah Royce Born here on November 20,1855. This tree was planted by the Harvard Club of San Francisco Veritas." Designated a National Historic Landmark on March 26, 1992. Fourth plaque dedicated 1992 by the Friends of the Nevada County Libraries. Text of plaque: "Gift of Carnegie Corporation of New York. Dedicated August 4,1916." Note: In 2003 the County Board of Supervisors named the library for the renowned philosopher.
NHS 61	Idaho Maryland Core Sample	Core-Weight 11 Tons. Portion taken from Idaho Shaft No. 2 bored to a vertical depth of 1,125 feet, diameter of shaft five feet, the core boring barrel was invention of J. B. Newsom, mining engineer. Was used as an experiment by the Idaho Maryland Mine Corporation under general manager Errol MacBoyle. With the cooperation of the directors of the 17th District Agricultural Association, through their manager, Malcolm E. Hammill, this core was erected in July 1961. Note: The Newsom drilling machine bored a round shaft, using no explosives. It was cheaper because no timbering was needed. Similar cores are displayed at Calanan Park (NGW 65C) and Empire Mine Park (CHL 298).
MISC 80	Red Ledge Stamp Mill	Stamp Mill. This three stamp mill was donated to the City of Grass Valley by Mrs. Stella Tracy, owner of the famous Red Ledge Mine near Washington, Nevada County, where this mill crushed tons of gold bearing ore for many years. It is erected here in memory of the 'Cousin Jack' miners who came from Cornwall, England with their knowledge of hardrock mining used to bring gold bearing quartz to the surface from the deep mines of the area. Frank Knucky, Mayor, Dennis Hill, Asst. Mayor, Councilmen: Jerrold Brust, Edward Scofield, Al Frisch Sr.
CHL 298	Empire Mine	This plaque marks the site of the Empire Mine, noted for its continuous operation 1850-1957 producing over $120,000,000 in gold. Designated a National Historical Landmark on December 9, 1977. Reference No. 77000169.
CHL 843	North Star Powerhouse (Mining Museum)	The North Star Powerhouse, built by A. D. Foote In 1895, was the first complete water powered compressed air transmission plant of its kind. Compressed air, generated by Pelton water wheels, furnished power for the entire mine operation. The 30 foot Pelton wheel was the largest in the world, and was in continuous use for over 30 years. Two other Pelton wheel plaques were added in the 1990s.

Site Number	Name	Description
VET 21	World War I Memorial, Grass Valley	Honor Roll. Heroes from the Grass Valley District who gave their lives for their country 1917-1918: Anthony J. Bevilacqua, Robert H. Beyer, Lawrence A. Brasher, Melvyn Frandy, Isaac Leslie Fleming, Hedley Hill, Lenville Dooley Jatunn, William Hague, William A. Kneebone, Albert Pinkham, William Hawley Moran, James Rodgers, Clarence Crase Thomas, J. M. Spencer, Elton Thomas Whiting, John Edward White. Note: The above inscription is on a very large monument. Surrounding it is a grove of 16 trees, each with a marker in front inscribed with the name of one of these men and the American Legion logotype. Memorial Park was built in 1921 in memory of World War I dead. The land and swimming pool were donated by the Empire Mine Co., the club house was donated by the Idaho-Maryland Mine Co., and people of the area subscribed $8,000.
VET 54	Veterans Memorial Flagstaffs, Grass Valley	Lest We Forget. This memorial flagstaff dedicated in eternal memory of those war veterans resting within the portals of this cemetery who served in the wars of our nation and those who gave their lives defending America's eternal freedoms.
VET 66	Vietnam War Memorials, Grass Valley	Gary Ames Miller Memorial. This memorial is dedicated to all American servicemen and women of the Vietnam War in the name of Gary Ames Miller, United States Marine Corps, the first local serviceman to give the full measure for God and country in this conflict. All Americans owe an endless debt of gratitude to the gallant men and women of our armed services for preserving our way of life, a life endowed with justice, freedom and democracy. Second plaque dedicated 1974 by the Hague-Thomas-Hegarty (now Frank Gallino) Post No. 130, American Legion. Text of second plaque: "Western Nevada County servicemen killed in action in Vietnam: Edward Alien Ownry 09/09/65, Gary Ames Miller 06/01/66, Douglas A. Rix 02/28/67, Bruce Allan Jensen 08/27/67, Alan Robert Haugen 04/06/68, Ronald J. Walber 04/25/68, Thomas W. Cranford 05/09/68, Harry Lee Theurkauf 06/12/68, Donald Ray Webb 10/12/68, Ernest James Stidham 12/22/68, John R. Kunkel 01/13/69, Philip A. Tritsch 01/28/69, Kenneth W. Scurr 05/31/69, Michael D. Goeller 06/01/69, David E. Freestone 08/27/69, James Deeble 04/17/70." Note: These plaques are mounted on a huge drill core.
VET 55	World War II & Korean War Memorial	World War II 1941-1946 Korean 1950-1955. To the men and women who made the supreme sacrifice for our country and her noble purpose, in memory of those who died that liberty might live. This plaque donated by Grass Valley Elks #538. Note: Plaque is on concrete monument that includes a flagpole and benches.
ECM 94	Nevada County Traction Co.	Nevada County Traction Co. 1901-1924. Four 28-ton standard gauge street street cars ran from 100 yards north of this spot five miles to Pine and Broad streets, Nevada City. Car barns and power plant were located mid-way at Glenbrook. Line was shut down after a winter storm Jan. 1924, never to run again-a victim of cars and buses.
CHL 799	Overland Emigrant Trail--Highway 49	At this point the old Overland Emigrant Trail approaches the present highway. More than 100 years ago it resounded to the creaking wheels of pioneer wagons and the cry of hardy but footsore travelers buoyed by the realization that their long trip to the goldfields was about over.
CHL 832	South Yuba Canal Office	Headquarters for the largest network of water flumes and ditches In the state. The South Yuba Canal Water Company was the first incorporated to supply water for hydraulic mining. The original ditch was in use in May, 1850, and this company office was in use from 1857 to 1880. The holdings later became the vast P.G. & E. hydro-electric system. Second plaque dedicated 1987 by Native Sons of the Golden West. The plaques are mounted on adjacent brick buildings. The one on the left originally was the Potter Building and the other began life as the City Drugstore, Both survived the great fire of 1856 and are two of the oldest in Nevada City.

Site Number	Name	Description
CHL 863	Nevada Theatre	Opened Sept. 11, 1865 with comic Dan Setchell and dancers Worrell Sisters. Built by Geo. S. Pierce. Mark Twain, Emma Nevada, Jack London, Gilbert Barry and Richard Jose performed here. Movies shown from 1908-1958 Acquired 1967 by Liberal Arts Commission for restoration. Landmark registered by State 1973. Second plaque dedicated 1974. Text of second plaque: "California's oldest existing theatre building, the Nevada, opened September 9, 1865. Celebrities such as Mark Twain, Jack London and Emma Nevada have appeared on its stage. Closed in 1957, the theatre was later purchased through public donations and reopened May 17, 1968 to again serve the cultural needs of the community." Designated a National Historical Landmark on March 14,1975. Reference No. 73000417. Note: Jack London's appearance in the Nevada Theatre is undocumented.
CHL 899	National Exchange Hotel	Originally the Bicknell Block, stagecoach, mail, express and telegraph center in mining days. Companies which became the Pacific Gas & Electric formed here. Site of first whipping post in state. Facade unchanged since 1854. Landmark registered by State 1972. Second plaque dedicated 1976. Text of second plaque: "This hotel, one of the oldest in continuous operation west of the Rockies, opened for business in August, 1856. Originally known as the 'Bicknell Block,' the structure consists of three common-walled buildings of simple brick construction embellished with classic revival and wrought iron railing ornamentation." Designated a National Historical Landmark on October 25, 1973. Reference No. 73000416.
ECM 65A	Nevada City Firehouse No. 1	Nevada Hose Co. No. 1 Occupied this firehouse from May 30, 1861 to 1938. Hand pulled hose carts, horse drawn engines and motorized pumpers all rolled out of this building to save life and property.
ECM 68A	Nevada County Narrow Gauge Railroad	Nevada County Narrow Gauge Railroad was dedicated May 20, 1876 one hundred feet east of this spot. Built by John Flint Kidder between 1874-76 it ran 22 miles from Nevada City to Colfax via Grass Valley. Rails taken up in 1942. Sarah Kidder, widow of builder, world's first woman railroad president 1901-13.
ECM 71A	Nevada Traction Company	Nevada County Traction Company 1901-1924. Our 28 ton standard gauge street cars ran from this spot five miles to Boston Ravine south of Grass Valley. Car barns and power plant located at Glenbrook mid-way. Line was victim of motor cars and busses.
ECM 72A	Ladies of the Evening	To commemorate that ubiquitous segment of society who have been unacknowledged; who though obscure, made an essential contribution to the settlement of the West.
ECM 78A	Kidd and Knox Building	Kidd & Knox Building 1856. Major commercial building since gold rush. early offices of judges, lawyers, statesmen including U.S. Senators A. A. Sargent, Wm. Morris Stewart; Calif. Supreme Court Chief Justices Niles Searls, Lorenzo Sawyer were here. Site of 'Dramatic Hall' where Edwin Booth, Lola Montez, Kate Hayes performed.
ECM 82B	Five-Stamp Mill 1893	Used to crush gold ore at the Fortuna Mine near Nevada City. Ore fed under iron 'stamps' from rear hopper. Steam, water or electric belt-driven power turned wheel which revolved cams. Donated to Nevada City by Bill Magers.
ECM 87	Pelton Water Wheel	In continuous use PG&E Drum Power House No. 4, 1928-1987. Produced 18,000 HP at 257 RPM and enough electrical power for 16,000 households. 12 ft. diameter, weight 15 tons. Built in San Francisco by Pelton Company. A Constitutional Bicentennial gift to Nevada City by Pacific Gas and Electric.
ECM 89	The Flagg Building	The Flagg Bldg. The Eternal Saloon. Built in 1856 on the site of the U.S. Hotel, this brick edifice has served Nevada City as the council chamber, Schreiber's, and since 1957 Eddie Furano's Bank Club. Here at Schreiber's Felix, the marvelous, mysterious music box thundered Strauss waltzes and "Carmen to generations with custom and good cheer."

Site Number	Name	Description
ECM 85	Powell House	Built in 1855 as the edifice of the Baptist Church. It was here that famed soprano Emma Nevada (Emma Wixom Palmer) made her debut at the age of three. In 1886 the church was remodeled as the residence of the E. T. R. Powell family. Note: The building now houses upscale apartments.
NEV 01	Original Ott Assay Office Site	Site of the Original Ott Assay Office. J. J. Ott's assay in 1859 helped develop the great Comstock Lode and the State of Nevada. Note: Ott's original Assay Office was built of wood. It burned in the fire of 1863 and Ott moved into the existing brick building next door. Designated a National Historic Landmark on April 4, 1975. Reference No. 75000447.
NEV 02	The Red Castle	Nevada City's earliest surviving brick home, built in 1860 by Judge John Williams, mine owner, businessman and civic leader, who with his family, crossed the plains in 1849. Near ruin, this house was restored by James Wade Schaar in 1963. The Red Castle stands today as a proud reminder of the part the Argonauts played in the Heritage of California.
NEV 11	Martin Luther Marsh House	Martin Luther Marsh arrived in Nevada City in 1851 after a journey from Ohio by the Nicaragua route. He worked as a carpenter, left to mine at Iowa Hill and finally returned to enter the lumber business. With his brother Dan he set up a saw mill on Little Deer Creek (now Pioneer Park). The enterprise boomed and in 1873 Marsh built this magnificent home using carefully seasoned sugar pine for the interior woodwork. His granddaughter Lucille and her late husband James B. Christie restored the house in 1955. Offers an example of excellent restoration of a fine period home. Contains many of the original furnishings. Designated a National Historic Landmark on April 11, 1973, Reference No. 73000415.
NEV 13	The Union Newspaper	Of the many historic newspapers started in the Northern Mines of the great Mother Lode during the famous gold rush era, only The Union of Grass Valley and Nevada City emerged a successful daily published for 100 years. Born in critical times-Civil War and presidential election-The Union has ever strived for unity and has evolved an independent voice supporting man and measure over partisanship. The Union is only the seventh daily newspaper in California to celebrate its Centennial under the original name. Centennial Date-October 28, 1964. Landmark registered in 1972. The plaque (mounted in the front lobby) moved with the newspaper to Sutton Way in December 1978.
NEV 15	Searls Law Office	This building completed December 18, 1872, was the law office for three generations of this family. Niles Searls, who arrived in 1851, practiced law here from 1872 to 1885. He had been elected district attorney in 1855, then district judge for Nevada, Sierra and Yuba counties, then became Chief Justice of the California Supreme Court in 1887. Fred Searls, his son, held the longest tenure in this building (1879-1929). He drafted the first incorporation papers of the hydroelectric industry of California. Carroll Searls, son of Fred, practiced here from 1915 to 1923; later became general counsel of the Newmont Mining Company in New York City; used this office until November 4,1970. Note: From 1972 until 2014 the building housed the historical society's Searls Historical Library and Archives.
NEV 16	William Morris Stewart House	William Morris Stewart Mansion Built 1855-56. Exact replica of wife's ante-bellum colonial birthplace. Only edifice of this type in California. Stewart, an early Nevada County district attorney, joined the 1859 Comstock silver rush, led battle for statehood and became Nevada's first U.S. Senator. Served 29 years known as the Silver Senator and Father of American mining law. Authored 15th Constitutional Amendment. Landmark registered 1972. Note: The Stewart family occupied the home for only a short time before selling the house in 1857 to Judge Niles Searls, whose family lived here from 1858 to 1862.

Site Number	Name	Description
NEV 17	American Hill Diggings	On this site in 1853 Edward E. Matteson developed one of the first hydraulic mines, an operation in which gold was washed from great quantities of earth with high pressure streams of water. The method used here became a standard of the mining industry through out the world. Second plaque added to first monument 2006. Text of second plaque: "The Hydraulic Monitor, Pipe & Gate Valve displayed here was installed by Native Sons of the Golden West, Hydraulic Parlor 56, Nevada City, January 2006." Note: The first approach to hydraulic mining may have been that of Antoine Chabot, said to have used water to direct gravel into the sluicebox at Buckeye Hill in 1852. But Matteson fully developed the system in 1853 by attaching a nozzle to a rawhide hose to wash down soil for gold recovery at American Hill. By the 1860s Nevada County miners universally credited Matteson with the invention of hydraulic mining and other labor-saving devices. See also NEV 21 and NGW 2010.
NEV 18	Trinity Episcopal Church (Site of Caldwell's Upper Store)	Trinity Episcopal Church. Founded as a parish in 1855, opened for Divine Service in this building on November 2, 1873. Previously on this site was 'Caldwell's Upper Store' built in 1849 for the miners of Upper Deer Creek Dry Diggings, now known as Nevada City, and Washington School, 1863, the community's first high school. The present building was erected by shipwrights working in the mines. Their craftsmanship may be seen in its construction. Note: In 1856 W. H. Orr built a brick house here that was used as a public high school from 1862 to 1869. The house was removed in 1871, two years before Trinity Church was built.
NEV 19	Aaron Augustus Sargent Homesteads	Homesteads of Nevada County's Statesman, a 49er. Arrived here In 1850 as a journeyman printer. Editor and owner of the county's first newspaper the Nevada Journal. Admitted to the bar 1854. District Attorney 1855-1857. First citizen elected to the House of Representatives 37th Congress 1861-1863; 41st and 42nd Congresses 1869-1873. First citizen elected to the United States Senate 1873-1879. Yeoman of the Republican Party. Author of the bill which created the first transcontinental railroad. Champion of the woman's suffrage movement, author of the Anthony Amendment giving women the right to vote; author of the Immigration Law, the first United States policy on immigration; author of the bill that revolutionized the mining industry, permitting mineral lands to be held in fee simple; author of the bill making the Pacific states and territories a U.S. Judicial Circuit; secured passage of the bill to establish a branch mint in the State of Nevada; secured appropriations for the construction of the mint and appraiser's building in San Francisco. Envoy extraordinary and minister plenipotentiary from the United States to the Court of Berlin, Germany, 1882-1884. Dedicated as National Historical Landmark on June 20, 1980, Reference No. 80000825.
NEV 20	Pioneer Cemetery	This cemetery was established in 1851 on a knoll back of the First Methodist Church. This gave the site its name. Many noted citizens rest here. Landmark registered about 1974. Note: The plaque is on a stone monument in the front part of the cemetery. Many famous pioneers and early settlers are buried here.

Site Number	Name	Description
NEV 21	Miners Foundry	Miners' Foundry (Allan's Machine Shop) Founded 1856. This original brick building in continuous usage as a Foundry for over 100 years. Famous Pelton waterwheel developed and manufactured here in 1878. Ingenious double-cupped bucket design by Lester A. Pelton of Camptonville and Nevada City. It became the basis for hydro-electric turbine generators throughout the world. Landmark registered 1974. Registered as California Historical Landmark 1994. Second plaque dedicated 1994. Text of second plaque: "Pelton Wheel Manufacturing Site. The Pelton Water Wheel, first commercially manufactured at George Allan's Foundry & Machine Works in 1879 was a major advancement in water power and revolutionized hard rock mining technology. Its unique feature was a series of paired buckets, shaped like bowls or spoons and separated by a splitter, that divided the incoming water into two parts. By the late 1800s, the Pelton Wheels were providing energy to operate water powered machinery throughout the world. In 1888, Lester Pelton moved his business to San Francisco, but granted continuing manufacturing rights to Allan's Foundry, where the wheels were manufactured into the early 1900s, when most local mines shifted to electric power. Note: Opened in 1855, the foundry was moved to its present location after the fire of 1856, and supplied equipment to the milling shops of many mines. Occupied in the 1970s and 1980s by the American Victorian Museum, the building now houses the Miners Foundry Cultural Center.
NEV 22	Plaza Grocery	This store, opened in 1882 by Tom Shurtleff, contained the only water-powered elevator in Nevada County. Longest continuous operation of any Nevada City grocery until it closed in 1973. Note: Building was a boarding house from 1880 to 1882. Celio family bought it in 1910 and leased to Scheemers in 1928. John Sbaffi bought the business in 1949 and purchased the building in 1965. It was a grocery until 1973, when 'The Jacks' leased it for use as a restaurant.
NEV 23	Englebright House	Notable as one of the earliest recorded houses in Nevada City and for its history of prominent owners. The tradition that the legendary William Morris Stewart built the house in 1853 cannot be documented for no deeds remain earlier than 1858. However, the house appears as the residence of P. G. Womack in the first map of the city prepared in 1855 and published in 1856. Other owners included the famous mining engineer, Capt. Thos. Mein, whose son William Wallace Mein was born in the house in 1873. The family of the late U.S. Representative Harry Englebright purchased the house in 1897 and resided there until 1959. The interior shows the work of many occupants and the exterior reflects eclectic borrowings from many past styles.
NEV 24	The Baruh House	The Baruh Home Built 1852. This site and home of two rooms was bought in 1866 by Mr. and Mrs. A. Baruh, grandparents of Mrs. Lucille Sherwood. Mrs. Clara Baruh Quigley, a charter member of Laurel Parlor No. 6, Native Daughters of the Golden West. Mr. Joseph Baruh, son, charter member of Hydraulic Parlor No. 56, Native Sons of the Golden West. Other family members: daughters Jenny Baruh Zellerbach, Rebecca Baruh Gabriel, sons Moses, Marcus and David. Mr. Aaron Baruh was a businessman operating a grocery store on Commercial Street, receiving gold dust for the commodities in the gold rush area. Later he operated a saloon and was very active in the early settlement of Nevada City. Note: Originally built by Jacob Coleman as a two-room cottage, it was expanded in 1866 by Aaron Baruh.
NEV 27A	Nevada City Library (Doris Foley Library of Historical Research)	Nevada City Public Library. Library Association formed December 19, 1857. First library was in Kidd-Knox Building, 228 Broad Street. It was moved to Oustamah Lodge IOOF No. 16 June 3, 1874. Nevada City Trustees assumed responsibilities October 1, 1902 and was moved into the Corcoran Building next to the Nevada Theater. The Carnegie Endowment was given to the city in 1907. The present library was dedicated October 4, 1907. City groups raised funds for furnishings and beautified grounds 1911. Designated a National Historic Landmark 1990,-Reference No. 90001809. The Doris Foley Library of Historical Research was formally dedicated on May 17, 1997. Note: Doris Foley, an outstanding historian and author who contributed greatly to scholarly research in this county, helped found the Historical Society and was the first librarian at Searls Historical Library.

Site Number	Name	Description
NEV 92-01	Allen Chapman House	Alien Chapman House Built in 1856. The home and dental office of Alien Chapman, Nellie Chapman, and their son C. W. Chapman. Nellie Pooler Chapman was the first woman licensed to practice dentistry in the western United States. Note: Dr. Allen Chapman and Miss Nellie E. Pooler were married in "The Red Castle" (see NEV 02) on March 24, 1861.
NEV 95-05	Pine Street Crossing at Nevada City	Pine Street Bridge 1996. Third span of Deer Creek at this location. It is a replica of the single arch steel Gault bridge (1903-1996) which replaced the suspension bridge (1862-1903) built by Andrew S. Hallidie, who later built the San Francisco cable car system. Note: Hallidie's patented structure collapsed two weeks after it opened, killing two men. The Gault bridge, similar to the one at Edwards Crossing (NEV 95-03) was named for Nevada City Mayor Alexander Gault.
NEV 96-02	Charles Marsh House	Built about 1866 by Charles Marsh, who arrived here in July, 1849, in what would later become Nevada City. Marsh was the first County Surveyor and the first County Supervisor from Nevada City. He created the water distribution system which formed the basis for P.G.& E. and the Nevada Irrigation District. Marsh was influential in the routing of the Central Pacific Railroad and served on its original Board of Directors, as well as the Board of the Nevada County Narrow Gauge Railroad. He was also instrumental in creating a Library Association in Nevada City.
NEV 96-03	Nathaniel P. Brown House	Nathaniel P. Brown, founding owner of the Nevada Daily Transcript and early political figure in Nevada City, lived here from 1865 until 1909. He expanded the original cottage to its current size in the 1880s, allowing for frequent entertaining. The home was built in 1858 by Jesse S. Wall, an early settler and merchant. Nathaniel Brown came to Nevada City from Massachusetts in 1853 at the age of 18, following his friend Aaron Sargent. He was part owner of the weekly Nevada Journal from 1855 to 1859. In 1860, Brown founded the county's first daily, the Morning Transcript, and from then until 1904 was prominent in newspaper circles and a constant champion of mine owner's rights. The most famous resident of the house was opera diva Emma Nevada. While her father, Dr. W. W. Wixom, sought a new home for his family, Emma and her mother boarded here until 1864. Between the ages of 4 and 13 she resided at Austin, Nevada. Emma Wixom achieved great fame as a singer and took the stage name 'Nevada' to honor the state in which she grew up and the county where she was born. She returned to Nevada City in 1902 and performed to a packed audience at the Nevada Theatre.
NEV 02-01	545 Main Street	Druggist and County Treasurer Edward F. Spence built this house on 3 lots in 1866 and lived here with his wife Marietta until her death in 1868. He founded Spenceville, organized banks in San Jose and Southern California, served as Mayor of Los Angeles, and was instrumental in establishing the Mt. Wilson Observatory. County Judge Addison C. Niles bought the house from Spence in 1870 and occupied it with his wife Elizabeth until his election to the California Supreme Court in 1871. The City of Niles, California, is named for him. Niles Searls bought the house from his brother-in-law, Addison Niles, in 1871. When he became a Supreme Court Commissioner in 1885 he and his wife Mary gave the house to son Fred and his bride, Helen Pond, as a wedding present. In 1887 Niles Searls became Chief Justice of the California Supreme Court, and served on the Supreme Court Commission from 1893 to 1899. Attorney Fred Searls (a native of Nevada City) and his wife Helen (a native of Downieville) lived here from 1885 until his death in 1929. The last member of the family to reside here was Fred Searls III, great-grandson of Niles Searls.
NGW 26A	Wells Fargo Building Site Nevada City	Site of Old Wells Fargo Building 1853. Dedicated to the Pioneers of California by Hydraulic Parlor No. 56 N.S.G.W. July 5, 1926. Plaque erected by Wells Fargo Bank and Union Trust Co. S.F. Calif.
NGW 32	First Brick Building in Nevada City	Built in 1853. First brick building erected in this city Dedicated to the memory of the pioneers of Nevada City. Note: This originally was the Dickerman carpenter shop. Bricks for this building were manufactured at Zeno P. Davis's brickyard.

Site Number	Name	Description
NGW 36B	Pioneer Emigrant Trail {I)	A branch of the Pioneer Emigrant Trail leading from Truckee Pass to the gold mines of Nevada County and to the Valley of the Sacramento divided on Harmony Ridge near the site of Lone Grave. One route circled the north horizon to Blue Tent, down to Selby Flat, up through this gap and on south.
NGW 36C	Pioneer Emigrant Trail (II)	A branch of the Pioneer Emigrant Trail leading from Truckee Pass to the gold mines of Nevada County traversed Harmony Ridge down through this gap and on to the Valley of the Sacramento.
NGW 36E	Sheriff David Fulton Douglass	On this spot Sheriff Douglass, a Native Son of the Golden West, gave his life July 26, 1896, bravely performing his duty. Alone he tracked a highwayman to this retreat and both fell In battle. It is believed Douglass was pitted against two and that one escaped. The bodies lay parallel. Note: Nearby is second plaque identifying spot where bandit lay.
NGW 36D	Indian Medicine Stone	Pioneer Emigrant Trail. This boulder was known to the pioneers as the Indian Medicine Stone. On its top are hollows in which the Indians lay while taking sun baths to cure their ills. One branch of the Emigrant Trail leading from Truckee Pass to the gold mines of Nevada County and to the Valley of the Sacramento passed close beside this stone.
NGW 37	Nevada City Hall	Dedicated June 19,1937 to the Pioneer Councilmen who erected the first City Hall Felix Gillet, K. Casper, J. C. Locklin, Alec. Gault, Dan. Baker and to H. D. Shearer and Wm. H. Kilroy Officers who were killed in line of duty Mayor Ben. Hall Councilmen Karl Kopp, Jas. Penrose, Chas. W. Leiter, Frank Davies. Text of second plaque (on floor of porch): "This building dedicated to Truth-Liberty-Toleration by the Native Sons of the Golden West June 19,1937." Third plaque dedicated 1987 by Native Sons of the Golden West. Text of third plaque: "U. S. Constitution. 1787-Bicentennial-1987 Nevada City. A Bicentennial Community."
NGW 65A	Nevada City Methodist Church	Historic Nevada City Methodist Church. Dedicated in 1864. Now one of the oldest existing churches.
NGW 65B	Saint Canice Catholic Church	Historic St. Canice Catholic Church was built and first services held in 1864 under the guidance of Father John Griffin. Note: This also is site of St. Peter and St. Paul Catholic Church, built in 1857 and destroyed by fire in 1863.
NGW 65C	Calanan Park Monitor and Drill Core	Historic. The first hydraulic mining originated on American Hill near Nevada City, California in 1853. This miner's giant known as the monitor washed hillsides away under high pressure uncovering gold bearing gravel beds. This mining technique flourished profitably until 1884 when the Sawyer decision closed hydraulic mining. Rivers were being filled with mud and debris causing flooding of the rich farmlands below. Wooden marker placed by unknown parties. Text of marker: "Calanan Park. Granted to the city of Nevada City by the United States through the Dept. of Interior." Note: Originally this marker included the date "Dec. 1, 1971," but that part has broken off. Second plaque dedicated 1988. Text of second plaque: "Shaft Drill Core 1935-1936. Experimental vertical shaft, 5' in diameter to 1125' depth thru serpentine and gabbro at Idaho-Maryland Gold Mine, Grass Valley. Machinery invented by J. B. Newsom. Greatest drilled footage, 21' in three days. Core weight 11-tons. Donated to Nevada City by Kenneth E. Baker."
NGW 83A	Isabel Hefelfinger Wagon Shed	The Wagon Shed. Generations of Californians living in the northern mines depended for their economics and social well-being on wheel transportation powered by the horse, mule, the ox. The vehicles displayed here represent some of those used to move people, goods and gold. The Nevada County Historical Society, Hydraulic Parlor No. 56, City of Nevada City, California Department of Parks & Recreation, Nevada City Lions Club and many other civic groups and individuals cooperated to preserve this collection. Second plaque dedicated 1993. Text of second plaque: "Isabel Hefelfinger Wagon Shed. This building is dedicated to the memory of Isabel Ross Hefelfinger (1899-1991) She encouraged many by her interest and dedication in remembering the past. Her untiring efforts to preserve history of Nevada County will not be forgotten."

Site Number	Name	Description
NGW 87C	Old Brick Gothic Church Building	Historic Old Brick Gothic Building. Constructed as a Congregational Church in 1857. Restored by First Baptist Church. Note: Also site of Nevada City's pioneer nondenominational church, which burned in March 1851. It was replaced by a wooden Congregational Church, that burned in 1856. Cornerstone of this brick building was laid on July 4, 1858-not 1857. The roof and interior burned in 1863 and the church was rebuilt once more in 1864.
NGW 94A	Nevada County Narrow Gauge Railroad	Nevada County Narrow Gauge Railroad 1874-1943. For 66 years, the Nevada City depot served as the northern terminus for the railroad affectionately known as the "Never Come Never Go. In 1874 a group of 7 men, led by lumber mill and gold mine owner John C. Coleman, organized the Nevada County Narrow Gauge Railroad. Engineer John Flint Kidder was hired on January 14, 1875 to build a 23 mile narrow gauge railroad from the Central Pacific Railroad connection in Colfax to Grass Valley and Nevada City. On a snowy May 20, 1876, John Coleman drove the last spike in Nevada City to dedicate the completion of the railroad. John Kidder controlled the railroad from January 1884, until his death on April 10, 1901; the following day, his widow Sara was elected president of the railroad. Sara Kidder successfully managed the company until its sale on April 24, 1913 to the Oakland, Antioch and Eastern, a predecessor to the Western Pacific. On May 13, 1926, the N.C.N.G.R.R. was purchased by a group of local investors and it operated until December 1942. The scrapping of the railroad was completed by May 5,1943." Second plaque dedicated 1994. Text of second plaque: "In fond appreciation of the known surviving employees of the Nevada County Narrow Gauge Railroad Co. 1876-1942. Bob Paine, Tony Dellea, Sadie Angelini, Eugene Katzer, Homer Bevared, George Jefferson, Edward Smith, Bill Tremewan." Third plaque dedicated 1994. Text of third plaque: "In grateful appreciation to the Northern Queen Inn and the Ramey family for their dedicated efforts in the restoration and preservation of Nevada County's railroad history."
NGW 94B	The Colley House	Queen Anne Style Built in 1860 Home of Ida Colley and niece, Winifred Mulloy, founders of Laurel Parlor #6 Native Daughters of the Golden West. Now Deer Creek Inn Bed & Breakfast.
NGW 2001	English and New Salmon Mine Stamp Mill	This stamp mill was manufactured at the Miners Foundry and Supply Co., Nevada City, California, in the late 1800's. After a circuitous journey, it has returned to its place of origin. It started its industrial life of crushing hard rock at the English Mine, and then the New Salmon Mine, owned by Donald McPherson, at Badger Hill. The stamp mill ceased operation in 1942 when all non-critical gold mines were shut down. After sitting idle through the years overgrown by trees and brush the stamp mill was moved in the 1970's to the Nevada City home of King McPherson, who generously donated the stamp mill back to the Miners Foundry in the 1980's. The stamp mill sat in pieces around the foundry, despite several attempts to reconstruct it. Through the efforts of the members of Hydraulic Parlor No. 56, Native Sons of the Golden West under the supervision of Mike Nevius, restoration was completed in the spring of 2000.
NGW 2006B	Ten Stamp Mill	'Six tall, upright rods of iron, as large as a man's ankle, and heavily shod with a mass of iron and steel at their lower ends . . .' So begins Mark Twain's description of a Nevada stamp mill. '. . . These rose and fell, one after the other, in a ponderous dance, in an iron box called a battery.' Each of the stamps weighed 600 pounds. 'One of us stood by the battery all day long, breaking up masses of silver-bearing rock with a sledge and shoveling it in.' At the end of his brief stint shoveling ore into the Nevada stamp mill, Twain told his boss he thought the $10 a week was not quite enough. He asked for a new wage of $400,000 a month. He didn't get it and had to become a newspaperman. This ten stamp mill stands just two blocks from where it was manufactured at Miners Foundry in 1904. It operated at the Alpha mine in Sierra County from 1905 until 1931. Each stamp weighs 1,000 pounds and was used to crush gold-bearing rock. Gary Cope recovered the stamp mill in 1975. It was bought and erected on this site, Native Sons Park, by Hydraulic Parlor No. 56 of the Native Sons of the Golden West with the help of the Historic Preservation Foundation of the N.S.G.W. in 2005.

Site Number	Name	Description
NGW 2010	Hydraulic Mining	The first hydraulic mining originated here at 'American Hill Diggins' by Edward Matteson in 1853. Matteson originally used canvas hose. The canvas hose was replaced with crinoline hose in 1860. These miners' giants, also known as water cannons, monitors and dictators, washed hillsides away with high pressure water, uncovering gold bearing beds. This mining technique flourished profitably until 1884. Rivers were being filled with mud and debris causing flooding of the rich farm lands in the valley. At that time, a lawsuit brought by farmers against hydraulic mining was heard in Marysville, California where a decision known as 'The Sawyer Decision', stopped all mining. Under a special use permit, granted by the Department of Fish and Game, these hydraulic monitors were last used at the Pacific Slab Mine near Foresthill, California in 1970, which was documented by the California Department of Parks and Recreation.
NHL 74-544	Nevada City Firehouse No. 2	Firehouse #2 or Pennsylvania Engine Company #2 January 14, 1861. Fire company formed June 13, 1860 as Eureka Hose No. 2 with 34 volunteers. Name changed in August of that year to 'Pennsylvania Engine.' Construction money raised in 1859 by popular subscription and a grand ball staged by the town's women. This firehouse has been in continuous use since 1861.
NHL 85-2303	Nevada Brewery	The Old Brewery. Constructed of granite blocks from the Sierras about 1882. Where Simon C. Hieronimus & family brewed and served lager beer to Nevada City, Queen of the Northern Mines and hydraulic mining communities.
NHL 85-2520	Nevada City Downtown Historic DIstrict	National Register of Historic Places. Nevada City, the 'Queen City of the Northern Mines', became a town of 10,000 to 16,000 in the early 1850s following the discovery of gold on Deer Creek in 1849. Here is located the largest and best preserved historical downtown district in California Gold Country. As the county seat of Nevada County, Nevada City has maintained its position as the county's center of government, professional services and cultural activities since its beginning in 1851 Entered National Register of Historic Places September 23,1985. Note: This includes only the downtown district, as contrasted to the Nevada City Historic District defined by the city in 1968.
NHS 73	Boyhood Home of Howard C. Naffziger	1884-M.D., F.A.C.S. -1961. World-renowned neurosurgeon. Professor of surgery, Chief of Surgery and Neurosurgery at University of California Medical School; and Regent of the University of California. House built in 1859 by J. H. Helms. Note: James Harvey Helm (not "Helms") was a City Trustee and operated the Empire Livery Stable on Broad Street.
VET 46	Memorial Grove Nevada City	This plot of land set aside by the City of Nevada, these trees living tributes to our war dead. This plaque and flag pole erected by the citizens of Nevada City dedicated July 4, 1946 to the memory of our heroes who gave their lives in World War II that the American way of life may continue. Caswell Fisher, Tevis Ferguson, Merton Downey, Donald Osrey, Bert Graham, Fred Doby, Eugene Davies, Albert Conti, Ernest Chapman, William G. Bennett, Hans G. Hirsef, Clifford M. Ruth, Timothy R. Livesay, Virgil Roseborough, David McCreary, Eugene Rickard, Robert D. Proctor, Louis G. Netz, Glenn Ponticelli , Walter O. St. John, Carl D. Tobiassen, Gus Wasley, James M. Odegaard, William Pohley, Reid Shurtleff.
VET 90	Korean War Memorial, Nevada City	Korea, June 25, 1950 - July 27, 1953, 'The Forgotten War'-Remembered- Let us not forget those Americans who served, those who died and those who still remain on that foreign soil in defense of freedom. As a result of that war: 54,246 Americans were killed 8,177 Americans are missing in action 389 Americans are prisoners of war.
VET 92	Vietnam War Memorial, Nevada City	Vietnam. All gave some-some gave all. If you are able, save for them a place inside of you and save one, backward glance when you are leaving for the places they can no longer, go. Be not ashamed to say you loved them, though you may or may not, have always. Take what they have left and what they have taught you, with their dying and keep it with your own. And in that time when men, decide and feel safe to call the war insane, take one moment to, embrace those gentle heroes you left behind. -Major Michael Davis O'Donnell, 1 January 1970, Dak To, Vietnam. Note: Major O'Donnell was a helicopter pilot. On 24 March 1970, while, attempting to rescue eight soldiers, his chopper was shot down. He and, three crew members were declared missing in action. This memorial plaque is dedicated as a tribute to those who served and fought in the Vietnam War, especially those who died, and those yet to return.

Site Number	Name	Description
MISC 33	Felix Gillet	Here lived and worked Felix Gillet, A Frenchman by birth, an American by adoption from 1871 to 1908 through whose vision and perseverance the horticulture of the world was enriched by the propagation and culture of walnuts, filberts, chestnuts, prunes. In commemoration of his work this tablet was set March 7, 1933 by the Women's Civic Club of Nevada City, California.
MISC 37	Nevada County Court House	Nevada County Courthouse History. Nevada County organized out of Yuba County May 11, 1851. Wooden court-house and log jail built on Broad Street in 1851. The first courthouse on this site was erected in 1856. The building was damaged by fire in July of the same year and rebuilt. Destroyed by fire in 1863 and rebuilt in 1864. Remodeled and enlarged in 1900. Modernized and enlarged 1936-37, George C. Sellon, Architect, Lindgren and Swinerton, Inc., Contractors, Robert Steger, Building Superintendent.
MISC 52	Nevada City High School Site	Nevada City High School was located on this site from 1912-1952. This plaque was placed by former students as a lasting memorial to their high school. Note: After merger of Grass Valley and Nevada City high schools, Seven Hills School used the building as a junior high school. In 1973 the buildings were sold to the County of Nevada and eventually torn down.
NEV 93-01	The Glenbrook Basin	Early In the 1850s Glenbrook Basin first became known as the site of county fairs, horse racing and other special events. When Olympia Park, located at the south end of the basin, opened in 1901, Glenbrook Basin became the recreational center of Nevada County and much of Northern California, and remained so for over fifty years. People would come to the basin by horse and buggy or later the automobile, but those wishing for a little more excitement would often use the Nevada County Traction Company's trolley, or the Nevada County Narrow Gauge Railroad. The large grandstands of the three-quarter-mile racetrack stood near the junction of present Brunswick Road and Sutton Way. Trotting, pacing, and running horse races were held at the track, and motor car races began in 1913. The racetrack was one of the first electrically lighted racetracks in the state. A dam was constructed just northeast of the existing electrical substation to form Lake Olympia. The lake soon became one of the Basin's main attractions. Located in the center of Lake Olympia was an island with a pavilion which had a coil-spring-mounted dance floor that swayed with the rhythm of the dancers' feet. There was swimming, boating and fishing in Lake Olympia, and during some winters there was ice skating. There were boats and bathing suits for rent, and the park contained a bathhouse, a roller skating rink, and a bar. Many a romance blossomed on the lake during an evening boat ride under the stars. Families rented cabins and picnicked in the shade of the large pine trees along the shores of Lake Olympia. Olympia Park was the site of high school commencements, football and baseball games, and special events such as fat ladies' races and freckled-face children contests. The annual miners' picnics were held at the park with mucking and drilling contests, tug-of-wars and Cornish wrestling, as refreshments of various kinds flowed freely. Olympic Park fell into disrepair in the 1950s and ceased operation in 1958. Glenbrook Basin, once the recreational center for Nevada County, has developed into one of the county's main centers of commerce in supplying various types of shopping, restaurants, services and recreation for the residents and visitors of Nevada County.
CHL 134	Donner or Pioneer Monument	In commemoration of the pioneers who crossed the plains to settle in California. Landmark registered by State and third plaque placed 1962. Designated National Historical Landmark on October 15, 1966. Reference No. 66000218. Rededicated 1969.
CHL 780-6	First Transcontinental Railroad--Truckee	While construction on Sierra tunnels delayed Central Pacific, advance forces at Truckee began building forty miles of track east and west of Truckee, moving all supplies by wagon and sled. Summit Tunnel was opened in December, 1867. The line reached Truckee April 3, 1868, and the Sierra was conquered. Rails reached Reno June 19, and construction advanced eastward one mile daily toward the meeting with Union Pacific at Promontory May 10, 1869, to complete the first transcontinental railroad.
ECT 1	Truckee's First Log Cabin	1863. First Log Cabin. Erected by Joseph Gray at S.W. corner of present day Bridge and Spring streets to serve Dutch Flat Wagon Road traffic over Donner Pass. Removed to this site 1907.

Site Number	Name	Description
ECT 3_14	Rocking Stone	A natural glacial formation, or the work of an unknown tribe as a form of altar. Its exact origin will never be known. The perfectly balanced stone until recently would rock at the touch of a finger. C. F. McGlashan built the original tower in 1895 and used it to display Donner Party relics and his famous butterfly collection. Site of an overnight stop for the Olympic Torch in 1960.
ECT 4_20	Old Chinese Herb Shop	Old Chinatown. Construction of the Central Pacific Railroad over Donner Summit brought thousands of Chinese laborers here in 1868. They used "squatter's rights to build a ramshackle colony along the Truckee River on what is now River Avenue East. A huge fire destroyed Chinatown on May 29, 1875, but the Orientals rebuilt their community. Finally, on Nov. 18, 1878, a group of about 500 citizens, under the leadership of the Caucasian League, tore down the shanty town and ordered the 1000 or more Chinese to leave. They simply moved across the river, adjoining this former site of a Chinese herb shop, and built anew. A third fire, on Jan. 3, 1883, consumed the "new" Chinatown and brought about the gradual end to the Chinese colony here." Bronze plaque rededicated 1980. Text of bronze plaque: "Old Chinese Herb Shop."
ECT 5_18	Jibboom Street	Jibboom Street. Sierra Site of the World's Oldest Profession 1867-1949.
ECT 6	Old Capitol Building	The Old Capitol. Erected in 1870. In its heyday it was the social center of Truckee . . . Many of the leading thespians . . . politicians . . . and other celebrities of that era gathered here . . . Note: This plaque has disappeared, but a plaque placed on front of building by unknown persons reads: "Capitol Building 1870 Truckee California."
ECT 8_22	Old Stone Garage	Truckee's Old Stone Garage and Site of Town's First Dwelling. In 1863, Joseph Gray built Truckee's first structure on this site for use as the Dutch Flat-Donner Lake Wagon Road's toll station. The old log structure was moved in 1907 to the Englehart property on Church Street, one block east of this site, where it still stands and the Brethren of ECV dedicated a plaque in 1965. In 1909, D. J. Smith, with the help of European-trained stone masons, constructed the present building for use as a livery and garage.
ECT 9	Sierra Sun-Bonanza	Oldest continuous business enterprise in the Central Sierra commenced publication in 1869 as the "Truckee Republican and was also informally known as the "Truckee Screwdriver." The definitive "History of the Donner Party" was first published in this newspaper in 1879 when author, teacher, statesman C. F. McGlashan was its editor." Note: The Truckee Republican, which began life as the Grass Valley Republican, commenced publishing at Truckee in 1872, not 1869.
ECT 11	Chief Truckee	Chief Truckee. The legendary Paiute leader; friend and guide to pioneers; breveted a "Captain by John C. Fremont; gave his name to this valley, river and town; died near Dayton, Nevada, in 1860."
ECT 12	Hobart Mills	This monument marks the townsite of Hobart Mills, California. A logging and lumbering enterprise of sixty-six years life in the Sierra Nevada mountains it commemorates and honors its founder Walter Scott Hobart 1839 1892 and those whose loyalty, industry and ability made its successful operation possible . . . . Second plaque dedicated 1975. Text of second plaque: "Walter Scott Hobart's Sierra Nevada Wood & Lumber Company moved machinery, buildings and railroad equipment here from Lake Tahoe in 1896. The town and business flourished for 40 years, ceasing operations in 1936. Fibreboard Corporation operated a mill and railroad here from 1946 to 1955, logging timber purchased from Southern Pacific. The old mill was burned in 1964. Hobart Mills was an important lumbering center and a major contributor to the heritage of the Eastern Sierra."
ECT 13	First Wagons Across the Sierra	The Stephens-Townsend-Murphy Party, with guidance from old Caleb Greenwood and Chief Truckee, brought their wagons up the Truckee River bed and on Nov. 25,1844 191 days out of Council Bluffs, Iowa passed this point and crossed the mighty Sierra summit directly to the west, blazing the famous California Emigrant Trail for all who followed.

Site Number	Name	Description
ECT 15	Boca Brewery	Boca. Noted as a railroad, ice and lumbering center since 1867 but most fondly remembered and hereby honored as home of the Boca Brewery which was located 1/2 mile south of this point across the Truckee River. Boca Lager Beer was world famous and mercifully slaked the thirst of a grateful mankind. Second plaque placed 2001. Text of second plaque: "Boca Beer. Warranted to keep in any weather."
ECT 17	Floriston (Bronco)	Established in 1872 as Bronco, this railroad wood stop became a noted ice and lumber center and was renamed in 1891. The Floriston Pulp and Paper Company built the present town after 1899 and operated one of the world's largest pulp mills through 1930. Its paper products and ice helped California's agricultural industry feed the hungry of the world.
ECT 21	Clinton Narrow Gauge Railroad	First steam railroad logging operation in the Truckee River Basin. Commenced operation in the late 1870's under the supervision of Fred Burckhalter, head of the Pacific Lumber and Wood Co. Line extended 10 miles along Juniper Creek with hope of eventual service to Lake Tahoe. Line abandoned in 1901 after several conflagrations at the PL&W Co. mill in Clinton.
ECT 24	Truckee's Vigilance ("601") Committee	Truckee's vigilance committee, known as the 601, was born in response to the rise in crime and 'undesirables' which plagued the young railroad town. In late 1874 and early 1875, the 601 carried out a campaign to intimidate and rid the town of those elements. After accidentally shooting one of their own members, the 601 disbanded until August 1889 when they reassembled for one last time. Though their goals were never fully achieved, the 601 did bring a semblance of law and order to the area through their vigilance.
ECT 25	Theodore Dehone Judah	As Chief Engineer of the Central Pacific Railroad, Judah's engineering skill, political savvy and financial genius, along with the promoters' capital, culminated in the formation and construction of the Trans-Sierra leg of the first transcontinental railroad. While fighting the excesses of the railroad's promoters, he died without seeing his dream completed.
ECT 29	George Schaffer	One of Truckee's earliest settlers, Schaffer in 1866 built the first lumber mill in the town. He freighted the locomotive 'San Mateo' to Truckee in a winter crossing of the Sierra prior to the laying of Central Pacific tracks. This building 'The Star Hotel' was built by Schaffer probably for his family. When mill operations were relocated up Martis Creek in 1871, this building was converted to a hotel and has remained in continuous operation to this day. For 24 years, the Truckee Basin supplied timber to railroads, mines and boom towns through 'Uncle George's' enterprises.
ECT 32	Truckee Flag Pole	Truckee / Jewel of the Eastern Sierras. First known as Gray's Toll Station, then Coburn's Station, Truckee was established in 1863. Renowned for its lumber industry, transcontinental railroad, icehouses, saloons and red light district, Truckee has never been known for her laid back demeanor. It has always been a town where people came to entertain themselves on Friday and Saturday nights, just as it is today. Second plaque dedicated 1994. Text of second plaque: "Truckee Fire Protection District. This flagpole represents 100 years of service by the Truckee Fire Protection District and its members, past and present for their commitment to the preservation of life and property."
ECT 27	China Wall at Donner Summit	Charles Crocker, construction chief of the Central Pacific Railroad (CPRR), contracted for a workforce of approximately 12,000 Chinese laborers to push the CPRR tracks over its Trans-Sierra crossing on its race east to meet with the Union Pacific at Promontory, Utah Territory. A railroad retaining wall and fill, constructed of Sierra granite, stand silently above on the pass as a lasting monument to these Asian "Master Builders who left an indelible mark on the history of California and the West."
NEV 98-01	Donner Summit Bridge	Dedicated to the pioneers who blazed the Overland Trail through these mountains. Built by the U. S. Bureau of Public Roads and the California Highway Commission, 1925-1926. Landmark registered and second plaque dedicated 1998. Text of second plaque: "1926 Donner Summit Bridge Restored 1995." Note: In 1926 it was anticipated that the bridge would become a popular stopping place on the Victory Highway. The bridge was designed by Norman C. Raab, whose wife, Ruby Bishop Raab was the great granddaughter of Isaac Hitchcock of the Stephens-Townsend-Murphy party (see NEV 94-01).

Site Number	Name	Description
NEV 94-01	Mt. Elisha Stephens	Stephens-Townsend-Murphy Party of 1844 First Pioneer Wagons Over the Sierra Nevada. On May 22, 1844, this small wagon party of 50 men, women and children "jumped off from Council Bluffs, Iowa, bound for California. These courageous pioneers were the first emigrants to take wagons over the Sierra Nevada, opening the Truckee Route of the California Trail. The Murphy, Townsend, Miller, and Hitchcock families formed the main groups of the party. Caleb Greenwood was the hired guide, and Elisha Stephens was elected Captain of the wagon train. After following the Oregon Trail to Fort Hall, Idaho, they turned away from the well-worn path and headed west into the unfamiliar Nevada desert. A Paiute Indian Chief showed them how to reach a river flowing from the Sierra Nevada, which they named 'Truckee' in his honor. Overcoming severe conditions, they followed the Truckee River to the base of the Sierra. Six members, on horseback, continued to follow the Truckee River and eventually arrived safely at Sutter's New Helvetia on December 10, 1844. Six of the wagons were left in the charge of two men, and young Moses Schallenberger, near Truckee Lake (present Donner Lake). Near this spot, with two feet of snow on the ground, they worked the remaining five wagons across the summit of the mighty Sierra Nevada on November 25, 1844. Deepening snow forced them to camp near Big Bend, on the South Yuba River. Leaving the wagons with two men and the women and children, the remaining 17 men continued on to New Helvetia to seek help. Somehow, John Sutter persuaded the men to enlist in his forces taking part in a Mexican civil war. Eventually the families were reunited, and all members (including two babies born on the way) arrived safely at Sutter's Fort in early March 1845." Note: Mount Elisha Stephens is west of the bridge on north side of road.
NEV 34	McGlashan Point	Dedicated August 10,1986 in honor of Charles Fayette McGlashan 1847-1931. Truckee's Patriarch, Historian, Author, Editor, Attorney, Legislator, Inventor, Entomologist and Astronomer. His last public address was given in 1926 at the Donner Summit Bridge Dedication. This site is named in his memory by the people of Truckee.
ECT 34	Truckee Round House	Needed to house and maintain the engines of the Central Pacific Railroad during construction of the trans-Sierra crossing, an enclosed wooden round house was constructed here in 1868. It was razed by fire in March of 1869. A 16 stall wooden structure was built that year as the maintenance facility of the C.P.R.R., Truckee Division. Another fire in 1876 resulted in construction of a 22 stall granite and wooden structure. This served thru 1942, when it was officially retired, a victim of the end of the steam era and consolidation of maintenance at other locations. The round houses were home to helper engines, fire trains and the first rotary snow plow in the Sierra.
ECT 94	Lake Tahoe Railway & Transportation Company	The Lake Tahoe Railway & Transportation Company was incorporated on December 1898 by Duane Leroy Bliss. The Narrow Gauge Railroad opened for seasonal traffic on May 1, 1900. The line ran from the Southern Pacific Depot in Truckee, 15 miles south to the shores of Lake Tahoe. Tahoe City hosted the railroad's shops. The Tahoe Tavern hotel and pier where the train met the Bliss steamer 'Tahoe'. Southern Pacific Purchased the line and converted it to standard gauge in 1926. Passenger Service operated until abandonment in November 1943.
ECT 95	Summit City/Meadow Lake	In June of 1863, the trapper Henry Hartley discovered gold bearing ore here and staked out the Excelsior Company claims. Exaggerated reports and a 1865 market panic in the Comstock mines of Virginia City brought thousands of miners overnight to the supposed 'Little Comstock' of Summit City. Within two years an incorporated town, renamed Meadow Lake grew to encompass 160 acres with 4,000 summer residents and over 500 buildings, including 200 business houses, a stock exchange, daily newspaper, post office, school, 6 breweries and 80 saloons. Streets were laid out grid fashion, with a 9,000 square foot plaza on the lakeshore. An excursion vessel ferried revelers to four hurdy-gurdy houses at the lake's upper end. The winter of 1866-1867 brought 30 feet of snow with the 'Snowshoe Express' delivering mail through Cisco. In all the eight stamp mills in a district of 10,910 claims failed to extract the expected gold from its "Rebellious Ore. The optimism faded and the town declined with like rapidity. July of 1869 found 60 residents. By 1873 only Hartley 'The Hermit' remained. His grave is on a hillside to the west of town." A wooden sign nearby was erected at an unknown date by Troop 40, Kentfield-Marin Council, Boy Scouts of America. Text of sign: "Meadow Lake-Excelsior. The granite dam was built 1858 for flumes of valley gold towns. Called Summit City with 2000 pop. after 1866. It incorporated as Meadow Lake 1866. Because gold could not be separated it was abandoned 1872."

Site Number	Name	Description
ECT 96	Tamsen and Elizabeth Donner	They gave unselfishly, their fortunes and their lives that their children should survive. Near this site, in the winter of 1846, two pioneer women gave up their lives for their families. Tamsen and Elizabeth Donner feared their many children could not survive the ravages of cold and starvation when the party was caught in an early blizzard. They provided care and comfort to their families and companions throughout the snowbound winter, desperately trying to prevent the death of their loved ones. Both lost their lives. However, most of their children survived to carry their mothers' dreams of new life and new beginnings to the valleys of California. The summit that they never crossed now bears the family name. An inspiration to all who followed their footsteps across the Sierra Nevada Mountains, we herein honor the memory and the sacrifices of these women. Their struggle to survive, enduring hardships we can barely imagine, remains a legacy of the pioneer spirit. On this 150th anniversary of their tragic encampment the Chief Truckee Chapter of E Clampus Vitus dedicates this monument to their spirit and the preservation of their memory that we not forget the sacrifices they made in opening California to its destiny.
ECT 97	Hooligan Rock	Behind this broken rock, vigilante justice in the form of a tar and feather party or other form of physical punishment was meted out to the villains and ruffians who plagued Truckee through the dawn of the 20th century. Constable Jacob Teeter bravely fought against vigilantism and his friend, attorney C. F. McGlashan, blasted the rock, ending its symbolism of terror, and used parts of the rock in a wall around his mansion. His granddaughter, Nona, recalled that the rock formed a 'backdrop of ugly secret scenes-floggings in the night, scalding tar and a smother of feathers, curses and screams for mercy.'
ECT 2000	Pollard's Station	On this site, Joseph Delos Pollard constructed the first resort on the west end of Donner Lake. Between mid 1864 and early 1868 Pollard's Station on the Dutch Flat & Donner Lake Wagon Road was office to the Pioneer Stage Co. and Wells, Fargo & Co. Express, as well as a hotel, boasting bar room, reading room, billiards and a bowling alley. Visitors could rent boats, horses or carriages to enjoy the scenic grandeur. The station was ravaged by fire twice and rebuilt once. The station was no longer needed due to the completion of the railroad in June 1868, which put a virtual end to wagon and stage traffic across the Sierra.
ECT 2001B	Sierra Mountain Cemetery	The Masonic and Odd Fellows lodges each established cemeteries here in 1869 or 1870 to provide a burial place for their deceased. Catholics established a cemetery to the southwest. Pioneers and prominent citizens were buried within the original cemetery grounds. The less reputable were buried outside the fences. Stories abound of the bodies placed in snowbanks or ice houses awaiting the ground thaw. The Truckee Cemetery District was formed in 1946 and received title to the land and named the cemetery in 1964. In 1954 the original site increased in size despite the best efforts of the community to prevent the townfolk from dying.
ECT 2002	The Tin Can -- Dot's	The two modern buildings replaced structures built in the early 20th century and used in two of Truckee's notorious industries-bootlegging and prostitution. They upheld a tradition begun on this street in the 1870's. Many a thirst was slaked and need fulfilled because of these buildings' contents. Politely ignored, although they never failed because of lack of business, they operated until mid century to serve the working men of this and surrounding communities. Changing commercial interests and ultimately property values doomed these buildings to history.

Site Number	Name	Description
ECT 2005	The Gateway Cabin	This cabin was one of several built by Jack Wolert for Dick Joseph in 1939 on US Route 40. The cabin was constructed of lumber salvaged from houses being dismantled 5 miles north of Truckee at Hobart Mills and served as the Gateway Motel's office. Originally located at the site of the current Gateway Shopping Center on Donner Pass Road (historic US 40). It was donated to the Truckee Donner Historical Society in 1990 and moved to this location on May 23, 1991. Thanks to community efforts, the cabin has been restored and serves as a historical research library. A second plaque, originally dedicated in 1929 by the Native Sons of the Golden West, was relocated to the Gateway Cabin. Text of second plaque: "The Emigrant Trail in the Pioneer Days of California came through the low pass to the north, facing this monument. The Trail turned west at this point for a distance of twenty-six hundred feet where a tablet describes the route then followed." Note: According to the P. M. Weddell map of the Historic Emigrant Road, the new resting place of the Native Sons' marker is close to its original location.
NEV 04	Truckee Jail	1875 Old Truckee Jail. Built in September 1875 and in continuous use until 1964. Landmark registered and dedicated 1971. Text of second plaque: "The first extension of the Nevada County jail which was built in 1875 by order of the County Supervisors on the petition of residents in Meadow Lake and Truckee townships due to the high cost of transporting prisoners from the eastern part of the county to the jail in Nevada City. Built of stone at a cost of $2,500 the building housed its first prisoner in September 1875." Note: Wooden plaque was replaced by a bronze one in 1978.
NEV 03	Western America Skisport Museum	Downhill ski racing history in the Western Hemisphere first began in California circa 1867, and in this famous Donner Pass of the Sierra Nevada the Auburn Ski Club presents a full exhibition of pioneer manpowered transportation and skisport history as prepared by historian William B. Berry. A monument and statue was placed by Snowshoe Thompson Lodge No. 78, Sons of Norway, Yuba City. Text on monument: "Snowshoe Thompson. A hero of the Sierra Nevada mountains! Probably the first skier of the West. This Viking Son of Norway exemplified the spirit of a true pioneer: Strong, daring, faithful and courageous. He was the answer to California's motto, 'Bring me men to match my mountains.' For 20 years he was the winter lifeline between the new state of California and the East with a regular mail schedule between Placerville, California, and Genoa, Nevada, and other isolated hamlets of the Mother Lode country. Mail, news of the world, medicine, supplies and equipment arrived on the sturdy shoulders of this giant Snow Viking over great snowdrifts, through raging winter storms, with packs of up to 100 pounds, he made his 'appointed rounds.' His daring rescues, errands of mercy, and many kindnesses made him a legend in his own time. He was born John Tostensen at Tinn in Telemark, Norway, April 30, 1827. He died May 15, 1876, at the age of 49. He rests at the base of the mountains he loved, by the side of his wife and son in the cemetery at Genoa, Nevada. A simple headstone, engraved with a pair of skis, marks his grave."
NEV 32	Boca, Ice Harvest Site	From 1868 to 1927 huge quantities of ice were harvested from the Truckee Basin. This provided employment and significantly contributed to the area's economic growth and its colorful history. Boca Pond was one of the first to be used to harvest ice and ship it across the nation. It was one of the last of the ice plants to survive competition from artificial ice companies.

Site Number	Name	Description
NEV 95-01	Schallenberger Cabin Site	Near this spot stood a small cabin built by 18-year old Moses Schallenberger and two other men. They were members of the Stephens-Townsend-Murphy party of 1844, the first pioneers to take wagons over the Sierra Nevada, opening the Truckee Route of the California Trail. The three men had volunteered to remain behind and guard six of the wagons left here by the main party. Due to extreme winter weather conditions and lack of food, the three men agreed to separate. The two older men rejoined the wagon party, but due to his weakened physical condition, Moses Schallenberger chose to remain at the cabin. The young man survived for nearly three months alone in the small cabin during the winter of 1844-45 before being rescued. His cabin would later provide shelter for the Breen family, members of the ill-fated Donner Party, who were stranded here in 1846-47. The courage and resolution of Moses Schallenberger during his solitary winter ordeal in this cabin makes him one of the true heroes in the saga of the California Trail. This monument was made possible through the generosity of many groups and individuals committed to the preservation of the California Trail.
NGW 29C	Emigrant Trail on Coldstream Road	The Emigrant Trail in the pioneer days of California turned to the south at this point for approximately three miles, then went across the summit of the Sierras about a mile south of the present railroad. It was here that the Donner Party missed the trail owing to the early snows, resulting in the tragedy.
NHL 61	Donner Camp Site	On October 28, 1846 the six covered wagons brought west by George and Jacob Donner and their families halted here for repairs. By March of 1847 one half of the party of 22 adults and children had died of starvation and cold. They came west seeking a new life and found misery and death. Designated a National Historic Landmark in 1961.
NHL 81-72	Newlands Reclamation Project--Boca Dam	Boca Dam 1937-1940. United States Department of the Interior, Harold L. Ickes, Secretary; Bureau of Reclamation, John C. Page, Commissioner; R. F. Walter, Chief Engineer; L. J. Foster and C. S. Hale, Construction Engineeers. Height 116 feet, Length 1629 feet, Storage capacity 40,901 acre-feet. Contractor, George W. Condon Co. Note: Originally called the Truckee-Carson Project, the Newlands Project covers a large area in western Nevada and a smaller area of Truckee-Tahoe area. One of five authorized by the Federal Reclamation Act of 1902, to reclaim arid lands for agricultural purposes. Renamed in 1919 in honor of U.S. Senator Francis G. Newlands of Nevada, water from natural flow and storage in Lake Tahoe and Boca Reservoir is diverted from Truckee River into the 32.5-mile Truckee Canal and then discharged into the Carson River.
NHL 82-2220	Kruger-White House	This property Kruger-White House has been placed on the National Register of Historic Places by the United States Department of the Interior. Note: W. H. Kruger, a local lumberman and entrepreneur, built this home 107 years ago. This application was made by Truckee planning consultant Paul A. Lord Jr.
MISC 66A	Trans-Sierra Freeway Project (Eastbound)	Civil Engineering Achievement of Merit, 1966, Awarded by the American Society of Civil Engineers.
MISC 66A	Trans-Sierra Freeway Project (Westbound)	Civil Engineering Achievement of Merit, 1966, Awarded by the American Society of Civil Engineers.
MISC 96	Donner Party Camp at Alder Creek Valley	In the fall of 1846, 25 members of the Donner Party became trapped by an early snowstorm here at Alder Creek Valley. The George and Jacob Donner families, their teamsters, and fellow travelers suffered extreme hardship and starvation. They spent the winter here cut off from the rest of their party who camped at Donner Lake. Only 11 survived the ordeal. Their survival, against desperate odds, stands as a testament to the enduring pioneer spirit that helped shape the future of California. Note: This plaque and one honoring Tamsen and Elizabeth Donner (ECT 96) were dedicated at the same time to commemorate the 150th anniversary of the tragedy.

Site Number	Name	Description
MISC 98	Victory Highway Monument	Dedicated to California's sons and daughters who served their country in the World War 1917-1918 and to the memory of those who gave the last full measure of devotion. Second plaque and monument dedicated 1998 by Truckee Town Council and California Department of Transportation. Text of second plaque: "Victory Highway Monument Rededication July 24, 1998. This monument was originally sited on old Highway 40 near the California/Nevada line in 1928 and removed in the mid 1970s due to vandalism. It was one of a series of monuments placed on the 'Victory Highway' across the U.S., honoring those who died serving the United States in World War I. Donner Pass Road and part of Glenshire Drive through Truckee still follow the basic alignment of the old highway. The Town of Truckee, in cooperation with CalTrans, has rededicated this monument not only for its original purpose and the history of Old Highway 40, but also for current revitalization efforts occurring in historic downtown Truckee. Rededication concept initialized in 1997 by Mayor Robert W. Drake, Truckee Town Council: Ronald Florian, Mayor Robert W. Drake, Donald C. McCormack, Maia Schneider, Joshua J. Susman."
CHL 247	First Long Distance Telephone	Built in 1877 by the Ridge Telephone Co, it connected French Corral with French Lake 58 miles away. It was operated by the Milton Mining Co., from this building which was built about 1853. Note: This plaque originally was on the brick building where telephone office was located. After building was torn down in 1955, plaque was moved to shoulder of Pleasant Valley Rd.
CHL 294	Rough and Ready	Established In 1849, and named after the Rough and Ready Company of miners from Wisconsin, in honor of General Zachary Taylor, this was one of the principle [sic] towns of Nevada County. Here in 1850, articles of secession were drawn up establishing the 'Republic of Rough and Ready.' As a result of disastrous fires, only a few structures remain today of those built in the 1850s. Second plaque dedicated 1970. Text of second plaque: "Republic of Rough and Ready April 1850-July 1850. This community of 300 people seceded from the Union to declare a free and independent state. Colonel E. F. Brundage was elected president. Congressional action on California statehood was pending at the time."
NEV 08-01	Rough and Ready Toll House	Built in 1859 by Benoni Thompson to collect tolls for using the Gephardt Union Turnpike running 6 miles from Penn Valley to Grass Valley. The last remaining original toll house in the West. It served as a Wells Fargo Express office and stage stop, and was the secret rendezvous place of Joaquin Murietta and Lola Montez. Note: The reference to Joaquin Murietta and Lola Montez must be taken with a grain of salt and credited to the droll humor of E Clampus Vitus. There is no evidence of such a friendship, although anything was possible in the Old West.
ECM 2003	Fippin's Blacksmith Shop	Built in the mid 1850s by John Fippin and John Single. Fippin married Single's daughter Julia in 1867, and they raised 10 children. Local legend has it that one of Lotta Crabtree's earliest performances was atop the anvil here. The building today is a combination of the original blacksmith shop and Single's carpenter shop. W. H. (Bill) Fippin and Frank A. Fippin followed their father as smiths and ran the business until well into the 20th century. Members of the Fippin and Single families have served Rough and Ready for generations as County officials, School Trustees and Postmasters.
NEV 95-04	Rough and Ready Schoolhouse Site	The original one-room Rough and Ready school was built in 1868. It served the community for many generations before being destroyed in the Trauner Fire of 1994. The house Kevin and Gaylene Collins built here in 1995 has an exterior like that of the schoolhouse. Note: Present owner requests privacy.

Site Number	Name	Description
CHL 390	Bridgeport Covered Bridge	This covered bridge across the South Fork of the Yuba River at Bridgeport, Nevada Co. was built by David I. Wood in 1862, with lumber from his mill in Plum Valley, Sierra Co. Calif. Landmark registered by State. Second plaque dedicated 1964. Text of second plaque: "Built in 1862 by David Isaac John Wood with lumber from his mill in Sierra County, this bridge was part of the Virginia Turnpike Company Toll Road which served the Northern Mines and the busy Nevada Comstock Lode. Utilizing a combination truss and arch construction, it is one of the oldest housed spans in the West and the longest single span, wooden covered bridge in the United States." Note: "Isaac" should have been "Ingerfield." Designated National Historic Civil Engineering Landmark on July 14, 1971. Reference No. 71000168. Third plaque dedicated 1971. Text of third plaque: "National Historic Civil Engineering Landmark American Society of Civil Engineers founded 1852. Bridgeport Covered Bridge ASCE1970." Fourth plaque dedicated 1973. Text of fourth plaque: "Bridgeport Bridge or 'Wood's Crossing' is the longest single span covered bridge in existence, used since 1862, built by David I. Wood. This plaque is dedicated to those pioneer Americans who came to California in search of a new life and passed this way to establish their homes in the Northern Mine country."
CHL 628-9	Alpha and Omega Hydraulic	One mile north of here were the towns of Alpha and Omega, named by gold miners in the early 1850s. The tremendous hydraulic diggings, visible from near this point, engulfed most of the original townsites. Alpha was the birthplace of famed opera singer Emma Nevada. Mining at Omega continued until 1949, and lumbering operations are carried on there today.
CHL 852	North Bloomfield Mining & Gravel Co.	This was a major hydraulic operation in California. Its vast system of canals and flumes using a drainage tunnel 7800 feet long was termed a feat of engineering skill. It was the principal defendant in an anti-debris lawsuit settled by the Sawyer decision in 1884. Sawyer's famous decision created controls that virtually ended hydraulic mining in California.
ECM 39	North San Juan Fire Department	First Fire Department. To the memory of the first fire department, organized 1862, George Murphy, first fire chief.
ECM 63A	North San Juan	North San Juan 1853. Dedicated to the memory of the founder Christian Keinz and to all the pioneer argonauts of San Juan Ridge, who by their labor and fortitude contributed so greatly to the wealth and economy of Nevada County, California and the nation.
ECM 78B	Wells Fargo Building, North San Juan	Wells Fargo & Company 1854. Office and holding center for gold and currency, 1854-60. Block & Furth Co. Clothing Store, 1861-69. Chinese Laundry and store operated by Happy Go Lucky, 1890-1920. Bar and liquor store since 1934. First saloon owner, 'Ma' Cunningham, 1934.
ECM 98A	Old North San Juan School	The first school building on this site was moved from Flume Street in 1869. It burned in 1924, and this building was moved here from Lake Vera. This site operated as a school from 1869 until 1984. It is currently used as a community center and library.
NEV 14	North San Juan Methodist Episcopal Church	Erected in 1857 at a cost of $1500, the structure Is the earliest existing church in the county. It contains early furnishings. A second plaque was dedicated 1980 by the church board and Chap 10 E Clampus Vitus. Text of second plaque: "North San Juan United Methodist Church 1856. One of the oldest of its faith in continuous operation in California. Escaped three major fires which destroyed the town. The Rev. H. B. Sheldon, first assigned pastor, rode circuit from Brandy City to French Corral on horseback."
ECM 65B	Brimskill Building	Built by Edward Brimskill, 1849-1851. Rear section built 1849. Iron shutters a protection from fire and robbers, imported from Scotland. Used in early days as general store and miners supply. Wells Fargo maintained desk room here for many years and shipped thousands of dollars of gold from here. One of the best preserved buildings in California of the gold rush era. Said to be oldest building in Nevada County.
ECM 67	Kohler Building	Built by Henry Kohler, pioneer merchant and miner born in Germany in 1825. He came to Washington from Indiana in 1854. He mined until 1861 when he opened a general merchandise store to supply groceries, hardware and mining supplies to the area.

Site Number	Name	Description
ECM 90B	Ormonde Town Site	The town of Ormonde was established here in 1887. Downstream, across the mouth of Canyon Creek was Canyonville 1850, and upriver approximately four miles was Maybert 1886. These towns were part of the upper Washington Mining District and were the furthest upstream of the serious mining ventures along the South Yuba. During its brief history the district yielded 17 million dollars in gold, but by 1897 it was nearly totally abandoned. The remains have since been obliterated by flooding." The town consisted of 8-10 buildings, including a store, saloon and boarding house.
ECM 2005	Washington Elementary School	100 Years of uninterrupted use as a California public school. Having survived fires, floods, wars, time, and politics, this school has been doing its part to ensure the rights of American children to receive a basic education.
NEV 94-02	Washington Hotel and Site	Hessel Buisman built the first hotel on this site in 1857. It was destroyed by fire in August 1867, along with neighboring businesses. Buisman replaced it with a 2-story hotel in that same year. In 1887, Buisman's daughter Harminia and her husband, E. T. Worthley, inherited the hotel, which burned in April 1896. The Worthleys reopened it with a third story in August 1896. John J. Rogers bought the hotel in 1910 for $50. and in 1911 he installed a water pipeline across the river to the Nice and Latta ditch to furnish water for the town. In 1912, he used the water to generate the first electricity for the hotel. Thomas B. Williamson, who had purchased a half interest in the hotel for $10 in 1911, bought out Rogers in 1916, and then sold it to Pietro Orzalli. Orzalli sold the property to R. F. Williamson (brother of Tom) in 1925. In 1926, Emory J. Haverstock bought the hotel and added dormer windows on the top floor, using lumber salvaged from the fire-ravaged Dugan Hotel (also in Washington). Haverstock sold it to Clark and Edna Waite for $10 in 1939. In 1955, the hotel was sold for $10 to Harold Moneyhun, former owner of the Holbrooke Hotel in Grass Valley, and Edwin Furano of Nevada City. In 1968, Thomas E. Walsh used siding salvaged from the National Hotel Annex in Nevada City to enclose the side porch on the upriver side of the hotel.
NEV 31	The Town of Washington	Washington, originally Indiana Boys Camp, is a town that refused to ghost. It was settled in 1849. By 1880 miners had recovered over $10,500,000 in gold here. Note: This plaque is on the Washington Hotel. A second plaque was dedicated at an unknown date in a small park at the town's entrance. Text of second plaque: "In August, 1850 Washington was the highest point on the South Yuba River at which gold had been discovered, with over a 1,000 miners. In 1870 the Chinese outnumbered the white population. The last try to strike it rich was in the 1890s. Washington is the last remaining village of the many that flourished in the Washington Mining District. Historical notes by Robert I. and Grace I. Slyter." Landmark registered 1982. Note: The only mining town in the county not destroyed by fire. Today, Washington (pop. about 250) is one of the few remaining early mining towns. The permanent population swells to more than 600 residents in the summer months.
NEV 91-01	Emigrant Trail to Nevada City	In 1850, the year after the fabulous gold strike on Deer Creek in Nevada City, the Overland Emigrant Trail branched off the original Bear River route at this point on its way to Nevada City and the Sacramento Valley. Soon thereafter the trail became a toll road and later a public road. The deep vehicle ruts can still be seen as they cross and recross Highway 20 many times.
ECM 66B	Malakoff Diggins Clampicnic Area	This picnic area, sponsored by the Wm. Bull Meek-Wm. Morris Stewart Chapter No. 10 E Clampus Vitus, is for the enjoyment of all. The redwood lumber for the tables came from Nevada City's Christmas Tree, a Sequoiadendron Giganteum, and continues to serve the residents and visitors of Nevada County. A second plaque, dedicated 1971, honors Alvin Stevens Trivelpiece 1903-1967.
ECM 73B	North Bloomfield School	North Bloomfield School 1872-73. Built at a cost of some 3,000 dollars. Modeled after schoolhouses at nearby Sebastopol and Sweetland, it served the community until closed in 1941.
ECM 79B	Shoot (Chute) Hill	Local historians relate that water from high mountain lakes flowed thru a 500' wooden 'chute' which led to a huge square tank or pressure box behind campsite 29. Here it entered a 3' pipe reduced to gain pressure to 2', then down hill 200' to the hydraulic monitors at the mine.

Site Number	Name	Description
ECM 82A	Mooney Flat Hotel	Mooney Flat Hotel 1856-1958. Site of the first 3 story team & stage stop on the Henness Pass route to the Northern Mines and Comstock Lode. Built and operated by George and Veronica Schmidt. Served miners, travelers, & teamsters.
ECM 92	Graniteville	A camp established in this area in 1850 was called Eureka; then later, Eureka South. By 1856 it sometimes had a winter population of 1000. Rich placer mining deposits were played out by 1865, but quartz mining continued. By 1867, total gold taken from this area was estimated at 20 million dollars. Area also important as distribution point for water from reservoirs, fed to hydraulic mines below by ditches. Name changed to Graniteville when post office was established on Aug. 26, 1867.
NEV 06	Columbia Hill School	The present school, built in 1875, is the earliest school in the county still in use. The original Columbia Hill School was built prior to March 11,1867. Note: In 1980 the State of California condemned the schoolhouse as unsafe. It was remodeled and used for a while as a community center. Later a new community center was established next door, and the old school building is used for other purposes, including a library.
NEV 09	Lone Grave	Julius Albert Apperson Born June 1855-Died May 6,1858. A pioneer who crossed the plains to California who died and was buried here. The Emigrant Trail followed along this ridge and through Nevada City. The marking of this lone grave perpetuates the memory of all lone graves throughout the state of California. Note: Julius Apperson was not a passerby. The boy died as the result of burns sustained on his parents' ranch and he was buried on Apperson property. Plaque incorrectly identifies this Landmark as number 001.
NEV 25	Red Dog Town Site	Red Dog (1851-1871), with a population of 2,000 at its peak, was the third town of importance in Nevada County, surviving longer than most of the earliest gold towns. The post office closed in 1869. Note: Park vehicle on Red Dog Rd and walk east on dirt road to BLM vehicle barrier, which you can climb over or walk around.
NEV 26	You Bet Town Site	This mining camp, established between 1858-1860, consisted of 40 or 50 buildings by 1864. A school house was built midway between You Bet and Red Dog. The town was destroyed by fire in April 1869, partially rebuilt, and burned again in September 1873 and August 1915. The courts halted most hydraulic mining in 1884, but gold mining continued until the 1940s. The You Bet post office was closed in 1903.
NEV 30	Root Cellar on Mexican War Land Grant	This old root cellar is located on property that originally was part of a Land Grant of 160 acres granted to Josiah Dodge by President Ulysses Grant in 1873 as Bounty Land for his service as a private 'with Captain Steen's Co., 1st U.S. Dragoons, War with Mexico.' In 1878 this property became part of the John Bree ranch. The root cellar, built by Bree in the 1880s was used to store his produce. Mr. Bree was among the first in the county to plant a Bartlett Pear orchard for commercial purposes.
NEV 92-02	Old Bear River Bridge	Since 1852 bridges near this site have served as the gateway to western Nevada County. This 1924 span was the first concrete bridge at this site and features a Roman style single arch design, constructed in a continuous pour method. The Colfax Highway Association led a citizens group that saved the bridge from the wrecker's ball in 1986, and placed this monument in 1992.
NEV 95-02	Purdon Crossing Bridge	Purdon Bridge 1895. Built by Cotton Brothers of Oakland, this steel bridge replaced several wooden bridges washed away in floods. It is the only bridge of the half-through truss design remaining in California. Purdon Crossing was a vital link of the main road from Nevada City to Downieville and the Northern Mines. Designated as a California Point of Historical Interest in 2000. Note: The unique quality of a half-through truss is that the deck is carried halfway between the top and bottom of the support structure; very few were built in California. First bridge at this site was built by William E. Robinson in 1854. In 1859 John Webber dismantled Robinson's Bridge and replaced it. Webber's Bridge washed away in December 1861 and was replaced by a rope suspension foot bridge in February 1862. Jesse Wall bought the foot bridge and crossing in the spring of 1862 and built a new bridge that summer. Wall sold it to James M. Black in 1864. Peter Purdon bought the bridge in 1870 and sold it to the county in 1890, which replaced it with this one in 1895.

Site Number	Name	Description
NEV 95-03	Edwards Crossing Bridge	Built in 1904 by the American Bridge Company of steel-connection-pin design to replace a wooden structure built in 1862 by William Edwards. In 1854 Edwards began operations here with a ferry, and in 1855 he built a bridge and toll road between Blue Tent and Lake City. His first bridge washed away in December 1861, and was replaced in the following year. The county acquired the bridge sometime after 1880. Note: Both this and the similar Gault bridge at Nevada City (NEV 95-05) were built under the supervision of Nevada County Surveyor W. W. Waggoner.
NEV 95-06	Old Auburn Road Bridge (Site)	The bridge consists of a single span pin-connected steel pony truss, 66 feet in length, 11 feet in width, with a timber deck carrying a single traffic lane. It was built in 1897 by Cotton Brothers and Co. of Oakland, California. Bronze plaque placed by unknown persons after bridge was removed in 2004. Text of plaque: "Historic Marker Perrin Crossing. This bridge replaces the original steel truss span constructed in 1897 and remained in continuous service until 2004. This crossing received its name from Joseph and Susan Perrin, who settled nearby in 1851. Close to this crossing the Perrin family operated a stagecoach stop known for its hospitality. This road was part of the original stagecoach route between Sacramento and Grass Valley."
NEV 96-04	Old Pacific Fruit Packing Shed	A smaller shed, built here in 1926, collapsed during a snowstorm in 1929. Its successor was built in 1930 by the Civilian Conservation Corps. The Nevada County Narrow Gauge Railroad tracks, depot, and water tower were alongside this building, where peaches and pears from the surrounding orchards were packed and sent to Colfax by train. There the boxes were transferred to standard sized refrigerator freight cars to be shipped to the East.
NGW 19	Donner Party -- Graves Cabin Site	Donner Party 1846-1847. On this spot stood the Graves Cabin.
NGW 49	Saint Columncille's Catholic Church	St. Columncille's Catholic Church. Formerly the Bridgeport Union Guard Hall, was used in 1860 to train men for the Civil War under Capt. Frank Coffey of French Corral. In 1880 it was purchased as a house of worship for the Catholics of the ridge towns. Note: This building formerly was located at Birchville. In 1969 it was purchased by Babe Pinaglia and given to Malakoff Diggins Park, where it occupies the site of the Catholic Church that once served the miners of North Bloomfield.
NHL 73-418	Malakoff Diggins -- North Bloomfield Historic District	Site of the world's largest hydraulic gold mining operation. The North Bloomfield Mining Company purchased approximately 1500 acres near the settlement of Malakoff in 1866. Hydraulic mining exposed the area to enormous amounts of high pressure water through nozzles called "monitors. The application of pressurized water on the mountainsides of Malakoff left a 1600 acre pit 7000 feet long by 3000 feet wide. The awesome effects of the world's largest hydraulic gold mining operation is still visible today." Note: According to historian Robert Wyckoff the La Grange Mine at Weaverville is larger.
NHL 81-180	Foote's Crossing Road	Foote's Crossing Road was built by A. D. Foote in 1913 as an all-season short-cut from Columbia Hill to the mines of the Alleghany area. Foote was president of the Tightner Mine Co., the largest gold producer in the region at that time. The road, a 15-foot shelf hanging on the sheer canyon wall above the Middle Fork of the Yuba River, is a spectacular engineering feat and scenic wonder. The rock walls, built without mortar are still intact today. Unforeseen difficulties in building the road caused it to far exceed specifications so Foote personally financed 60% of the total cost, the balance being paid by Nevada and Sierra counties and the U.S. Forest Service. Designated a National Historic Landmark on January 29, 1981. Reference No. 81000180.
MISC 66B	Rollins Dam and Reservoir	Nevada Irrigation District, Yuba-Bear River Development, Rollins Dam & Reservoir Completed 1965.

Site Number	Name	Description
MISC 93	Saint Paul Lutheran Church Site	On this site donated by Anna Pusheck the German Evangelical Lutheran St. Paul congregation was established in 1902 for worship and praise to God, continuing until 1984. Note: The St. Paul Lutheran church building was dedicated in December 1904. After the church was destroyed by fire on Mother's Day 1971, services were held in the parsonage until 1984. Most services and record keeping were in the German language until 1924. From then until 1942 both English and German were used to compile important data, and English services were held once a month. An English-language hymnal was used for the first time on September 28, 1924. After the outbreak of World War II the use of German was discontinued altogether.

Source: Nevada County GIS