
Alpine County Multi-Jurisdictional Hazard Mitigation Plan



99 Water Street
Markleeville, CA 96120

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BLM	United States Bureau of Land Management
BOE	Board of Equalization
BVWD	Bear Valley Water District
Cal OES	California Office of Emergency Services
CAL FIRE	California Department of Forestry and Fire Protection
CAS	California Climate Adaptation Strategy
CBC	California Building Code
CDC	Center for Disease Control
CDF	California Department of Forestry
cfs	cubic feet per second
CFR	Code of Federal Regulations
County	Alpine County
CRS	Community Rating System
DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DOT	United States Department of Transportation
DVR	Diamond Valley Ranch
DWR	Division of Water Resources
EHS	Extremely Hazardous Substance
EMPG	Emergency Management Planning Grant
EOC	Emergency Operation Center
EPA	United States Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HAZUS-MH	(abbreviation for HAZ ards U nited S tates) is a geographic information system-based natural hazard loss estimation software package developed and freely distributed by the Federal Emergency Management Agency
HMGP	Hazard Mitigation Grant Program
HTNF	Humboldt-Toiyabe National Forest
KMPUD	Kirkwood Meadows Public Utility District
LAWC	Lake Alpine Water Company
LHMP	Local Hazard Mitigation Plan
LTC	Local Transportation Board
M	Magnitude
mph	miles per hour
MWC	Markleeville Water Company

MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Association
NVE	Nevada Energy
NWS	National Weather Service
PG & E	Pacific Gas and Electric
PDM	Pre-Disaster Mitigation
POC	Point of Contact
RFC	Repetitive Flood Claims
SERC	State Emergency Response Commission
SRL	Severe Repetitive Loss
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
State	State of California
STPUD	South Tahoe Public Utility District
URM	Unreinforced Masonry Buildings
USC	United States Code
USDA	US Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey
WA	Alpine County Water Agency
WMD	Weapons of Mass Destruction
WMWC	Woodfords Mutual Water Company

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Across the United States, natural and human-caused disasters have led to increasing levels of death, injury, property damage, and interruption of business and government services. The toll on families and individuals can be immense and damaged businesses cannot contribute to the economy. The time, money and effort to respond to and recover from these emergencies or disasters, divert public resources and attention from other important programs and problems. Alpine County and the State of California recognize the consequences of disasters and the need to reduce the impacts of natural and human-caused hazards.

The elected and appointed officials of Alpine County also know that with careful selection, mitigation actions in the form of projects and programs can become long-term, cost effective means for reducing the impact of natural and human-caused hazards. Applying this knowledge, the Alpine County Hazard Mitigation Local Planning Team updated the *Alpine County Hazard Mitigation Plan*. With the support of various County officials, the State of California Office of Emergency Services (Cal OES), and the United State Department of Homeland Security/Federal Emergency Management Agency (FEMA), this plan is the result of several months' worth of work to update a hazard mitigation plan that will guide the County toward greater disaster resistance in full harmony with the character and needs of the community and region.

People and property in Alpine County are at risk from a variety of hazards that have the potential for causing widespread loss of life and damage to property, infrastructure, and the environment. The purpose of hazard mitigation is to implement actions that eliminate the risk from hazards, or reduce the severity of the effects of hazards on people and property. Mitigation is any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation encourages long-term reduction of hazard vulnerability. The goal of mitigation is to save lives and reduce property damage. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, mitigation can protect critical community facilities, reduce exposure to liability and minimize community disruption. Preparedness, response, and recovery measures support the concept of mitigation and may directly support identified mitigation actions.

The *Alpine County Hazard Mitigation Plan* has been updated in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Sec. 104 the Disaster Mitigation Act of 2000 (DMA 2000), Public Law 106-390 of October 30, 2000. Since the first plan was adopted in 2005, two mitigation actions have been completed, three are in progress, and 26 are ongoing. This updated plan identifies on-going and new hazard mitigation actions intended to eliminate or reduce the effects of future disasters throughout the County.

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This section provides an overview of the Disaster Mitigation Act of 2000 (DMA 2000; Public Law 106-390), the adoption of the updated *Alpine County Multi-Jurisdictional Hazard Mitigation Plan* (MJHMP) by the local governing body, and supporting documentation for the adoption.

1.1 DISASTER MITIGATION ACT OF 2000

The DMA 2000 was passed by Congress to emphasize the need for mitigation planning to reduce vulnerability to natural and human-caused hazards. The DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act; 42 United States Code [USC] 5121-5206 [2008]) by repealing the act's previous Mitigation Planning section (409) and replacing it with a new Mitigation Planning section (322). In addition, Section 322 provides the legal basis for the Federal Emergency Management Agency's (FEMA's) mitigation plan requirements for mitigation grant assistance.

To implement the DMA 2000 planning requirements, the Federal Emergency Management Agency (FEMA) published an Interim Final Rule in the *Federal Register* on February 26, 2002. This rule (44 Code of Federal Regulations [CFR] Part 201) established the mitigation planning requirements for states, tribes, and local communities. The planning requirements are described in detail in Section 2 and identified in their appropriate sections throughout the Plan. In addition, a crosswalk documenting compliance with 44 CFR is included as **Appendix E**.

1.2 ADOPTION BY THE LOCAL GOVERNING BODY AND SUPPORTING DOCUMENT

The requirements for the adoption of an MJHMP by the local governing body, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PREREQUISITES

Adoption by the Local Governing Body

Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).

Element

Has the local governing body adopted the plan?

Is supporting documentation, such as a resolution, included?

Source: FEMA, March 2008.

The Alpine County Hazard Mitigation Plan was conceived, developed, written, and adopted as a multi-jurisdictional planning document. While there are no incorporated cities or towns within Alpine County, the participating special districts located within the County will benefit from this plan. The Alpine County MJHMP meets the requirements of Section 409 of the Stafford Act and Section 322 of the DMA 2000.

The local governing body of Alpine County (Alpine County Board of Supervisors) has adopted this MJHMP. The signed resolution is provided in **Appendix A**.

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This section provides an overview of the County's MJHMP. This includes a review of the purpose and authority of the MJHMP and a description of the document.

2.1 PLAN PURPOSE AND AUTHORITY

The DMA 2000, also referred to as the 2000 Stafford Act amendments, was approved by Congress on October 10, 2000. On October 30, 2000, the President signed the bill into law, creating Public Law 106-390. The purposes of the DMA 2000 are to amend the Stafford Act, establish a national program for pre-disaster mitigation, and streamline administration of disaster relief.

The Alpine County MJHMP meets the requirements of the DMA 2000, which calls for all communities to prepare hazard mitigation plans. By preparing this MJHMP, the County is eligible to receive Federal mitigation funding after disasters and to apply for mitigation grants before disasters strike. This MJHMP starts an ongoing process to evaluate the risks different types of hazards pose to the County, and to engage the County and the community in dialogue to identify the steps that are most important in reducing these risks. This constant focus on planning for disasters will make the County, including its residents, property, infrastructure, and the environment, much safer.

The local hazard mitigation planning requirements encourage agencies at all levels, local residents, businesses, and the non-profit sector to participate in the mitigation planning and implementation process. This broad public participation enables the development of mitigation actions that are supported by these various stakeholders and reflect the needs of the entire community.

States are required to coordinate with local governments in the formation of hazard mitigation strategies, and the local strategies combined with initiatives at the state level form the basis for the State Mitigation Plan. The information contained in MJHMPs helps states to identify technical assistance needs and prioritize project funding. Furthermore, as communities prepare their plans, states can continually improve the level of detail and comprehensiveness of statewide risk assessments.

For FEMA's Pre-Disaster Mitigation (PDM) grant program and Hazard Mitigation Grant Program (HMGP), a local jurisdiction must have an approved MJHMP to be eligible for PDM and HMGP funding for a Presidentially declared disaster after November 1, 2004. Plans approved any time after November 1, 2004, will allow communities to be eligible to receive PDM and HMGP project grants.

Adoption by the local governing body demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in the MJHMP. Adoption legitimizes the updated MJHMP and authorizes responsible agencies to execute their responsibilities. The resolution adopting this MJHMP is included in **Appendix A**.

2.2 STAFFORD ACT GRANT PROGRAMS

The following grant programs require a State, tribe, or local entity to have a FEMA-approved State or Local Mitigation Plan.

Hazard Mitigation Grant Program (HMGP): HMGP provides grants to State, tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property as a result of natural disasters and to enable mitigation measures to be implemented during the immediate recovery from disaster. Projects must provide a long-term solution to a problem: for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. The program may provide a State or tribe with up to 20 percent of the total disaster grants awarded by FEMA. The cost-share for this grant is 75/25 percent (Federal/non-Federal).

Pre-Disaster Mitigation (PDM) Program: PDM provides funds to State, tribes, and local entities, including universities, for hazard-mitigation planning and the implementation of mitigation projects before a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Congress appropriates the total amount of PDM funding available on an annual basis. The cost-share for this grant is 75/25 percent (Federal/non-Federal).

Flood Mitigation Assistance (FMA): The FMA program provides funds on an annual basis so that measures can be taken to reduce or eliminate risk of flood damage to buildings insured under the National Flood Insurance Program (NFIP). FMA provides up to 75% Federal funding for a mitigation activity grant and/or up to 90% Federal funding for a mitigation activity grant containing a repetitive loss strategy.

Repetitive Flood Claims (RFC): The RFC program provides funds on an annual basis to reduce the risk of flood damage to individual properties insured under the NFIP that have had one or more claim payments for flood damages. RFC provides up to 100% Federal funding for eligible projects in communities that qualify for the program.

Severe Repetitive Loss (SRL): The SRL program provides funds on an annual basis to reduce the risk of flood damage to residential structures insured under the NFIP that have had one or more claim payments for flood damages. SRL provides up to 75% Federal funding for eligible projects in communities that qualify for the program.

2.3 PLAN ORGANIZATION

The remainder of this MJHMP consists of the following sections.

- **Section 3 - Community Description**

Section 3 provides a general history and background of the County and historical trends for population, demographic and economic conditions that have shaped the area. Trends in land use and development are also discussed.

- ***Section 4 - Planning Process***

Section 4 describes the planning process, identifies Local Planning Team members, and the key stakeholders within the community and surrounding region. In addition, this section documents public outreach activities and the review and incorporation of relevant plans, reports, and other appropriate information.

- ***Section 5 - Risk Assessment***

Section 5 describes the process through which the Local Planning Team identified and compiled relevant data on all potential natural hazards that threaten the County and the immediate surrounding area. Information collected includes historical data on natural and manmade hazard events that have occurred in and around the County and how these events impacted residents and their property.

The descriptions of natural and manmade hazards that could affect the County are based on historical occurrences and best available data from agencies such as FEMA, the U.S. Geological Survey (USGS), and the National Weather Service (NWS). Detailed hazard profiles include information on the frequency, magnitude, location, and impact of each hazard as well as probabilities for future hazard events.

- ***Section 6 – Vulnerability Analysis***

Section 6 identifies potentially vulnerable assets such as people, housing units, critical facilities, infrastructure and lifelines, hazardous materials facilities, and commercial facilities. These data were compiled by assessing the potential impacts from each hazard using GIS and FEMA's natural hazards loss estimation model, HAZUS-MH. The resulting information identifies the full range of hazards that the City could face and potential social impacts, damages, and economic losses.

- ***Section 7 - Capability Assessment***

Although not required by the DMA 2000, Section 7 provides an overview of the County's resources in the following areas for addressing hazard mitigation activities:

- Legal and regulatory resources
- Administrative and technical: The staff, personnel, and department resources available to expedite the actions identified in the mitigation strategy
- Fiscal: The financial resources to implement the mitigation strategy

- ***Section 8- Goals, Objectives & Actions - Mitigation Strategy***

As Section 8 describes, the Local Planning Team developed a list of mitigation goals, objectives, and actions based upon the findings of the risk assessment and the capability assessment. Based upon these goals and objectives, the Local Planning Team reviewed and prioritized a comprehensive range of appropriate mitigation actions to address the risks facing the community. Such measures include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities.

- *Section 9 - Plan Maintenance Process*

Section 9 describes the Local Planning Team’s formal plan maintenance process to ensure that the MJHMP remains an active and applicable document. The process includes monitoring, evaluating, and updating the MJHMP; implementation through existing planning mechanisms; and continued public involvement.

- *Section 10 - References*

Section 10 lists the reference materials used to prepare this MJHMP.

- *Appendices*

The appendices include the Adoption Resolution, Maps, Local Planning Team Meetings, and Public Involvement process.

- *Annexes*

- The *Alpine County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP)* is a multi-jurisdictional plan that geographically covers the entire area within the County’s jurisdictional boundaries. The following communities participated in the planning process and are seeking approval of the plan update:

- Alpine County Unified School District and Office of Education
- Bear Valley Water District
- Kirkwood Meadows Public Utility District
- Markleeville Public Utility District

This section describes the history, location, and geography of the County as well as its government, demographic information, and current land use and development trends.

3.1 HISTORY, LOCATION, AND GEOGRAPHY

Carved out of the beautiful Sierra Nevada, Alpine County was created in response to the discovery of natural riches in the form of silver deposits within the mountains of the area. Beginning in 1858, a steady flow of prospectors raised the region’s population to over 11,000 and signaled the formation of Alpine County in 1864. The excitement was short-lived though, and by 1868 fewer than 1,200 people called Alpine County home. Ever since, those who have come to live in this most sparsely populated County in California have had to address the various natural hazards inherent to this mountainous landscape.

Today, the population of Alpine County remains low, with 1,116 residents. Whereas other areas surrounding the County have experienced tremendous levels of population growth, Alpine County remains essentially unchanged. Regardless, the threat of natural hazards typical to this mountain region is real to the County’s residents and the absence of growth does not minimize the potential impact of natural hazards to the population, the business community, or the natural environment of the County.

Alpine County is subject to avalanches, dam failure, drought, earthquake, flooding, hazardous materials events, landslides, severe weather, utility loss, and wildland fires. It is impossible to predict exactly when any of these disasters might occur. It is also impossible to predict the extent of damage, the extended cost of that damage, or the degree to which the County will be affected. What is certain is that these natural hazards will happen. Natural disasters highlight the County’s past and they will continue to occur in the County’s future. Nonetheless, with prudent and thorough planning, cooperation among County, state, and federal agencies, partnership with private-sector organizations, and an informed citizenry, losses from natural disasters can be minimized.

3.2 GOVERNMENT

Alpine County is governed by a five-member Board of Supervisors, each of whom is elected from the District in which he/she lives. Terms of office for the Supervisors are four years. The Board of Supervisors is the legislative authority of the County.

The Alpine County Board of Supervisors also sits as the Local Transportation Commission (LTC), the Alpine County Water Agency (WA), and the Board of Equalization (BOE).

Below please see key community officials and County departments.

Key Community Officials

Supervisor District 1	Assessor/Recorder	Public Health Officer
Supervisor District 2	Behavioral Health Services Director	Health and Human Services Director
Supervisor District 3	County Clerk	County Librarian
Supervisor District 4	County Counsel	Superior Court Judges
Supervisor District 5	Community Development Director	Sheriff
County Administrative Officer/ Director of Finance	District Attorney	Superintendent of Schools

County Departments/Divisions

Alpine County Superintendent of Schools	Behavioral Health Services	Health & Human Services
Assessor/Recorder	County Clerk	Library & Archives
Finance Department	County Counsel	Museum
Community Development	District Attorney	Sheriff

3.3 DEMOGRAPHICS

According to the U.S. Census Bureau Quick Facts, 2014 Population Estimate, Alpine County’s population was 1,116. The California Department of Finance estimates the 2015 population at 1,121 persons, or 87 fewer people than 15 years ago. This equates to an annual percentage decrease in the population of 0.5 percent per year. The California Department of Finance (DOF) Demographic Research Unit provides population projections for California and its counties (Table 1). DOF forecasts around 1 percent average annual increase in the population to 1,296 persons in 2020 and 1,329 persons in 2025. These projections are in contrast to the historical trend for the past 15 years has been a decline in population by 0.5 percent annually. If the historical population decline rate is applied to the 2015 population, the estimated 2020 population would be 1,093 persons, while the 2025 population estimate would be 1,067 persons.

Table 3-1 Alpine County Historical and Projected Population

	1970	1980	1990	2000	2010	2015	2020	2030
Alpine County Population	484	1,097	1,113	1,196	1,233	1,252	1,296	1,328
<i>Annual Percent Growth</i>		8.2%	0.1%	0.7%	0.3%	0.3%	0.3%	0.2%
<i>Over Previous Period</i>		126.7%	1.5%	7.5%	3.1%	1.5%	3.5%	2.5%
California Population	19,953,134	23,667,902	29,760,021	33,871,648	37,341,978	38,896,969	40,619,346	44,085,600
<i>Annual Percent Growth</i>		1.7%	2.3%	1.3%	1.0%	0.8%	0.4%	0.8%
<i>Over Previous Period</i>		18.6%	25.7%	13.8%	10.2%	4.2%	4.4%	8.5%

3.4 LAND USE AND DEVELOPMENT TRENDS

Alpine County sits astride the Pacific crest and is approximately 96 percent public land. Elevation ranges from just under 5000 feet above sea level where the West Fork Carson River leaves the County northeast of Woodfords to 11,462 feet above sea level on Sonora Peak at the southern tip of the County near Sonora Pass. The eastern side of the County sits on the edge of the Great Basin along the eastern Sierra front. This area is characterized by valley, meadow, foothill and canyon areas of the eastern Sierra. To the west toward the Pacific crest, the landscape changes to the mountains and high meadows within the Sierra Nevada. Further west, the County extends to the Pacific crest and high elevations along the western slope of the Sierras. The high elevations along the western slope of the Sierras receive significant winter snowfall. A near record one season snowfall for the continental United States was measured at Tamarack, located in Calaveras County just a few miles west of Bear Valley - 884 inches (73.7 ft.) in 1906-07. Snow depths at Bear Valley and Kirkwood can often exceed 20 to 30 feet. The Sierra Nevada creates a rain shadow effect that results in decreasing snowfall and precipitation as one travels from the high elevation western slopes of the Pacific crest to the lower elevations along the eastern edge of the County. Vegetation changes follow the precipitation pattern, transitioning from the relatively lush forests and high meadows of the Sierra Nevada western slope to the drier forests, sagebrush and grasslands along the eastern Sierra front.

Open space and scenic vistas of valleys, mountains and meadows are the dominant elements of landscape scale character in Alpine County. Elements of the built environment (structures, roads and other man-made improvements) are present; however, they are clearly secondary to the dominant natural landscape elements. Within this context, development with rural character in Alpine County is defined by a combination of very small relatively compact communities, low density development outside of existing communities and large areas of undeveloped lands that include natural areas and natural resource production (timber, water, forage), and agricultural lands that include grazing areas and irrigated pastures. Communities within Alpine County include Bear Valley and Kirkwood, Markleeville, Woodfords, Mesa Vista/River Ranch, and Hung-A-Lel-Ti.

While the Alpine County Land Use Element does designate areas for future development, Alpine County is first and foremost a rural place and residents want it to stay that way. In a community

survey conducted by the Alpine County Planning Department in the fall of 2005, respondents were asked to rate a number of community values or characteristics. The highest rated items generally relate to the County's natural setting and environment - scenic beauty and views, natural environment and wide-open spaces. The County's rural/small town character, uniqueness (not like everywhere else), nearby public lands, outdoor recreation opportunities, being a good place to raise a family, and the presence of agricultural lands and working ranches were also rated highly.

3.5 WASHOE TRIBE OF NEVADA AND CALIFORNIA

Although the Washoe Tribe of Nevada and California is developing their own Multi-Hazard Mitigation Plan separately from the Alpine County MJHMP, they are actively participating in the Alpine County MJHMP planning process. The following section provides a community profile for the Tribe in order to provide a more complete picture of the composition of the entire community.

The ancestral homeland of the Washoe Tribe radiated from Lake Tahoe, a spiritual and cultural center in the central Sierra Nevada Mountain Range west of Alpine County. The area originally encompassed over 1.5 million acres, the traditional homelands stretched from the Central Sierra Nevada in California to the Great Basin in Nevada.

Today, through ongoing tribal efforts and federal collaborations, the Tribe has recovered approximately 5,669 acres and approximately 65,420 acres of individual trust allotments within the ancestral homelands. Washoe Tribal lands are unique in that they do not comprise a single reservation, but are fractionated into several discrete parcels, located in six different counties and two different states. While the Tribe has some forested lands in the Sierra Nevada, most current lands are located just within the boundaries of the Great Basin Desert, in the Carson River Watershed.

The last Tribal census in 2010 determined the total tribal enrollment to be 1,649 (one-quarter or more blood quantum), with 590 Tribal members living on one of the four reservation communities. While not all of these Tribal members live within Alpine County, a significant number do. In addition, the Tribe maintains around 304 employees, most of whom work out of the administration buildings in the Dresslerville parcel. While many of these employees are not residents of Tribal lands, they are nonetheless exposed to the hazards therein.

There is one federally recognized community under the Washoe Tribe of Nevada and California that is located within the jurisdictional boundary covered by this Hazard Mitigation Plan. Hung-A-Lel-Ti is a Washoe tribal community comprising 80 acres on Diamond Valley Road in the Dutch Valley area. It is situated at 5400 feet elevation on a mesa overlooking the Carson Valley. Hung-A-Lel-Ti is under the combined jurisdiction of the Washoe Tribe of Nevada and California, and the Bureau of Indian Affairs.

Twenty miles north of Alpine County, Washoe Tribal headquarters is centrally located on Tribal Land within the Dresslerville Community and within a 20-mile radius of nearly all current Tribal lands.

The Tribe is organized under the provisions of the Indian Reorganization Act of June 18, 1934, exercising rights of home rule and responsibility for the general welfare of its membership. The

Washoe Tribal Council, a 12-member body, serves as the local authority for purposes of authorizing any planning program for the Tribe's future.

3.6 SPECIAL PUBLIC DISTRICTS

In addition to the Washoe Tribe, there are several special districts participating in the planning process with the Local Planning Team. The districts are Alpine County Unified School District, Bear Valley Water District, Kirkwood Meadows Public Utility District, Markleeville Public Utility District, South Tahoe Public Utility District, and Washoe Utility Management Authority. Of these special public districts, four have chosen to be annexed into this updated plan. They are Alpine County Unified School District, Bear Valley Water District, Kirkwood Meadows Public Utility District, and Markleeville Public Utility District. These districts have utility connection authority. They do not have zoning or land use development authority. These districts are further discussed in the Annex A – D portion of the plan.

3.6.1 Alpine County Unified School District

Local Planning Team Member:

Patrick Traynor, Superintendent
Alpine County Unified School District
43 Hawkside Drive
Markleeville, CA 96120
(530) 694-2230
Email: ptraynor@alpinecoe.k12.ca.us

The Alpine County Unified School District includes Diamond Valley Elementary School, Alpine County Community Day School, Alpine County Opportunity School, and Bear Valley School.

3.6.2 Bear Valley Water District

Local Planning Team Member:

Jeff Gouveia, General Manager
Bear Valley Water District
441 Creekside Drive
Bear Valley, CA 95223
(209) 753-2112
Email: gmbearvalleywater@sbcglobal.net

The Bear Valley Water District (BVWD) provides wastewater collection and treatment service for Bear Valley, Lake Alpine campground, and the Bear Valley Mountain Resort (ski area). The BVWD is a California Special District governed by a Board of Directors.

3.6.3 Kirkwood Meadows Public Utility District

Local Planning Team Member:

Michael Sharp, General Manager
Kirkwood Meadows Public Utility District
33540 Loop Rd
Kirkwood, CA 95646
(209) 258-4444
Email: msharp@kmpud.com

Established in 1985, the Kirkwood Meadows Public Utility District (KMPUD) was formed as a public municipal corporation under the California Public Utilities Code after detachment from the El Dorado Irrigation District. The District is located in a remote area in the Sierra Nevada mountains within Alpine, Amador, and El Dorado Counties. KMPUD's service area encompasses an area of approximately 1.875 square miles. Kirkwood, California is a resort-oriented community and includes the key facilities of Kirkwood Mountain Resort, one of the top ski mountains in North America. The District is governed by a five-member Board of Directors elected by registered voters to serve staggered, four-year terms.

The District services 844 active water connections, of which 703 are residential, 45 are commercial, and 96 are irrigation. KMPUD receives its water supply entirely from groundwater wells.

In 2011, the District acquired Mountain Utilities and with that acquisition became the provider of electric and propane services for the Kirkwood Valley. A new powerhouse was constructed to house three Caterpillar and five Volvo diesel generators. During the summer of 2013, the District begins construction of a power line that will connect the Kirkwood community to the regional electric grid. The construction project includes approximately 25 miles of buried line extending from Kirkwood to the south side of Bear River Reservoir in Amador County. From this point, the power line will be an overhead line within an existing overhead line corridor to Salt Springs Reservoir where it will connect to existing PG&E lines. Construction is expected to take two years to complete. In the fall of 2014 it is anticipated that Kirkwood will be connected to the regional electric grid.

3.6.4 Markleeville Public Utility District

Local Planning Team Member:

Adam Coyan, General Manager
Markleeville Public Utility District
P.O. Box 222
Markleeville, CA 96120
(530) 694-2140
Email: braemear@yahoo.com

Markleeville Public Utility District provides waste-water collection and treatment for Markleeville.

3.6.5 South Tahoe Public Utility District

Local Planning Team Member:

Jim Hilton, Operations Manager
South Tahoe Public Utility District
1275 Meadow Crest Drive
South Lake Tahoe, CA 96150
(530) 543-6286
Email: jhilton@stpud.dst.ca.us

The South Tahoe Public Utility District (STPUD), a public agency chartered in 1950, operates on the south shore of Lake Tahoe in El Dorado County. The District supplies drinking water and provides wastewater collection and treatment for the community of South Lake Tahoe. The District recycles 100% of its wastewater and transports it to Alpine County, where its application benefits agricultural land. Lake Tahoe's seasonal tourism and the large number of part-time residents cause wide fluctuations in both daily water production and wastewater flows.

The District serves water to more than 13,900 homes and businesses, with annual water production at nearly 2.6 billion gallons. The water system includes 14 active wells, 22 water tanks, 15 booster stations, and 370 miles of water mainline.

The sewage collection system consists of more than 420 miles of collection lines and 42 lift stations, providing service to more than 17,800 homes and businesses. The wastewater treatment plant capacity is 7.7 million gallons per day. The design and operation of the wastewater treatment plant makes it possible to achieve water quality that allows water and biosolids recycling. Each year the plant treats and exports more than 1.6 billion gallons of recycled water that meets high reuse standards. Under provisions of the 1968 Porter-Cologne Water Quality Control Act, the District transports the recycled water nearly 26 miles out of the Tahoe Basin to the District-owned and operated Harvey Place Dam and Reservoir. The recycled water facilities, known as Diamond Valley Ranch (DVR,) are located near Woodfords, California in neighboring Alpine County. The South Tahoe Public Utility District, a public agency established on September 28, 1950, (pursuant to Section 9 of "The Public Utility District Act") supplies drinking water and provides sewage collection, treatment, and export to protect Tahoe's delicate ecosystem.

3.6.6 Washoe Utility Management Authority

Local Planning Team Member:

David Tom, General Manager
Washoe Utility Management Authority
919 Hwy 395 South
Gardnerville, Nevada 89410
(775) 221-0697
Email: David.tom@washoetribe.us

The Washoe Utility Management Authority provides water and wastewater services to the Woodfords community.

3.7 PRIVATE UTILITY COMPANIES

There are three private utility companies participating in the planning process with the Local Planning Team.

3.7.1 Lake Alpine Water Company

Local Planning Team Member:

Kimi Johnson, General Manager

Lake Alpine Water Company

301 Schimke Road

Bear Valley, CA 95223

(209) 753-2409

Email: info@lakealpinewater.com

Lake Alpine Water Company (LAWC) is a privately-owned Class D water utility serving Bear Valley, California in Alpine County. LAWC serves nearly 300 homes, 20 businesses and 179 condominium units. All water is obtained from springs and snow melt into Bear Lake.

LAWC is regulated by the California Public Utilities Commission and the State Water Resources Control Board. LAWC is managed by a board of directors.

3.7.2 Markleeville Water Company

Local Planning Team Member:

Kris Hartnet, Construction Manager

Markleeville Water Company

P.O. Box 131

Markleeville, CA 96120

(530) 694-1879

Email: khartnet@hotmail.com

Markleeville Water Company (MWC) is a privately owned mutual water company serving Markleeville, California. MWC has 195 customers. MWC is regulated by the State Water Resources Control Board. MWC is managed by a board of directors.

3.7.3 Woodfords Mutual Water Company

Woodfords Mutual Water District

P.O. Box 191
Markleeville, CA 96120

Woodfords Mutual Water Company (WMWC) is a privately owned mutual water company serving the Alpine Village Subdivision in Woodfords, California. WMWC has 50 customers. WMWC is regulated by the California Department of Public Health. WMWC is managed by a board of directors.

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This section provides an overview of the planning process; identifies Local Planning Team members, and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used in the development of this MJHMP. Additional information regarding the Local Planning Team and public outreach efforts is provided in **Appendices C and D**.

The requirements for the planning process, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Planning Process

Documentation of the Planning Process

Requirement §201.6(b): 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.

Requirement §201.6(c)(1): [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.

Element

- Does the new or updated plan provide a narrative description of the process followed to prepare the plan?
- Does the new or updated plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan Committee, provided information, reviewed drafts, etc.?)
- Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Does the new or updated plan indicate that an opportunity was given for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the updated plan document how the planning team reviewed and analyzed each section of the plan?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- Does the updated plan indicate for each section whether or not it was revised as part of the update process?

Source: FEMA, March 2008.

4.1 OVERVIEW OF PLANNING PROCESS

The first step in the planning update process was to establish a Local Planning Team comprised of existing Alpine County agencies. Brian Peters, Community Development Director, served as the primary Point of Contact (POC) for the Alpine County and the public. Alpine County retained R.O. Anderson Engineering, Inc., to facilitate the planning process.

Each section of the previous MJHMP plan was reviewed for content and the Local Planning Team revised every section of the plan. The plan was re-drafted into a new outline to better assist the State Hazard Mitigation Officer in the review process.

Although no plan maintenance was performed during the 7 years since the previous plan was adopted, Alpine County has remained very active in hazard mitigation planning through other projects and planning. In the 2009 *Alpine County General Plan*, Safety Element Section there was discussion regarding history and mitigation actions for hazards including fire, earthquake, unstable slopes, flood, and hazardous materials. Also in 2009, the *Community Wildfire*

Protection Plan was completed. Additionally, in 2012, Alpine County participated in the Carson River Watershed Discovery Project as part of the FEMA Risk MAP Program which included watershed-wide discussions about increasing resilience to flooding. The Discovery Project resulted in a prioritized list of mitigation actions.

Once the Local Planning Team was formed, the following five-step planning process took place during the 18-month period from January 2015 to July 2016.

- **Organize resources:** The Local Planning Team identified resources, including County staff, agencies, and local community members, which could provide technical expertise and historical information needed in the development of the MJHMP.
- **Assess risks:** The Local Planning Team identified the hazards specific to the County, and developed the risk assessment for the ten identified hazards. The Local Planning Team reviewed the risk assessment, including the vulnerability analysis, prior to and during the development of the mitigation strategy.

Assess capabilities: The Local Planning Team reviewed current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards. For future assessment of these capabilities, the County and Annex Jurisdictions will review these capabilities annually, based on any changes that have occurred within the year. The county and annex jurisdictions will take in to account if these capabilities need to be updated due to any new development, and any increases in hazards due to the public’s perception of climate change effect on hazards and if any increases or decreases in hazards to the county have occurred., They will also utilize other updated information in the plans currently adopted by the County and annex jurisdictions for up to date information, in order to expand, improve upon or add any additional information to this plan, so that the information contained in this plan document stays current.

-
- **Develop a mitigation strategy:** After reviewing the risks posed by each hazard, the Local Planning Team worked to develop a comprehensive range of potential mitigation goals, objectives, and actions. Subsequently, the Local Planning Team identified and prioritized the actions to be implemented.
- **Monitor progress:** The Local Planning Team developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to the County.
- The following table provides the new section format and provides details on the update.

Table 4-1. Plan Outline and Update Effort

Plan Section	Update Effort	What Changed
Section 1 – Official Record of Adoption	New	The process for plan adoption remains the same but the update provides a discussion of this process.
Section 2 - Background	New	This section was added to include the Disaster Mitigation Act of 2000 and Stafford Grant Programs for completeness.
Section 3 – Community Description	Moderate Revisions	Changed from Section I to Section 3. This section was updated to include new demographic information, as well as a description of the Washoe Tribe of Nevada and California, as well as each of the special districts.

Section 4 – Planning Process	Major Revisions	Changed from Section I to Section 3. This section details the current plan's planning process. Public and stakeholders outreach efforts.
Section 5 – Hazard Analysis	Moderate Revisions	Changed from Section II to Section 5. The individual hazard sections were reformatted. New data was incorporated from hazard subcommittee reviews, particularly in regard to hazards history in the last ten years. Maps were updated. All sections had moderate revisions, except energy emergency which only had minor revisions.
Section 6 – Vulnerability Analysis	Moderate Revisions	Changed from Section II to Section 6. Updated analysis of residential, nonresidential, and critical facilities based on mapping efforts tied to hazards was included. Future development was included.
Section 7 – Capability Assessment	Major Revisions	Changed from Section I to Section 7. This section was expanded to include a detailed listing of the County's legal and regulatory capabilities, administrative and technical capabilities, and financial capabilities.
Section 8 – Mitigation Strategy	Moderate Revisions	Changed from Section III to Section 8. Goals and actions were reviewed and progress was included goals and actions were added, actions were deleted at Table 8-4 Action Plan Matrix. The prioritization process was expanded to include the STAPLE+E process to better evaluate and prioritize actions.
Section 9 – Plan Maintenance	Major Revisions	Changed from Section III to Section 9. Plan maintenance was expanded to include monitoring and evaluating the plan, implementation through existing planning mechanisms, and continued public involvement. Planning forms were included in Appendix F to help with the maintenance process.
Section 10 – Reference	New	Added to include materials referenced from the previous plan and this update.

4.2 HAZARD MITIGATION LOCAL PLANNING TEAM

4.2.1 Formation of the Local Planning Team

As previously noted, the planning process began in January 2015. Brian Peters, Community Development Director, for Alpine County, formed the advisory body, known as the Local Planning Team, utilizing staff from relevant County agencies and community organizations. The Local Planning Team members are listed in **Table 4-2**. The Local Planning Team meetings are described in section 4.2.2. Meeting minutes are provided in **Appendix C**.

Table 4-2. Alpine County Hazard Mitigation Local Planning Team

Name	Department	
Chair: Brian Peters, Community Development Director	Alpine County	Chair of the Committee, chaired meetings, provided evaluation and information on the following sections, hazard profile, vulnerability analysis, risk assessment, mitigation strategies, plan maintenance, provided public outreach. Attended meetings, reviewed drafts and provided input.
Tony Creter, Building Official	Alpine County Building	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, particularly regarding flood and earthquake.
Dennis Lampson, Director of Environmental Health	Alpine County	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, particularly regarding drought and hazardous materials.

SECTIONFOUR

Planning Process

Rick Stephens, Sheriff	Alpine County Sheriff	Reviewed drafts of plan.
Zach Wood, Planner III/GIS	Alpine County	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input on all hazards, prepared mapping and vulnerability assessment.
Patrick Traynor, Superintendent	Alpine County School District	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input on all hazards.
Jeff Gouveia, General Manager	Bear Valley Water District	Provided hazard information, mitigation strategy. Reviewed drafts and provided input on all hazards.
Kimberly Lorenz, Emergency Services Coordinator	CalOES	Attended meetings, reviewed drafts and provided input.
Ed James, General Manager	Carson Water Subconservancy District	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, particularly regarding drought and flood.
Terry Hughes, Fire Chief	Eastern Alpine Fire & Rescue	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, particularly regarding wildland fire.
Rick Ansel, Assistant Manager, Operations	Kirkwood Meadows Public Utility District	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, particularly regarding wildland fire.
Kimi Johnson, General Manager	Lake Alpine Water Company	Attended meetings, reviewed drafts and provided input, particularly regarding dam failure.
Kris Hartnet, Construction Manager	Markleeville Water Company	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, particularly regarding drought, communication/ utility loss and wildland fire.
Adam Coyan General Manager	Markleeville Public Utility District	Reviewed drafts and provided edits for the update plan.
Dave Harden, P.E. BEN I EN	Markleeville Public Utility District	Reviewed Table 8.4 and provided comments and edits to the plan update.
Chris Smallcomb, Warning Coordination Meteorologist	NOAA	Provided information on hazard profile. Reviewed drafts and provided input particularly regarding drought, floods and severe weather.
Jim Hilton, Operations Manager	South Tahoe Public Utility District	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input particularly regarding drought, dam safety, and floods.
Linda Guy	USFS, HTNF	Provided information on hazard profile. Reviewed drafts and provided input particularly regarding wildland fire.
Anna Belle Monti, Forester	USFS, HTNF	Provided information on hazard profile. Reviewed drafts and provided input particularly regarding wildland fire.
Rob Beltramo, Planning/Project Manager	Washoe Tribe of Nevada and California	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, on all hazards.

Lisa Christensen, Chairwoman	Washoe Tribe of Nevada and California	Provided hazard information, mitigation strategy. Attended meetings, reviewed drafts and provided input, on all hazards. Provided updated demographics and additional information for Washoe Tribe.
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4.2.2 Local Planning Team Meetings & Monthly Progress

- *June 2015*

During the kick-off meeting, the Local Planning Team discussed the objectives of the DMA 2000, the hazard mitigation planning process, the public outreach process, and the steps involved in updating the MJHMP and achieving the County’s goals. The planning process was discussed including the purpose of the plan. The Local Planning Team identified existing plans, studies and technical reports to be reviewed and incorporated into the MJHMP (as shown in section 4.4). The Local Planning Team discussed a press release and notification letter to be sent to neighboring communities. The 8 potential hazards from the original MJHMP (as shown in Section 5.2), were reviewed and modifications to the hazards list were discussed. A hazard identification table was completed for the update. The exercise identified the specific hazards that the Local Planning Team wanted to address in the MJHMP. Two new human caused hazards were added: communications/utility loss and hazardous materials. The Local Planning Team then used the hazards identified and completed a Hazard Profiling Worksheet. The exercise used group averaging to prioritize the hazards into high, medium and low categories. See **Appendix E** for agenda and handouts.

- *July 2015*

During the July Local Planning Team meeting, the consultant briefed the Local Planning Team on progress made to date, including the new plan format and result of the hazard ranking from the previous meeting. The Local Planning Team reviewed drafts of Section 1-4 and discussed information needed. The Local Planning Team reviewed and edited the first five hazards including: avalanche, communications/utility loss, dam failure, drought & water shortage, and earthquake. The Local Planning Team reviewed the previous plan’s mitigation action items and considered revisions and new action items.

- *September 2015*

During the September Local Planning Team meeting, the consultant briefed the Local Planning Team on progress made to date, including edits received during and after the previous meeting. The Local Planning Team briefly reviewed drafts of Section 1-4 and discussed information needed. The Local Planning Team reviewed edits to the first five hazards including: avalanche, communications/utility loss, dam failure, drought & water shortage, and earthquake. The Local Planning Team reviewed the last five hazards including floods, hazardous materials, landslide, severe weather, and wildland fire. Team members provided historical event information and other edits. The Local Planning Team reviewed the previous plan’s mitigation action items and considered revisions and new action items. Additionally, preliminary mapping and status of the vulnerability analysis was discussed.

- *October 2015*

The consultant continued to edit the draft plan based on comments received from the Local Planning Team. Additionally, the consultant drafted Sections 7-9 for review. During the October

Local Planning Team meeting, the Team reviewed the previously distributed Sections 1-4 and Section 5 Hazards. Additionally, the Team discussed the progress made on the vulnerability assessment. Section 7 Capabilities Assessment was reviewed and the Local Planning Team provided updates. The Local Planning Team also reviewed Section 8 Mitigation Strategy and added two new goals and several new mitigation actions. Following the meeting, the consultant worked to finalize the on-line survey for distribution to the Planning Team for testing.

- *November 2015*

The Planning Team met to review edits to Sections 1-5 and new Sections 7-9. Team discussed progress made on vulnerability assessment and reviewed online GIS mapping of hazards. The team also discussed several new mitigation actions to be added and edited a few of the existing to be more specific. The Planning Team also discussed final edits to the public questionnaire and potential dates and locations to hold the public workshop.

- *January 2016*

The final Planning Team meeting was held to review the draft plan and discuss any edits to be made. The Planning Team also discussed the potential venue for the public workshop and what it would entail. The STAPLE+E was given to all committee members in attendance, with directions for filling out the STAPLE+E. The group spent time discussing the mitigation actions and evaluation of the actions to complete the STAPLE+E form. The consultant discussed the final steps for edits and review of the draft plan.

- *March 2016*

The consultants and members of the Local Planning Team attended the local 50 Plus Meeting to provide information to the public about hazard mitigation planning in the County. Draft plans were available for review, public questionnaires were distributed, and the County provided an online display of the current hazards maps.

4.3 PARTICIPATION AND PUBLIC INVOLVEMENT

Invitations to create the planning team for this update, were sent via email to Alpine County departments, the local tribe and neighboring communities and districts. Alpine County is the only agency with jurisdiction to regulate development. There are no incorporated cities located in the County. The larger annex agencies such as the KMPUD have a more extensive review of development proposals due to the comprehensive public services they provide. The Reason we didn't seek more involvement from the neighboring jurisdictions can be summarized as follows:

- Mono, El Dorado and Tuolumne Counties. Almost exclusively federal land management at the border. Nearest populated places are Topaz, South Lake Tahoe, and Camp Commell have little connection to Alpine county as related to land use planning.
- Amador County. Amador and Alpine Counties consistently collaborate on land use planning in the Kirkwood Valley through the Tri County Technical Advisory Committee.
- Douglas County, NV. Douglas County border with Alpine County is largely federally managed lands or agricultural private lands with spares population.

The Alpine County Hazard Mitigation Questionnaire was designed to help the Local Planning Team identify the community's concerns about natural and human-caused hazards. The questionnaire was considered an essential development tool to the County's MJHMP. In March 2016, the County requested public input using the County website (See Appendix C). An online questionnaire was posted on the website. Hard copies of the questionnaire were also available at the public workshop, held March 10, 2016, at the local 50 Plus Meeting. Approximately 6 questionnaire responses were returned via the workshop and online. Questionnaire responses were tallied and written comments were reviewed. The questionnaire and the results can be found in Appendix D.

The concerns (rated at Low, Med, and High) of citizens residing in Alpine County are indicated below, highest to lowest:

- a. Drought & Water Shortage
- b. Communication/Utility Loss
- c. Wildland Fire
- d. Flood
- e. Severe Weather
- f. Landslide
- g. Earthquake
- h. Dam Failure
- i. Avalanche
- j. Hazardous Materials Events

The questionnaire revealed that the majority of Alpine County citizens wish to receive information about how to make their homes safer from natural disasters from the Fire Department/Emergency Management, the American Red Cross, and the Utility companies. Less effective was receiving information from the News Media, Institutions and other Government Agencies.

Having water, a flashlight and checking smoke detectors annually was 83.33% of the results received. Having batteries, battery powered radio, fire extinguishers, medical supplies and discussing utility shutoffs, were 66.67% of the results received. Some have developed a plan and some plan to do so. In addition, 66.67% of the responses received said that they have been trained in First Aid/CPR and AED. With half of the responses planning to do so.

The questionnaire provided excellent feedback from the community concerning hazard mitigation issues and was used during the update to the Alpine County Multi-Jurisdictional Hazard Mitigation Plan.

The County also sent emails regarding the update of the MJHMP to the following entities inviting them to join the planning process:

- California Office of Emergency Services

- Washoe Tribe of Nevada and California
- Markleeville Public Utility District
- U.S. Forest Service, Carson Ranger District
- U.S. Forest Service, HTNF
- Caltrans Woodfords Maintenance
- Bear Valley Water District
- Markleeville Water Company
- South Tahoe Public Utility District
- Eastern Alpine Fire & Rescue
- Carson Water Subconservancy District
- Lake Alpine Water Company
- Kirkwood Meadows Public Utility District
- National Oceanic and Atmospheric Administration
- Bureau of Land Management, Carson Field Office
- Alpine County Unified School District
- Alpine County Sheriff's Department
- Douglas County (Neighboring County to the northeast)
- Eldorado County (Neighboring County to the northwest)
- Mono County (Neighboring County to the south)

4.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, the Local Planning Team reviewed and incorporated information from existing plans, studies, reports, and technical reports into the MJHMP. A synopsis of the sources used follows.

- ***Alpine County Area Plan (Hazardous Materials Incidents)***: Developed to enable public and private agencies in Alpine County to better respond to hazardous materials incidents within their county.
- ***Alpine County Building Code***: These regulations adopt the 2013 California Building Code and establish minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, access to persons with disabilities, sanitation, adequate lighting and ventilation, and energy conservation; safety to life and property from fire and other hazards attributed to the built

environment; and to provide safety to firefighters and emergency responders during emergency operations.

- ***Alpine County Fire Restrictions and Fuels Reduction Code:*** Developed to mitigate fire hazard in Alpine County.
- ***Alpine County Floodplain Development Standards:*** Developed to minimize public and private losses due to flood conditions in specific areas. Action 7A is consistent with the County's Code 16.08 which relates to development standards.
- ***Alpine County General Plan (February 2009):*** Guiding principle includes a Land Use Element and Safety Element which address hazard mitigation. Mitigation action 1B describes updates for consistency between the ACMJHMP and the General Pa. The General Plan Safety Element implementation measures related to hazards are consistent (i.e. fuels reduction, identify flood zones).
- ***Alpine County Wildland-Urban Interface Fire Regulations:*** This document includes regulations for building and maintaining homes in wildland fire prone areas. Mitigation Action 10 A is consistent with WUI regulations.
- ***Alpine County Zoning Ordinance:*** Adopted to promote and protect the public health, safety, morals, comfort, convenience and general welfare, and to implement the county General Plan.
- ***California Multi-Hazard Mitigation Plan:*** This plan, prepared by Cal OES, was used to ensure that the County's MJHMP was consistent with the State's Plan. The ACMJHMP is consistent with the State HMP.
- ***Carson River Geographic Response Plan (2005):*** This is a regional plan covering five counties in two states. The plan was developed to protect the health, safety, environment, and property (both public and private) from the effects of hazardous materials incidents in or near the Carson River. This plan is a multi-state, multi-agency planning document which is consistent with Mitigation Action 2.B/
- ***Carson River Watershed Regional Floodplain Management Plan (2008 & 2013 Update):*** This plan provides strategies for floodplain management that can be applied regionally as well as locally. Mitigation Action 7 A is directly related to the management plan recommendations.
- ***Carson River Watershed Discovery Report (2012):*** Intended to initiate watershed-wide discussions about increasing resilience to flooding. The goal of Discovery is to determine which areas within a watershed require mapping, risk assessment, or mitigation planning assistance.
- ***Community Wildfire Protection Plan (2009):*** This document includes findings and recommendations for mitigating the threat to property from wildland fires. This document includes the following mitigations which are consistent with the CWPP proposed projects: 10 C identify WUI areas, 10 D Reduce fuels, 10 I develop partnerships.
- ***Washoe Tribe of NV & CA Hazard Mitigation Plan 2005***

The following FEMA guides were also consulted for general information on the MJHMP process:

- ***How-To Guide #1: Getting Started: Building Support for Mitigation Planning (FEMA 2002c)***

- *How-To Guide #2: Understanding Your Risks – Identifying Hazards and Estimating Loss Potential (FEMA 2001)*
- *How-To Guide #3: Developing the Mitigation Plan: Identifying Mitigation Actions and Implementing Strategies (FEMA 2003a)*
- *How-To Guide #4: Bringing the Plan to Life: Implementing the Hazard Mitigation Plan (FEMA 2003b)*

A complete list of the sources consulted is provided in Section 10, Reference.

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A hazard analysis includes the identification and screening of each hazard and subsequent profiling of each hazard. Hazard identification is the process of recognizing the natural and human-caused events that threaten an area. Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude. Human-caused hazards result from human activity and include technological hazards and terrorism. Technological hazards are generally accidental or result from events with unintended consequences, for example, an accidental hazardous materials release. Terrorism is defined as the calculated use of violence or threat of violence to attain goals that are political, religious, or ideological in nature.

Even though a particular hazard may not have occurred in recent history in the study area, all hazards that may potentially affect the study area are including in the screening process. The hazards that are unlikely to occur or for which the risk of damage is accepted as being very low, are eliminated from consideration.

All identified hazards will be profiled by describing hazards in terms of their nature, history, magnitude, frequency, location, and probability. Hazards are identified through the collection of historical and anecdotal information, review of existing plans and studies, and preparation of hazard maps of the study area. Hazard maps are used to determine the geographic extent of the hazards and define the approximate boundaries of the areas at risk.

5.1 HAZARD IDENTIFICATION AND SCREENING

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Risk Assessment – Overall

Identifying Hazards

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

- Does the new or updated plan include a description of all the types of all-natural hazards that affect the jurisdiction?

Source: FEMA, March 2008.

The first step of the hazard analysis is the identification and screening of hazards, as shown in **Table 5-1**. During the first MJHMP meeting, the Local Planning Team using the *California Multi-Hazard Mitigation Plan* and the County's previous plan as a starting point and reviewing previous disaster declarations the Local Planning Team identified 8 possible hazards.

The Local Planning Team added Communications/Utility Loss and Hazardous Materials as new hazards to be profiled.

Table 5-1. Identification and Screening of Hazards

Hazard Type	Should It Be Profiled?	If Yes is this a New Hazard?	Explanation
Avalanche	Yes	No	Alpine County has a history of avalanches.
Civil Disturbance	No	N/A	No recent or historic events have occurred.
Dam Failure	Yes	No	While there have been no historic events, dam failure has the potential to impact Alpine County.
Drought	Yes	No	Alpine County is presently in a period of drought based on the recent series of below-average precipitation winters.
Earthquake	Yes	No	There is a history of earthquakes in Alpine County.
Epidemic	No	N/A	No recent or historic events have occurred.
Flood	Yes	No	Alpine County has a well-chronicled history of flooding dating back to the 1850s.
Hazardous Material Event	Yes	Yes	Alpine County is susceptible to hazardous material events.
Infestations	No	N/A	No recent or historic events have occurred.
Landslide	Yes	No	Alpine County has a history of landslides which usually occur as part of a larger, more widespread natural hazard event.
Levee Failure	No	N/A	No levees are located in Alpine County.
Severe Weather	Yes	No	Alpine County has a history of severe winter storms, severe windstorms, severe thunderstorms and severe heat.
Seiche	No	N/A	There is no threat of seiche in Alpine County
Tornado	No	N/A	Alpine County has no history of tornadoes.
Volcano	No	N/A	The nearest volcanos are approximately 100 miles away at Mono Lake Craters.
Utility Loss	Yes	Yes	Utility loss is of concern in Alpine County as is communication loss.
WMD / Terrorism	No	N/A	No recent or historic events have occurred.
Wildland Fire	Yes	No	The terrain, vegetation, and weather conditions in the region are favorable for the ignition and rapid spread of wildland fires.

Assigning Vulnerability Ratings

During a Local Planning Team meeting the members were tasked to prioritize the hazards by their total impact in the community. An exercise requiring the committee to complete a form which tabulated their ratings of each hazard was accomplished. The exercise formula took into account the historical occurrence of each respective hazard, the potential area of impact when the disaster does occur, and the magnitude. Please see **Table 5-2** below for scoring criteria.

It is important to note that hazards of the same magnitude and the same frequency can occur in similar sized areas; however, the overall impact to the areas would be different because of population densities and property values in the areas impacted.

Table 5-2: Vulnerability Ratings Rubric

	Frequency	Magnitude/Severity	Warning Time	Duration	
Lowest	1	1000+ years	1-5% Damaged; No deaths; Local	> 48 hrs	1 - 3 Days
	2	100 -1000 years	5-15%; No deaths; City/Community	24 to 48 hrs	4 - 7 Days
	3	10 -100 years	15-30%; < 5 Deaths; County	12 to 24 hrs	8 - 14 Days
	4	5 -10 years	30-50%; > 5 Deaths; State	6 to 12 hrs	15 - 20 Days
Highest	5	0 - 5 years	50+%; Significant Deaths; Region IX	< 6 hrs	20+ Days

The Local Planning Team referenced the historical records and data provided in the 2005 *Alpine County Natural Hazard Mitigation Plan*, as well as knowledge of events that have occurred since the 2005 plan and any events that triggered local, state and/or federal disaster declarations. The Local Planning Team calculated scores for magnitude, economic and frequency based on historical frequencies and / or projected probabilities of the hazards identified.

Upon obtaining total scores for each hazard, the team utilized the scores to analyze and prioritize the hazards to focus upon during the profiling, vulnerability assessment and mitigation strategy. **Table 5-3** provides a summary of the hazards scoring results of both the members present at the meeting and those that supplied feedback via e-mail after the meeting.

The Planning Committee determined that 10 hazards pose a threat to the County. Natural hazards include: avalanche, dam failure, drought & water shortages, earthquakes, floods, landslides, severe weather, and wildfire. Two human-caused hazards were added since the previous update: communication/utility loss and hazardous materials.

The following table provides the results of the exercise.

Table 5-3: Alpine County Hazard Ranking

High Risk	Moderate Risk	Low Risk
Drought	Earthquake	Avalanche Dam Failure
Severe Weather	Flood	
Wildland Fire	Landslides	
Communication/ Utility Loss	Hazardous Materials	

Upon obtaining total scores for each hazard, the team utilized the scores to analyze and prioritize the hazards to focus upon during the profiling, vulnerability assessment and mitigation planning. The Local Planning Team discussed the results of the exercise and through team deliberation it was agreed that drought, severe weather, wildland fire, and communication/utility loss are considered high hazards. Earthquake, flood, landslides, and hazardous materials were considered moderate. Avalanche and dam failure were considered low hazards.

The remaining hazards excluded through the screening process were considered to pose a lower threat to life and property in the County due to the low likelihood of occurrence or the low probability that life and property would be significantly affected. Should the risk from these hazards increase in the future, the MJHMP can be updated to incorporate a vulnerability analyses for these hazards.

5.2 HAZARD PROFILES

The requirements for hazard profile, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Risk Assessment – Profiling Hazards
<p>Profiling Hazards 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.</p> <p>Element</p> <ul style="list-style-type: none"> ■ Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the plan? ■ Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the plan? ■ Does the plan provide information on previous occurrences of each hazard addressed in the plan? ■ Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the plan? <p><i>Source: FEMA, March 2008.</i></p>

The specific hazards selected by the Local Planning Team for profiling have been examined in a methodical manner based on the following factors:

- Nature
- History
- Location of future events
- Extent of future events
- Probability of future events

Each hazard was reviewed for climate change. To the extent each hazard was affected, climate change considerations were incorporated into the *Location, Extent, and Probability of Future Events* section of each hazard profile.

The hazards profiled for the County and presented in Section 5.3 are in alphabetical order. The order of presentation does not signify the level of importance or risk. Local Planning Team members considered expert in the specific hazard were tasked to review the previous MJHMP and make modifications to each profile. Revisions were made to update the historical information and new information was incorporated into each profile.

5.2.1 Avalanche

Planning Significance - Low

5.2.1.1 Nature

Alpine County is located along the crest of the Sierra Nevada. The county's elevation ranges from a low of about 4800 feet to high elevations in excess of 11,000 feet. With these elevation characteristics, all areas of the county are susceptible to snow storms, even the lowest lying areas of the county. Moreover, the county's topography is high-relief. The Sierra Nevada mountain range, a tilted fault block geologic formation, forms steep mountain slopes. The county's drainage patterns are typically fast-flowing streams and rivers which enunciate the high-relief terrain. The combination of snowfall potential and high-relief creates a potential danger for snow avalanches throughout the winter months in Alpine County. Avalanche – can be defined but the amount of displaced snow per event in tons, and/or area in feet/yards effected per event. For Alpine County an avalanche refers to any fall, release, or slide of snow in an amount sufficient enough to cause damage to or threaten the safety of people.

Avalanches are possible when weak layers of snow within the cumulative seasonal snowpack fail to support the weight of the snow above and collapse. The result causes the overlying snow to break free and flow *downhill*. There are two destructive elements at work within an avalanche. Primarily, the actual impact from the displaced snow and ice is a concern. Embedded within the snow, debris such as broken-off trees and branches are just as dangerous as the snow itself. Secondly, the avalanche wind, caused by air pushed ahead of the moving mass of snow, can cause damage as well.

Areas most susceptible to snow avalanche are typically in sheltered regions of the mountain topography where snow is most prone to accumulate. In general, the most sheltered aspects in the Sierra Nevada, where snow can most greatly accumulate, are upon north and northeast facing slopes. These slope faces must also be situated above 7000 feet where snow is more likely to accumulate over the course of the winter snowfall season.

5.2.1.2 History

The effects of an avalanche are for all intents and purposes confined to the areas within and around the avalanche path. In Alpine County's historical past, areas of considerable avalanche danger were an unknown. Today, the areas of substantial avalanche danger are clearly known and usually avoided. Too, avalanche areas in the county's downhill ski resorts and along the county's state highways are administered to drastically reduce the chance for avalanche-causing conditions to develop. Thus, few unplanned or damage-causing avalanches occur in places where people or property might be threatened. Still, avalanches can and do happen in Alpine County and although personal injury or property damage is unlikely, these misfortunes are a possibility. Alpine County's avalanche season extends from the first major snowfalls of late fall to whenever the last remnants of snow have melted away. In some of the highest elevation areas of the county, it may be possible during some winter seasons for snow to remain the entire year.

Avalanches are classified by several scales; danger, relative size and destructive force. To further explain, relative size to path takes the whole avalanche path into account and include the horizontal and vertical extent as well as the depth of the fracture. The destructive force is a

measure of the avalanche’s potential to damage of trees, people, structures and property in its track or runout zone of the avalanche. Alpine County has historically and in the period since the last MJHMP update had several avalanches of Destruction Scale R3-R4, which is consistent with avalanches of several thousand cubic yards that can sweep away vehicles and destroy structures. Please refer to Figure 5-1 below.

Figure 5-1 North American Avalanche Destruction Scale

Size Relative to Path		Destructive Force	
R1	Very small	D1	Relatively harmless Approximate path length: 33 ft (10 m)
R2	Small	D2	Could bury, injure, or kill a person Approximate path length: 330 ft (100 m)
R3	Medium	D3	Could bury and destroy a car, damage a truck, destroy a wood frame house or break a few trees Approximate path length: 3,300 ft, 0.6 miles (1,000 m)
R4	Large	D4	Could destroy a railway car, large truck, several buildings, or a substantial amount of forest Approximate path length: 6,600 ft, 1.25 mi (2,000 m)
R5	Maximum	D5	Could gouge the landscape Approximate path length: 9,900 ft, 1.9 mi (3,000 m)

Source – Snow, Weather and Avalanches: Observation Guidelines for Avalanche Programs in the United States – SWAG

Most recently, avalanches occurred which caused damage to single family residences in the East Meadows subdivision in January 2017. Infrastructure is the most affected by avalanches of higher volume which cause longer highway closures and can damage the built environment in the Kirkwood and Bear Valley ski areas.

Smaller volume (less overall destructive potential) avalanches are more likely to occur overall. These avalanches are a significant risk to backcountry travelers. Risk of death and injury from direct burial and blunt trauma is greater in the backcountry travel environment vs the built environment.

Table 5-4 below list the avalanche incidents from 2005 -2015 in the Carson Pass area. A map of avalanche hazard areas and these incidents can be found in Appendix B.

Table 5-4 Avalanche History 2005-2017

Date	Location
January 1, 2009	Kirkwood Mountain Resort
November 27, 2010	Red Cliffs Caples Lake
November 28, 2010	Red Lake Peak

February 21, 2011	Forestdale Divide
March 28, 2011	Frog Lake
March 31, 2014	Carson Pass North Bowl
January 20, 2017	East Meadows subdivision

The greatest impact that avalanches have on Alpine County are to transportation infrastructure. Two state highways in the county, Highway 4 over Ebbetts Pass and Highway 89 over Monitor Pass, are closed during the winter months, in part because of avalanche danger. Their closure limits the travel options of county residents and places increased importance on State Route 88 over 8,573-foot Carson Pass, which is maintained as a year-round highway. Highway 88 thus is the county's only east to west travel corridor during the winter months and its importance to transportation cannot be underestimated. Avalanches do impact this and other year-round thoroughfares.

During winter storms, periodic avalanche control must be performed on the highway in order to promote motorist safety over the pass. Avalanche control is also performed on State Route 89 at 7,735-foot Luther Pass along the northern boundary of the county. Without these avalanche control measures being performed by the California Department of Transportation, travel over the county's main highway corridors would be a very treacherous proposition during the winter season. With avalanche control, public safety is improved and avalanche danger is minimized.

The two major ski resorts in the county, Kirkwood and Bear Valley, also employ avalanche control techniques to mitigate avalanche danger. Ski patrollers perform avalanche control every morning that it is required in order to promote safety throughout the mountain for all skiers and riders.

Much of the dangers associated with avalanches are known and efforts are made to lessen the potential for avalanche events in areas frequented by people. Problems can arise in backcountry areas where avalanche control measures are not in place. Here, out-of-bounds downhill skiers, cross country skiers, and snowmobile riders can trigger avalanches. In April 2003, two snowmobile riders triggered an avalanche north of Blue Lakes in the Charity Valley area of Alpine County. The snowmobile riders were "highmarking" and set off a 500-foot-wide by 1000-foot-long avalanche which cost one rider their life. Although both riders were experienced, neither was carrying a beacon, probe, or shovel.

Thus, avalanches are natural hazards that still pose a threat to life and property. Away from areas that have developed and maintain avalanche control methods, Alpine County is still very vulnerable to avalanche danger. As long as individuals travel into backcountry regions during the winter, injuries will still be a possibility. Other problems associated with avalanches are loss of electricity due to power lines being disabled by avalanche and localized damage to the environment within the avalanche path.

5.2.1.3 *Location, Extent, and Probability of Future Events*

Avalanches are isolated incidences predominantly located in the backcountry areas of the county. Any avalanche would most likely affect individuals in the backcountry during the winter. There is also a lesser degree of avalanche danger within the established ski resorts of the county as well as on the highways that traverse the high-elevation passes in the county.

Still, the greatest danger is to the very few who venture into winter backcountry settings. This considered, there is **low probability** and **very low risk** associated with avalanche hazard in Alpine County. The probability of future severe avalanche events that impact public safety, property or infrastructure have roughly a .1 percent chance of occurrence in a given year.

Avalanche hazards in Alpine County are most prevalent during the winter in the backcountry regions of the county. Individuals who venture into the backcountry during the winter need to be aware of the dangers posed by avalanches and take the necessary precautions when the potential for an avalanche is present.

Individuals who frequently snowmobile, ski, cross-country ski, or snowshoe in the backcountry in the winter should educate themselves in avalanche awareness and safety. Many certificate programs are available.

The California Department of Transportation, the United States Forest Service, and the National Weather Service all have avalanche danger forecasting capabilities which they utilize to inform the public of any avalanche hazards. Specifically, the USFS Sierra Avalanche Center will issue warnings of high or extreme avalanche danger for the backcountry of Alpine County as conditions warrant. Regardless, no absolutely successful method has been found to keep individuals out of avalanche danger zones, even when it is extremely unwise to be present.

5.2.2 Communication/Utility Loss

Planning Significance - High

5.2.2.1 *Nature*

This section will address communication, electrical utility, propane gas distribution (Kirkwood), and water and wastewater utility loss. Any disruption in the supply of energy, gas or water and wastewater utility causes human suffering and economic loss. The causes of most of the shortages are beyond the control of local governments. Response to these emergencies may include rationing and emergency supply distribution.

Data and/or telecommunications loss may result as a secondary hazard to most any other natural or human-caused hazard discussed in this analysis. It is important to assure that adequate safeguards are in place to protect vital data and telecommunications systems in the event of a catastrophic event.

Alpine County depends on data and telecommunications to provide internal services as well as a great majority of service to the communities they serve. A serious loss of data and telecommunications ability could result in degraded or loss of emergency dispatch capabilities, planning services, infrastructure monitoring capabilities, access to statistical data, financial and procurement services, and access to personnel records.

Electrical utility loss is defined as any interruption or loss of electrical service due to disruption of power transmission caused by accident, sabotage, natural hazards or equipment failure. A significant power failure is defined as any incident of a long duration which would require the involvement of the local and/or state emergency management organizations to coordinate provisions of food, water, heating, and shelter. Electrical distribution systems can be interrupted for a number of reasons, but those that have historically been the main cause are high winds, severe thunderstorms and winter storms. A prolonged major electrical distribution system failure during the middle of winter, accompanied by very cold temperatures, can have dramatic effects on a population.

Liquid petroleum gas (primarily propane) is supplied to individual users by distributors operating out of the Gardnerville/Minden area and South Lake Tahoe.

The availability of water supply for fire suppression varies among communities within Alpine County. Bear Valley and Kirkwood have developed water supply systems with hydrants capable of delivering substantial amounts of water for suppression. Water supplies are more limited or nonexistent on the east slope of the County. The Markleeville area and the Alpine Village subdivision in Woodfords have small water systems designed for domestic use only. Fire hydrants have been connected to the South Tahoe Public Utility District effluent disposal pipeline that extends through the Woodfords area. However, there are restrictions on the ability to use this water for fire suppression.

Responsible distributors are listed in the table below:

Table 5-5 Utility Distributors

Utility	Company
Communications	Frontier
Electricity	PG & E, Liberty Energy, & KMPUD
Propane Gas	KMPUD Private Propane Suppliers
Water	Kirkwood Meadows Public Utility District Markleeville Water Company Lake Alpine Water Company Washoe Utility Management Authority
Wastewater	Bear Valley Water District Markleeville Public Utility District South Tahoe Public Utility District Washoe Utility Management Authority

5.2.2.2 History

Power outages are both costly and disruptive. Weather disruptions account for a large amount of outages and cost significant amounts of money to repair. From March 2014 to July 2015, there were 8 power outages in Alpine County. The table below provides details regarding the cause/circumstance and failure locations.

Table 5-6 Liberty Utility Reported Power Outages March 2014 – July 2015

Date	Time	Cause/Circumstance	Failure Location
July 14, 2015	06:58	Squirrel at interrupting device	Liberty
June 27, 2015	17:41	Loss of transmission source to Muller	NVE
June 27, 2015	20:06	Lightning strike	NVE
Feb 6, 2015	12:06	Major wind/snow storm; broken poles	NVE
Dec 11, 2014	07:20	Major storm; tree through line near Woodfords	Liberty
Nov 1, 2014	02:01	Squirrel at interrupting device	Liberty
July 1, 2014	18:30	Wire slapping (affected Markleeville only)	Liberty
March 5, 2014	10:20	Line regulator failure	NVE

5.2.2.3 Location, Extent, and Probability of Future Events

The likelihood of damages to the electrical transmission and distribution systems are high across the County. Due to weather extremes which occur in all parts of the County, these occurrences are unpredictable and can cause significant damages. All areas are affected as electrical power is used for residential and commercial purposes as well as agricultural land needs. Severe weather events cause outages on a regular basis during all seasons. However, since this is outside of the

Local Planning Team's areas of expertise, the probability of future occurrences cannot be determined.

Any disruption in the supply of energy, water or utility causes human suffering and economic loss. The causes of most of shortages are beyond control of local governments. Responses to these emergencies may include rationing, and emergency supply distribution. Within Alpine County, water systems and sewer treatment plants would be affected by a power outage. Very few of these types of facilities in Alpine County have back-up generators.

5.2.3 Dam Failure

Planning Significance - Low

5.2.3.1 *Nature*

Dam failure is a potential “man-made” natural disaster that has the possibility to impact Alpine County. It is man-made in that the dam itself was constructed through human effort. Without man’s effort, no dam would exist and, as such, no dam failure could be contemplated. It is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, dam failure would most probably happen in consequence of another natural disaster. An earthquake, severe storm, or flood could trigger dam failure within that larger disaster event.

Many of the water bodies located in Alpine County are man-created reservoirs. Some of the reservoirs only slightly raise the level of the water body behind them. Other dams substantially raise the water level of the lake behind them. Caples Lake, the county’s largest lake in size at over 630 acres, is a good example of a natural lake enhanced in size by dams. A small number of dams within the county harness waters that were created solely by the dam’s construction. As a general rule, reservoirs formed via dam construction hold back the greatest volume of water. Utica and Union Valley Reservoirs are the two best examples of this in Alpine County. Both of these dams create large flat-water lakes behind them that encompass hundreds of acres.

Most dams in this sparsely populated county are removed from the population clusters of the county. The remote location of dams, shields residents from the potential hazards associated with dam failure and the resulting inundation. One exception to this fortunate pattern is Reba Dam. Located within and above the community of Bear Valley, Bear Lake and the dam that holds back its waters do form a natural hazard to the community below and within the path of inundation that would occur if a failure occurred.

5.2.3.2 *History*

Thankfully, no dam failure events are found within the historic record of Alpine County.

Dams in Alpine County are closely monitored to ensure dam stability and integrity. The California Department of Water Resources is entrusted with supervision over non-federal dams in the State. Dams under jurisdiction are artificial barriers, together with appurtenant works, which are 25 feet or more in height or have an impounding capacity of 50 acre-feet or more. Any artificial barrier not in excess of 6 feet in height, regardless of storage capacity, or that has a storage capacity not in excess of 15 acre-feet, regardless of height, is not considered jurisdictional. Larger dams in the county are owned by private entities, the South Tahoe Public Utility District, the El Dorado Irrigation District, and Pacific Gas & Electric Company.

These dams are monitored by the California Department of Water Resources. Smaller dams that are not within California Department of Water Resources jurisdiction also exist within the county and are inspected and maintained by their owners.

There has never been a dam failure in Alpine County. Retention devices designed to hold back water are described in the historical record as having failed, but these were designed as temporary construction and not to be construed as being true permanent dam structures. Just because the county has never experienced a dam failure does not exclude the county from ever suffering a dam failure.

Although a dam could be considered a very small possibility of failing due to poor construction or lack of appropriate maintenance, the possibility for a dam failure increases during other natural hazard events. Dam failure could occur in an earthquake. Dependent upon the seismic epicenter, and the measured magnitude of the quake, it becomes increasingly possible for dam integrity to be compromised and dam failure to occur. Severe storms and floods also heighten the threat to dams within the county. If large amounts of precipitation fall in a very short period of time, dams can be crested, their structure weakened, and supports eroded. Added awareness of dam conditions is critical during these other natural disaster events.

Dam Name	Significance (Hazard class)	River	Main Purpose	Dam Height (m) (1 meter = 3.281 feet)	Normal Reservoir Storage	Year Completed
Alpine Main	High	Silver Creek	Hydroelectric, Water Supply, Recreation	14.9	5,081,945.2	1891
Bear Valley SH	Significant	Tr. Bloods Creek	Irrigation; Water Supply	13.1	426,784.7	1975
Caples Lake Main	High	Caples Creek	Hydroelectric and Recreation	26.2	15,541,871.4	1922
Heenan Lake	Low	Tr. East Fork Carson River	Irrigation; Water Supply	11.9	3,823,793.8	1929
Lower Blue Lake	Low	Blue Creek	Hydroelectric	12.2	6,278,422.6	1885; modified 2004
Meadow Lake	Low	North Fork Mokelumne River Tr.	Hydroelectric	22.4	6,981,507.3	1903; modified 2004
Reba	High	Tr. Blood Creek	Water Supply; Recreation	21.3	445,287.0	1965
Twin Lake	Low	North Fork Mokelumne River Tr.	Hydroelectric	6.7	1,492,513.0	1903
Union Main	High	North Fork Stanislaus River	Hydroelectric, Water Supply; Recreation	11.0	3,860,798.2	1910
Upper Blue Lake	Significant	Blue Creek	Hydroelectric	6.4	9,004,417.5	1901
Utica Main	High	North Fork Stanislaus River	Hydroelectric, Water Supply; Recreation	18.0	2,898,682.4	1903

Figure 5 - 2_Dam Structures in Alpine County

Source: National Performance of Dams Program (NPDP) data 2015-10-12

Tr = Tributary;

Significance (Hazard Classification): The potential hazard to the downstream area resulting from failure or misoperation of the dam or facilities:

1. Low 2. Significant 3. High Definitions, as accepted by the Interagency Committee on Dam Safety, are as follows: 1. Low Hazard Potential: Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property. 2. Significant Hazard Potential: Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life, but can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure. 3. High Hazard Potential: Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

Reservoir Storage: The capacity of the reservoir, usually in acre-feet. Dam design and reservoir operation utilize reservoir capacity and water surface elevation data. To ensure uniformity in the establishment, use, and publication of these data, the following standard definitions of reservoir capacities shall be used. Reservoir capacity as used here is exclusive of bank storage capacity.

5.2.3.3 Location, Extent, and Probability of Future Events

Dam failure is an ever-present threat to the residents of Alpine County who live near or around a dam. Especially impacted are those residents who live below a dam and within the potential path of inundation from water released by a dam failure. Still, very few residents in Alpine County face those circumstances. Most dam sites are located in the predominantly remote regions of the county. Failure of one of these remote dams would cause damage to the landscape in the path of floodwaters, but threat to life and property would be very minimal. Moreover, there has never been a dam failure in Alpine County, further reducing any present tangible danger of a dam failure materializing. Thus, there is a **very low probability** of a dam failure in Alpine County, and a **very low risk** associated with this natural hazard.

The possibility of a dam failure is an ever-present possibility in Alpine County. Just as one cannot accurately predict the occurrence of an earthquake, such is the case with dam failures as well. Individuals do have an opportunity to plan for a dam failure though, in order to lessen the potential impact of the hazard event and the resulting threat to life and property.

The one dam that is located in close proximity to human population is the aforementioned Bear Lake Dam which holds back Bear Lake. Both lake and dam are located in the Bear Valley planned development in the southwestern corner of the county. The dam was built in 1963 under the direction of the California Department of Water Resources. At high water, the lake encompasses nearly fourteen (14) acres, with a total water capacity of 240 acre-feet of water. A map of possible Dam Failure locations and Inundation Areas can be found in Appendix B. If dam failure occurred at Bear Lake Reservoir, no less than 133 families would be impacted. These families would reside in either single-family residences or condominiums within the path of inundation. Additionally, twenty-four (24) facilities below the dam would be affected. Electricity service would be interrupted as a result of the inundation. Gas and propane services would also be impacted as gas lines might be ruptured or even swept away by floodwaters. Loss of power and gas services would inconvenience and discomfort both citizens inside and outside the path of inundation.

Infrastructure associated with communication and transportation would also be affected in a dam failure. Telephone lines could be washed away, cellular towers might be lost, and cabling related to computer technologies might be damaged, further taxing information exchange options. Roads and other transportation amenities might be made impassible by mud and debris from the dam failure. Emergency personnel response times can be lengthened as a result of dangerous travel conditions. Other impacts of dam failure would be related to and determined by any natural disaster that could be considered responsible for the dam failure, such as an earthquake or severe storm.

Bear Valley Water District (BVWD) also manages two dams. BVWD's larger earthen impoundment holds 76.4 million gallons (MG) (234-acre feet) of secondary treated wastewater effluent and is bounded by both a main, northern dam, and a southern, auxiliary dam. The smaller treatment lagoon holds 14.18 MG (43.5-acre feet) of raw wastewater and/or water under treatment.

In the worst-case scenario, dam failure, coinciding during another significant environmental event such as an earthquake or other natural disaster, could release as much as 90.58 MG (278-acre feet) into the Stanislaus River watershed with deleterious effects on downstream users as well as aquatic habitat. Additionally, it should be noted that dam failure of this magnitude would likely severely damage or completely destroy the collection and treatment facilities located adjacent to these dams disrupting wastewater service capabilities for an extended period creating a public health emergency for the community of Bear Valley as well as Bear Valley Mountain Resort and the Lake Alpine basin.

In the areas of Alpine County that are near a dam site or within a dam's potential path of inundation, damage to property and threat to the health of county residents is decreased with their ability to be prepared for dam failure. To be able to most effectively address the threat dam failure poses, citizens, families, and businesses should:

1. Have an escape plan, including a path out of the inundation area.
2. Store extra supplies of food and water.
3. Store other related supplies such as flashlights, batteries, and firewood.
4. Have a battery-operated radio within their home or business.
5. Know the locations for turning off all electrical and gas utilities.

The probability of dam failures occurring within the Alpine County area, is low (unlikely as 0 – 50% chance of occurrence) and is relative to the capacity of each dam, prior to a significant event and the probability of other hazards triggering a failure such as an earthquake, severe storm or flood. The probability of dam failure is also impacted by the age and construction of the dam. Climate changes such as increases in precipitation and heat causing faster than normal seasonal snow melt could increase the potential for dam failures in Alpine County. Given the history of Alpine County not having a dam failure also contributes to a low probability.

5.2.4 Drought & Water Shortage

Planning Significance - High

5.2.4.1 *Nature*

Droughts are a natural disaster that can impact Alpine County. Extended periods of substantially reduced or no precipitation can severely injure the agricultural and recreational industries of the county. Reduction of ground and surface water resources resulting from periods of drought can also threaten residential and commercial water supplies, making drought a very serious matter among residents throughout the county. There is no specific timeframe concerning droughts; a drought can occur at any time and last for wide-ranging periods of time. An exact threshold that indicates precipitation is at drought levels is lacking, subsequently drought measurement levels usually vary from one locale to another. There is no warning as to when a drought will begin or end either, making the phenomenon of drought a very enigmatic concern. Summer thunderstorms, even if generous, do little to alleviate drought conditions due to their scattered nature and fast runoff.

For Alpine County, drought occurs when winter precipitation fails to materialize.

During the winter months, Alpine County experiences the majority of its annual precipitation. Four climatic factors together work to develop this annual season of precipitation: high altitude, orographic (mountain) barriers, prevailing storm tracks, and air masses.

- The county's location along the crest of the Sierra Nevada naturally gives the county a high average elevation. Elevation ranges from about 4800 feet to over 11,400 feet, with the majority of the county being in excess of 7000 feet.
- Alpine County is located along the crest of the Sierra Nevada mountain range. The mountain range acts as a barrier to approaching air masses which approach the mountains from the west. The mountains act as a lifting mechanism as air masses migrate over them, increasing the chance for precipitation.
- The winter storm track for Alpine County funnels storm systems from a semi-permanent low-pressure system in the Gulf of Alaska southward to the California coast following the Westerlies, a global atmospheric wind pattern that provides a relatively consistent westerly flow of air throughout most of the year.
- Air masses typical of Alpine County are classified as marine polar. The county's proximity to the Pacific Ocean, in conjunction with the aforementioned storm track, brings cold and moist marine polar air masses over the county throughout much of the year, especially during the winter months.

These climatic variables are the driving factors in analyzing and categorizing the climate of Alpine County, identified as a Csb (dry-summer) climate type within the Köppen Geiger climate classification system. The Csb classification signifies that climate within the county can be considered generally temperate, with a warm temperature range, and dry summers. Important here is the indication that precipitation predominantly occurs in the winter months. Thus, drought events happen when conditions develop that redirect or hinder the path of the storm track or alter the characteristics of air masses that migrate through the county, or both conditions transpire to concurrently alter or stop the arrival of winter storms in the county. When the winter storms fail

to arrive, or fail to provide substantial amounts of moisture, then the potential for the development of drought is present.

5.2.4.2 *History*

Alpine County is presently in a period of exceptional drought per the US Drought Monitor, the result of four consecutive dry winters including 2014-2015 where statewide snowpack was the lowest in recorded history. Many portions of the Sierra are nearly 1 to 1.5 years behind on precipitation over the last four years. The winter of 2014-2015 was notable not only for the lack of precipitation, but also for how warm it was – warmest on record since the late 1800's. So, when the region did see a winter storm, snow levels were unusually high leading to even less snowfall in the mountains.

Up until recently, perhaps the most alarming period of drought in Alpine County's history occurred between 1987 and 1992. Most dramatic during this drought period was the dilemma faced by Markleeville residents. The creek providing water for Markleeville dried up. A pipeline was constructed to a new water source to remedy the problem. Other periods of recorded drought were during the mid-1970s, from 1975 to 1978, and in the early 1980s.

5.2.4.3 *Location, Extent, and Probability of Future Events*

Drought can have extensive, far-reaching effects within Alpine County. Below-average precipitation can have increasingly dire effects as each year of substandard precipitation builds on the years before. As seasons of drought pass, more and more hazards and threats become real dangers to the population.

The greatest effects from drought are economic in nature. Impacts on agricultural operations can be devastating in an extended drought condition. Water is a necessity whether you are a rancher raising beef cattle or a farmer growing alfalfa. Livestock must be supplied with water and crops must be irrigated. The forest products industry also suffers during drought. Trees become weakened without a source of water. Trees can eventually die as a result of an extended period of no water or succumb to insect infestation in consequence of being in a drought-weakened state. Regardless of the agricultural concern, water is an important ingredient. Lack of water equates to economic hardship.

Drought also impacts recreational concerns and ventures within the county. During the winter, lack of snowfall can keep Bear Valley and Kirkwood ski resorts closed, causing a tremendous fiscal hardship on those resort operators. Other winter resort accommodations suffer in kind, as much of their business is derived from the two aforementioned major winter resorts. Day trips into Alpine County for skiing, cross-county skiing, snowshoeing, and winter play are diminished.

In the summer, camping can be substantially restricted during drought conditions. Dry forest conditions can cause campgrounds to close or to have campfire restrictions. Low stream and reservoir levels reduce or eliminate the potential for water sport activities. Beaches may be closed, recreational quality may be minimized, or the variety of water-related activities may be lessened. Alpine County visitors in the summer can expect numerous aquatic activities, including swimming, beach bathing, boating, sailing, canoeing, and fishing. All of these endeavors can be eliminated or decreased during drought.

The lack of water usually means fewer visitors to Alpine County. Lowered visitation equates to lowered county sales tax revenues. During the winter, lack of snow means a lack of snow

enthusiasts. During the summer, lack of water means less campers and fishermen. The effects on county economic infrastructure can be substantial, especially if the drought lasts an extended period of time.

Not to be minimized is the threat to domestic and commercial water supplies that drought introduces. Most of the county's water supplies are drawn from groundwater supplies. In drought conditions, depth to water table increases and well production can decrease. As drought conditions worsen, well production can continue to decrease. In the worst drought conditions, well production can be severely reduced or eliminated. This danger is a real concern of citizens who, for the most part, rely upon well water for their primary water supply. County residents who rely upon reservoir water supplies are no less at risk of reduced water supplies during extended periods of drought. If drought conditions persist long enough, reservoir levels drop and surface water supplies become compromised. As was the case in Markleeville during the 1987 – 1992 drought years, surface water supplies can entirely dry up when drought conditions persist.

Drought also initiates concern for other natural hazards. Wildfire potential grows exponentially as drought conditions lengthen in time – with large scale mortality of pine trees. The Washington Fire burned 17,790 acres in the summer of 2015 along Highways 89 and 4. This will lead to enhanced flash flood and debris flow risk for at least a couple of years. Additionally, to a much lesser extent, drought can be responsible for more landslide events. Lowered moisture content weakens soil structure characteristics and increases landslide potential.

Droughts are naturally occurring climatic phenomena that can and do develop in Alpine County. Long periods of drought-free years can allay concerns for drought and the level of preparation for addressing periods of drought. Inevitably though, drought conditions happen and residents learn to live with periods of less than normal precipitation. Thus, there is a **high probability** (highly likely as 80 – 100% chance of occurrence) of a drought developing in Alpine County, but a **low risk** associated with this natural hazard.

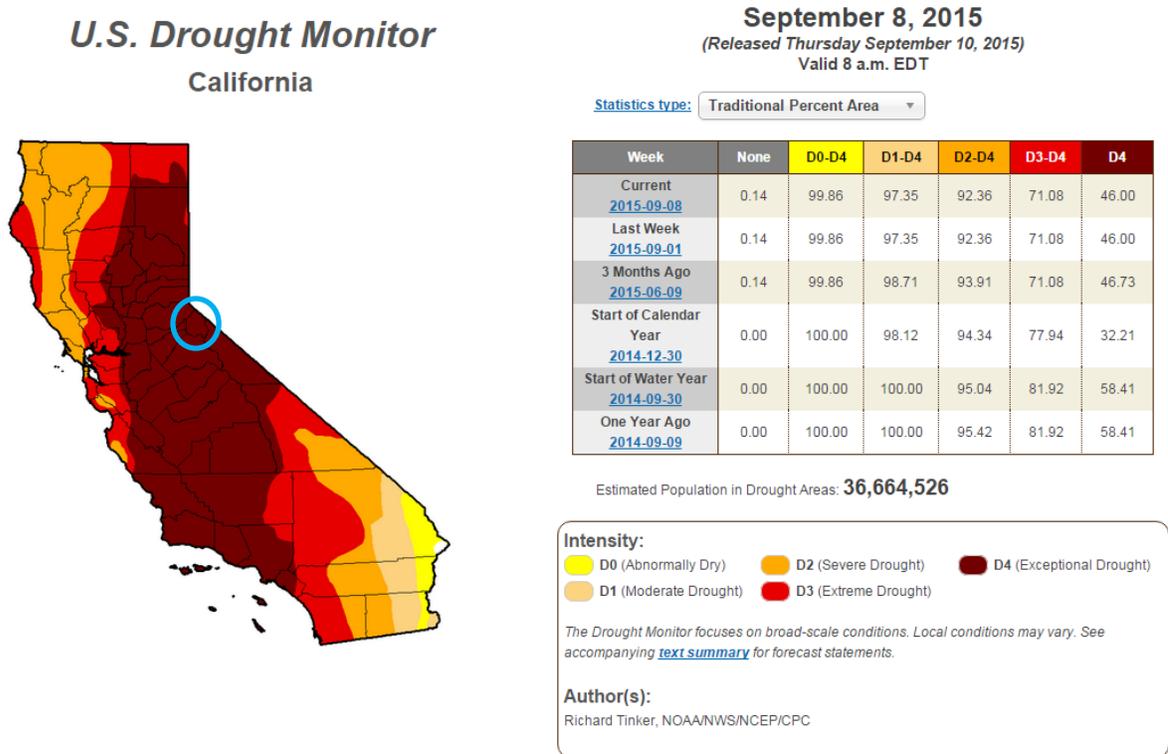
The possibility of drought in Alpine County is a constant concern. As with most climatic trends, one cannot accurately predict when or with what severity a drought might materialize. Despite the inability to predict drought, the certainty that a drought will eventually develop and impact Alpine County residents is inarguable. Conservation of water resources should not be a response to drought conditions, but instead it should be a conscious practice at all times. Citizens should always be prepared for the onset of drought conditions.

According to the *California Multi-Hazard Mitigation Plan*, climate scientists studying California find that drought conditions are likely to become more frequent and persistent.

Climate scientists studying California specifically find that drought conditions are likely to become more frequent within the 21st century due to climate change. The recent experiences in California represent the need to look closely at the state's water shortages, how the water is managed and distributed, conserved and put water use policies into place.

Drought can be a devastating natural disaster. It can have far reaching economic impacts to the county and its residents. It can cripple agricultural and recreational business concerns, and leave residential and commercial properties without water supplies. It also heightens fear for wildfire events. Learning to conserve water resources is perhaps the most effective way to mitigate drought. The more residents of the county that work to protect the quantity and quality of ground and surface water resources, the more effectively and efficiently the county will be able to address drought situation.

Figure 5-3. U.S. Drought Monitor



US Drought Monitor as of September 8, 2015 showing a staggering 46% of California, including Alpine County, in the most severe drought classification (D4).

5.2.5 Earthquake

Planning Significance - Moderate

5.2.5.1 Nature

Earthquakes can occur at any time in Alpine County. There are no precursory events to signal an increased potential for an earthquake, no advanced alarm to warn of impending seismic activity, and no earthquake season per se. Earthquakes are simply a part of living in Alpine County.

It should come as no surprise that such is the case. Alpine County is located along the border of California and Nevada, two of the most geologically active, earthquake prone states in the United States. Here, two of the Earth's tectonic plates collide. The North American plate slowly moves westward, colliding with the Pacific plate. Simultaneously, the Pacific plate migrates north and westward. As it does so, the Pacific plate pulls at the North American plate to follow suit. This tensional force stretches the Earth's crust, causing a system of north-and-south fault structural systems all along the boundary between the two tectonic plates. Also as a result of this tensional stress, ranges of tilted fault block mountain ranges are formed in response to this faulted crustal structure.

Alpine County's earthquake prone geology is resultant from this tectonic stretching. The county's eastern portion is considered to be part of the Basin and Range province of the western United States. Here the Earth's crust has been stretched up to 100% of its original width. The entire region has been subjected to extension that thinned and cracked the crust as it was pulled apart, creating large faults. Earthquakes occur as part of these huge faulted mountain ranges. Moreover, virtually the entirety of the county lies within the Sierra Nevada range of mountains. This mountain range formed less than five million years ago. Through a combination of uplift of the Sierra block and down-dropping of the area to the east, the Sierra rose upward, rising far more steeply to the east than the west. The entire Sierra Nevada can be thought of as an enormous tilted fault block with a long, gentle slope westward to California's Central Valley and a steep eastern slope. Alpine County sits atop the crest of this gigantic tilted block of granite.

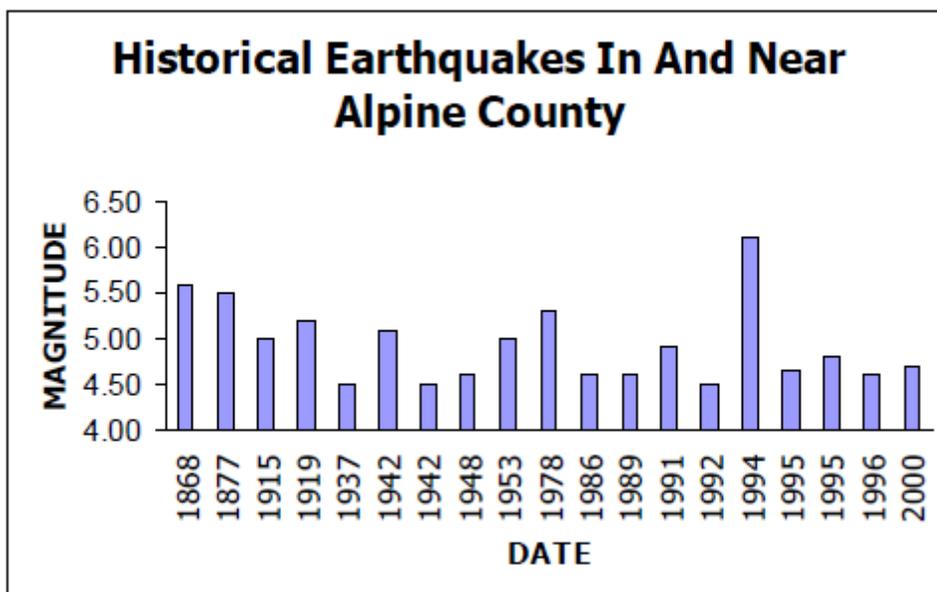
With mountain ranges formed through the stretching and faulting of the Earth's surface, earthquakes occur constantly within and around the county. Thankfully, most are of a magnitude that causes no damage and may not even be felt by the population. Earthquake magnitude is commonly measured using the Richter scale. The Richter magnitude scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by seismographs. Adjustments are included for the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude; as an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value. Thus, a 4.0 earthquake is roughly 31 times stronger than a 3.0 earthquake. Earthquakes with magnitude of about 2.0 or less are usually called microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs. Events with magnitudes of

around 4.5 or greater are strong enough to cause damage to property. As the magnitude increases beyond 5.0, the potential for damage to life and property increases dramatically.

5.2.5.2 History

The most recent earthquake to affect Alpine County occurred in 2000. In the early morning of September 26, a magnitude 4.7 earthquake was felt in eastern Alpine County. The trembler was framed by a 3.0 foreshock and a 4.2 aftershock, with the primary 4.7 earthquake lasting nearly thirty (30) seconds. No injuries or damages were reported. The last earthquake to cause damages in Alpine County occurred along the Double Spring Flat fault system just to the east of Alpine County. It struck on September 12, 1994 and measured 6.1 on the Richter scale. Damage was limited to minor cosmetic damage (cracked mortar) at the Alpine County Courthouse. No significant structural damage was reported. The last earthquake of consequence centered within the county's boundaries occurred in 1978. It measured 5.3 on the Richter scale and was centered roughly two miles north of Woodfords.

Figure 5-4.



Earthquakes that occur within Alpine County are unpredictable, and can occur at any time. Their anticipated magnitude is also an unknown, but an earthquake of high magnitude, 7.0 or greater, has occurred in the past and is a probability in the future. The Genoa Fault, which extends along the eastern front of the Carson Range south of Alpine County, Nevada into the northern reaches of Alpine County, has been identified as responsible for two large earthquakes measuring in the magnitude seven (7) range during the past 1,000 years.

Earthquakes can also initiate other natural hazard events. An earthquake can be the direct cause of landslides, avalanches, and dam failure due to seismic shaking of the ground and fracturing that might accompany any shaking. The damages wrought within an earthquake event can be the indirect cause of other natural hazard events too. Damages resulting from an earthquake might be responsible for igniting wildland fires if fallen power lines ignite or gas lines are ruptured.

The primary concern in assessing an earthquake hazard is structural damage from the earthquake event. High magnitude earthquakes would most probably cause widespread structural damage within the county, especially near the epicenter of the seismic activity. It could be surmised that the closer a locale is to the origination of an earthquake the greater the extent of damage would be. Too, areas more susceptible to ground shaking are at a greater risk of damage from earthquakes. Alpine County does include land with higher probabilities for amplified shaking during an earthquake. Thus, the distance from the epicenter and the potential for ground shaking are the two major indicators of potential damage from an earthquake. In that earthquakes cannot be predicted, all of the structures in Alpine County are at risk of damage to one degree or another.

In conjunction with structural damage, earthquakes also can cause damage to utilities. Electrical lines can be compromised and power lost during an earthquake. Gas and propane lines can be ruptured. Loss of power can complicate recovery efforts. Loss of gas for heating and cooking can additionally exacerbate conditions and further discomfort citizens.

Transportation and communication infrastructure can be damaged in an earthquake. Roads can be closed by landslides or debris. Roads can suffer structural damage from fissuring, subsidence, or upheaval of the paved surface. Bridges can also be structurally compromised. When roads are compromised by earthquake events, safety is threatened, travel time is extended, and emergency personnel response times are lengthened. Telephone and internet communications can be interrupted in an earthquake as well. Telephone poles can be knocked over and telephone service lost. Likewise, internet and computer capabilities can be interrupted causing difficulties in exchange of information potentially critical in post-disaster response.

In an extreme earthquake, dam failure can become a concern. Alpine County has several small dams that create small to medium-size lakes used for power generation, irrigation, drinking water, and recreation. Most reservoirs within the county are on the seismically stable western slope of the Sierra Nevada and pose no measurable natural hazard threat. There are reservoirs on the eastern side of the county. Although these reservoirs have not been damaged in past earthquakes, it is impossible to measure their success in any future hazard event. If a reservoir were to be compromised as a result of an earthquake, there would be many resulting ramifications to residents in the resulting path of inundation. Fortunately, Alpine County has few residents and threat to life is minimal. Still tremendous property damage could be anticipated in the event of any dam failure resulting from an earthquake.

County residents cannot be expected to be ever vigilant in the anticipation of an earthquake. They can though, know that a future earthquake is a likely if not guaranteed event.

5.2.5.3 *Location, Extent, and Probability of Future Events*

Earthquakes are naturally occurring events that will eventually inevitably occur in this region of the world. The combination of plate tectonics and associated mountain building geology, essentially guarantees earthquake as a result of the periodic release of tectonic stresses. Alpine County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the county. Thus, there is a **moderate to high probability** (highly likely as 80 – 100% chance of occurrence) of an earthquake in Alpine County, but a **moderate to low risk** associated with this natural hazard. Climate change is not a

factor for this hazard, as it is not likely to increase the frequency or strength of an earthquake in Alpine County.

The possibility of an earthquake is an ever-present phenomenon in Alpine County. Although one cannot accurately predict the occurrence of seismic activity, they can be assured that the eventuality of an earthquake is a certainty. Therefore, individuals have an opportunity to plan for an earthquake in order to lessen the potential hazards that result either directly or indirectly from an earthquake event.

With this said, damage to property and threat to the health of county residents is decreased with their ability to be prepared for earthquakes. To be able to most effectively address the threat of earthquakes, and the landslides, avalanches, and other dangers associated with them, citizens, families, and businesses should:

1. Have a plan, including alternative travel routes.
2. Store extra supplies of food and water.
3. Store other related supplies such as flashlights, batteries, and firewood.
4. Have a battery-operated radio within their home or business.
5. Know the locations for turning off electrical and gas utilities.
6. Develop a home escape plan and practice implementing the plan.

5.2.6 Floods

Planning Significance - Moderate

5.2.6.1 Nature

Alpine County is located almost entirely within the mountainous Sierra Nevada. Drainages that course from the Sierra Nevada traverse through high-relief, deeply-cut river canyons with only occasional level areas that might be termed floodplains. Regardless, tremendous amounts of water can be gravitationally fed through these river canyons and Alpine County subsequently has a long history of flood events.

There is over 1600 miles of drainage within Alpine County. On the western slope of the Sierra Nevada, most of these drainages in the county funnel into the Mokelumne or Stanislaus River systems. On the steeper eastern slopes, the entire eastern region of the county is drained by the East and West Fork of the Carson River. Of the county's 729 square miles, 346 square miles are drained by the East Fork Carson River and 107 square miles are drained by the West Fork Carson River. The remaining 276 square miles involve west slope drainages and a small northern section of the county which drains into Lake Tahoe. Thus, the majority of the lands in Alpine County drain easterly from the upper Carson River watershed into central Nevada.

Two types of flood events are typical to Alpine County. Each type of flood event causes associated water, erosion, and sediment damage within the watersheds where the flood event transpires. The two types of flooding are:

- Wet-mantle or rain-on-snow flood
- Dry-mantle or flash flood

Wet-mantle and rain-on-snow are typically late winter or early spring occurrences and are generally widespread in nature. Characteristically, wet-mantle and rain-on-snow flooding develops when warm rains fall on already saturated ground. Particularly devastating are flood events where heavy snows preclude warmer rain events, causing the mantle of snow to melt and run off in conjunction with the rain.

Dry-mantle flood events are a result of violent summer thunderstorms and are much more localized in nature. Dry-mantle flooding is characteristic of localized summer thunderstorm activity. Dry-mantle flooding is not widespread, as in the case of wet-mantle and rain-on-snow events. Severe flash floods are much more likely to occur over recent burn areas, of which Alpine County can have. This thunderstorm related flooding can be a major concern though, as severe local rain and hail can create conditions for flash-flooding and considerable threat to life and property. No historical record is available for dry-mantle flood events.

The current state of predictive science allows for a greater heads-up on **major river floods** than even just 5 or 10 years ago. The large atmospheric river storms that often create winter floods can be tracked across the Pacific Ocean 5-8 days in advance, with more detailed river forecasts up to 2-4 days in advance. It should be noted that uncertainties in snow level forecasts remain one of the biggest flood prediction challenges and are often of low confidence until 12-24 hours ahead of the storm. The prediction of weather patterns favorable for **flash flooding** has advanced

in recent years, such that a general heads-up can be given 1-3 days in advance. However, due to the localized nature of thunderstorms that create flash floods, the current predictability of specific flash floods is limited to about 15-45 minutes of warning, but is sometimes zero.

5.2.6.2 History

Alpine County has a well-chronicled history of flooding dating to the 1850s and the settlement of the areas in and around the county. The earliest flood of record following permanent habitation of the region occurred in December 1852 and was a precursor to the type of flooding characteristic to the Carson River watershed. As described in one historical journal, the storms began “with a heavy wet snow, which lasted for two days and left a three-foot snow depth across Carson Valley. Beginning with the storm’s third day, the snow typically turned to a relatively warm rain, which lasted another four days, until December 30. By that time, the snow accumulation had completely melted and run off, along with great quantities of rainwater.” Most of the substantial flood events on the historical record occurred in this fashion.

Such was the case in the greatest flood event on record, the record flood on January 1 and 2, 1997. Heavy snows had fallen on the eastern Sierra watershed below Carson Pass in the days prior to Christmas 1996. Then, warm rains began falling shortly after New Year’s Eve and increased in intensity as the hours progressed into January 2. Very heavy storm cells hovered over the Hope Valley area, just north and east of Carson Pass, and began pouring warm rain onto snow resulting in unprecedented amounts of runoff into the West Fork Carson River. The West Carson flows were so high just above and below Woodfords that, for the first time, large, rounded rip-rap boulders placed along the channel banks were mobilized and became part of the sediment load. This created a “thunderous, almost surrealistic, noise” that caused most of the residents around Woodfords to evacuate even though there was no direct danger to their wellbeing.

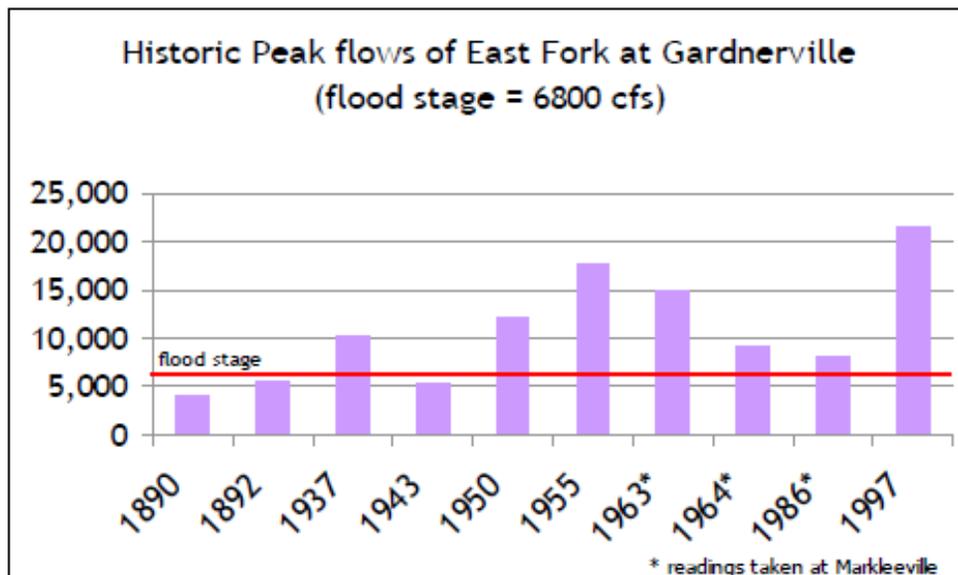
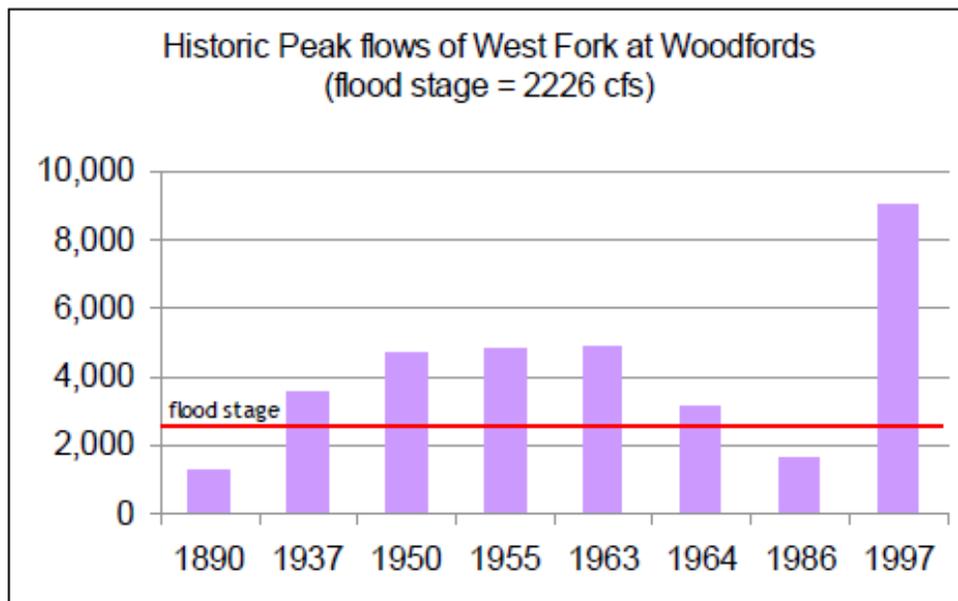
During the same period, similar storm patterns on the East Fork Carson River upper watershed, near Ebbetts Pass, were just as intense, producing record level runoff into not only the East Fork Carson, but local streams as well. Heavy rains on saturated soil caused mudslides in the upper East Fork drainage and high flows, traveling at high velocities, produced widespread erosion in the East Fork Carson River canyon. State Route 89 was washed out south of Markleeville. In Wolf Creek Canyon, which drains into the East Fork Carson River, a U.S. Forest Service road failed and slid several hundred feet down into Wolf Creek? Another tributary of the East Fork, Markleeville Creek, caused heavy damage to the U.S. Forest Service guard station in Markleeville. No road in Alpine County escaped damage, from major bridge damage near Woodfords to widespread shoulder washouts throughout the county.

December 31st, 2005 brought another round of flooding to the region with impacts in Alpine County. A series of very wet pacific storms during the last half of December culminated in widespread flooding of creeks and rivers in northern California and western Nevada on December 31st, 2005. The most intense rainfall occurred on December 30th at which time 2 to 6 inches of rain fell in the Reno-Carson City areas and 4 to 10 inches fell in the Lake Tahoe Basin. This final episode of heavy rain brought widespread flooding of main stem rivers and flooding of smaller creeks and streams. Per the National Weather Service, “Localized flooding was reported on the East Fork Carson River near Markleeville, and in rural areas across the eastern half of the county.”

While there have been several other flood advisories from 2005 to 2015, there been no major flood events in Alpine County since the 1997 event. However, there were two debris flow incidents in July 2014, one at Wolf Creek Road and the other at Kirkwood. The debris flows were a result of heavy rainfall during a summer thunderstorm. The debris flow at Wolf Creek deposited materials on the roadway. There were no damages in Kirkwood from the same storm.

The following tables chronicle the major flood events in Alpine County’s history. The charts are divided into river flows for the two primary forks of the Carson River. The West Fork Carson River data was measured at Woodfords. The East Fork Carson River data was measured at Gardnerville except where an asterisk appears. In those cases, the measurements were recorded near Markleeville.

Figure 5-5 Historic Peak Flows



5.2.6.3 *Location, Extent, and Probability of Future Events*

Because of the predominantly high relief of Alpine County, the effects of flooding are generally confined to areas near the waterways of the county. As waterways grow in size, from local drainages up to the primary rivers of the county, so grows the threat of flood and the dimensions of that threat. The lack of floodplain topography severely reduces flood hazards and the scope of flood impact.

The majority of flood related hazards in Alpine County are transportation related. Flood- waters do not normally cause road closure due to inundation because of the aforementioned lack of floodplains. Rather, roads are closed due to varying degrees of erosion-related washout. At the most minimal levels, road shoulders are compromised due to high levels of runoff from precipitation. Roads may be reduced to passage in only one direction at a time. At the most severe levels, whole road structures are eroded away from high river discharges for distances in excess of one-hundred yards. In these instances, bridge facilities can be threatened or lost because of debris impacting the bridge structures. In either case, road damage and road closure affects the transportation infrastructure of the county, interrupting the movement of people, supplies, and services while reducing productivity because of increased commute time. The county's public safety response is affected as well, slowing the arrival of sheriff deputies and other emergency response personnel.

Flood related erosion can cause damage to homes, businesses, and government structures, including damage to ancillary structures, utilities, and parking facilities. Structural foundation undercutting is the most prevalent form of damage to structures. Structures can also be damaged from trees falling as a result of water-logged soils.

Electrical power outages happen and the interruption of power causes many problems. The effects of lost electricity are discussed in the severe weather section of this document. Lost power is usually a precursor to the closure of government offices, or the offices may be subject to reduced schedules. Public schools may also be closed or on a delayed start schedule as well.

Dry-mantle flooding, although not as impressive in extent, possesses many hazards as well. Dramatic, localized flash flooding can occur as a result of extreme thunderstorm activity and associated heavy rainfall. The risk of damaging flash flooding is enhanced near and downstream of recent moderate to severe burn areas, such as the Washington Fire (2015). Coupled with volcanic soils which slide easily, the Washington Fire burn scar is likely to produce an enhanced risk of flash flooding and debris flows in Alpine County through 2017. This is true for both summer and winter heavy rainfalls. Flood damages can be just as substantial in a flash flood/thunderstorm event. The production of lightning and hail stones introduces additional natural hazard. Property damage can include erosion of structural foundations, hail damage to structures and vehicles, and the potential of electrical outages due to lightning strikes.

Floods have been a part of Alpine County's historical past and will continue to be so in the county's future. The absence of floodplain within the vast majority of the county though, limits the extent and magnitude of damages directly attributed to any flood event. The geography of the county, namely its steep highly defined river channels, funnels floodwater out of the county and deposits it on floodplains just outside the county's borders. Winter wet-mantle and rain-on-snow flood events are more widespread and more severe than summer dry-mantle flood events. In the winter, the type of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread damages.

Consequently, the winter flood is of most concern to assorted governmental services, including the public works department, volunteer fire departments, emergency medical services, search and rescue units, and the county sheriff's department. Dependent upon the severity of flooding, emergency shelters might occasionally be required.

Based on the history of flooding in Alpine County, there is **High Probability** (highly likely as 80 – 100% chance of occurrence) of a flood event occurring in Alpine County. Although the probability of flooding is high, there is **Low to Moderate Risk** to life and property within the county due to the geography of this mountainous region and the rivers that flow from it.

Climate change studies state that increased warming increases the capacity of the atmosphere to hold moisture, which leads to more water vapor in the atmosphere. Individual storms supplied with increased moisture might produce more intense precipitation events. Further warmer conditions between summer thunderstorms can additionally dry and compact the soil, making it more impervious to heavy rain, increasing the rate of run off during flash floods.

Aside from severe storms, flooding is the most frequent natural hazard event in Alpine County. Floods can cause a tremendous amount of damage within the county, but the overwhelming majority of that damage is generally limited to transportation infrastructure. The lack of floodplains within the county restricts damages to within the narrow river canyons of the county and consequently limits the amount of damages inflicted upon residents and real and personal property to a relatively small area of the county. In contrast though, flash-flooding resultant from summer thunderstorms could happen anywhere within the county, but not nearly at the level of a winter flood event.

Although a flood is not going to occur with the frequency of a severe storm, individual citizens, families, and businesses of the county should to be prepared to address floods when they occur. As in the case of earthquake, fire, and other natural disasters, citizens should prepare themselves before such an event takes place. To be able to effectively address flood problems, citizens, families, and businesses should:

1. Have a plan, including a set of alternate travel routes.
2. Store extra supplies of food and water.
3. Store other related supplies such as flashlights, batteries, firewood, etc.
4. Have a battery-operated radio within their home or business.
5. Stay aware of weather trends, especially after considerable periods of snowfall.

5.2.7 Hazardous Materials Events

Planning Significance - Moderate

5.2.7.1 *Nature*

Hazardous materials may include hundreds of substances that pose a significant risk to humans. These substances may be highly toxic, reactive, corrosive, flammable, radioactive, or infectious. Hazard materials are regulated by numerous Federal, State, and local agencies including the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), National Fire Protection Association, FEMA, U.S. Army, and International Maritime Organization.

Hazardous material releases may occur from any of the following:

- Fixed site facilities (such as refineries, chemical plants, storage facilities, manufacturing, warehouses, wastewater treatment plants, swimming pools, dry cleaners, automotive sales/repair, and gas stations)
- Highway and rail transportation (such as tanker trucks, chemical trucks, and railroad tankers)
- Air transportation (such as cargo packages)
- Pipeline transportation (liquid petroleum, natural gas, and other chemicals)

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly serious due to the impairment or failure of the physical integrity of containment facilities. The threat of any hazardous material event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-off of response personnel and equipment.

5.2.7.2 *History*

While there has been no history of hazardous materials releases in Alpine County, it is important to the Local Planning Team to profile particularly due to the potential impacts a spill could have on the Carson River, its tributaries, its reservoirs, as well as irrigation ditches and canals associated with the river.

Increased use of the narrow, steep mountain highways by large trucks increases risks for hazard materials releases. Highway 88 has become a major year-round trans-Sierra route and has been added to the National Highway System with the designation of a scenic highway. In the winter it is one of only three trans-Sierra routes available and frequent slides on Highway 50 put additional pressure on its limited capacity. There have been several incidents recently in neighboring counties which closed down major transportation routes during clean up. One such event occurred in August 2015, when a big rig overturned releasing gasoline onto the highway. The road was closed for over a week. Another incident, although not a hazardous materials event, occurred on Monitor Pass in Mono County in 2007 or 2008 when an ice cream truck failed to properly navigate the curvy, steep road and went off the side.

An additional threat for hazard materials releases is a sewage spill or leak. On Washoe Tribe property in Carson City, Nevada, in March of 2015 there was a 48,000-gallon raw sewage spill

on to Stewart tribal property as the result of an older pipe breaking from the Walmart Topsy Lane location.

5.2.7.3 *Location, Extent, and Probability of Future Events*

There are no large generators of hazardous waste in the County and no procedures of hazardous materials. The majority of waste generated in the County is from households, small businesses, ski areas, and Caltrans, U.S. Forest Service and County vehicle maintenance stations.

The Alpine County Hazardous Waste Management Plan adopted in 1988 identified four potential sites in the County for hazardous waste storage and transfer facilities, 1) the Mud Lake Road Area, 2) the County Maintenance Yard, 3) The County Airport, and 4) Harvey Reservoir and nearby private lands. Leviathan Mine Superfund Site is the only known contaminated site in the County.

Bear Valley Water District uses chlorine gas as a disinfectant agent in the wastewater treatment process. If a chlorine gas leak occurred, through dam failure or otherwise, as much as 2400 pounds of chlorine gas may be released also causing a public health issue in the vicinity of Bear Valley Village. BVWD is regulated by the California EPA and prepares and submits annual updates to its Hazard Materials Inventories and Emergency Response and Training Plans as required. No such leak has occurred to date.

In addition to fixed facilities, hazardous material events have the potential to occur along State Route 4, 88, 89 and 207. The trucks that use these transportation arteries commonly carry a variety of hazardous materials including gasoline, liquid propane, other crude oil derivatives, and other chemicals known to cause human health problems. Of particular concern is the possibility of an oil or other chemical release which could potentially impact the Carson river, its tributaries, its reservoirs, as well as irrigation ditches and canals associated with the river.

Comprehensive information on the probability and magnitude of hazardous material events from all types of sources (such as fixed facilities or transport vehicles) is not available. Wide variations among the characteristics of hazardous material sources and among the materials themselves make such an evaluation difficult. While it is beyond the scope of this MJHMP to evaluate the probability and magnitude of hazardous material events in the County in detail, it is possible to determine the exposure of population, buildings, and critical facilities should such an event occur. Areas at risk for hazardous material events include any area within a 1-mile radius of State Route 4, 88, 89 and 207, and fixed facilities.

5.2.8 Landslide

Planning Significance - Moderate

5.2.8.1 *Nature*

Alpine County's terrain and climate combine to create conditions conducive to landslide. Where avalanches are a threat isolated primarily to the winter months, the threat of landslides is generally distributed throughout the year. Most landslide events are associated with and resultant from other natural hazards such as seismic activity or floods.

Landslide is a generic term which is defined as the downward sliding of a relatively dry mass of earth and rock. An even more simplistic definition is "slope failure." The primary factor involved in landslides is gravity, but three other factors have varying degrees of influence. They are:

- slope angle
- slope material, and
- amount of water

Gravity is the constant in any equation trying to quantify the stability or instability of a slope face. Slope angle, slope material, and the amount of water are the variable factors that, combined with gravity, determine slope stability. Other factors that help identify the stability of a slope to a lesser degree are vegetation and climate.

Landslides are categorized into groups using two variables; the type of movement and the type of material that is involved. Type of movement is categorized into three groups:

- falls
- slides, and
- flows

The amount of water usually is the defining ingredient when classifying the movement. In falls, very little water is present, whereas in flows there is allot of water involved. The type of material involved is broken into three groups: soil (earth), rock, and debris. Thus, one can identify rockfalls, earthflows, or debris slides. Again, each of these events is determined by the composition of materials and the speed of movement. A rockfall is dry and fast while a debris flow is wet and fast. Regardless of the speed of the slide, the materials within the slide, or the amount of water present in the movement, landslides are a serious natural hazard.

Landslides and mudslides cause up to two billion dollars in damage annually in the United States. They are attributed to between 25 and 50 deaths annually.

Landslides are a natural process and are unavoidable in the long term, being due to the patient nature of gravity and the gradual weathering of the Earth's surface. Although natural disturbances like earthquakes and storms can trigger landslide events, humans can also have a direct effect on and even accelerate landslide occurrence. Any time a slope is graded or cut into, a formerly stable slope can become unstable, eventually seeking a new equilibrium in the form of a landslide.

5.2.8.2 History

In Alpine County, with the county's high-relief landscape, landslides are a natural hazard concern. Although no lives have been taken as a result of landslides, the threat to life and property is real. In recent history, landslides occurred as a result of the weather associated with the January 1997 flood. A portion of Wolf Creek Road was lost to a large landslide and other smaller landslides endangered county residents and their property. Other landslide events affected Carson River Road, Diamond Valley Road, and Airport Road in 1986.

5.2.8.3 Location, Extent, and Probability of Future Events

Landslides that occur within Alpine County are most often experienced as part of a larger, more widespread natural hazard event. Landslides can take place as a result of severe storms, floods, and earthquakes. They can also happen as an aftermath to wildland fires.

In that landslides are ancillary events within larger natural hazard events, the dangers resulting from these parent hazard events are concurrent to landslides.

If electrical lines are compromised within the slide, electrical power can be lost. The length of time power is interrupted is a direct result of the size of the slide and its impact upon the power lines and electrical infrastructure. Water lines and other buried facilities can be put in danger or lost to a landslide as well.

Roads and highways are often victimized by landslide events. Excavations into slopes to create roadbed cause a disruption to the natural slope while simultaneously steepening the slope face. These two consequences together weaken slope structure and introduce the potential for landslides. This potential is often realized when severe storms produce increased moisture, the result being slope failure and landslides. When roads are compromised by landslides, motorist safety is threatened and travel time is lengthened. Emergency personnel response time is also affected.

Landslides can threaten the stability and safety of homes in two ways. If the slope fails above a home, the foundation and the structure itself can be threatened. The weight of the slide, the water, earth, and vegetation that has become mobile, can slam into a house, knock the structure from its foundation and perhaps even destroy the house. If the home sits on a bench cut into a hillside, the potential for a landslide is again introduced. Construction of a home on a graded or altered slope can have devastating effects. Changing of the slope face, the additional weight of the home and associated materials, plus the added water of sprinkler systems and septic tanks, make a formerly stable slope unstable. Add a severe storm with substantial rainfall and the home and the artificial slope it sits upon can be victimized by landslides.

Since degree of slope directly affects the gravitational force exerted upon land and its potential to slide, much of Alpine County is potentially impacted by landslides. This potential threat is increased when other natural hazards that trigger landslides occur. In this fact, county residents should be more alert to the potential for landslides whenever natural hazards that generate landslides, such as severe storms or floods, are happening. Landslides are naturally occurring events that will inevitably happen as long as gravity itself is a controlling factor upon the landscape. Since Alpine County's mountainous terrain challenges gravity as it rises to over 11,000 feet, much of the high-relief topography in the county can be identified as land with the potential for landslides. Much of that land though is in remote and undeveloped locales, which

reduces the risk of this natural hazard. Thus, there is a **moderate to high** (moderately to highly likely as 50 – 100% chance of occurrence) probability of landslide in Alpine County, but a moderate to **low risk** associated with this natural hazard.

Landslide hazard in Alpine County can be considered a year-round phenomenon. An example of the extent of a landslide hazard can be provided based on the historical data of the Wolf Creek Road that has had debris flow approximately 2,000 – 10,000 cubic yards. This extent is a measurement of the displaced debris per event in cubic yards. The county's high-relief and high-altitude landscape promote the wearing away of the landscape via both physical and chemical weathering mechanisms. In the winter, added moisture in the soil strata can generate landslides, and the varying temperature ranges during the summer months can have a similar effect. In general, higher slopes equate to higher landslide potential. Therefore, individuals should be alert in high-relief areas to the threat of landslides at all times of the year. In flatter, level areas of the county, the threat from landslide is greatly diminished.

Landslides are more prevalent as a result of earthquakes, floods, and severe storms. They are also to be expected after wildland fires. This tendency can act as an early warning to the presence of landslide danger, allowing the public to be appropriately prepared for the possible occurrence of a landslide. With this said, damage to property and threat to the health of county residents is decreased with their ability to be prepared for landslide events during or as part of larger natural hazard events.

To be able to most effectively address the threat of landslides, citizens, families, and businesses should:

1. Have a plan, including alternative travel routes.
2. Store extra supplies of food and water.
3. Store other related supplies such as flashlights, batteries, and firewood.
4. Have a battery-operated radio within their home or business.
5. Stay aware of soil conditions, especially during periods of considerable rainfall.

Climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). 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.

5.2.9 Severe Weather

Planning Significance - High

5.2.9.1 Nature

The climate of Alpine County is inherently conducive to severe storm weather events and severe weather events can happen at any time of the year. These severe weather events can be broken down into four categories:

1. severe winter storm
2. severe windstorm
3. severe thunderstorm
4. extreme heat

Severe Winter Storm

During the winter months, Alpine County can experience strong winter storms. Four climatic factors together work to create a higher than average potential for severe winter storms: high altitude, orographic (mountain) barriers, prevailing storm tracks, and air masses.

- The county's location along the crest of the Sierra Nevada naturally gives the county a high average elevation. Elevation ranges from about 4800 feet to over 11,400 feet, with the majority of the county being in excess of 7000 feet.
- Alpine County is located along the crest of the Sierra Nevada mountain range. The mountain range acts as a barrier to approaching air masses which approach the mountains from the west. The mountains act as a lifting mechanism as air masses migrate over them, increasing the chance for precipitation.
- The winter storm track for Alpine County funnels storm systems from a semi-permanent low-pressure system in the Gulf of Alaska southward to the California coast following the Westerlies, a global atmospheric wind pattern that provides a relatively consistent westerly flow of air throughout most of the year.
- Air masses typical of Alpine County are classified as marine polar. The county's proximity to the Pacific Ocean, in conjunction with the aforementioned storm track, brings cold and moist marine polar air masses over the county throughout much of the year, especially during the winter months.

Putting all four of these climatic variables together equals a higher than average potential for severe winter weather events. Cold moisture-laden air masses are carried from the Gulf of Alaska southward with the Westerlies. Following the storm track, this moist air encounters the Sierra Nevada, becomes unstable as it is forced over this natural barrier, and provides substantial amounts of precipitation before migrating eastward. In the winter months, heavy snows might be the result, with extremely strong winds accompanying the precipitation. When reviewing the extent of severe weather storms in the county and within the local jurisdictions, cold temperatures by themselves are usually not hazardous unless someone is caught outdoors all night without shelter. However, when combined with wind, the wind chill can quickly become a health hazard and cause severe frostbite. Usually the risk increases quickly when wind chill

values drop below -20F. For example, air temperatures near zero with a 15-mph wind can cause this wind chill reading of -20F. This is rare in the populated areas of Alpine County since when it's that cold normally wind is calm in lower elevation valley locations. However, for higher elevations and near ski areas wind chills of this magnitude can be quite common during the winter months, particularly during winter storms with heavy snow. So, for extent, temperature (wind chill) issues would be confined to higher elevations, ski areas, and backcountry locations – not as much within the towns such as Markleeville that are in more sheltered valleys. Now if there is a multi-day post-storm power outage combined with very cold temperatures this would result in health impacts for those in populated areas without access to heat. For heavy snows – the entire county is at risk of those, often occurring several times each winter. The higher elevations are much more prone to this extent.

An example of a severe winter weather event in Alpine County is the winter storm of December 2002. In a three-day span, two to as much as three feet of snow fell in the Woodfords and Markleeville area accompanied by “ferocious” winds. At higher elevations in the county, as much as ten feet of snow was reported to have fallen. The combination of heavy snows and strong winds knocked out power to the county for as long as two weeks, while Woodfords and Markleeville went without power for a full week. County offices and local schools were shut down for an entire week. Many roofs in the Mesa Vista area of the county were damaged. In summary, every resident of the county was in some way adversely affected by this severe weather event. In addition, the record low temperatures in nearby South Lake Tahoe are typically less than 0°F. These low temperatures are one of the greatest risks when they are prolonged over a multiple day period of below freezing (32 °F) with no or very little snowpack on the ground to provide insulation. The extended low temperatures commonly affect water systems and seasonal residences due to freeze/thaw flooding events. The threats from heavy snow and low temperatures are normally exclusive as extreme low temperatures and extreme snowfall are caused by changing and different climate and weather patterns.

The current predictability of severe winter storms is roughly 3-5 days in advance with a general heads-up, with more specific information 1-3 days in advance. Some of the larger “atmospheric river” winter storms can be identified by forecasters up to 7 days in advance, though there are often large errors in storm track and intensity this far in advance.

Severe Windstorm

In any season, the mountainous Alpine County landscape promotes the formation of wind, often winds at very high speed. Windstorms can affect all areas of the county during any month of the year. The stronger wind events usually take place in autumn, winter, and spring. In these storms, winds can gust over 100 mph along the ridges of Alpine County with gusts over 50 mph in the populated valleys such as near Markleeville. These wind events are called downslope wind storms and favor high winds along and east of the Sierra crest. Limited weather sensor data in Alpine County makes exact determinations of peak wind speeds a challenge.

The current predictability of downslope wind storms is roughly 2-4 days in advance with a general heads-up or High Wind Watch, with more specific information 1-2 days in advance with a High Wind Warning. The areas of worst damage from downslope wind storms are often dictated by just subtle changes in wind direction, which limits how predictable the storms are.

Severe Thunderstorm

During the summer months, and primarily June – August, climatic factors combine to promote the development of thunderstorms. As heated air from lower elevations rises and rapidly cools, intense thunderstorm cells can develop in Alpine County’s high elevation landscape. Summer thunderstorms typically develop over the highest terrain of the Sierra including around Alpine County, then move to the east or northeast into western Nevada. The extent of summer storms over Alpine County is typically isolated at best and only impact the region during the afternoon hours, but on- the order of 3-10 days each summer, these storms can become numerous and strong enough to produce hail, frequent lightning, flash flooding, and strong outflow winds above 50 mph. Tornadoes are almost unheard of in Alpine County. Since October 2007 only one report of severe weather has occurred in Alpine County – a damaging hailstorm near Bear Valley on July 20, 2015.

The current predictability of specific thunderstorms is limited to 0-30 minutes ahead, though forecasters are able to highlight days where the ingredients for thunderstorms are likely to combine up to 1-3 days in advance.

Extreme Heat

The National Weather Service (NWS) will issue a Heat Advisory if high temperatures are forecast to be 105 or higher for two consecutive days or more. This is extremely rare in Alpine County due to the high elevation of the region. With that said, even temperatures in the 90’s or lower 100’s is unusual and can cause impacts to susceptible populations or people recreating outdoors.

The current predictability of heat waves is about 4-6 days in advance for a general heads up; sometimes longer for the bigger excessive heat events. More specific and detailed temperature forecasts can be given about 1-3 days in advance.

The effects of severe weather events such as snowstorms, thunderstorms, windstorms, and extreme heat on Alpine County are likely to exhibit certain similarities. Downed trees and fallen power lines might occur. Transportation around the county can be affected too, with road closures interrupting movement. Damages to homes, businesses, and government buildings are a possibility. Fatalities as a result of severe weather events are uncommon, but can occur on occasion.

Electrical power outages happen with most extreme weather event. The interruption of power causes many problems. Loss of electricity affects heating of homes, heating of water, pumping of water, refrigeration, lighting, computing, and loss of communication systems like television and the internet. Additionally, businesses lose the use of cash registers, gasoline pumps, restaurant kitchen appliances, and the like.

Severe winter storms produce snow and ice. The majority of problems associated with severe winter storms are transportation related. Roads are closed or are open only to vehicles that are properly equipped. Productivity is lost due to the increased time it takes to go from one point in the county to another. When roads are closed for avalanche prevention or snow removal, drivers who must wait by the roadside are put at an increased risk because being stranded in route. Electrical power might be lost. Government offices may be closed or start schedule. Structures are put at an increased risk due to increased snow loads on roofs, and the increased threat of falling trees or power lines.

Severe windstorms pose potential hazards. Power and phone lines may be knocked over and electrical power might be lost. Downed power lines pose a fire and/or electrocution threat. Uprooted trees and fallen limbs pose possible hazards to roadways, structures, vehicles, and people. Extremely violent windstorms might also damage large tracts of commercial forest causing economic losses to the forest products industry and to recreation.

Severe thunderstorms introduce natural hazards of lightning, hail stones, and flash flood. Electricity can be interrupted by lightning strikes, property damage can occur if hail stones reach a larger diameter, and flooding can occur with particularly intense or prolonged rain events associated with the thunderhead. Recreational activities can also be interrupted. Playing field and pools and beaches may be temporarily evacuated, and hot springs facilities may close for safety reasons.

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.”

5.2.9.2 History

Severe storm events happen in all parts of Alpine County at all times of the year. The degree of regularity is greater during various seasons for the different storm types, but the overall threat of a severe storm event is a relative constant over the calendar year. Severe winter storms with heavy snow (and rain if warm enough) are most common from November through March. Downslope wind storms with damaging winds are most common from October through April. Hazards from thunderstorms including hail, lightning, flash flooding are most common from June through August. Extreme heat events, while rare, can occur June through August.

Repetitive severe windstorms have caused damage to the roof on the Hung-A-Lel-Ti Wellness Center which is a critical facility used as a shelter for evacuations and mass casualty.

Some storms are more severe than others. When this is the case, assorted governmental services might be activated. These might include the public works department, volunteer fire departments, emergency medical services, search and rescue units, and the county sheriff’s department. The length of time electrical power is interrupted is often the leading indicator of a storm’s severity, and also dictates the level of response from the indicated agencies. If a storm causes an extended period of power interruption, emergency shelter might be required, especially during the cold winter months.

Figure 5 – 6 History of Severe Weather events in Alpine County

NOAA's Severe Weather Data Inventory
<https://www.ncdc.noaa.gov>

Preliminary Local Storm Reports for the NOAA National Weather Service			
Nov. 22, 2010			
Feb. 19, 2011			
Feb. 25, 2011			
Mar. 19, 2011			
Nov. 20, 2013			
Nov. 29, 2014			
Nov. 24, 2015			
Filtered Hail Signatures (Max Size >0 and Probability = 100%)			
July 6, 2010			
Aug. 8, 2010			
July 6, 2011			
June 6, 2013			
July 25, 2013			
June 5, 2014			
June 6, 2014			
July 14, 2014			
July 17, 2014			
July 19, 2014			
Sept. 20, 2014			
July 7, 2015			
July 8, 2015			
July 16, 2015			
Lightning Strikes from Vaisala NLDN			
July 6, 2010	May 5, 2013	Jun 5, 2014	Apr 22, 2015
July 16, 2010	May 14, 2013	Jun 6, 2014	May 24, 2015
August 8, 2010	Jul 1, 2013	Jul 14, 2014	Jun 9, 2015
October 2, 2010	Jul 2, 2013	Jul 15, 2014	Jul 2, 2015
October 4, 2010	Jul 4, 2013	Jul 16, 2014	Jul 3, 2015
June 7, 2011	Jul 23, 2013	Jul 17, 2014	Jul 4, 2015
June 29, 2011	Jul 25, 2013	Jul 19, 2014	Jul 7, 2015
July 6, 2011	Aug 18, 2013	Jul 20, 2014	Jul 8, 2015
Sept. 10, 2011	Sept 14, 2013	Jul 30, 2014	Jul 9, 2015
Sept. 11, 2011		Aug 7, 2014	Jul 16, 2015
Sept. 12, 2011		Aug 12, 2014	Jul 19, 2015
July 23, 2012		Sep 20, 2014	Jul 21, 2015
August 12, 2012		Sep 21, 2014	Jul 22, 2015
August 13, 2012			Aug 1, 2015
August 14, 2012			Aug 7, 2015

5.2.9.3 Location, Extent, and Probability of Future Events

Based on the history of severe storms in Alpine County, there is a **High Probability** (highly likely as 80 – 100% chance of occurrence) of a severe storm event occurring in Alpine County. Although the probability of a severe storm is high, there is a **Low to Moderate Risk** to life and property within the county due to the overall preparedness of this mountainous region in addressing, managing, and acclimating to severe weather events.

Of the natural hazards, the severe storm event has the greatest probability of occurrence in Alpine County. Severe storms of any type can cause a great amount of damage and can affect the lives of Alpine County citizens in a meaningful way. All of Alpine County is subject to severe storm events, and these events can occur during any time of the year.

Alpine County experiences all types of severe weather during all seasons of the year. Severe weather events can take the form of wind storms, rain storms, snow storms, hail and thunderstorms. When severe storm events do occur, they have the potential to significantly impact Alpine County, presenting a genuine threat to the lives of Alpine County residents and the personal and real property of citizens, triggering the prospect for considerable economic loss.

As the climate warms, extreme events are expected to become more frequent, including severe storms and heat waves. General circulation models of climate variability predict that heat waves will become more frequent and intense. Although overall temperatures will increase, the greatest effect may be when the temperature differential between daytime and nighttime decreases, that is when there is less of a cooling effect during the nighttime. Many prevalent human diseases are linked to climate fluctuations and higher temperatures, such as cardiovascular mortality and respiratory illnesses exacerbated by warmer heat waves.

Due to the possible frequency of severe storm events, individual citizens, families, and businesses of the county need to be prepared to address severe storms when they occur. As in the case of earthquake, fire, and other natural disasters, citizens should prepare themselves before such events take place. To be able to effectively “weather the storm,” citizens, families, and businesses should:

1. Have a plan.
2. Store extra supplies of food and water.
3. Store other related supplies such as flashlights, batteries, firewood, etc.
4. Have a battery-operated radio within their home or business.
5. Trim all tree limbs away from buildings.
6. Secure all potentially wind-blown possessions when not in use.

5.2.10 Wildland Fire

Planning Significance - High

5.2.10.1 Nature

Wildland fire is perhaps the most dangerous natural disaster threat in Alpine County. Annually, as winter precipitation diminishes and the seasonal snowpack melts, the possibility of fire concurrently increases. Generally, the wetter the winter, the lower the wildfire threat during the following dry summer months. Other climatic variables can, and often do, skew that simplified statement though. When the precipitation fell, whether the precipitation was snow or rain, when the moisture melted, how fast the melt-off occurred, and wind characteristics; all of these considerations as well as others are seasonal indicators as to the potential severity of wildland fires during the dry summer season.

Regardless of the seasonal environmental variables that act as indicators of wildland fire potential, most wildland fire events are caused by human actions. Whether the ignition source is a discarded cigarette, an unattended campfire, or an act of arson, it is people who have the greatest impact on and control over the number of wildland fires in a fire season. Mother Nature can also be responsible for igniting wildland fires. Lightning is an especially dangerous element during the dry summer season.

Wildland fires also tend to originate in lesser developed areas. These natural lands pose a difficult problem for fire suppression personnel. First, natural lands tend to contain a denser variety of vegetation, providing more fuels to ignite and spread a fire. Fires can grow rapidly in these denser fuel environments. Second, firefighting personnel are usually located farther from these lesser developed areas. The extended time it takes for fire suppression personnel to reach and react to a wildland fire further complicates the effort to contain and extinguish a newly ignited wildland fire.

5.2.10.2 History

There have been four major wildland fires in Alpine County in the last twenty (20) years. In June 1984, the Indian Creek Fire burned approximately 6000 acres of forest in Alpine County (17,000 acres in total) near Indian Creek on the east slope of the Sierra Nevada east of Woodfords. In July 1986, a fire burned 2000 to 3000 acres of wildland plus two structures near Fredericksburg to the north of the Indian Creek Fire. One year later, in late July 1987, the Acorn Fire burned 6000 acres and destroyed 26 structures near Woodfords in what many consider the most destructive fire in Alpine County history. All three of the fires started in the dry summer months and all three of the fires were caused by human activity.

More recently, in September 2008, a fire on Burnside Lake Road burned approximately 250 acres and resulted in the evacuation of Sorenson's Resort for 7 days. Although located in the neighboring Stanislaus County, the Rim Fire of 2013 degraded air quality for two weeks from hazardous to unhealthy conditions. The fire burned over 250,000 acres from August to November and reduced tourism visitation. The last and most recent wildland fire was the Washington Fire which occurred in June 2015 and burned 17,790 acres.

5.2.10.3 Location, Extent, Probability of Future Events

Wildland fire danger is a seasonal hazard and provides some measure of awareness and predictability to the hazard. The threat of wildland fire increases as winter snowpack melts, summer temperatures rise, and forest fuels become dry and susceptible to fire. The summer months of June, July, August, and September are traditionally the wildland fire season in Alpine County. Fire season can extend later into the year until precipitation arrives in the fall. The National Weather Service issues Fire Weather Watches and Red Flag Warnings up to three days in advance, for instances of strong winds and low humidity or thunderstorms with abundant dry lightning. These critical fire weather conditions result in the rapid spread of wildfire, which can overwhelm initial fire suppression efforts. On average, 8-15 Red Flag Warnings are issued for Alpine County each year.

The California Department of Forestry (CDF) is responsible for providing wildland fire protection on all State and private timberlands, watersheds, and rangelands in Alpine County. The CDF contracts out this responsibility to the United States Forest Service (USFS). While, in general, the USFS is adequately prepared to protect developed areas in the instance of wildland fire, Forest Service fire fighters are not equipped, trained, or legally permitted to fight structural fires. The County is served by volunteer fire departments located in the population centers of the county for structural fire protection. With only approximately 1200 year-round residents, structural fire protection has been adequate.

According to the National Fire Danger Rating System wildland fire severity classifications for Alpine County, many areas of the county that presently contain or are planned to contain residential development have moderate or high wildland fire hazard ratings. The CDF also has a fire rating system called the Fire Hazard Severity Classification System which considers quantity of flammable vegetation within a critical fire area, weather, and slope. This system rates the entire county as “high hazard.”

The Insurance Services Office of California has given Alpine County communities low fire insurance ratings that indicate a high potential for fire occurrence. The ratings are on a scale of one (1) to ten (10) with ten being the worst fire potential rating possible. The Markleeville area is rated 8, the Bear Valley area is rated 7 and Kirkwood is rated at 6 for areas within 100 feet of a fire hydrant. The remainder of the county is given a rating of 9. These ratings only substantiate the high potential for wildland fire throughout Alpine County.

Of greatest concern in assessing wildland fire hazard is the threat to human life that wildland fire poses. Alpine County’s geography promotes swift movement of fire once one has been ignited. Combined with possibly high fuel loading and dry summer conditions, the county’s high-relief landscape and strong localized wind patterns only enhance the rapid spread of fire. Population clusters in the county are predominantly located in areas less vulnerable to wildland fire, but the hazard is obviously still a very prevalent one as indicated in the previous rating scales. Three variables dictate the level of hazard a wildland fire potentially presents:

- The location of the fire’s origin.
- The weather at the time of the fire.
- The time of year the fire ignited.

The further the fire’s point of ignition is to the primary responder to the fire, the greater the opportunity for the fire to grow and establish itself. The longer it takes a firefighting team to

arrive on scene, the greater the potential for a wildland fire to spread. The weather at the time the fire starts weighs tremendously into how the fire might spread. If the fire starts during a period of high humidity or cooler temperatures, again the potential for rapid spread is lessened. If the fire starts during low humidity and high temperatures, the potential growth of the fire is substantially increased. The time of year when the fire starts is critical as well. If a fire ignites early in the summer when fuels are still relatively wet, the growth of the fire is hampered. But if the fire is ignited late in the summer when fuels are tinder-dry, then the potential for a large wildland fire grows exponentially. The three previous variables together, act as indicators of the potential size of a wildland fire. The presence of wind equates to additional growth of the fire.

Wildland fires can have devastating effects that are essentially measured in terms of how much area is burned in the fire. The more area that burns, the greater the impact is on wildlife. Loss of forest can have a serious impact on wildlife and wildlife habitat. Restoration of wildlife habitat could take decades to evolve back into pre-fire habitat conditions. Loss of timber in a wildland fire event could impact the economic health of the county for decades. Timber production could be drastically reduced as a result of a wildfire event. Recreational opportunities could be deteriorated or reduced as a result of fire. Campgrounds and other recreational features could be destroyed or damaged.

Just as important are the environmental hazards created in the aftermath of wildland fire. Burnt slopes could become unstable without vegetation. Steep slopes could suffer landslides and mudslides when winter precipitation arrives. Mud and debris could choke streams and rivers, diminishing water quality and endangering fish habitat. Recreational access roads could be damaged or washed away, reducing or eliminating recreational opportunities in the county.

In turn, the economic health of the county could be jeopardized by a large-scale wildland fire event. Loss of revenue from the tourism and recreation industry might impact county revenues and consequently lower the level of county services. The recreational industry might see a reduction in camping, fishing, hiking, biking, sight-seeing, and other recreational activities, lowering sales and transient occupancy tax revenues to the county. The timber products industry could be impacted as well.

Depending on the size and location of the fire, transportation and communication infrastructure could be seriously affected. Electrical power poles and transmission lines could be lost to flames. Underground utilities could be damaged, including transmission cables, gas pipelines, and water delivery systems. Roads could be closed for an extended length of time, or open on a reduced access schedule.

Loss of power also complicates daily routines. Lack of electricity and/or natural gas can make cooking, cleaning, and heating impossible for many. More catastrophic is the potential loss of homes, structures, and lives if a wildland fire enters a home site. This becomes more and more a possibility as homes are built in the rural locations of Alpine County.

Wildland fires are naturally occurring hazard events that have and will happen in Alpine County. The probability and risk of a wildland fire is seasonal in nature, with the greatest potential for a wildland fire being during the dry months of summer and early fall. Many variables combine to dictate the severity of risk for wildland fire occurrence. These considered, there is a **moderate to high** probability of a wildland fire in Alpine County, and a **moderate to high risk** associated with this natural hazard.

Numerous studies indicate that warmer weather coupled with lengthening of the fire season, could lead to an increase both in fire occurrence and in the areas burned. Increased surface drying and water temperatures increase vegetation stress, allowing trees to be more susceptible to mortality from insects. Changes in precipitation patterns along with increasing temperatures could shift plant species from their native locations. Invasive species, aided by climate variability, could affect the vegetative mix and the return interval for native species from fires of various intensities.

Wildland fires have happened in Alpine County in the past and will inevitably happen in the future. Alpine County's dry summer climate enables an annual seasonal threat to wildland fire, a threat that is periodically realized in potentially devastating fashion. Citizens have an opportunity to minimize the threat of wildland fire by creating defensible space around structures, which includes appropriate landscaping. Use of fire resistant roofing assists in protecting structures from wildland fire. Because of residents ability to be prepared for the possibility of wildland fire, damage to property and the threat to human life is decreased. To be able to most effectively address the threat of wildland fires, citizens, families, and businesses should:

1. Have an escape plan, including alternative travel routes.
2. Store extra water for use against wildland fire.
3. Have a battery operated radio within their home or business.
4. Know the locations for turning off electrical and gas utilities.
5. Develop defensible spaces around all structures on their property.
6. Consult with fire officials for specific advice and guidelines to protect both their lives and their property.

Alpine County has a Biomass Pile/Fuels Reduction Program typically held twice a year, in the spring and fall, and is free of charge. The event is provided by the Alpine County Department of Public Works in cooperation with the Eastern Alpine Fire/Rescue and the Alpine Fire Safe Council. Additionally, there are other regional facilities that accept biomass including Bently Ranch, Carson City Landfill, Douglas Disposal, Full Circle Compost and South Lake Tahoe Refuse.

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk of damage. A vulnerability analysis consists of the following six steps: assets inventory, methodology, data limitations, exposure analysis, and summary of impacts.

6.1 ASSET INVENTORY

Asset inventory is the first step of a vulnerability analysis. Assets within each community that may be affected by hazard events include population, residential and non-residential buildings, and critical facilities and infrastructure. Assets and insured values throughout the County are identified and discussed in detail below.

6.1.1 Population and Building Stock

Population data for the County was obtained from the California Department of Finance and verified from the 2010 U.S. Census and shown in **Table 6-1**. The California Department of Finance maintains annual population estimates by county. Estimated numbers and replacement values for residential and nonresidential buildings, as shown in **Table 6-1**, were obtained from the County Assessor’s office and were verified by building footprint and by parcel data. To achieve a value, the improvement value was increased by 10% to get current market value.

The residential buildings considered in this analysis include single-family dwellings, mobile homes, multi-family dwellings, temporary lodgings, institutional dormitory facilities, and nursing homes.

The building count was verified by photo and parcel data from the Assessor’s Office. The buildings’ values were calculated to the net assessed value of buildings to get the market value. This was done by Alpine County Community Development.

Although the building count or value may not be precise, whether residential or nonresidential, this analysis will meet the intention of DMA 2000 by providing Alpine County residents with an accurate visual representation of their community’s risk by hazard. This data is the most complete dataset available at the time and will be updated in future versions of the MJHMP.

Table 6-1. Estimated Population and Building Inventory

Population		Residential Buildings		Nonresidential Buildings	
2010 Census Population Count	Ca DOF Projected 2015 Population	Total Building Count	Total Value of Buildings (in millions)	Total Building Count	Total Value of Buildings (in millions)
1175	1121	1821	\$431,000,000	190	100,000,000

Source: U.S. Census 2010 population data; California Department of Finance; US Census Community Survey; Alpine County Assessor

6.1.2 Critical Facilities and Infrastructure

A critical facility is defined as a public or private facility that provides essential products and services to the general public, such as preserving the quality of life in the County and fulfilling

important public safety, emergency response, and disaster recovery functions. They are identified in **Table 6-2**.

Similar to critical facilities, critical infrastructure are defined as infrastructure that is essential to preserve the quality of life and safety in the County. Existing County roads were not critical to evacuation or response. Critical infrastructure is identified in **Table 6-2**.

Table 6-2. Critical Facilities and Infrastructure

Category	Type	Number	Estimated Value Per Structure/Mile (millions of \$)
Critical Facilities	Sherriff Stations	2	\$3,000,000
	Fire Stations	5	\$2,000,000
	EOCs	1	\$100,000
	Public Primary and Secondary Schools	4	\$8,000,000
	Communication Facilities	6	\$2,000,000
	State Owned Critical Buildings	20	\$1,000,000
Critical Infrastructure	State and Federal Highways (miles)	80	\$3,000,000
	Airport Facilities	1	\$3,000,000
	Bridges	30	\$3,000,000
	Utilities (Water, Waste Water, Gas, Electrical)	100	\$1,000,000

6.2 METHODOLOGY

A conservative exposure-level analysis was conducted to assess the risks of the identified hazards. Hazard areas were determined using information provided by the U.S. Seasonal Drought Monitor, California Department of Water Resources, CalFire, HAZUS, California Department of Conservation, USGS, and NWS. This analysis is a simplified assessment of the potential effects of the hazard on values at risk without consideration of probability or level of damage.

Using GIS, the building footprints of critical facilities were compared to locations where hazards are likely to occur. If any portion of the critical facility fell within a hazard area, it was counted as impacted. Using census block level information, a spatial proportion was used to determine the percentage of the population and residential and nonresidential structures located where hazards are likely to occur. Census blocks that are completely within the boundary of the hazard area were determined to be vulnerable and were totaled by count. A spatial proportion was also used to determine the amount of linear assets, such as highways and pipelines, within a hazard area. The exposure analysis for linear assets was measured in miles. For drought, population was the only asset analyzed, as drought mainly affects people and agricultural lands (which were not considered in this version of the MJHMP).

Replacement values or insurance coverage were developed for physical assets. These values were obtained from the Assessor’s Office and the Community Development Department. For facilities that did not have specific values per building in a multi-building scenario, the buildings were grouped together and assigned one value. For each physical asset located within a hazard area, exposure was calculated by assuming the worst-case scenario (that is, the asset would be

completely destroyed and would have to be replaced). Finally, the aggregate exposure, in terms of replacement value or insurance coverage, for each category of structure or facility was calculated. A similar analysis was used to evaluate the proportion of the population at risk. However, the analysis simply represents the number of people at risk; no estimate of the number of potential injuries or deaths was prepared.

6.3 DATA LIMITATIONS & FUTURE DEVELOPMENT

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment, as well as approximations and simplifications that are necessary for a comprehensive analysis.

The resulting analysis was compiled to the highest degree possible with the hardware, software and data availability limitations discovered during plan preparation. HAZUS was able to determine the population and critical facilities within a given hazard area and from there a limited assessment was derived. In the situation of Drought & Epidemic, where structures would not usually be affected the term N/A (not applicable) is used.

It is also important to note that the quantitative vulnerability assessment results are limited to the exposure of people, buildings, and critical facilities and infrastructure to a hazard. It was beyond the scope of this MJHMP to develop a more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function, and economic losses). Such impacts may be addressed with future updates of the MJHMP.

6.3.1 Future Development

Alpine County population has decreased since 2000 with a population of 1208. The 2010 Census population (1175) and the 2014 State Department of Finance estimated population of 1121 describe a trend of decreasing population. Alpine County has a high level of vacant residential units at approximately 66% due to high levels of second home ownership especially in Bear Valley and Kirkwood. Master planned projects are approved with significant build out potential in Bear Valley, Kirkwood, and Markleeville. These projects are expected to have low population generation due to the type of projects which are primarily intended for second homes.

For the purposes of this plan significant growth over the next five years is not expected, growth from 2016 to 2020 is expected at less than 1%. Therefore, the numbers and values of the Figures in the **Table 6-3** and **6-4** below are viewed as accurate. During the plan maintenance activities this should be reviewed and during the next plan update process growth can be revisited.

The vulnerability of the County and the participating annexed agencies has not increase or decreased due to changes in development. In Kirkwood, Bear Valley, and Markleeville, where the participating agencies are located, there have been no significant changes in projected development or approved plans.

6.4 EXPOSURE ANALYSIS

The requirements for a risk assessment, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Assessing Vulnerability, Overview

Assessing Vulnerability: Overview

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.

Element

- Does the new or updated plan include an overall summary description of the jurisdiction’s vulnerability to each hazard?
- Does the new or updated plan address the impact of each hazard on the jurisdiction?

Source: FEMA 2008.

DMA 2000 Recommendations: Assessing Vulnerability, Identifying Structures

Assessing Vulnerability: Identifying Structures

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 area.

Element

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Source: FEMA 2008.

DMA 2000 Recommendations: Assessing Vulnerability, Estimating Potential Losses

Assessing Vulnerability: Estimating Potential Losses

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.

Element

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan reflect changes in development in loss estimates?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Source: FEMA 2008.

The results of the exposure analysis are summarized in **Tables 6-3** and **6-4** and in the discussion below. The results in this exposure analysis were greatly affected by the hardware, software and data availability limitations described above.

Table 6-3. Potential Hazard Vulnerability Assessment – Population and Buildings

Hazard	Population ⁴ Number	Buildings			
		Residential		Nonresidential	
		Number ³	Value (\$)¹	Number ³	Value (\$)¹
Total for Alpine County	1175	1812	431,000	190	100,000
Avalanche	3	10	2,400	1	1,000
Dam Failure	15	48	12,000	10	5,000
Drought	1175	1812	431,000	190	100,000
Earthquake	590	900	200,000	80	50,000
Flood - 100-Year Flood Zone	100	98	42,000	20	10,000
Hazardous Materials Event – 1-mile buffer transport corridors 10% of 75%	88	100	44,000	20	10,000
Landslide	3	1	350	0	0
Severe Weather	270	18	5,000	2	1,000
Communications/Utility Loss	1175	1812	431,000	190	100,000
Wildland Fires	1000	1100	240,000	100	55,000

¹ Value = Estimated Market value (x1000) Data acquired from Alpine County Assessor’s Office

N/A = Not Applicable

SECTION SIX

Vulnerability Assessment

Table 6-4 NATURAL HAZARD THREATS

Organization	Facility	Avalanche	Dam Failure	Drought	Earthquake	Floods	Hazardous Materials	Landslide	Severe Weather	Utility Loss	Wildland Fire	Potential Loss
Alpine County											(\$)	
(Markleeville)	County Courthouse				X	X			X		X	746,893.00
	Library				X	X		X	X		X	796,445.00
	Annex				X	X			X		X	95,618.00
	Chamber of Commerce Building				X	X			X		X	113,878.00
	Government Center				X	X			X		X	5,000,000.00
	Museum				X	X		X	X		X	432,939.00
	Historic Jail				X	X		X	X		X	91,739.00
	Historic Schoolhouse				X	X		X	X		X	77,757.00
	Markleeville Firehouse –Station 92				X	X			X		X	292,920.00
(Turtle Rock Park)	Community Center				X	X			X		X	495,748.00

SECTION SIX

Vulnerability Assessment

Table 6-4 NATURAL HAZARD THREAT

Organization	Facility	Avalanche	Dam Failure	Drought	Earthquake	Floods	Hazardous Materials	Landslide	Severe Weather	Utility Loss	Wildland Fire	Potential Loss
(Woodfords)	Woodfords Firehouse – Station 91			X	X	X			X		X	(\$) 321,661.00
(Diamond Valley)	Road Quonset Hut				X	X			X		X	39,090.00
	Road House Dwelling				X	X			X		X	108,360.00
	Road House Garage				X	X			X		X	25,028.00
	Community Development Office				X	X			X		X	500,000.00
	Building and Grounds Office				X	X			X		X	227,404.00
	Road Storage Building				X	X			X		X	1,108.00
	Road Equipment Storage Shed				X	X			X		X	246,748.00
	Recycle Building				X	X			X		X	20,879.00
	Storage Shed				X	X			X		X	10,180.00
	Sand Shed				X	X			X		X	147,871.00
	Oil Recycling Shed				X	X			X		X	40,661.00
	Road Shop				X	X			X		X	272,222.00
	Social Services & Public Health				X	X			X		X	954,744.00
	Public Health Clinic				X	X			X		X	2,846,155.00

SECTION SIX

Vulnerability Assessment

Table 6-4 NATURAL HAZARD THREAT													
Organization	Facility	Avalanche	Dam Failure	Drought	Earthquake	Floods	Hazardous Materials	Landslide	Severe Weather	Utility Loss	Wildland Fire	Potential Loss	
(Bear Valley)	Perry Walther Community Center		X		X	X			X		X	(\$)	507,678.00
	Community Building		X		X	X			X		X		346,080.00
	Fire House		X	X	X	X			X		X		296,472.00
(Miscellaneous)	Contractors Equipment	X	X		X	X		X	X		X		1,370,000.00
	Vehicles	X	X		X	X		X	X		X		4,345,000.00
	Ambulance	X	X		X	X		X	X		X		50,000.00
Alpine County Unified School District													
	Diamond Valley School				X	X			X		X	(\$)	2,896,201.00
	Bear Valley School		X		X	X			X		X		2,137,007.00
	Alpine County Learning Center				X	X			X		X		3,176,000.00
	Alpine County Opportunity Class				X	X			X		X		54,785.00
Bear Valley Water District													
	Lake Alpine Station		X		X	X			X		X	(\$)	300,000.00
	Main Pump Station		X		X	X			X		X		405,000.00
	Equipment House		X		X	X			X		X		230,000.00

SECTION SIX

Vulnerability Assessment

Table 6 -4 NATURAL HAZARD THREAT

Organization	Facility	Avalanche	Dam Failure	Drought	Earthquake	Floods	Hazardous Materials	Landslide	Severe Weather	Utility Loss	Wildland Fire	Potential Loss	
Bear Valley Water District (continued)													
	Collection System		X		X	X			X		X	(\$)	1,500,000.00
	Storage Ponds		X		X	X		X	X		X		1,500,000.00
	Reservoir		X		X	X		X	X		X		2,000,000.00
	Other Buildings		X		X	X			X		X		1,320,000.00
	Vehicles	X	X		X	X		X	X		X		100,000.00
Kirkwood Meadows Public Utility District													
	Buildings				X	X			X		X	(\$)	4,774,739.00
	Fixed Equipment				X	X			X		X		1,264,957.00
	Vehicles	X	X	X	X	X		X	X		X		349,491.00
Markleeville Public Utility District													
	Collection System				X	X			X		X	(\$)	1,500,000.00
	Pump House				X	X			X		X		400,000.00
	Lift Station				X	X			X		X		250,000.00
	Storage Pond				X	X		X	X		X		750,000.00
	Equipment Building				X	X		X	X		X		200,000.00

SECTIONSIX

Vulnerability Assessment

Table 6 -4 NATURAL HAZARD THREAT

Organization	Facility	Avalanche	Dam Failure	Drought	Earthquake	Floods	Hazardous Materials	Landslide	Severe Weather	Utility Loss	Wildland Fire	Potential Loss	
Markleeville Water Company													
	Main Water Lines				X	X		X	X		X	(\$)	2,500,000.00
	Water Plant				X	X			X		X		500,000.00
	Pump Houses				X	X			X		X		15,000.00
	Water Tanks				X	X			X		X		20,000.00
	Collection Gallery Facility			X	X		X	X		X	X		20,000.00
South Tahoe Public Utility District													
Harvey Place Dam Facility	Harvey Place Dam				X	X		X	X		X	(\$)	50,000,000.00
	Compound				X	X			X		X		750,000.00
	Diversion Structure				X	X		X	X		X		388,000.00
	Compressor Building				X	X			X		X		34,000.00
Indian Creek Dam Facility	Indian Creek Dam				X	X		X	X		X		15,000,000.00
	Compressor Building				X	X		X	X		X		18,000.00
	Export Pipeline				X	X		X	X		X		30,000,000.00
	Diamond Ditch Siphons				X	X		X	X		X		1,500,000.00
	West Fork Diversion Structure				X	X		X	X		X		100,000.00
	Snowshoe Thompson Ditch #1				X	X		X	X		X		750,000.00

SECTION SIX

Vulnerability Assessment

Table 6 -4 NATURAL HAZARD THREAT													
Organization	Facility	Avalanche	Dam Failure	Drought	Earthquake	Floods	Hazardous Materials	Landslide	Severe Weather	Utility Loss	Wildland Fire	Potential Loss	
South Tahoe Public Utility District (continued)													
	Mullich Ditch				X	X		X	X		X	(\$)	750,000.00
	Diamond Ditch				X	X		X	X		X		4,500,000.00
	Fredericksburg Ditch				X	X		X	X		X		500,000.00
	Harvey Ditch				X	X		X	X		X		300,000.00
Washoe Tribe of Nevada and California													
	160 Homes (\$100,00 each)				X	X			X		X	(\$)	16,000,000.00
	Community Building				X	X			X		X		250,000.00
	Community Office Building				X	X			X		X		250,000.00
	Gymnasium				X	X			X		X		500,000.00
	Community Well/ Plumbing System				X	X			X		X		15,000.00
	Water/Utility Delivery System				X	X			X		X		1,000,000.00

6.4.1 Avalanche

Alpine County with high elevations and extreme snowfall has considerable avalanche terrain. The potential for avalanches exists adjacent to existing infrastructure and communities. Avalanche control is typical during and after winter storm events for State Highway 88, Kirkwood Mountain Resort, and Bear Valley Mountain Resort. The 2003 Kirkwood Specific Plan identified avalanche potential (Mears). Low probability avalanches could affect three (3) buildings. No critical facilities are at risk to this hazard. The highway is at moderate risk, however, there are alternate routes.

6.4.2 Dam Failure

Failure of dams and impoundments could affect facilities for Lake Alpine Water Company, South Lake Tahoe Public Utility District, and Bear Valley Water District. Bear Lake which impounds Bear Creek has been studied for inundation in the event of a failure. A portion of the population in adjacent to Bear Creek would be affected by an inundation event. Forty-eight (48) buildings could be affected.

6.4.3 Drought

According to the U.S. Seasonal Drought Monitor, the entire area of the County is at equal risk to a drought event. The entire population of 1,175, may be affected by the drought however buildings and critical facilities would just be limited in their use but would not be damaged.

6.4.4 Earthquakes

Earthquake hazard was analyzed according to USGS ground motion probability data. The Genoa fault and fault systems on the Carson Range have the highest probability for significant earthquake events. The buildings and population of Woodfords and Markleeville are at risk from a moderate to severe earthquake. Fifty percent of the population (590) and buildings (900) are at risk. Assuming 37% estimated damages sustained from moderate to severe could be up to \$80 million.

6.4.5 Floods

The DWR Flood Awareness boundaries were used for the County to estimate at risk buildings. Alpine County does not have FEMA flood elevation maps. Within Alpine County, the risk posed by the 100-year flood is moderate with 98 homes within or immediately adjacent to the 100-year floodplain. The exposure to the buildings is \$42 million, to which includes exposure to critical facilities, South Lake Tahoe Public Utility District, "C" line and Harvey Place storage, and Markleeville Public Utility District waste water facility. The affected building inventories and values were calculated from the Alpine County Community Development and Alpine County Assessor's office data.

6.4.6 Hazardous Materials Events

Transportation of hazardous waste along State Highways corridors within Alpine County poses a risk to population and buildings. The majority of population in Alpine County is adjacent to State

Highways; seventy-five percent (75%) of the buildings and population reside within the 1-mile buffer from State Highways. Therefore, the Alpine County Community Development estimated that 10% of the population (88) and buildings (\$44 million) which are within the 1-mile buffer may be affected by a hazardous material event. The affected population, building inventories, and values were calculated from Alpine County Community Development GIS data and Assessor's Office information.

6.4.7 Landslide

The landslide area could affect very few residential buildings and no commercial buildings; however, landslide is usually limited to a specific area and these figures overstate the exposure. Therefore 1% was used to represent those structures that are at risk which include one residential building worth \$350,000 with three people exposed. There are no critical facilities within the landslide area.

6.4.8 Severe Weather

Using winter storm data provided by the NWS, risk posed by winter storms were calculated for the County. All population and buildings are within the severe winter storm hazard area however homes and buildings within Alpine County are built to withstand a degree of severe weather. The Local Planning Team determined that a severe winter storm or wind event may affect 25% of the population and 1% of the buildings which are 270 people, and 18 buildings (worth \$5 million).

6.4.9 Communication/Utility Loss

Utility loss was included as a possible hazard to the citizens of the County. The entire population of Alpine County, 1175 persons, could be affected by the loss however; buildings and critical facilities would just be limited in their use not damaged. Most State and County critical facilities including law enforcement, administration, health services, and road maintenance have back-up generators.

6.4.10 Wildland Fires

According to the CalFire Fire Hazard Severity Zones for Alpine County, the risk posed by wildland fire to property within the State Responsibility Area (SRA) is majority classified high or very high risk. Exposed within the very high and high wildland fire hazard area, are 1000 people and 1100 buildings (worth \$144 million).

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While not required by the DMA 2000, an important component of a hazard mitigation plan is a review of the County’s resources to identify, evaluate, and enhance the capacity of those resources to mitigate the effects of hazards. This section evaluates the County’s resources in three areas—legal and regulatory, administrative and technical, and financial—and assesses capabilities to implement current and future hazard mitigation actions.

7.1 LEGAL AND REGULATORY CAPABILITIES

The County and the Annex agencies currently support hazard mitigation through its regulations, plans, and programs. The Alpine County Building Code outlines hazard mitigation-related ordinances. Additionally, the Alpine County General Plan includes a Land Use Element and Safety Element which address hazard mitigation, including fire, earthquake, landslides, flood and hazardous materials. In addition to policies and regulations, the County carries out hazard mitigation activities by participating in the Carson River Watershed RiskMAP program. The following table, **Table 7-1**, summarizes the County’s hazard mitigation legal and regulatory capabilities.

Table 7-1. Legal and Regulatory Resources Available for Hazard Mitigation

Regulatory Tool	Title	Effect on Hazard Mitigation
Plans	General Plan	Updated 2009. Contains goals, policies, objectives, and implementation measures designed to guide growth and development within the jurisdiction. In the future the General Plan amendments or revisions to the Safety element will require an analysis of Climate Change and Adaption per SB 379. Policies regarding Climate Change risks, adaptations, and mitigations will be added to the General Plan Safety Element.
	Capital Improvements Plan	Updated 2015. Includes communications projects based on public safety needs, road projects, and water storage projects for fires. The CIP can also include projects which are also per disaster mitigation including road drainage improvements.
	Economic Development Plan	Updated 2009. Business Development.
	Emergency Operations Plan	Updated 2010. Provides emergency response.
	Community Wildfire Protection Plan	2009, currently being updated by Fire Safe Council. Provides Wildfire hazards. Enables County to mitigate fuel loads. The recent update of the CWPP can include projects recognized as re disaster mitigation such as education and outreach, fuels reduction, or the protection enhancements.
	Alpine County Area Plan (Hazardous Materials Incidents)	Provides emergency response to reduce impact of HAZMAT spill.
	Carson River Geographic Response Plan	Establishes the emergency response organization for hazardous materials incidents occurring within the Carson River watershed.
	Carson River Watershed Discovery Report	Provides flood hazard identification and mitigation measures within the Carson River Watershed.

Table 7-1. Legal and Regulatory Resources Available for Hazard Mitigation

Regulatory Tool	Title	Effect on Hazard Mitigation
	Carson River Watershed Floodplain Management Plan	Updated 2014. Long-term vision and strategies for floodplain management to reduce flood damage impacts. The CRWFMP also includes: NRIP: In the future the County could improve the Flood Plain management ordinances per the Carson River Watershed Floodplain Management Plan for better consistency with NFIP standards Building Code, Zoning, and Growth – Development regulations can be revised in the future to incorporate. Roadway, Driveway, and land standards: When change are made to CalFire Fire Safe Regulations in the future the development standard can be revised to meet or exceed the requirements of PRC 4290 and 4291..
	Local Control Accountability Plan (LCAP)	The LCAP is intended to reflect an LEA’s annual goals, actions, services and expenditures within a fixed three-year planning cycle. LEAs must include a plan summary for the LCAP each year
	Alpine County Unified School District Hazardous Substance Communication Program	Employee training information provided on hazardous substances to which an employee is exposed or for which there is potential exposure.
Programs	National Flood Insurance Program	Alpine County adopts and enforces a floodplain management ordinance to reduce future flood damage. In exchange, the NFIP makes Federally backed flood insurance available to homeowners, renters, and business owners.
Ordinances and Policies	Building Code Title 19, 24, & 25 (CBC 2013 & its appurtenances)	Master Plan, Land Use Plan Element. Provides regulations to reduce hazard impact.
	Zoning Ordinances	
	Growth management ordinances	
	Alpine County Development Standards	Subdivision ordinance or regulations, wildfire ordinances, hazard set back requirements, well and on-site wastewater standards.
	Roadway, Driveway, and Lane Standards	Consistent with CalFire Fire Safe Regulations.
Utility District Development Standards	Water and wastewater standards.	

For future assessment of the Legal and Regulatory capability assessment the County and Annex Jurisdictions will review annually, based on any changes that have occurred within the year. The county and annex jurisdictions will take in to account if this capability requires to be updated due to any new development, and any increases in hazards due to the public’s perception of climate change effect on hazards and if any increases or decreases in hazards to the county have occurred. They will also utilize other updated information in the plans and programs currently adopted by the County and annex jurisdictions for up to date information, in order to expand, improve upon or add any additional information to this plan, so that the information contained in this plan document stays current.

In the future the County can pursue updates to its floodplain ordinance and General Plan safety element to reduce risk; and can participate with the Carson Water Subconservancy District on ongoing efforts to update the Carson River Watershed Floodplain Management Plan and continuing efforts toward projects to implement the plan. The safety element can also include incorporation of the FEMA-approved local hazard mitigation plan to comply with AB2140.

7.2 ADMINISTRATIVE AND TECHNICAL CAPABILITIES

The administrative and technical capability assessment identifies the staff and personnel resources available within the County to engage in mitigation planning and carry out mitigation projects. Although Washoe Tribe staff and personnel resources are not listed separately, there is close coordination between Alpine County and all departments of the Washoe Tribe, as well as with the Tribal Council. In the future administrative and technical function capabilities of Alpine County and the annex agencies can be enhanced through training, table top exercise, and multi-agency collaboration. The administrative and technical capabilities of the County are listed in **Table 7-2**.

Table 7-2. Administrative and Technical Resources for Hazard Mitigation

Staff/Personnel Resources	Department / Agency
Planner(s) or engineer(s) with knowledge of land development and land management practices	Planning & Public Works
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Building & Public Works
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Building, Planning, Public Health Emergency Preparedness
Staff with education or expertise to assess the community's vulnerability to hazards	Building, Fire, Public Works
Floodplain manager	Public Works
Personnel skilled in GIS and/or HAZUS-MH	GIS Program, Community Development
Emergency Services	Sheriff's Department
Finance (purchasing) – Fiscal Management	Finance Department
Public Information Officers, Planner(s)	Administration, Planning

For future assessment of the Administrative and Technical Resources capability assessment the County and Annex Jurisdictions will review annually, based on any changes that have occurred within the year. The county and annex jurisdictions will take in to account if this capability requires to be updated due to any new staff or changes within divisions and any increases in hazards due to the public's perception of climate change effect on hazards and if any increases or decreases in hazards to the county have occurred. They will also utilize other updated information in the plans and programs currently adopted by the County and annex jurisdictions for up to date information, in order to expand, improve upon or add any additional information to this plan, so that the information contained in this plan document stays current. In the future the County can update its Emergency Operations Plan, conduct training (desk top and situational exercises) to improve capabilities in emergency response, and increase training for the floodplain manager. Additionally, staff can be trained to provide public outreach on mitigating hazards.

7.3 FINANCIAL CAPABILITIES

The fiscal capability assessment lists the specific financial and budgetary tools that are available to the County for hazard mitigation activities. These capabilities, which are listed in **Table 7-3**, include both local and Federal entitlements.

Table 7-3. Financial Resources for Hazard Mitigation

Financial Resources	Effect on Hazard Mitigation
Local	
Authority to levy taxes for specific purposes	Yes. Upon approval of the Board of Supervisors, staying within the stipulations set forth in California Code.
Capital Improvement Plans and Fire Impact Fees	Assigns impact development fees to finance fire control capital improvement programs.
Community Development Block Grants	Yes. Subject to grant from Fed/State.
Capital Improvement Project funding	Yes. General Fund.
Fees for water, sewer, gas or electric service	Yes, for utility districts and private entities.
Incur debt through general obligation bonds	Yes. Upon voter approval, staying within the stipulations set forth in California Code.
Incur debt through special tax and revenue bonds	Yes. Upon voter approval, staying within the stipulations set forth in California Code.
Incur debt through private activity bonds	Yes. Upon voter approval, staying within the stipulations set forth in California Code.
Withhold spending in hazard-prone areas	Yes.

For future assessment of the Financial Resources capability assessment the County and Annex Jurisdictions will review annually, based on any changes that have occurred within the year. The county and annex jurisdictions will take in to account if this capability requires to be updated due to any new Grants awarded, taxes or impact fees assessed, if any new or reduction in bonds have occurred, and any increases in hazards due to the public's perception of climate change effect on hazards and if any increases or decreases in hazards to the county have occurred that would affect these fees and revenue. They will also utilize other updated information from the State, in the plans and programs currently adopted by the County and annex jurisdictions for up to date information, in order to expand, improve upon or add any additional information to this plan, so that the information contained in this plan document stays current.

In the future the County can track grant funding opportunities specifically targeted to hazard mitigation and emergency response.

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The following provides an overview of the four-step process for preparing a mitigation strategy: developing mitigation goals and objectives, identifying and analyzing potential actions, prioritizing mitigation actions, and implementing an action plan.

8.1 MITIGATION GOALS AND OBJECTIVES

The requirements for the local hazard mitigation goals, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy	
Local Hazard Mitigation Goals	
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.	
Element	
<ul style="list-style-type: none"> ■ Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards? 	
<i>Source: FEMA, March 2008.</i>	

The previous plan's goals were as follows:

- Goal 1 – Save lives and protect property.
- Goal 2 – Reduce impacts of future disaster events.
- Goal 3 – Enable post-disaster funding.
- Goal 4 – Hasten recovery from disasters.
- Goal 5 – Demonstrate a dedication to improving the county's safety and wellbeing.

Using the 2005, Hazard Mitigation Plan Goals, as a starting point, local planning documents as guidelines, the Local Planning Team reorganized the 5 long term Goals and developed 10 Goals to reduce or avoid long-term vulnerabilities to the identified hazards (**Table 8-1**).

The lead committee determined that each hazard identified in the plan would have a goal except for communication/utility loss and hazardous materials. For hazardous materials, with no previous occurrence and being covered under other regulations, the Local Planning Team agreed actions under current Goals 1 and 2 can be used to advance hazard mitigation for these hazards as well as all the hazards profiled in Section 5. Additionally, the Local Planning Team agreed actions under current Goals 1 and 2 can be used to advance hazard mitigation for communication/utility loss.

Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions.

Table 8-1. Mitigation Goals

Goal Number	Goal Description
1	Promote increased and ongoing Alpine County's involvement in hazard-mitigation planning and projects.
2	Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.
3	Reduce the possibility of damage and losses due to avalanche.
4	Reduce the possibility of threat to life and losses due to dam failure.
5	Reduce the possibility of damage and losses due to drought and water shortage.
6	Reduce the possibility of damage and losses due to earthquake.
7	Reduce the possibility of damage and losses due to floods.
8	Reduce the possibility of damage and losses due to landslides.
9	Reduce the possibility of damage and losses due to severe weather.
10	Reduce the possibility of damage and losses due to wildland fire.

8.2 IDENTIFYING MITIGATION ACTIONS

The requirements for the identification and analysis of mitigation actions, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy
<p>Identification and Analysis of Mitigation Actions</p> <p>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.</p> <p>Element</p> <ul style="list-style-type: none"> ■ Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard? ■ Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure? ■ Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure? ■ Does the mitigation strategy identify actions related to the participation in and continued compliance with the NFIP? <p><i>Source: FEMA, March 2008.</i></p>

Mitigation actions from the previous plan were reviewed by the Local Planning Team and are listed in **Table 8-2 Alpine County Hazard Ranking** with their current status and decision to keep them with this update.

Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. As such, **Table 8-2** lists the revised goals and potential actions selected for this MJHMP and which actions address reducing hazards on new and/or existing buildings.

Table 8-2 was review by the Local Planning Team. Comments were incorporated and the table details all the actions considered important to hazard mitigation by the committee.

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
<p><i>Goal 1:</i></p> <p><i>Promote increased and ongoing Alpine County involvement in hazard-mitigation planning and projects.</i></p>	1.A	E/N	Enhance/Develop the Seasonal Multi-Hazard Public Awareness Program.	Alpine County Planning; Alpine County School District; Bear Valley Water District; Kirkwood Meadows Public Utility District; Markleeville Public Utility District
	1.B	E/N	Review/update the General Plan to integrate components of the MJHMP.	Alpine County Local Planning Team/Emergency Management; Alpine County School District; Bear Valley Water District; Kirkwood Meadows Public Utility District; Markleeville Public Utility District
	1.C	N	Adopt CBC 2016 code and local facts and findings.	Alpine County Public Works, Building; Alpine County School District; Bear Valley Water District; Kirkwood Meadows Public Utility District; Markleeville Public Utility District
<p><i>Goal 2:</i></p> <p><i>Build and support local capacity to enable the public to prepare for,</i></p>	2.A	N/E	Develop, enhance, and implement education programs aimed at mitigating natural hazard, and reducing the risk to citizens, public agencies, private property owners, business, and schools.	Alpine County Community Development, Public Works; Alpine County School District; Bear Valley Water District; Kirkwood Meadows Public Utility District;

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
<i>respond to, and recover from disasters.</i>				Markleeville Public Utility District
	2.B	N/E	Increase interagency coordination and cooperation.	All
	2.C	N/E	Obtain additional data needed for GIS mapping to understand and improve knowledge about Alpine County's vulnerabilities.	All
	2.D	N/E	Utilize the county website and social media as a communication tool, as well as an education tool for hazard loss prevention.	All
	2.E	N/E	Conduct a minimum of one disaster exercise each year.	All
Goal 3: <i>Reduce the possibility of damage and losses due to avalanche.</i>	3.A	N/E	Initiate or tie into existing Sierra Avalanche Center avalanche warning information system to inform and warn backcountry users of the current level of avalanche danger.	Alpine County Sheriff's Office; KMPUD
	3.B	N/E	Work with the ski resorts of the County on educating skiers on avalanche hazards.	Alpine County Community Development, Ski Resorts; KMPUD
	3.C	N/E	Maintain a backcountry patrol to enforce and fine snowmobile out-of-bounds violations to reduce backcountry avalanche potential.	USFS
Goal 4: <i>Reduce the possibility of threat to life and losses due to dam failure.</i>	4.A	N/E	Improve communication with the California Department of Water Resources to ensure that the larger dams in the County have been and continue to be inspected per law.	All
	4.B	N/E	Develop education and outreach to inform potentially affected citizens about dam safety and being prepared in the event of a dam emergency.	All
Goal 5:	5.A	N/E	Develop education and outreach for water conservation techniques.	All

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
<i>Reduce the possibility of damage and losses due to drought and water shortage.</i>	5.B	N/E	Review and update County ordinance concerning septic system installation and maintenance to protect County groundwater reserves from potential septic system contamination.	Alpine County, Health and Human Services; BVWD; KMPUD; MPUD
<i>Goal 6: Reduce the possibility of damage and losses due to earthquake.</i>	6.A	N	Review and update the County Building Code to ensure the construction of seismically safe buildings in Alpine County.	Alpine County, Building Department
	6.B	N/E	Develop a homeowner’s guide to earthquake preparedness techniques to educate homeowners on earthquake preparedness.	Alpine County, Health and Human Services
	6.C	E	Retrofit all County buildings to withstand earthquake events.	Alpine County, Building Department
	6.D	E	Have all school buildings in the district surveyed by a structural engineer to make certain that all structures meet state earthquake standards.	Alpine County Unified School District
	6.E	N/E	Strengthen the earthen walls of the evaporation ponds to make them more earthquake resistant.	Markleeville Public Utility District
	6.F	N/E	Replace old World War II surplus pipeline with new piping designed to withstand earthquake stresses.	Markleeville Water Company
	6.G	N/e	Install flexible connectors between water tanks and water lines to provide a measure of elasticity between infrastructural elements in the water delivery system.	Markleeville Water Company
<i>Goal 7: Reduce the possibility of damage and losses due to</i>	7.A	N	Review and update County ordinance to ensure no construction takes place in recognized flood-prone areas in the future.	Alpine County Planning, Building Department
	7.B	N/E	Ensure that all bridges within Alpine County are structurally safe from failure during peak flow scenarios by inspecting the bridges in the County.	Alpine County Public Works, California Department of

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
<i>floods.</i>				Transportation
	7.C	E	Stockpile sandbags in order to ensure an adequate supply to combat erosion during flood events.	Alpine County Public Works
	7.D	E	Increase the capacity of the drainage systems servicing district campuses.	Alpine County School District
	7.E	E	Retrofit district manholes to be water-tight.	Bear Valley Water Company
	7.F	E	Replace old manholes with water-tight products.	Kirkwood Meadows Public Utility District
	7.G	E	Remove 1300 feet of existing sewer main lying along Markleeville Creek and connect customers to an existing main located outside of the stream channel.	Markleeville Public Utility District
	7.H	E	Protect the collection gallery and the supply line from the gallery to the water treatment facility from potential flood damages by reinforcing the collection gallery and relocating the supply line out of the stream channel.	Markleeville Water Company
	7.I	E	Drill one or more back-up wells to ensure a reliable source of water during severe storm and flood events.	Markleeville Water Company
	7.J	E	Construct a facility to provide emergency effluent storage.	South Tahoe Public Utility District
	7.K	E	Convert/replace network of ditches with pipeline.	South Tahoe Public Utility District
<i>Goal 8: Reduce the possibility of damage and losses due to</i>	8.A	N/E	As part of road maintenance, inspect road cuts and fills for signs of slope failure. Stabilize slopes as necessary.	Alpine County Public Works, California Department of Transportation
	8.B	N	Draft and adopt a County grading ordinance.	Alpine County Public Works

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
<i>landslide.</i>	8.C	N	Within a County grading ordinance, ensure cut and fill techniques provide for finished slopes at the angle of repose.	Alpine County Public Works
	8.D	N	Within a County grading ordinance, ensure that all disturbed slopes are revegetated after grading to reduce erosion potential while promoting slope stabilization.	Alpine County Public Works
	8.E	N	Within County zoning ordinance, draft and adopt measures that limit construction on steep slopes where extensive cut and fill would be necessary.	Alpine County Public Works
<i>Goal 9 Reduce the possibility of damage and losses due to severe weather.</i>	9.A	N/E	Review County ordinance to facilitate adequate snow storage and drainage easements.	Alpine County Public Works and Planning Department
	9.B	N	Dedicate snow storage and drainage easements within all new development.	Alpine County Public Works and Planning Department
	9.C	E	Design and install new roof on the Hung-A-Lel-Ti Wellness Center which is used for a shelter for evacuations and mass casualty.	Washoe Tribe
<i>Goal 10: Reduce the possibility of damage and losses due to wildland fire.</i>	10.A	N	Review and update County ordinance to ensure the construction of fire-resistant homes in the future.	Alpine County Public Works and Planning Department
	10.B	N	Enforce County ordinance relating to road construction to facilitate emergency vehicle ingress and egress.	Alpine County Public Works and Planning Department
	10.C	E	Identify wildland interface buffer areas surrounding established communities in the county.	Alpine Fire Safe Council
	10.D	E	Reduce fuel loading within identified wildland interface buffer areas.	Alpine Fire Safe Council, Property Owners, California

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
				Conservation Corps & other property owners
	10.E	N/E	Promote improved forest health within the National Forests of the County to reduce fuel loading in the forests of the County.	USFS
	10.F	N/E	Endorse "firewood sales" by the Forest Service as a method of fuel load reduction in the National Forests of the County.	USFS
	10.G	E	Sponsor a community "burn pile" to promote the removal of refuse from private parcels.	Alpine County Public Works
	10.H	N/E	Continue a homeowner guide for reducing the threat of wildland fire to private homes.	Alpine Fire Safe Council
	10.I	E	Develop partnerships with concerned citizen groups to identify and implement neighborhood-specific fire safety programs.	Alpine County Planning Department and citizens
	10.J	E	Develop a fuels reduction program around school campuses to include removal of dead and dying trees and vegetation.	Alpine County School District
	10.K	E	Construct a water line and hydrants to provide fire protection to the Kirkwood Inn area of the Kirkwood valley.	Kirkwood Meadows Public Utility District
	10.L	N/E	Replace old fire hydrants and associated pipe within the Kirkwood valley to assure reliable and adequate firefighting water supply to the Kirkwood service area.	Kirkwood Meadows Public Utility District
	10.M	N/E	Upgrade the fire resistance of the equipment building.	Markleeville Public Utility District
	10.N	N/E	Relocate the lift station controls to the equipment building.	Markleeville Public Utility District
	10.O	E	Install a sprinkler system on the water company treatment plant roof to protect it from fire.	Markleeville Water Company

Table 8-2: Mitigation Goals and Potential Actions

Goals	Action	New or Existing Buildings	Description	Entity
	10.P	E	Retrofit water treatment plant house and pump houses with fire-resistant exterior siding.	Markleeville Water Company
	10.Q	E	Procure a generator to allow for service during power-outage conditions.	Markleeville Water Company
	10.R	E	Drill one or more back-up wells to provide alternative water sources if the current surface water collection system is rendered unusable due to fire.	Markleeville Water Company
	10.S	E	Control vegetation growth within and around STPUD facilities.	South Tahoe Public Utility District
	10.T	E	Provide reclaimed water for use in firefighting.	South Tahoe Public Utility District
	10.U	E	Implement a fuels reduction program to provide for defensible space against any potential wildland fire.	Washoe Tribe
	10.V	E	Explore feasibility of a second ingress/egress at Marklee Village for evacuation and emergency services.	Alpine Fire Safe Council
	10.W	N/E	Prepare feasibility study to determine whether a biomass-to-bioenergy facility is viable for fuels reduction and forest thinning in Alpine County. The project may be infeasible due to any number of economic conditions.	Alpine Fire Safe Council

Reduce Hazard Effect on N = New Buildings, E = Existing Buildings, N/E = New and Existing Buildings

8.3 NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

<p>DMA 2000 Requirements: Mitigation Strategy – National Flood Insurance Program</p> <p>National Flood Insurance Program (NFIP) Compliance</p> <p>Requirement: §201.6(c)(3)(iii): [The mitigation strategy] must also address the jurisdiction’s participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.</p> <p>Element</p>

DMA 2000 Requirements: Mitigation Strategy – National Flood Insurance Program

- Does the updated plan document how the planning team reviewed and analyzed this section of the plan and whether this section was revised as part of the update process?
- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Source: FEMA, March 2008.

Alpine County does not have a FEMA Flood Insurance Study (FIS). The entire County is currently mapped by FEMA as Zone D. Alpine County does not participate in the Community Rating System (CRS).

Alpine County does participate in the NFIP and joined the National Flood Insurance Program (NFIP) on August 1, 1984. In addition to providing insurance for properties at risk of flooding, the program collects and published statistics on flood-related losses in participating jurisdictions. The County will continue NFIP compliance by enforcing County Code 16.08 – Floodplain Development Standards. The County is pursuing updates to the Floodplain Development standards which were last updated in 1988.

The County has outlined mitigation actions listed under goals for flood detailed in **Table 8-4, Mitigation Goals and Potential Actions**.

NFIP insurance data indicates that as of August 15, 2015, the County had 98 policies in force resulting in \$ 1,638,200 of insurance in force. There have been four historic claims for flood losses totaling \$48,077.57. Of the four claims, there has been one repetitive loss property. The Bear Valley Branch Library located at 367 Creekside Drive, Bear Valley, CA 95223 has had two repetitive loss events in the past seven years. The losses were at least \$1,000 each and have been paid under the NFIP within a 10-year period. The Bear Valley Branch Library is within the jurisdiction of the Bear Valley Water District. (Please see Annex B). Alpine County and the Annex Jurisdictions will continue NFIP compliance by continuing to enforce the floodplain management ordinance, and by accomplishing mitigation actions as listed under the goals for the flood hazard as detailed in Table 8-4, Mitigation Goals and Potential Actions, on page 8-12.

8.4 EVALUATING AND PRIORITIZING MITIGATION ACTION

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

Implementation of Mitigation Actions

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.

Element

- Does the mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)
- Does the mitigation strategy address how the actions will be implemented and administered? (For example, does

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

it identify the responsible department, existing and potential resources, and timeframe?)

- Does the prioritization process include an emphasis on the use of a cost-benefit review (see page 3-36 of *Multi-Hazard Mitigation Planning Guidance*) to maximize benefits?

Source: FEMA, March 2008.

The mitigation actions were finalized during the Local Planning Team meeting on January 20, 2016. At this time, the Local Planning Team evaluated and prioritized each of the actions. To complete this task, the Local Planning Team completed the STAPLE+E evaluation criteria using rankings of one for lowest and three for highest priority, acceptance, feasibility etc. The rankings for each action were totaled and used as a starting point by the committee. See **Table 8-3** for the evaluation criteria.

Table 8-3. STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider..."	Considerations
Social	The public Support for the overall mitigation strategy and specific mitigation actions	Community acceptance; adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution	Technical feasibility; Long-term solutions; Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing; Funding allocation; Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support; Local champion; Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations	Local, State, and Federal authority; Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit Cost Analysis	Benefit/cost of action; Contributes to other economic goals; Outside funding required; FEMA Benefit Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community	Effect on local flora and fauna; Consistent with community environmental goals; Consistent with local, State and Federal laws

Upon review by the Local Planning Team, mitigation actions were selected for Alpine County that best fulfill the goals of the MJHMP and were appropriate and feasible to implement during the 5-year lifespan of this version of the MJHMP. In reviewing the actions, the Local Planning Team considered the following:

- Actions that strengthen, elevate, relocate, or otherwise improve buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters
- Actions in which the benefits (which are the reduction in expected future damages and losses) are greater than the costs considered as necessary to implement the specific action
- Actions that either address multi-hazard scenarios or address a hazard that present the greatest risk to the jurisdiction

The lead committee used the STAPLE+E results (see **Appendix E**) as a starting point and then through discussion and consensus made adjustments to include actions that were considered a high, moderate and low priority to the County. These are shown in **Table 8-4**.

8.5 IMPLEMENTING A MITIGATION ACTION PLAN

The Mitigation Action Plan Matrix which was prepared detailing how the overall benefit-cost were taken into consideration and how each mitigation action will be implemented and administered. This matrix is **Table 8-4**.

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
1.A	Enhance/Develop the Seasonal Multi-Hazard Public Awareness Program.	Alpine County Planning	Local General Fund	2 Years	Protection of lives due to better infrastructure and building codes.	High
1.B	Review/update the General Plan to integrate components of the MJHMP.	Alpine County Local Planning Team/Emergency Mgmt.	Local General Fund	18 months	Provide information for planning & Public Works project to protect lives and property.	High
1.C	Adopt CBC 2016 code and local facts and findings.	Alpine County Public Works, Building	Local General Fund	Ongoing	Provide information to agencies in their efforts to protect lives and property.	Medium
2.A.	Develop, enhance, and implement education programs aimed at mitigating natural hazard, and reducing the risk to citizens, public agencies, private property owners, business, and schools.	Alpine County Community Development, Public Works	EMPG, SERC, USEPA	18-24 months	Protection of lives due to pre-planning.	Medium
2.B	Increase interagency coordination and cooperation.	All Entities	HMGP, PDM, SERC, EMPG, Local General Fund	Ongoing	Protection of lives and property due to pre-planning.	High
2.C	Obtain additional data needed for GIS mapping to understand and improve knowledge about Alpine County's vulnerabilities.	Alpine County Community Development	EMPG, SERC, PDM, HMGP, Local General Fund	Ongoing	Protection of lives and property due to pre-planning.	Medium
2.D	Utilize the county website and social media as a communication tool, as well as an education tool for hazard loss prevention.	Alpine County Community Development	Local General Fund	18-24 Months	Protection of lives and property due to awareness.	Medium
2.E	Conduct a minimum of one disaster exercise each year.	All Entities	EMPG, HMGP, CDC, USFS	18-24 Months	Protection of lives and property due to awareness.	Medium
3.A	Initiate or tie into existing Sierra Avalanche Center avalanche warning information system to	Alpine County Sheriff's Office	Local General Fund,	12 months	Protection of lives.	High

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	inform and warn backcountry users of the current level of avalanche danger.					
3.B	Work with the ski resorts of the County on educating skiers on avalanche hazards.	Alpine County Community Development, Ski Resort Personnel	Local General Fund	Ongoing	Protection of lives and property.	High
3.C	Maintain a backcountry patrol to enforce and fine snowmobile out-of-bounds violations to reduce backcountry avalanche potential.	USFS	USFS	Ongoing	Protection of lives.	Medium
4.A	Improve communication with the California Department of Water Resources to ensure that the larger dams in the County have been and continue to be inspected per law.	Alpine County Community Development, Public Works	Local General Plan	Ongoing	Protection of lives, property, critical facilities and critical infrastructure.	Medium
4.B	Develop education and outreach to inform potentially affected citizens about dam safety and being prepared in the event of a dam emergency.	Alpine County Community Development, Public Works	Local General Plan	12 months	Protection of lives, property, critical facilities and critical infrastructure.	Medium
5.A	Develop education and outreach for water conservation techniques.	Alpine County Health and Human Services	Local General Fund	12 months	Protection of natural resources.	Medium
5.B	Review and update County ordinance concerning septic system installation and maintenance to protect County groundwater reserves from potential septic system contamination.	Alpine County Health and Human Services	Local General Fund	12 months	Protection of natural resources.	Medium
6.A	Review and update the County Building Code to ensure the	Alpine County Building	Local General Fund	Ongoing	Protection of lives, homes, businesses, infrastructure, and critical facilities.	Medium

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	construction of seismically safe buildings in Alpine County.	Department				
6.B	Develop a homeowner's guide to earthquake preparedness techniques to educate homeowners on earthquake preparedness.	Alpine County Health and Human Services	Local General Fund	12-16 months	Protection of lives and homes.	Medium
6.C	Retrofit all County buildings to withstand earthquake events.	Alpine County Building Department	PDM, HMGP, HUD	60 months	Protection of lives, homes, businesses, and critical facilities.	Low
6.D	Have all school buildings in the district surveyed by a structural engineer to make certain that all structures meet state earthquake standards.	ACUSD	Local General Funds	12 months	Protection of lives and critical facilities.	Low
6.E	Strengthen the earthen walls of the evaporation ponds to make them more earthquake resistant.	Markleeville Public Utility District Staff	PDM, HMGP, HUD	24-36 months	Protection of critical infrastructure.	Medium
6.F	Replace old World War II surplus pipeline with new piping designed to withstand earthquake stresses.	Markleeville Water Company Staff	PDM, HMGP, HUD	60 months	Protection of critical infrastructure.	Medium
6.G	Install flexible connectors between water tanks and water lines to provide a measure of elasticity between infrastructural elements in the water delivery system.	Markleeville Water Company Staff	PDM, HMGP, HUD	12 months	Protection of critical infrastructure.	Medium
7.A	Review and update County ordinance to ensure no construction takes place in recognized flood-prone areas in the future.	Alpine County Planning, Building Dept.	Local General Fund	12 months	Protection of lives, homes, businesses, and critical facilities.	Medium
7.B	Ensure that all bridges within Alpine County are structurally safe from failure during peak flow scenarios by inspecting the bridges in the County.	Alpine County Public Works Department and California	Local and State General Fund	12 months	Protection of lives and critical facilities.	High

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
		Department of Transportation				
7.C	Stockpile sandbags in order to ensure an adequate supply to combat erosion during flood events.	Alpine County Public Works	EMPG, Local Gen Fund	Ongoing	Protection of homes, businesses, and critical facilities.	High
7.D	Increase the capacity of the drainage systems servicing district campuses.	Alpine County Unified School District Buildings and Grounds Staff	District General Funds	Ongoing	Protection of critical facilities.	Medium
7.E	Retrofit district manholes to be water-tight.	Bear Valley Water Company Staff	Bear Valley Water Company Funds	Ongoing	Protection or critical facilities.	High
7.F	Replace old manholes with water-tight products.	KMPUD Staff	KMPUD Funds	Ongoing	Protection of critical facilities.	Medium
7.G	Remove 1300 feet of existing sewer main lying along Markleeville Creek and connect customers to an existing main located outside of the stream channel.	MPUD Staff	PDM, HMGP, HUD, USDA, California State Grant Funds	2 years	Protection of critical facilities.	Medium
7.H	Protect the collection gallery and the supply line from the gallery to the water treatment facility from potential flood damages by reinforcing the collection gallery and relocating the supply line out of the stream channel.	Markleeville Water Company Staff	Water Company Funds	36-48 months	Protection of critical facilities.	Medium
7.I	Drill one or more back-up wells to ensure a reliable source of water during severe storm and flood events.	Markleeville Water Company Staff	Water Company Funds	24-36 months	Protection of critical facilities.	Medium
7.J	Construct a facility to provide emergency effluent storage.	STPUD Engineering	PDM, HMGP, HUD, USDA, California State Grant Funds	24-36 months	Protection of critical facilities.	Medium
7.K	Convert/replace network of ditches with pipeline.	STPUD Engineering	PDM, HMGP, HUD, USDA, California	48-60 months	Protection of critical facilities.	Medium

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
			State Grant Funds			
8.A	As part of road maintenance, inspect road cuts and fills for signs of slope failure. Stabilize slopes as necessary.	Alpine County Public Works, California Department of Transportation	Local and State General Fund	Ongoing	Protection of lives, homes, businesses, and critical facilities.	Medium
8.B	Draft and adopt a County grading ordinance.	Alpine County Public Works	Local General Fund	1 year	Protection of lives, homes, businesses, and critical facilities.	Medium
8.C	Within a County grading ordinance, ensure cut and fill techniques provide for finished slopes at the angle of repose.	Alpine County Public Works	Local General Fund	1 year	Protection of lives, homes, businesses, and critical facilities.	Medium
8.D	Within a County grading ordinance, ensure that all disturbed slopes are revegetated after grading to reduce erosion potential while promoting slope stabilization.	Alpine County Public Works	Local General Fund	1 year	Protection of lives, homes, businesses, and critical facilities.	Medium
8.E	Within County zoning ordinance, draft and adopt measures that limit construction on steep slopes where extensive cut and fill would be necessary.	Alpine County Public Works	Local General Fund	1 year	Protection of lives, homes, businesses, and critical facilities.	Medium
9.A	Review County ordinance to facilitate adequate snow storage and drainage easements.	Alpine County Public Works and Planning Department	Local General Fund	12 months	Protection of property and critical facilities.	Medium
9.B	Dedicate snow storage and drainage easements within all new development.	Alpine County Public Works, Building, and Planning Department	Local General Fund	12 months	Protection of property and critical facilities.	Medium
9.C	Design and install new roof on the Hung-A-Lel-Ti Wellness Center	Washoe Tribe Staff	PDM, HMGP, USDA	12-24 months	Protection of lives and property.	Medium

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	which is used for a shelter for evacuations and mass casualty.					
10.A	Review and update County ordinance to ensure the construction of fire-resistant homes in the future.	Alpine County Public Works, Building and Planning	Local General Fund	12 Months	Protection of lives and property.	Medium
10.B	Enforce County ordinance relating to road construction to facilitate emergency vehicle ingress and egress.	Alpine County Public Works, Building and Planning	Local General Fund	Ongoing	Protection of lives and property.	Medium
10.C	Identify wildland interface buffer areas surrounding established communities in the county.	Alpine Fire Safe Council	Local General Fund	Ongoing	Protection of lives and property.	Medium
10.D	Reduce fuel loading within identified wildland interface buffer areas.	Alpine Fire Safe Council, individual property owners, California Conservation Corp, & affected government agencies	USEPA, USFS, PDM, HMGP, USDA NRCS, CAL FIRE	Ongoing	Protection of lives and property.	Medium
10.E	Promote improved forest health within the National Forests of the County to reduce fuel loading in the forests of the County.	USFS	USFS	Ongoing	Protection of lives and property.	High
10.F	Endorse "firewood sales" by the Forest Service as a method of fuel load reduction in the National Forests of the County.	USFS	USFS	Ongoing	Protection of lives and property.	Medium
10.G	Sponsor a community "burn pile" to promote the removal of refuse from private parcels.	Alpine County Public Works Department	Local General Fund	Ongoing	Protection of lives and property.	Medium
10.H	Continue a homeowner guide for	Alpine Fire Safe	Local General Fund	Ongoing	Protection of lives and property.	Medium

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	reducing the threat of wildland fire to private homes.	Council				
10.I	Develop partnerships with concerned citizen groups to identify and implement neighborhood-specific fire safety programs.	Citizens and Alpine County Planning Department	Local General Fund	Ongoing	Protection of lives and property.	Medium
10.J	Develop a fuels reduction program around school campuses to include removal of dead and dying trees and vegetation.	Alpine County Unified School District Building and Grounds Staff Alpine Fire Safe Council	USEPA, USFS, PDM, HMGP, USDA NRCS, CAL FIRE	12-24 months	Protection of lives and property.	Medium
10.K	Construct a water line and hydrants to provide fire protection to the Kirkwood Inn area of the Kirkwood valley.	KMPUD District Staff	USEPA, USDA, HUD	12-24 months	Protection of lives and property.	Medium
10.L	Replace old fire hydrants and associated pipe within the Kirkwood valley to assure reliable and adequate firefighting water supply to the Kirkwood service area.	KMPUD District Staff	USEPA, USDA, HUD	24-36 months	Protection of lives and property.	Medium
10.M	Upgrade the fire resistance of the equipment building.	MPUD District Staff	USDA, HUD	12-24 months	Protection of lives, property, and critical infrastructure.	Medium
10.N	Relocate the lift station controls to the equipment building.	MPUD District Staff	USDA, HUD	12-24 months	Protection of lives, property, and critical infrastructure.	Medium
10.O	Install a sprinkler system on the water company treatment plant roof to protect it from fire.	MWC Staff	USDA, HUD	24-36 months	Protection of lives, property, and critical infrastructure.	Medium
10.P	Retrofit water treatment plant house and pump houses with fire-resistant exterior siding.	MWC Staff	USDA, HUD	24-36 months	Protection of lives, property, and critical infrastructure.	Medium
10.Q	Procure a generator to allow for service during power-outage	MWC Staff	PDM, HMGP, USDA,	12-24 months	Protection of lives, property, and	Medium

Table 8-4. Action Plan Matrix

Action Number	Action Item	Department / Division	Potential Funding Source	Implementation Timeline	Economic Justification	Priority Level
	conditions.		HUD		critical infrastructure.	
10.R	Drill one or more back-up wells to provide alternative water sources if the current surface water collection system is rendered unusable due to fire.	MWC Staff	USDA, HUD	24-36 months	Protection of lives, property, and critical infrastructure.	Low
10.S	Control vegetation growth within and around STPUD facilities.	STPUD Maintenance Staff	Land Application Operations and Maintenance Budget	Ongoing	Protection of lives, property, and critical infrastructure.	Medium
10.T	Provide reclaimed water for use in firefighting.	STPUD Engineering	USDA, HUD	Ongoing	Protection of lives, property, and critical infrastructure.	Medium
10.U	Implement a fuels reduction program to provide for defensible space against any potential wildland fire.	Washoe Tribe Staff	USEPA, USFS, PDM, HMGP, USDA	12-24 months	Protection of lives and property.	Medium
10.V	Explore feasibility of second ingress/egress at Marklee Village for evacuation and emergency services.	Alpine Fire Safe Council	PDM, HMGP, USDA	24-48 months	Protection of lives, property, and critical infrastructure.	Medium
10.W	Prepare feasibility study to determine whether a biomass-to-bioenergy facility is viable for fuels reduction and forest thinning in Alpine County. The project may be infeasible due to any number of economic conditions.	Alpine Fire Safe Council	USEPA, USDA	24-48 months	Protection of lives, property, and critical infrastructure.	Medium

BLM= Bureau of Land Management
Alpine County PW = Alpine County Public Works
CAL FIRE = California Department of Forestry and Fire Protection
DHS= Dept. of Homeland Security
EMPG = Emergency Management Performance Grant

HMGP = Hazard Mitigation Grant Program
HUD- Department of Housing and Urban Development
NRCS – Natural Resources Conservation District
PDM = Pre-Disaster Mitigation

SERC = State Emergency Response Commission
USDA = U.S. Department of Agriculture
USEPA = U.S. Environmental Protection Agency
USFS = U.S. Forest Service
USGS = U.S. Geological Survey

This section describes a formal plan maintenance process to ensure that the MJHMP remains an active and applicable document. It includes an explanation of how Alpine County and local jurisdictions (annexed into this update) and the Local Planning Team intend to organize its efforts to ensure that improvements and revisions to the MJHMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail below:

- Monitoring, evaluating, and updating the MJHMP
- Implementation through existing planning mechanisms
- Continued public involvement

9.1 MONITORING, EVALUATING, AND UPDATING THE MJHMP

The requirements for monitoring, evaluating, and updating the MJHMP, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Monitoring, Evaluating, and Updating the Plan

Monitoring, Evaluating and Updating the Plan

Requirement §201.6(c)(4)(i): [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.

Element

- Does the new or updated plan describe the method and schedule for monitoring the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)
- Does the new or updated plan describe the method and schedule for evaluating the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)
- Does the new or updated plan describe the method and schedule for updating the plan within the five-year cycle?

Source: FEMA 2008.

During the review process of the previous plan dated 2010, previous mitigation actions were reviewed by the team. The team provided information on the actions, in terms of those that have been completed, removed, or are currently ongoing within the County and within the specific jurisdiction areas. The team also provided the status of the actions, and noted reasons for not being complete or provided other comments pertinent to this update. Please see TABLE 9.1.

Table 9.1 Previous Plan Action Review and Evaluation

Action Item	Action Description	Status	Comments/Link
WILDLAND FIRE			
1.1	Review and update County ordinance to ensure the construction of fire-resistant homes in the future.	Complete	Adopted CA Building code 2016 requiring seismic structural protections. Staff: Public Works, Building, and Planning Department.
1.2	Enforce County ordinance relating to road construction to facilitate emergency vehicle ingress and egress.	Complete	Approved development according to 2014 Development Standards and California Fire Safe regulations for emergency access. Staff: Public Works, Building, and Planning Department. http://www.alpinecountycalifornia.gov/DocumentCenter/View/1457
1.3	Identify wildland interface buffer areas surrounding established communities in the county.	In progress	CWPP is being update with this information Staff: Alpine Fire Safe Council.
1.4	Reduce fuel loading within identified wildland interface buffer areas.	Complete	Roadside fuels reduction grant for County road ROW, chipping program, biomass\fuels collection. Staff: Individual property owners, Alpine Fire Safe Council, the California Conservation Corp, and affected government agencies. http://www.sierranevada.ca.gov/other-assistance/docs/798.pdf
1.5	Promote improved forest health within the National Forest of the County to reduce fuel loading in the forest of the County.	Complete	Marklee village fuels reduction project adjacent to Markleeville neighborhood on forest lands. Staff: United States Forest Service. http://snc.ca.gov/other-assistance/board/829.pdf
1.6	Endorse "Firewood sales" by the Forest Service as a method of fuel load reduction in the National Forest of the County.	Complete	Firewood collection is ongoing per historic activity; no expansion of firewood permitting has occurred in the National Forests. Staff: Forest Service personnel.
1.7	Sponsor a community "burn pile" to promote the removal of reuse form private parcels.	Complete	Biomass collection pile is on-going with bi-annual events at Turtle Rock Park. Staff: Public Works department. http://www.alpinecountycalifornia.gov/index.aspx?NID=171
1.8	Develop a homeowner guide for reducing the threat of wildland fire to private homes.	Complete	County provides resources from multiples sources regarding defensible space and fire safe best practices. Staff: Alpine Fire Safe Council.
1.9	Develop partnerships with concerned citizen groups to identify and implement neighborhood-specific fire safety programs.	Complete	Alpine Fire Safe Council (Eastern Alpine), Calaveras Fire Safe Council (Bear Valley), Kirkwood Volunteer VFD (Kirkwood), and Woodfords Community Council (Washoe Tribe) all work on projects in their own areas. Alpine Biomass Committee (ABC) is a new stakeholder group with mission regarding forest health and fuels reduction. Staff: Citizens and the Planning Department. https://alpinebiomasscommittee.wordpress.com/

EARTHQUAKE			
2.1	Review and update the County Building Code to ensure the construction of seismically safe buildings in alpine county.	On going	Adopted CA building code 2015 requiring class A fire resistant roofing and siding. Staff: Building Department http://www.bsc.ca.gov/Home.aspx http://www.alpinecountyca.gov/DocumentCenter/View/32
2.2	Develop a homeowner's guide to earthquake preparedness techniques to educate homeowners on earthquake preparedness.	Complete	Building department provides materials at the office (brochures, handouts) Staff: Health and Human Services.
2.3	Retrofit all county buildings to withstand earthquake events.	In process: Funding to retrofit buildings is a low priority for capital expenditures on building maintenance	County offices have been remodeled including Gov't Center and Community Development to 2013 Building Code standards. Retrofitting for earthquake has not occurred due to lack of funding. Staff: Building Department.
SEVERE STORM			
3.1	Review and update County ordinance to facilitate adequate snow storage and drainage easements.	Complete	Staff: Pubic Works, Building, and Planning Department. http://www.alpinecountyca.gov/DocumentCenter/View/1457
3.2	Dedicate snow storage and drainage easements within all new development.	Complete	Development standards adopted of 2014 require snow storage and drainage easements Staff: Pubic Works, Building, and Planning Department. http://www.alpinecountyca.gov/DocumentCenter/View/145 7
FLOOD			
4.1	Review and update County ordinance to ensure no construction takes place in recognized flood-prone areas in the future.	In process	No recent permits for floodplain development. Staff: Planning Department
4.2	Ensure that all bridges within Alpine County are structurally safe from failure during peak flow scenarios by inspecting the bridges in the County.	Not complete: No work has been done to update floodplain development ordinances; County has	Staff: Public Works, California Department of Transportation.

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		partnered with CWSD on Model Floodplain Standards	
4.3	Relocate the United States Forest Service Guard station to rehabilitate the section of constricted flow on Hot Springs/Markleeville creek.	In process: Grant funds have not been acquired to date to implement the project	USGS Guard station was relocated to Turtle Rock Park in 2010. County is working to restore the creek floodplain "Markleeville Creek Restoration Project" is shovel ready awaiting funding Staff: Public Works Department, United States Forest Service. http://www.alpinecountyca.gov/DocumentCenter/View/1610
4.4	Stockpile sandbags in order to ensure an adequate supply to combat erosion during flood events.	Complete	County orders sandbags as needed. Sandbags were available with adequate notice during the Declared flood disasters in California of January and February 2017. Staff: Public Works Department.
LANDSLIDE			
5.1	As part of road maintenance, inspect road cuts and fills for signs of slope failure. Stabilize slopes as necessary.	In process	This an on-going maintenance function. After flood disaster of 2017 County engineer evaluated slopes with significant erosion for treatment as disaster recovery. Staff: Public Works Department and the California Department of Transportation.
5.2	Draft and adopt a County grading ordinance.	In process	Community Development has prepared an administrative draft grading ordinance for consideration of the Board of Supervisors in winter 2017-18. Staff: Public Works Department
5.3	Within a County grading ordinance, ensure cut and fill techniques provide for finished slopes at the angle of repose.	In process	See grading ordinance draft Staff: Public Works Department
5.4	Within a County grading ordinance, ensure that all disturbed slopes are revegetated after grading to reduce erosion potential while promoting slope stabilization.	In process	See grading ordinance draft Staff: Public Works Department
5.5	Within County zoning ordinance, draft and adopt measures that limit construction on steep slopes where extensive cut and fill would be necessary.	In process	See grading ordinance draft Staff: Planning Department
DROUGHT			
6.1	Develop a homeowner's guide to water conservation techniques.	Not complete: Not really an HHS function, more related to community	Staff: Health and Human Services.

		development	
6.2	Review and update County ordinance concerning septic system installation and maintenance to protect County groundwater reserves from potential septic system contamination.	In process	Staff: Health and Human Services.
AVALANCHE			
7.1	Initiate an avalanche warning information system to inform and warn backcountry users of the current level of avalanche danger.	Not complete: Redundancy with existing SAC advisory	Sierra avalanche center warnings include Alpine County, no need to implement local warning system. Staff: Sheriff's Office. https://www.sierraavalanchecenter.org/
7.2	Work with the ski resorts of the County on educating skiers on avalanche hazards.	Complete	Ski areas provide backcountry access and provide information to skiing public related to avalanche conditions found within the ski area boundaries. Staff: Ski resort personnel.
7.3	Develop and expand a backcountry patrol to enforce and fine snowmobile out-of-bounds violators to reduce backcountry avalanche potential.	In process	Alpine County Sheriff's office is funded by California State Parks OHV "green sticker" grants to patrol for OHV and OSV registration and regulation compliance. This expands their ability to patrol backcountry recreation; providing outreach about avalanche safety. Staff: United States Forest Service.
DAM FAILURE			
8.1	Improve communication with the California Department of Water Resources to ensure that the larger dams in the County have been and continue to be inspected per law.	In process	No real existing communication exists with DWR re: dam safety Staff: County Staff.
8.2	Develop a "Living with Dams" pamphlet to inform potentially affected citizens about dam safety and being prepared in the event of a dam emergency.	In process:	low priority for Community Development No pamphlet has been created Staff: County Staff.
Jurisdiction Specific			
Alpine County Unified School District			
1.1	Develop a fuels reduction program around school campuses to include removal of dead and dying trees and vegetation.	In process:	Not determined if there is a formal fuels reduction plan. Staff: School District Buildings and Ground staff.
2.1	Have all school buildings in the district surveyed by a structural engineer to make certain that all structures meet state earthquake	In process:	ACUSD has hired an architect to review structures for compliance Staff: Structural Engineer

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	standards.		
3.1	Increase the capacity of the drainage system servicing district campuses.	In process:	Some drainage upgrades have been completed but no formal plan exists. Staff: School District Buildings and Grounds staff.
Bear Valley Water District			
1.1	Protect main pump station equipment from flood damage by elevating the equipment and/or providing a perimeter barrier to hold back flood water from intruding into the pump station building.	Complete	Staff: Bear Valley Water Company staff.
1.2	Retrofit district manholes to be water-tight.	In process	Staff: Bear Valley Water Company staff.
Kirkwood Meadows Public Utility District			
1.1	Construct a waterline and hydrants to provide for protection to the Kirkwood Inn area of the Kirkwood valley.	Not complete	Staff: Kirkwood Meadows Public Utility District staff.
1.2	Replace old fire hydrants and associated pipe within the Kirkwood valley to assure reliable and adequate firefighting water supply to the Kirkwood service area.	In process	Staff: Kirkwood Meadows Public Utility District staff.
2.1	Replace old manholes with water-tight products.	In process	Staff: Kirkwood Meadows Public Utility District staff
Markleeville Public Utility District			
1.1	Upgrade the fire resistance of the equipment building.	Not complete	No grant monies were secured. Staff: Public Utility District
1.2	Relocate the lift station controls to the equipment building.	Not complete	No grant monies were secured. Staff: Public Utility District
2.1	Strengthen the earthen walls of the evaporation ponds to make them more earthquake resistant.	Not complete	No grant monies were secured. Staff: Public Utility District
3.1	Remove 1300 feet of existing sewer main lying along Markleeville Creek and Connect customers to an existing main located outside of the stream channel.	In progress	CEQA complete as part of restoration project. Pursuing grant funding through the Prop 1 Technical Assistance Program, independently from the restoration project. Staff: Public Utility District
Markleeville Water Company			
1.1	Install a sprinkler system on the water company treatment plant rood to protect it from fire.	Not complete	Low priority Staff: Water Company staff.
1.2	Retrofit water treatment plant house and pump houses with fire-resistant exterior siding.	Not complete	Low priority Staff: Water Company staff.
1.3	Procure a generator to allow for	In process	

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	service during power-outage conditions.		MWC is currently in negotiation with Alpine County to acquire a Generator from the County. Staff: Water Company staff.
2.1	Drill one or more back-up wells to provide alternative water sources of the current surface water collection system is rendered unusable due to fire.	Complete	Operational 2012 Staff: Water Company staff.
3.1	Replace old World War II surplus pipeline with new piping designed to withstand earthquake stresses.	In process	Partially completed. The 2012 portion of our system was replaced in Markleeville, we are seeking a Grant to replace portions of the existing pipeline from our Plant to the intersection of Hot Springs Road. Waterlines upgraded in Markleeville 2011 Staff: Water Company staff.
3.2	Install flexible connectors between water tanks and water lines to provide a measure of elasticity between infrastructural elements in the water delivery system.	No complete	No funding Staff: Water Company staff.
4.1	Protect the collection gallery and the supply line from the gallery to the water treatment facility from potential flood damages by reinforcing the connection gallery and relocating the supply line out of the stream channel.	Not complete	No funding Staff: Water Company staff.
4.2	Drill one or more back-up wells to ensure a reliable source of water during sever storm and flood events.	Complete	Operational 2012 Staff: Water Company staff.
South Tahoe Public Utility District			
1.1	Control vegetation growth within and around STPUD facilities.	On-going	Staff: STPUD Maintenance staff.
1.2	Provide reclaimed water for use in firefighting.	Not complete	Staff: STPUD Engineering.
2.1	Construct a facility to provide emergency effluent storage.	Not complete	Staff: STPUD Engineering.
2.2	Convery/replace network of ditches with pipeline.	Not complete	Staff: STPUD Engineering.
Washoe Tribe			
1.1	Implement a fuels reduction program to provide for defensible space against any potential wildland fire.	Not complete	Staff: Washoe Tribe Staff.

The Local Planning Team recognizes the need for plan maintenance and wanted to include tools into the plan for improved maintenance. The MJHMP was prepared as a collaborative effort between Alpine County, the local jurisdictions and the Local Planning Team and California Office of Emergency Services. To maintain momentum and build upon this hazard mitigation planning effort and successes, the Local Planning Team will monitor, evaluate, and update the MJHMP. The Local Planning Team will be responsible for implementing the Mitigation Action

Plan. Brian Peters, the Local Planning Team leader, will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate, and revise the MJHMP.

The Local Planning Team will conduct an annual review of the progress in implementing the MJHMP, particularly the Mitigation Action Plan. As shown in **Appendix F**, the Annual Review Questionnaire and Mitigation Action Progress Report will provide the basis for possible changes in the overall Mitigation Action Plan by refocusing on new or more threatening hazards, adjusting to changes to or increases in resource allocations, and engaging additional support for the MJHMP implementation. The Local Planning Team leader will initiate the annual review one month prior to the date of adoption. The findings from this review will be presented annually to the County Administrative Officer. The review will include an evaluation of the following:

- Participation of Alpine County agencies and other participating jurisdictions in the MJHMP implementation process
- Notable changes in the County's and the local jurisdiction's risk of natural or human-caused hazards.
- Impacts of land development activities and related programs on hazard mitigation.
- Progress made implementing the Mitigation Action Plan (identify problems and suggest improvements as necessary).
- The adequacy of resources for implementation of the MJHMP.

The process of reviewing the progress on achieving the mitigation goals and implementing the Mitigation Action Plan activities and projects will also be accomplished during the annual review process. During each annual review, a Mitigation Action Progress Report will be submitted to the Local Planning Team and provide a brief overview of mitigation projects completed or in progress since the last review. As shown in **Appendix F**, the report will include the current status of the mitigation project, including any changes made to the project, the identification of implementation problems and appropriate strategies to overcome them, and whether or not the project has helped achieve the appropriate goals identified in the plan.

In addition to the annual review, the Local Planning Team will update the MJHMP every five years. To ensure that this occurs, in the third year following adoption of the MJHMP, the Local Planning Team will undertake the following activities:

- Thoroughly analyze and update the County's and local jurisdiction's risk of natural and man-made hazards.
- Provide a new annual review (as noted above), plus a review of the three previous annual reports.
- Provide a detailed review and revision of the mitigation strategy.
- Prepare a new action plan with prioritized actions, responsible parties, and resources.
- Prepare a new draft MJHMP and submit it to the Alpine County Board of Supervisors for adoption; and to the local jurisdiction's review boards for adoption.
- Submit an updated MJHMP to the California State Hazard Mitigation Officer and FEMA for approval.

9.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms

Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Element

- Does the new or updated plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?
- Does the new or updated plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?

Source: FEMA 2008.

The following plans, projects and maps were developed over the past ten years as planning mechanisms to incorporate the MJHMP. These were adopted and include hazard mitigation components. The information from these items for this plan update can be found in section 4.4 of this plan. A listing of the planning mechanisms are as follows:

- A new General Plan 2009 included a section on Safety Element and Land Use principles which address Hazard Mitigation. In the future the General Plan amendments or revisions to the Safety Element will require an analysis of Climate Change and adaption per SB 379. Climate Change impacts analysis is similar to the analysis of risk assessment in the ACMJHMP. Future General Plan amendments would integrate the ACMJHMP risk assessment and mitigation strategy policies.
- Markleeville Creek Floodplain Restoration Project – Alpine County in cooperation with the Alpine Watershed Group has been working on a project at the Markleeville Guard Station in order to reduce flood damages to downtown Markleeville.
- Risk Map Charter – Alpine County signed a Risk Map Charter as part of the Carson River Watershed in order to collaborate between the six counties located in the watershed as well as local, state, and federal entities, in order to identify, assess, communicate, and plan for flood risk within the watershed. Through the Risk Map Charter, a mapping and modeling project underway will revise the existing floodplain mapping of the entire Carson River, including Alpine County which is currently mapped by FEMA as a Zone D.
- Carson River Watershed Discovery Project – Alpine County participated in the Carson River Watershed Discovery Project as part of the ongoing Risk MAP Charter that is occurring in the Carson River Watershed. Through the Discover Project, they identified several other needed mitigation measures for flooding.
- Other mitigation projects such as routine culvert replacements and two stream bank reinforcement projects for eroding banks adjacent to County roads (completed in 2012).

- Alpine County Area Plan: The area plan contents are determined by law and the plan update process may include a review of the ACMJHMP to incorporate any new applicable information.
- Alpine County Building Code: Local building code technical amendments in the future may consider the information of the ACMJHMP for updates.
- Alpine County Fire Restrictions and Fuels Reduction Code: Local fire safety code amendments in the future may consider the information of the ACMJHMP for updates.
- Alpine County Floodplain Development Standards: The best available mapping used to for the ACMJHMP can be used in the future for floodplain development ordinance revision.
- Alpine County Wildland – Urban Interface Fire Regulations: Alpine County will adopt the most recent California Fire Codes which include urban interface provisions. Local Building Code technical amendments in the future may consider the information of the ACMJHP for updates.
- Alpine County Zoning Ordinance: Future Alpine County zoning ordinance revision may integrate the risk assessment and mitigation strategies of the ACMJHMP when considering amendments to zoning districts.
- California Multi-Hazard Mitigation Plan: This plan is a statewide plan which would not information specific actions form an individual County.
- Carson River Geographic Response Plan (2005): The physical conditions of the Carson River and risk of spills impacting the river have not changed significantly since the adoption of the CRGRP. Upon any future update to the CRGRP the ACMJHMP risk assessment and strategies may be integrated.
- Carson River Watershed Regional Floodplain Management Plan (2008 & 2013) Update: Upon future updates of the CRWRFMP the proposed flood management strategies and Carson River Watershed Discovery Report (2012): the Discovery Report is being revised (2017) and included the mitigation strategies of the ACMJHMP.
- Community Wildfire Protection Plan (2009): Updated to the CWPP (2017) and the ACMJHMP are occurring simultaneously and include similar mitigation strategies.
- Washoe Tribe of NV and CA Hazard Mitigation Plan 2005: The Washoe Tribe may consider the ACMJHMP risk assessment and mitigation strategies to inform future updates of the WTHMP.

This activity is considered successful due to the volume of plans which now include hazard mitigation activities. After the adoption of the MJHMP, the Committee will continue to ensure that the MJHMP, in particular the Mitigation Action Plan, is incorporated into existing planning mechanisms. Each member of the Local Planning Team will achieve this incorporation by undertaking the following activities.

- Conduct a review of the community-specific regulatory tools to assess the integration of the mitigation strategy. These regulatory tools are identified in **Table 7-1**.
- Work with pertinent divisions and departments to increase awareness of the MJHMP and provide assistance in integrating the mitigation strategy (including the action plan) into

relevant planning mechanisms. Implementation of these requirements may require updating or amending specific planning mechanisms.

9.3 CONTINUED PUBLIC INVOLVEMENT

The requirements for continued public involvement, as stipulated in the DMA 2000 and its implementing regulations, are described below.

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

Continued Public Involvement

Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

Element

- Does the new or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an ongoing mitigation plan committee, or annual review meetings with stakeholders?)

Source: FEMA 2008.

Public participation was not solicited between the previous plan's adoption until the current planning process due to the maintenance of the plan not being conducted or tracked. However, many of the actions and planning mechanism changes did occur and since these are public documents the public was included. Additionally, each time one of the planning mechanisms mentioned above was completed it was included on the County website.

However, the County is dedicated to involving the public directly in the continual reshaping and updating of the MJHMP. A downloadable copy of the plan and any proposed changes will be posted on the City's Web site. This site will also contain an e-mail address and phone number to which interested parties may direct their comments or concerns.

The Local Planning Team will also identify opportunities to raise community awareness about the MJLMHMP and the County's hazards. This could include attendance and provision of materials at Alpine County-sponsored events. Any public comments received regarding the MJHMP will be collected by the Local Planning Team leader, included in the annual report to the County Administrative Officer, and considered during future MJHMP updates. A press release and notice on the City's website will be issued each year before the annual maintenance meeting inviting the public to participate. A sample press release can be found in **Appendix F**.

During the initial kick-off meeting held in June 2015, the local planning team identified existing plans, studies and technical reports that should be reviewed, incorporated, and referenced in this update to the MJHMP. Throughout the planning update process, the local planning team members determined that the MJHMP should be referenced as a resource in the County's Master Plan and as part of the Safety Element of the Alpine County General Plan. A synopsis of the existing plans and other relevant information has been prepared as Section 4.4 of the Planning Process. In addition, the following websites and documents were accessed, discussed and presented to the team and invited public as excellent planning tools and references to utilize during this update process between June 2015 and July 2016. To be specific the CalOES website and FEMA bulletins were used and referenced to meet the CalOES and FEMA guidance for updating the Alpine County Multi-jurisdictional plan. Other resources were utilized and researched to provide historical and accurate data that has occurred since the last 2010 update to the MJHMP.

Resources and References:

Alpine County Building Department. 2015. *Alpine County Code Title 8, 15, 16, 18*.
<http://www.codepublishing.com/CA/alpinecounty/>.

Alpine County. 2009. *Alpine County General Plan*.
<http://www.alpinecountyca.gov/DocumentCenter/View/51>

Alpine County Health Department. 2007. *Alpine County Area Plan (Hazardous Materials Incidents)*.

California Governor's Office of Emergency Services. 2013. *California Multi-Hazard Mitigation Plan*. http://hazardmitigation.calema.ca.gov/docs/SHMP_Final_2013.pdf

California Natural Resources Agency. 2009. *California Climate Adaptation Strategy*.

Carson & Walker River Area Committee. 2005. *Carson River Geographic Response Plan*.

Carson Water Subconservancy District. 2008. *Carson River Watershed Regional Floodplain Management Plan*. <http://www.cwsd.org/library/Final%20floodplain%20plan%209-08.pdf>

Carson Water Subconservancy District. 2012. *Carson River Watershed Discovery Report*.
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FEMA. 2002a. 44 CFR Parts 201 and 206, RIN 3067-AD22, Hazard Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule. In *Federal Register* 67, No. 38. U.S. Department of Homeland Security, Federal Emergency Management Agency. <https://www.federalregister.gov/articles/2007/10/31/E7-21264/hazard-mitigationplanning-and-hazard-mitigation-grant-program>

FEMA. 2002b. *State and Local Plan Interim Criteria Under the Disaster Mitigation Act of 2000 – Final Draft*. U.S. Department of Homeland Security, Federal Emergency Management Agency. <https://www.fema.gov/pdf/help/fr02-4321.pdf>.

FEMA. 2002c. *How-To Guide #1: Getting Started: Building Support For Mitigation Planning*. U.S. Department of Homeland Security, Federal Emergency Management Agency.

- FEMA 386-1. <http://www.fema.gov/media-library-data/20130726-1521-20490-3966/howto1.pdf>
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- FEMA. 2002e. 44 CFR Parts 201 and 206, RIN 3067-AD22, Hazard Mitigation Planning and Hazard Mitigation Grant Program, Interim Final Rule. In *Federal Register* 67, no. 190. U.S. Department of Homeland Security, Federal Emergency Management Agency. <http://www.fema.gov/media-library-data/20130726-1524-20490-9388/67fr61512.txt>
- FEMA. 2003a. *How-To Guide #3: Developing The Mitigation Plan; Identifying Mitigation Actions and Implementing Strategies*. U.S. Department of Homeland Security, Federal Emergency Management Agency. FEMA 386-3. <http://www.fema.gov/media-library-data/20130726-1521-20490-5373/howto3.pdf>
- FEMA. 2003b. *How-To Guide #4: Bringing the Plan to Life: Implementing the Hazard Mitigation Plan*. U.S. Department of Homeland Security, Federal Emergency Management Agency. FEMA 386-4. http://www.fema.gov/media-library-data/20130726-1521-20490-9008/fema_386_4.pdf
- United States Census Bureau. 2000. American Fact Finder Fact Sheet. <http://factfinder.census.gov> .
- United States Drought Monitor. 2005. <http://www.drought.unl.edu/dm/monitor.html>
- Washoe Tribe of Nevada and California. 2005. *Washoe Tribe of NV & CA Hazard Mitigation Plan*.
- Western Regional Climate Center. 2005. Historical Climate Information. <http://www.wrcc.dri.edu/CLIMATEDATA.html> .

Appendix A
Adoption Resolution

RESOLUTION NO. _____

**RESOLUTION OF THE BOARD OF SUPERVISORS,
COUNTY OF ALPINE, STATE OF CALIFORNIA**

WHEREAS, *Alpine County* has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the *Alpine County* Multi-Jurisdictional Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the *Community Development Department* in association and cooperation with a multi-agency Local Planning Team for the reduction of hazard risk to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for *Alpine County*;

WHEREAS, the Plan recommends several hazard mitigation actions/ projects that will provide mitigation for specific natural and human caused hazards that impact *our community* with the effect of protecting people and property from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, the *Alpine County, Hazard Mitigation* website and media outlets to garner comments and collect input as required by law;

BE IT HEREBY RESOLVED by the Board of Supervisors, County of Alpine, State of California that this Board:

1. The Plan is hereby Adopted as an official plan of *Alpine County*; and
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions based upon availability of resources; and

3. Future revisions and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA, are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.; and
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the, *Board of Supervisors* by October 31st of each calendar year.

PASSED AND ADOPTED this _____ day of _____, 2017 by the following vote:

AYES:

NOES:

ABSENT:

Katherine Rakow, Chair, Board of
Supervisors,
County of Alpine, State of California

ATTEST:

APPROVED AS TO FORM:

Stephanie Fong, County Clerk and ex-officio
Clerk to the Board of Supervisors

David Prentice, County Counsel



Alpine County Office of Education
Alpine County Unified School District

Patrick Traynor, Ph.D., Superintendent
43 Hawside Drive, Markleeville, California 96120-9522
Superintendent (530)694-2230 • Fax (530) 694-2379 • Buisness Services (530) 694-2495
ptraynor@alpinecoe.k12.ca.us • Web Site: www.alpinecoe.k12.ca.us

RESOLUTION TO ADOPT)
THE UPDATE TO THE)
MULTI-JURISDICTIONAL) RESOLUTION NO: _____
HAZARD MITIGATION PLAN)

WHEREAS, *The board of supervisors* has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the *Alpine County* Multi-Jurisdictional Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the *county board of education* in association and cooperation with a multi-agency Local Planning Team for Alpine County, CA. for the reduction of hazard risk to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for *Alpine County Unified School District*;

WHEREAS, the Plan recommends several hazard mitigation actions/ projects that will provide mitigation for specific natural and human caused hazards that impact *our community and school district* with the effect of protecting people and property from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, the *Alpine County, Hazard Mitigation* website and media outlets to garner comments and collect input as required by law;

BE IT HEREBY RESOLVED by the Board of Education, County of Alpine, State of California that this Board:

1. The Plan is hereby Adopted as an official plan of *Alpine County Unified School District and Education Department*; and
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions based upon availability of resources; and
3. Future revisions and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA, are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.; and
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the, *Board of Education* by October 31st of each calendar year.

THEREFORE, This resolution was duly passed and adopted by the Alpine County Board of Education at a regular meeting held on _____ by the following polled vote:

AYES: _____

NOES: _____

ABSENT: _____

ABSTAIN:

Signed and approved: _____
President, Governing Board

Clerk of the Board

RESOLUTION NO. _____

A RESOLUTION APPROVING THE UPDATE THE ALPINE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, *The Board of Directors* has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the *Alpine County* Multi-Jurisdictional Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the *Bear Valley Water District* in association and cooperation with a multi-agency Local Planning Team for Alpine County, CA. for the reduction of hazard risk to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for *Bear Valley Water District*;

WHEREAS, the Plan recommends several hazard mitigation actions/ projects that will provide mitigation for specific natural and human caused hazards that impact *our community and water district* with the effect of protecting people and property from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, the *Alpine County, Hazard Mitigation* website and media outlets to garner comments and collect input as required by law;

BE IT HEREBY RESOLVED by the Board of Directors of the Bear Valley Water District, County of Alpine, State of California that this Board:

1. The Plan is hereby Adopted as an official plan of *Bear Valley Water District*; and
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions based upon availability of resources; and

3. Future revisions and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA, are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.; and
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the, *Board of Directors* by October 31st of each calendar year.

* * * * *

**I hereby certify that the foregoing Resolution was duly and
Regularly passed and adopted by the Board of Directors of the Bear
Valley Water District, Alpine County, California, at a meeting thereof
Held on the _____ day of _____ 2017, by the following vote:**

AYES, and in favor thereof, Directors:

NOES, Directors:

ABSENT, Directors:

**Secretary
Bear Valley Water District**

ORDINANCE NO. _____

**AN ORDINANCE OF THE BOARD OF DIRECTORS OF
THE KIRKWOOD MEADOW PUBLIC UTILITY DISTRICT
ON ADOPTING THE UPDATE TO THE
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN
FOR ALPINE COUNTY, CA**

BE IT ENACTED by the Board of Directors of the Kirkwood Meadows Public Utility District as follows:

WHEREAS, *The Board of Directors* has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the *Alpine County* Multi-Jurisdictional Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the *Kirkwood Meadows Public Utility District* in association and cooperation with a multi-agency Local Planning Team for Alpine County, CA. for the reduction of hazard risk to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for *Kirkwood Meadows Public Utility District*;

WHEREAS, the Plan recommends several hazard mitigation actions/ projects that will provide mitigation for specific natural and human caused hazards that impact *our community and water district* with the effect of protecting people and property from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, the *Alpine County, Hazard Mitigation* website and media outlets to garner comments and collect input as required by law;

BE IT HEREBY RESOLVED by the Board of Directors of the *Kirkwood Meadows Public Utility District*, County of Alpine, State of California that this Board:

1. The Plan is hereby Adopted as an official plan of *Kirkwood Meadows Public Utility District*; and
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions based upon availability of resources; and
3. Future revisions and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA, are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.; and
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the, *Board of Directors* by October 31st of each calendar year.

PASSED AND ADOPTED by the Board of Directors of the Kirkwood Meadows Public Utility District on the ____ day of _____ 2017, by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

President

Attest:

Secretary

ORDINANCE NO. _____

**AN ORDINANCE OF THE BOARD OF DIRECTORS OF
THE MARKLEEVILLE PUBLIC UTILITY DISTRICT
ON ADOPTING THE UPDATE TO THE
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN
FOR ALPINE COUNTY, CA**

BE IT ENACTED by the Board of Directors of the Markleeville Public Utility District as follows:

WHEREAS, *The Board of Directors* has historically experienced severe damage from natural and human-caused hazards such as flooding, wildfire, drought, thunderstorms/high winds, and hazardous materials incidents on many occasions in the past century, resulting in loss of property and life, economic hardship, and threats to public health and safety;

WHEREAS, the *Alpine County* Multi-Jurisdictional Hazard Mitigation Plan (the Plan) has been developed after more than one year of research and work by the *Markleeville Public Utility District* in association and cooperation with a multi-agency Local Planning Team for Alpine County, CA. for the reduction of hazard risk to the community;

WHEREAS, the Plan specifically addresses hazard mitigation strategies and plan maintenance procedures for *Markleeville Public Utility District*;

WHEREAS, the Plan recommends several hazard mitigation actions/ projects that will provide mitigation for specific natural and human caused hazards that impact *our community and water district* with the effect of protecting people and property from loss associated with those hazards;

WHEREAS, public input was gathered through meetings, the *Alpine County, Hazard Mitigation* website and media outlets to garner comments and collect input as required by law;

BE IT HEREBY RESOLVED by the Board of Directors of the *Markleeville Public Utility District*, County of Alpine, State of California that this Board:

1. The Plan is hereby Adopted as an official plan of *Markleeville Public Utility District*; and
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions based upon availability of resources; and
3. Future revisions and Plan maintenance required by the Disaster Mitigation Act of 2000 and FEMA, are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.; and
4. An annual report on the progress of the implementation elements of the Plan shall be presented to the, *Board of Directors* by October 31st of each calendar year.

PASSED AND ADOPTED by the Board of Directors of the Markleeville Public Utility District on the ____ day of _____ 2017, by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

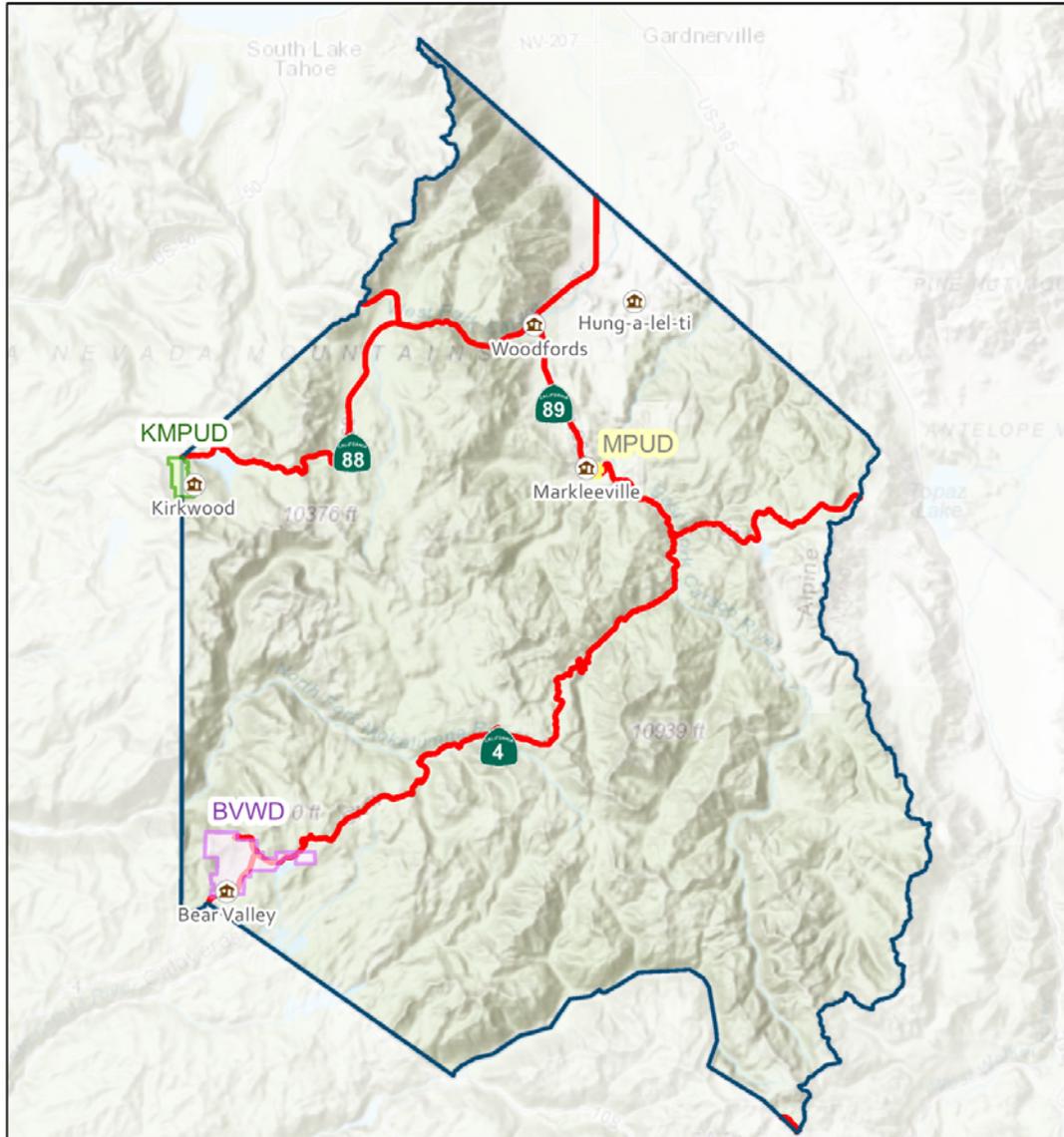
President

Attest:

Secretary

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Appendix B
Figures

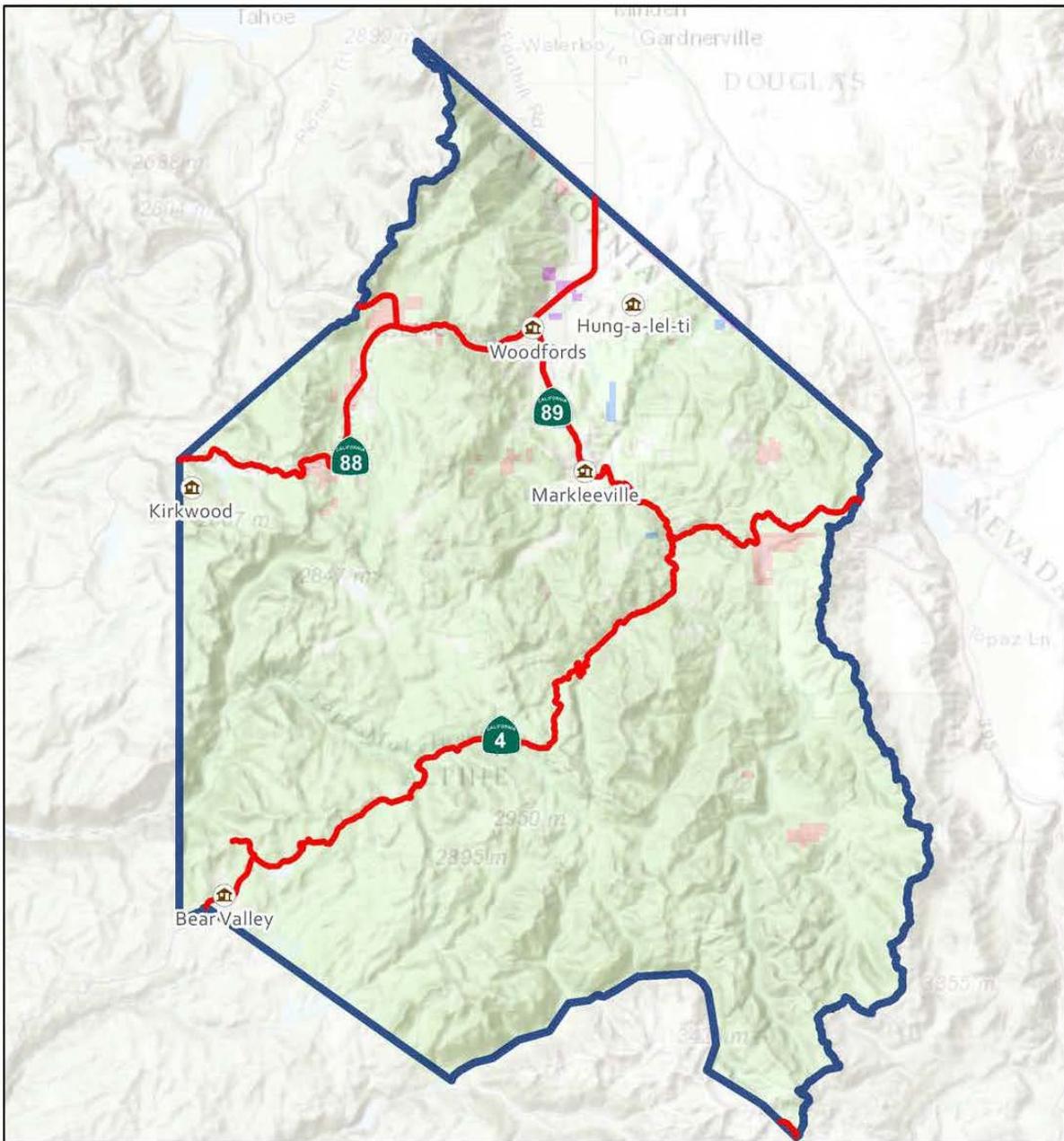


Project Location

N
Alpine County
Hazard Mitigation Plan



Source: Alpine County GIS
Date: December 11, 2017

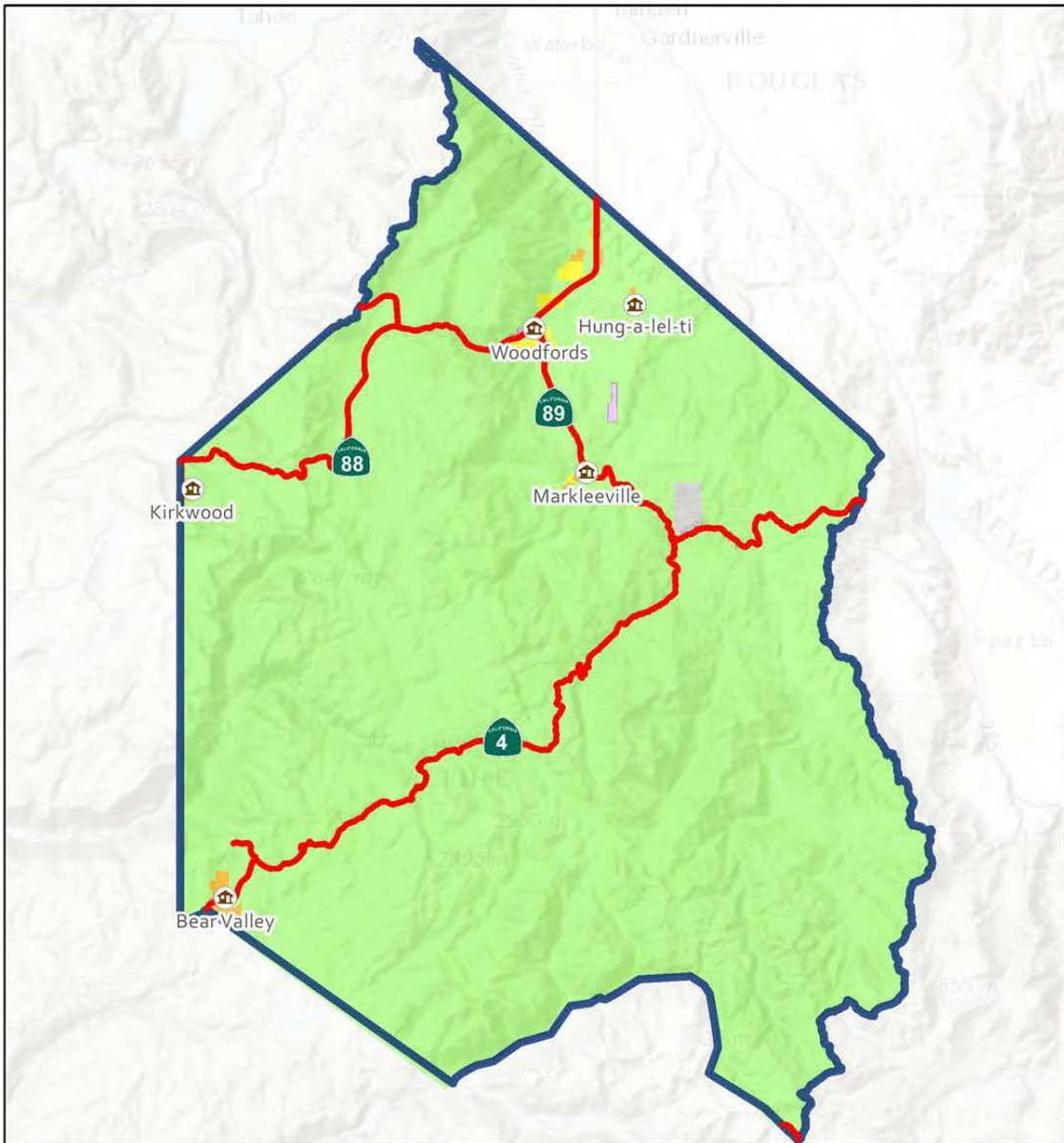


Surface Management Legend

Ownership	California
Owner	Federal
Alpine County	Private
BIA	



Source: Alpine County GIS
 Date: December 11, 2017



Alpine County Landuse

Legend

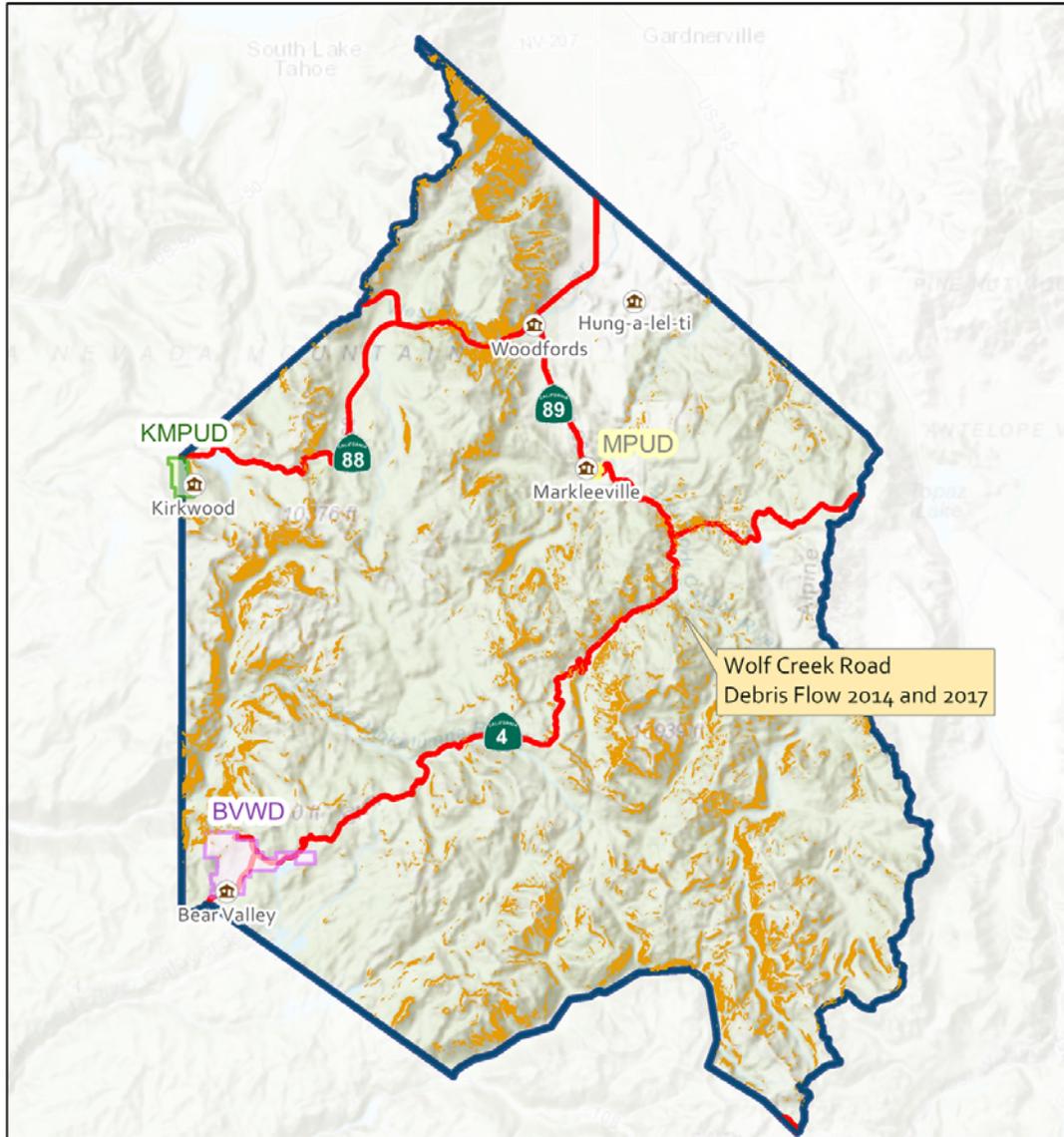
- Industrial
- Public
- Open Space/Agriculture
- Commercial
- Low Density Residential
- High/Medium Density Residential

N

 Alpine County
 Hazard Mitigation Plan



Source: Alpine County GIS
 Date: December 11, 2017

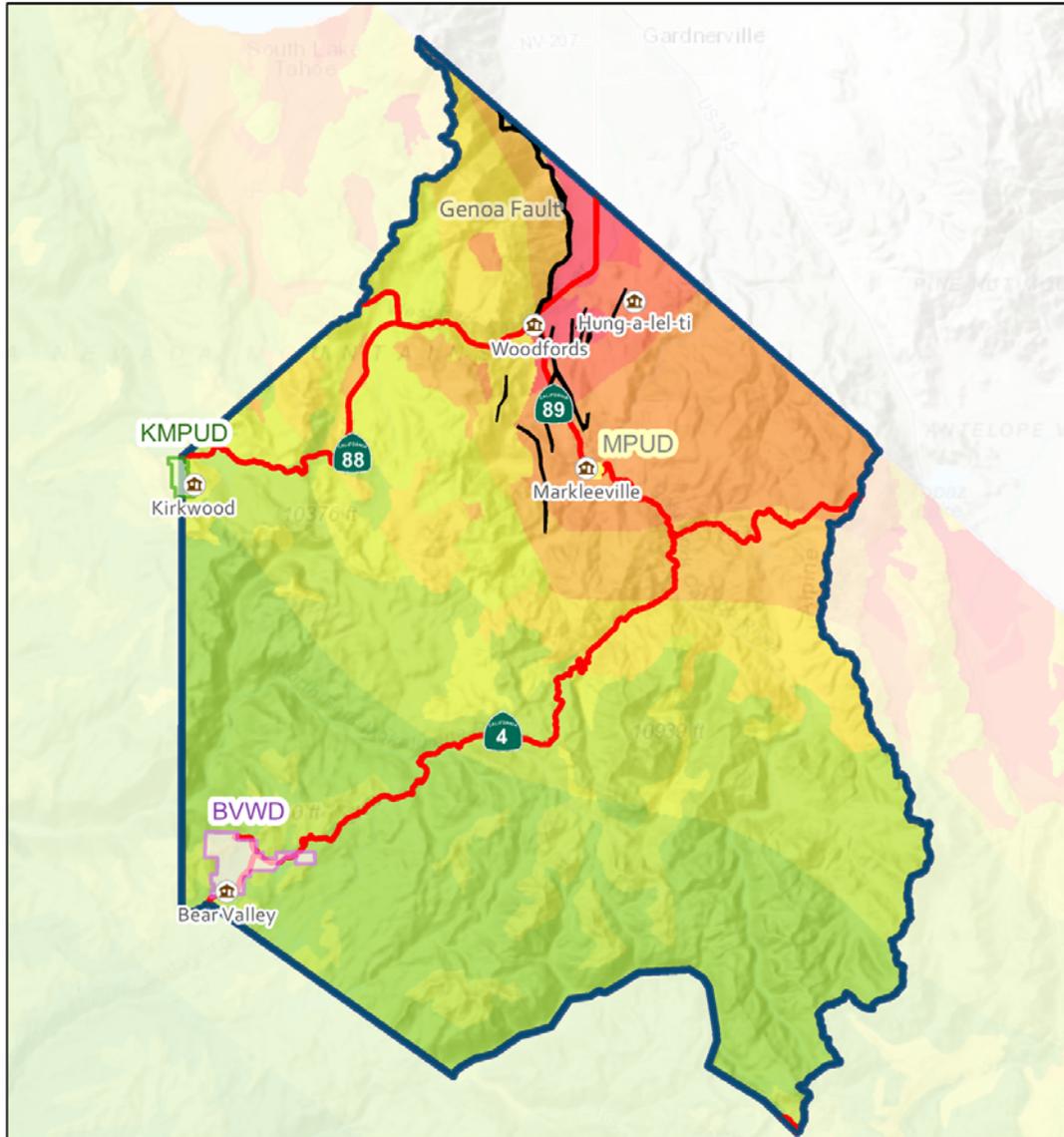


Landslide Hazards and Incidents

- Landslide Hazard Area
- Highways
- Kirkwood Meadows Public Utility District
- Bear Valley Water District
- Markleeville Public Utility District
- Alpine County Unified School District

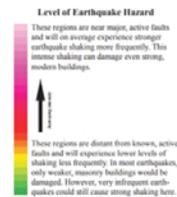


Source: Alpine County GIS
 Date: December 11, 2017



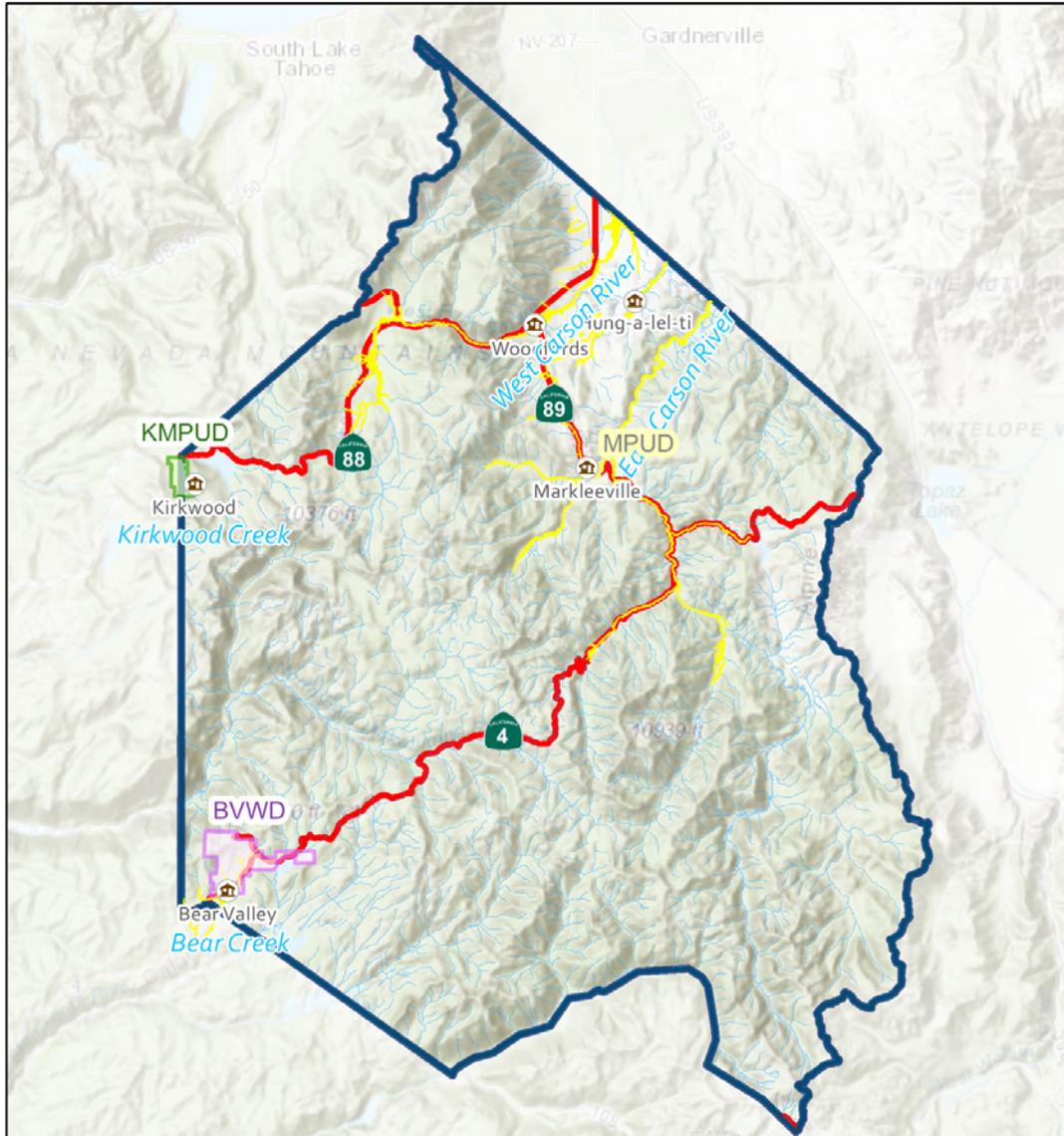
Earthquake Shaking and Faults

Legend
 ■ Alquist-Priolo Fault Zones



N
 Alpine County
 Hazard Mitigation Plan

Source: Alpine County GIS
 Date: December 11, 2017

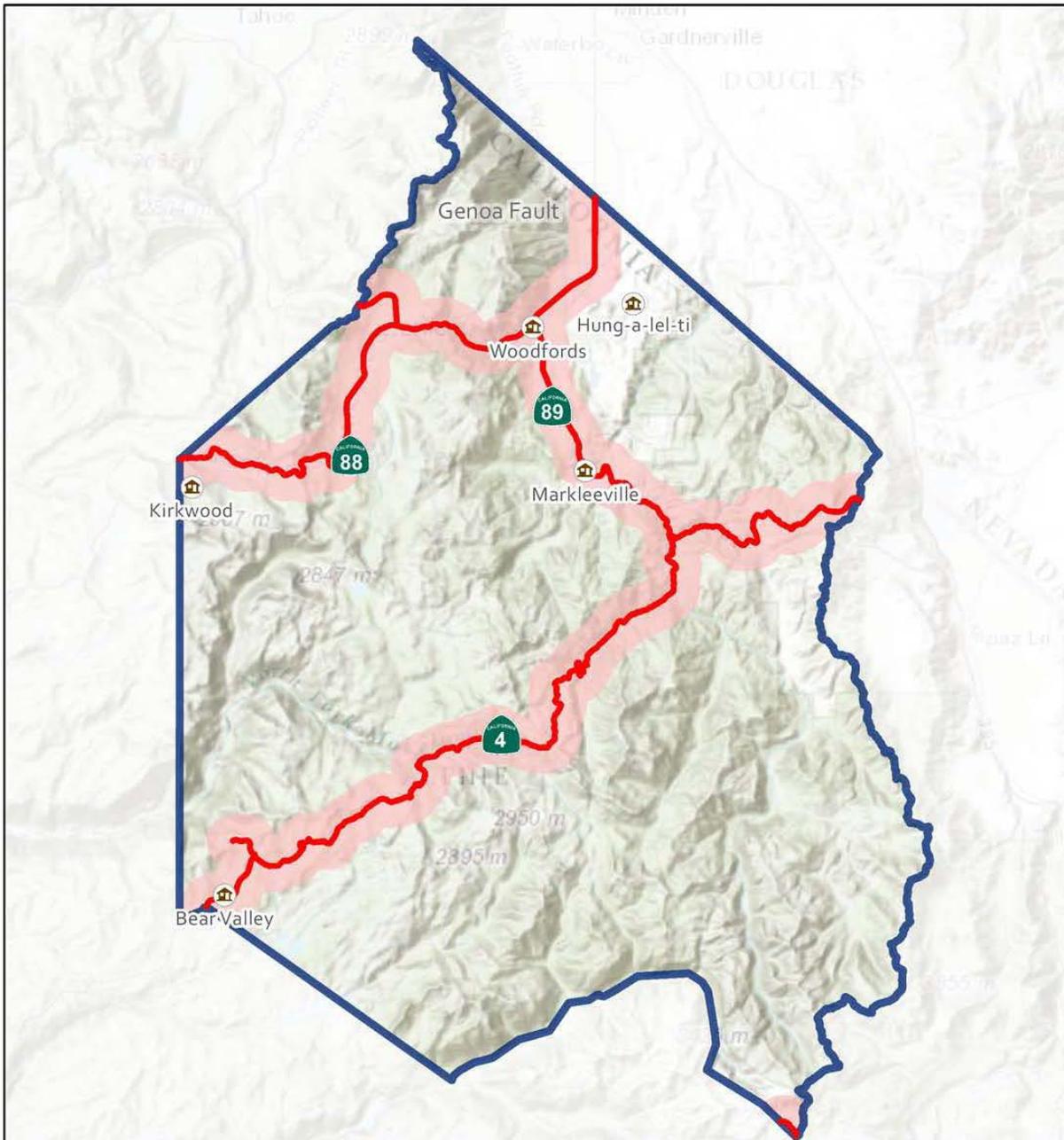


Flood Awareness
 Department of Water Resources
 Legend

- DWR Flood Awareness Area
- Streams



Source: Alpine County GIS
 Date: December 11, 2017



Hazardous Substances

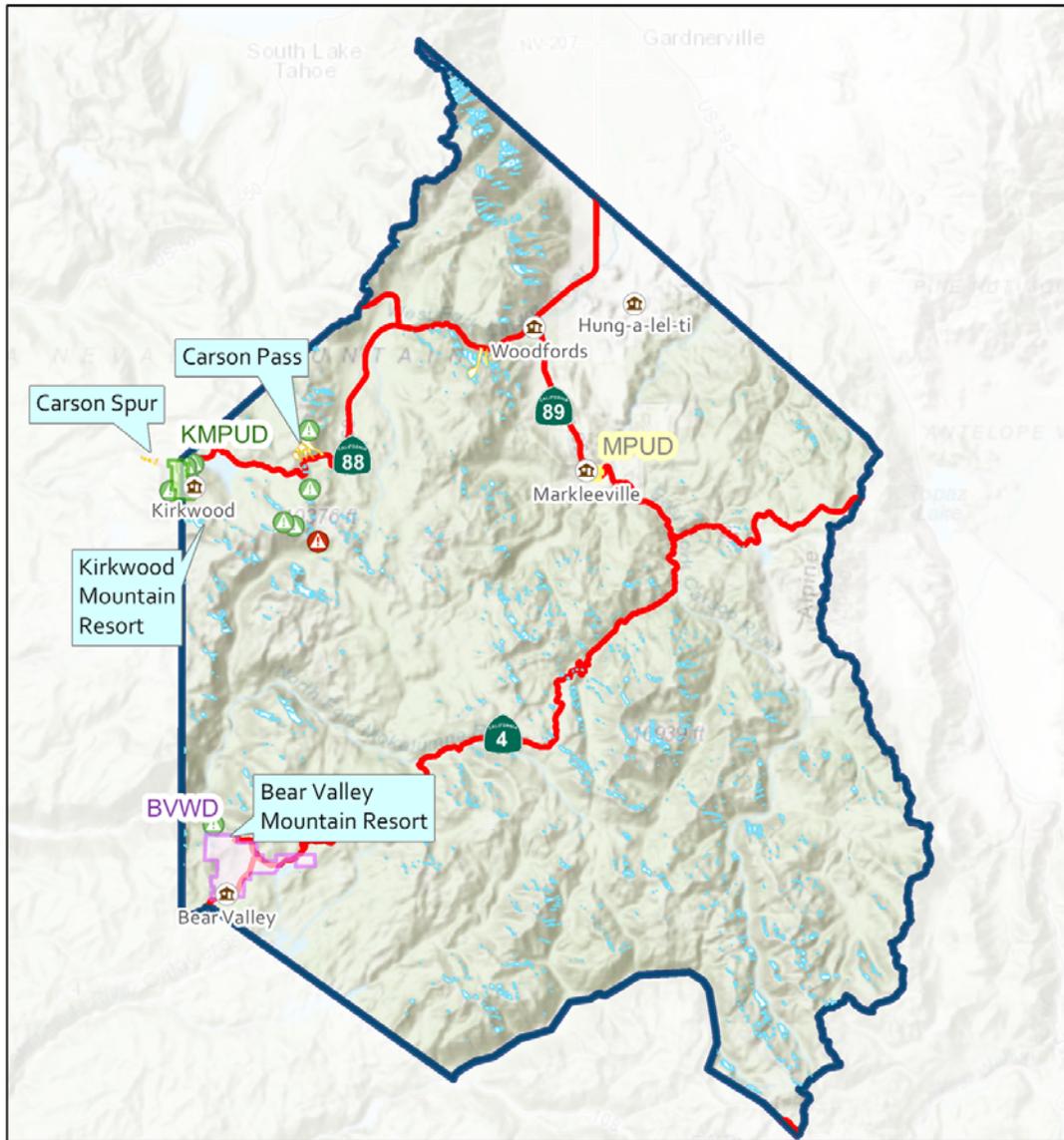
Legend

 Highways 1 Mile Buffer

N
Alpine County
Hazard Mitigation Plan



Source: Alpine County GIS
Date: December 11, 2017

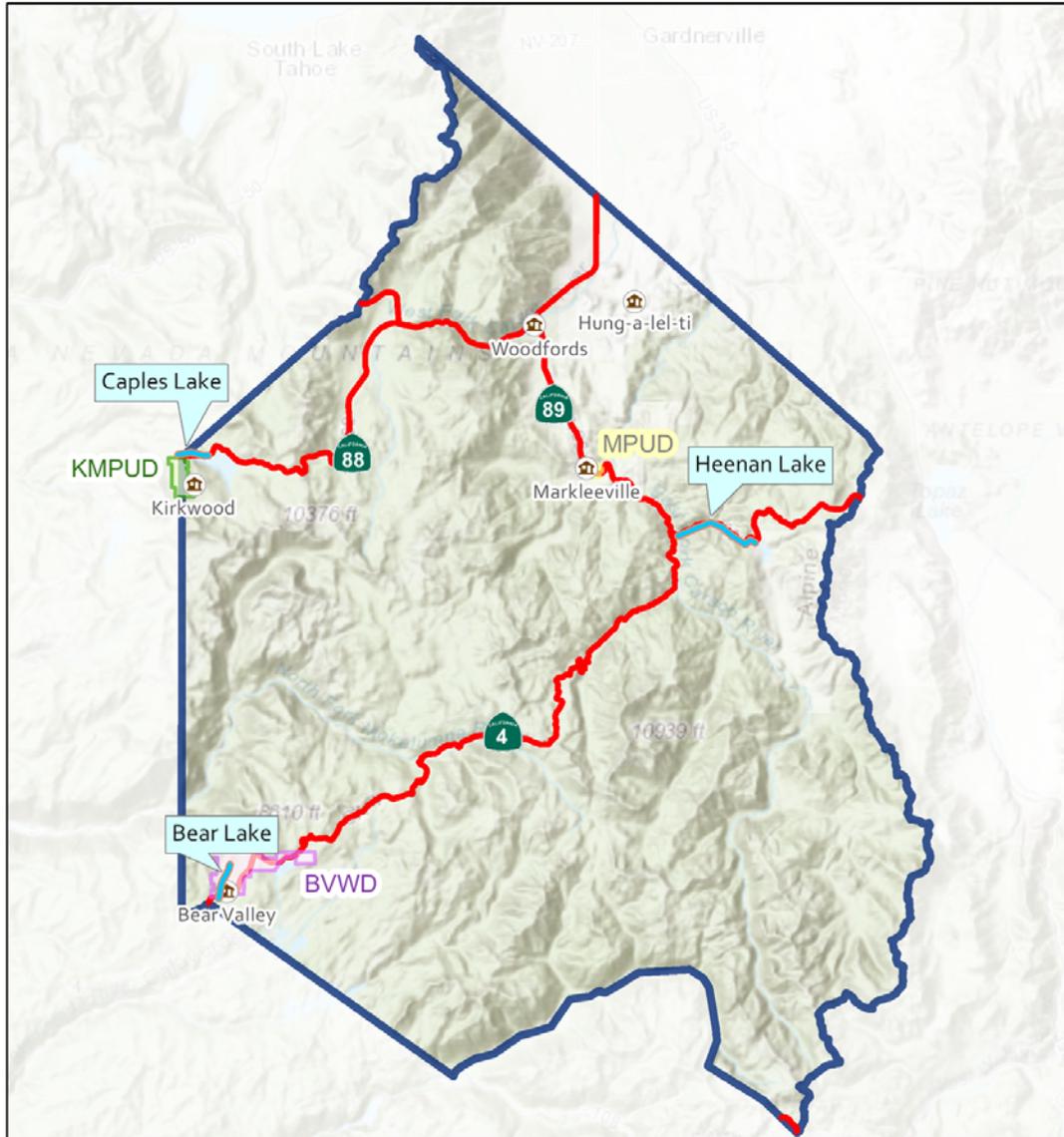


Avalanche Hazards and Incidents

- Avalanche Incidents 2009-2017
- FatalityNUM
 - 0
 - 1
- Highway Avalanche Path
- Avalanche Hazard Area
- Highways
- Annex Districts
 - Kirkwood Meadows Public Utility District
 - Bear Valley Water District
 - Markleeville Public Utility District
 - Alpine County Unified School District



Source: Alpine County GIS
 Date: December 11, 2017

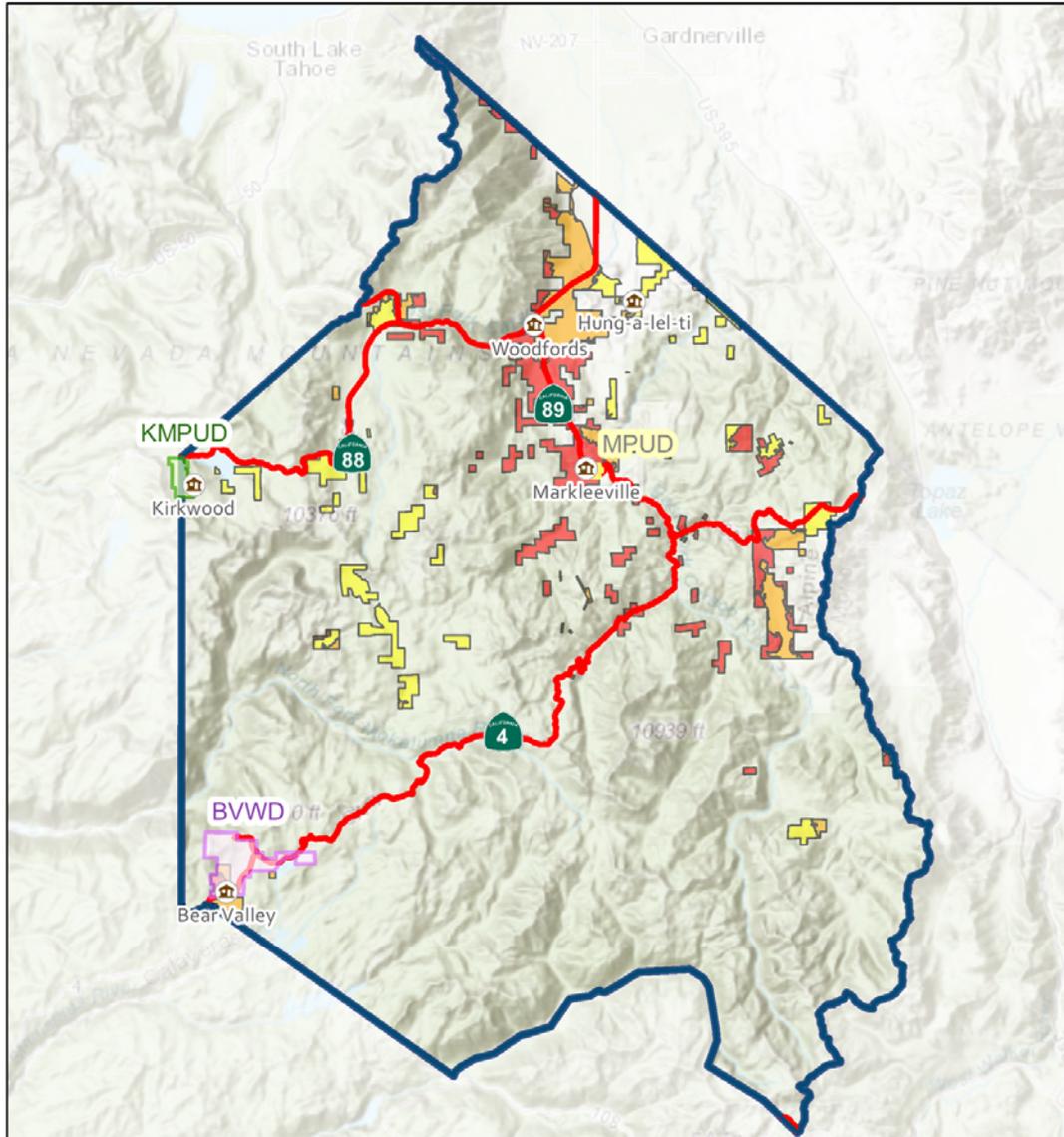


Dam Failure and Inundation Areas

N
Alpine County
Hazard Mitigation Plan

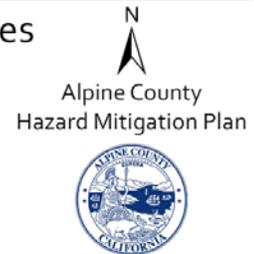


Source: Alpine County GIS
Date: December 11, 2017

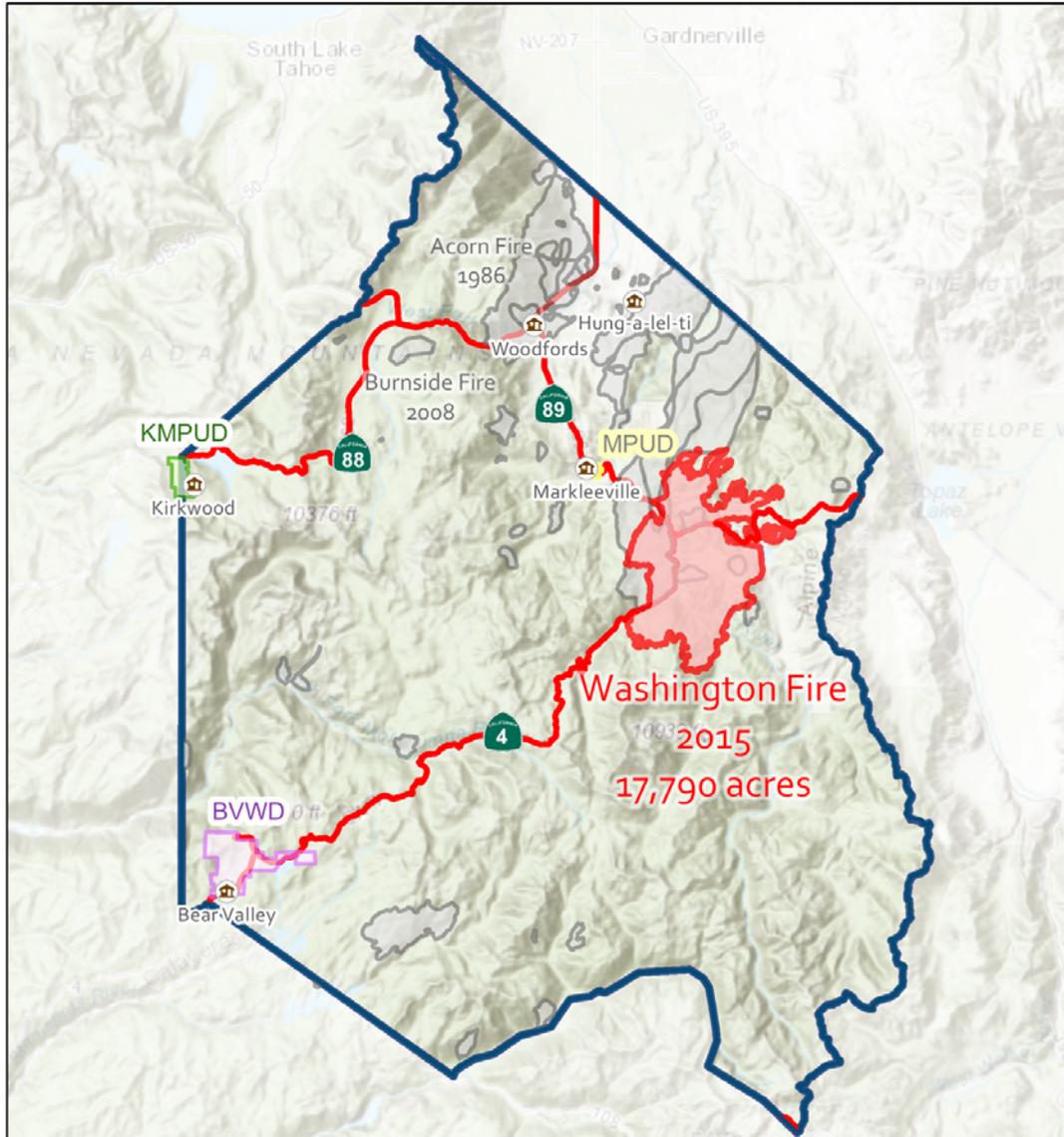


CalFire Fire Hazard Severity Zones

- Legend
- CalFire Fire Hazard Severity Zone
- Very High
 - High
 - Moderate



Source: Alpine County GIS
 Date: December 11, 2017



Source: Alpine County GIS
 Date: December 11, 2017

Appendix C
Local Planning Team Meeting Minutes

- *June 2015*

During the kick-off meeting, the Local Planning Team discussed the objectives of the DMA 2000, the hazard mitigation planning process, the public outreach process, and the steps involved in updating the MJHMP and achieving the County's goals. The planning process was discussed including the purpose of the plan. The Local Planning Team identified existing plans, studies and technical reports to be reviewed and incorporated into the MJHMP (as shown in section 4.4). The Local Planning Team discussed a press release and notification letter to be sent to neighboring communities. The 8 potential hazards from the original MJHMP (as shown in Section 5.2), were reviewed and modifications to the hazards list were discussed. A hazard identification table was completed for the update. The exercise identified the specific hazards that the Local Planning Team wanted to address in the MJHMP. Two new human caused hazards were added: communications/utility loss and hazardous materials. The Local Planning Team then used the hazards identified and completed a Hazard Profiling Worksheet. The exercise used group averaging to prioritize the hazards into high, medium and low categories. See **Appendix E** for agenda and handouts.

- *July 2015*

During the July Local Planning Team meeting, the consultant briefed the Local Planning Team on progress made to date, including the new plan format and result of the hazard ranking from the previous meeting. The Local Planning Team reviewed drafts of Section 1-4 and discussed information needed. The Local Planning Team reviewed and edited the first five hazards including: avalanche, communications/utility loss, dam failure, drought & water shortage, and earthquake. The Local Planning Team reviewed the previous plan's mitigation action items and considered revisions and new action items.

- *September 2015*

During the September Local Planning Team meeting, the consultant briefed the Local Planning Team on progress made to date, including edits received during and after the previous meeting. The Local Planning Team briefly reviewed drafts of Section 1-4 and discussed information needed. The Local Planning Team reviewed edits to the first five hazards including: avalanche, communications/utility loss, dam failure, drought & water shortage, and earthquake. The Local Planning Team reviewed the last five hazards including floods, hazardous materials, landslide, severe weather, and wildland fire. Team members provided historical event information and other edits. The Local Planning Team reviewed the previous plan's mitigation action items and considered revisions and new action items. Additionally, preliminary mapping and status of the vulnerability analysis was discussed.

- *October 2015*

The consultant continued to edit the draft plan based on comments received from the Local Planning Team. Additionally, the consultant drafted Sections 7-9 for review. During the October Local Planning Team meeting, the Team reviewed the previously distributed Sections 1-4 and Section 5 Hazards. Additionally, the Team discussed the progress made on the vulnerability assessment. Section 7 Capabilities Assessment was reviewed and the Local Planning Team provided updates. The Local Planning Team also reviewed Section 8 Mitigation Strategy and added two new goals and several new mitigation actions. Following the meeting, the consultant worked to finalize the on-line survey for distribution to the Planning Team for testing.

November 2015

The Planning Team met to review edits to Sections 1-5 and new Sections 7-9. Team discussed progress made on vulnerability assessment and reviewed online GIS mapping of hazards. The team also discussed several new mitigation actions to be added and edited a few of the existing to be more specific. The Planning Team also discussed final edits to the public questionnaire and potential dates and locations to hold the public workshop.

- *January 2016*

The final Planning Team meeting was held to review the draft plan and discuss any edits to be made. The Planning Team also discussed the potential venue for the public workshop and what it would entail. The STAPLE+E was given to all committee members in attendance, with directions for filling out the STAPLE+E. The group spent time discussing the mitigation actions and evaluation of the actions to complete the STAPLE+E form. The consultant discussed the final steps for edits and review of the draft plan.

- *March 2016*

The consultants and members of the Local Planning Team attended the local 50 Plus Meeting to provide information to the public about hazard mitigation planning in the County. Draft plans were available for review, public questionnaires were distributed, and the County provided an online display of the current hazards maps.

Appendix D
Public Information

Hazard Mitigation Planning Meetings



Over the next few months, Alpine County, in partnership with Alpine County School District, Bear Valley Water District, Kirkwood Meadows Public Utility District, Markleeville Public Utility District, Markleeville Water Company, South Tahoe Public Utility District, Lake Alpine Water Company and the Washoe Tribe of Nevada and California, will conduct a planning effort to update the Hazard Mitigation Plan for Alpine County. This updated plan will be developed to facilitate compliance with federal requirements and to provide a tool for local government, industry, and private venues to help reduce the impact of these threats. The plan examines the potential threats that Alpine County residents may face. It also addresses mitigation efforts that can take place in both public and private venues that can help reduce the impacts of these threats.



One of the major components of the plan development is having a good cross-section of community input and participation by neighboring communities and the public. Therefore, the public is encouraged to attend.

Meetings will be held at
Alpine County Board of Supervisors' Chambers
County Administrative Building
99 Water Street in Markleeville

On the following dates:

September 14, 2015	10:00am – 12:00pm
October 19, 2015	10:00am – 12:00pm
November 16, 2015	10:00am – 12:00pm
February 22, 2016	10:00am – 12:00pm

Public Workshop

February 25, 2016 Following BOS Meeting



For more information:
Alpine County Community Development Department
50 Diamond Valley Road, Markleeville, CA 96120
Brian Peters, Director, bpeters@alpinecountyca.gov, 530.694.1361

R.O. Anderson Engineering, Inc.
1603 Esmeralda Avenue, Minden, NV 89423
Stephanie Hicks, AICP, CFM, shicks@roanderson.com, 775.215.5042
Tammy Kinsley, tkinsley@roanderson.com, 775.215.5013

R|O|Anderson

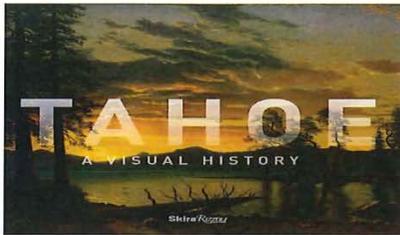


50+ Club Potluck

Thursday March 10, 2016 5pm

(new time this month only)

The Learning Center 100 Foothill Rd.



VIEWING 30 MINUTE DVD

TAHOE: A VISUAL HISTORY

FROM EXHIBIT AT NV MUSEUM OF ART

CORNED BEEF & CABBAGE PROVIDED

PLEASE BRING SALAD OR DESSERT TO SHARE.

Representatives will be on-site with information about Alpine County's
Local Hazard Mitigation Plan

Reserve your spot March 10th for outing to Shakespeare on the Lake, "A Comedy of Errors"
on August 11th. Performance starts at 7:30pm, we will provided bus transportation from
Learning Center at 4:30pm. Space is limited, Cost \$20 and food is on your own.



For more information please call Amy Broadhurst
694.1320, or abroadhurst@alpinecountyca.gov



WELLNESS · RECOVERY · RESILIENCE



COUNTY OF ALPINE
Community Development

Brian Peters, Director

May 27, 2015

Dear Neighboring Community,

We would like to invite you to participate in the update of our Alpine County Hazard Mitigation Plan update.

Over the next few months, we will conduct a planning effort to update our Regional Hazard Mitigation Plan for Alpine County. This updated plan will be developed to facilitate compliance with federal requirements and to provide a tool for local government, industry, and private venues to help reduce the impact of these threats. Further, the plan will help our community develop infrastructure to lessen potential damage.

One of the major components of the plan development is having a good cross-section of community input and participation by neighboring communities, and that is the reason for this invitation. I am hoping that you will agree to be included on the Local Planning Team. The level of commitment will involve a few meetings, plus a review of the components of the plan as they are written. I anticipate meeting five times over the next eight to ten months. Generally, much of the work can be completed via email.

I am hoping that you can participate as a representative of your profession. If you are willing to join our team, please RSVP to me at bpeters@alpinecountyca.gov or at 530-694-1361.

Cordially,

Brian Peters,
Community Development Director

50 Diamond Valley Road, Markleeville, CA 96120 (530) 694-2140 / Fax (530) 694-2149
www.alpinecountyca.gov

From: [Tammy Kinsley](#)
To: rob.beltramo@washoetribe.us; lisa.christensen@washoetribe.us; braemear@yahoo.com; tcrceter@alpinecountyca.gov; idadavidson@fs.fed.us; chris.gemmill@dot.ca.gov; gmbearvalleywater@sbcglobal.net; khartnet@hotmail.com; jhilton@stpod.dst.ca.us; athughes75@hotmail.com; thughes@alpinecountyca.gov; edjames@cwscd.org; jennifer.johnson@washoetribe.us; info@lakealpinewater.com; msharp@kmpud.com; Rstephens@alpineso.com; l70thoma@blm.gov; ptraaynor@alpinecoe.k12.ca.us; zwood@alpinecountyca.gov; [Brian Peters](#); [Stephanie Hicks](#)
Subject: Alpine County Hazard Mitigation Local Planning Team Meeting June 29, 2015
Start: Monday, June 29, 2015 10:00:00 AM
End: Monday, June 29, 2015 12:00:00 PM
Location: Alpine County Community Development office, 50 Diamond Valley Road, Markleeville, CA.

Dear Local Planning Team Member:

Brian Peters, Community Development Director respectfully requests your participation in the 2015 - 2016 review and update of the Alpine County Hazard Mitigation Plan.

As you may be aware, Alpine County developed a comprehensive Multi-Hazard Mitigation Plan in 1988, which was last updated in 2004. FEMA requires the plan to be updated and resubmitted for federal approval every five years. Therefore, over the next several months, R.O. Anderson Engineering, Inc. will be assisting Alpine County Community Development to facilitate the planning effort in order to accomplish this task.

This plan was developed to facilitate compliance with federal requirements and to provide a tool for local government, industry, and private venues to help identify and reduce the impact of potential threats. The plan examines the potential threats that Alpine County residents may face. It also addresses mitigation efforts that can take place in both public and private venues that can help reduce the impacts of these threats.

The first Local Planning Team Meeting will take place on Monday, June 29, 2015, 10:00 am to 12:00 noon, at the Alpine County Community Development office, 50 Diamond Valley Road, Markleeville, CA.

We hope you can participate as a representative in your expertise. If you are willing to join the Alpine County Hazard Mitigation Plan Update Local Planning Team, please RSVP to me at HYPERLINK "mailto:tkinsley@roanderson.com" tkinsley@roanderson.com.

Sincerely,
Tammy J. Kinsley
Associate Planner
R.O. Anderson Engineering, Inc.



MITIGATION QUESTIONNAIRE				
<p>A county partnership has recently been formed to address natural and human-caused hazards that may occur in Alpine County. A local planning team has been selected to oversee this process. In order to identify and plan for future natural and human-caused disasters, we need assistance from the residents of Alpine County. This questionnaire is designed to gauge the level of knowledge local citizens have about natural and human-caused disaster issues and areas vulnerable to any type of natural and human-caused disasters. The information you provide will help coordinate activities to reduce the risk of injury or property damage in the future.</p> <p>This questionnaire consists of 11 questions and will take approximately 5 minutes to complete.</p>				
GENERAL HOUSEHOLD INFORMATION				
<p>The following requested demographic information will aid the Local Planning Team in determining the hazard mitigation needs of our community. For example, indicating whether you own a house or are a tenant will help determine the needs for both renters and homeowners. The answers provided in this action will be treated as confidential, will be used solely for the preparation of this plan, and will not be provided to any other group or interest.</p>				
<p>1. Please indicate your zip code: _____</p> <p>2. Please check all that apply.</p> <p>Do you own a home in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If you do not own a home, do you rent a residence in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own a business located in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own a business outside of Alpine County, but operate your business in the County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own or operate a vehicle in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>				
NATURAL AND HUMAN-CAUSED HAZARD INFORMATION				
<p>The following requested demographic information will aid the Local Planning Team in determining needs and desires for educating and preparing our community for natural and human-caused disasters. The answers provided in this action will be treated as confidential and will be used solely for the preparation of this plan and will not be provided to any other group or interest.</p>				
<p>3. In the past 10 years which of the following types of natural and human-caused hazard events have you or someone in your household experienced within Alpine County, and indicate your level of concern for the hazards impact on Alpine County? (Please check all that apply.)</p>				
Natural and Human-caused Hazards	Have Experienced Y/N	Low Concern	Moderate Concern	High Concern
Avalanche				
Dam Failure				
Drought and Water Shortage				
Earthquakes				
Flood				
Hazardous Materials Events				
Landslides				
Severe Weather				
Communication/Utility Loss				
Wildland Fire				



MITIGATION QUESTIONNAIRE																																		
Other _____																																		
<p>4. Prior to receiving this questionnaire, were you aware of your County's Hazard Mitigation Plan (HMP)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5. Prior to receiving this questionnaire, were you aware that the Federal Emergency Management Agency (FEMA) requires your City to update the HMP every five years in order for your County to be eligible for federal pre- and post-disaster hazard mitigation funds? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>																																		
PREPAREDNESS ACTIVITIES IN YOUR HOUSEHOLD																																		
<p>Households can do many things to prepare for natural and human-caused disasters or emergencies. What you have on hand or are trained to do when a disaster strikes can make a big difference in your comfort and safety in the hours and days following natural and human-caused disasters or emergencies. Basic services, such as electricity, gas, water, and telephones, may be cut off, or you may have to evacuate at a moment's notice. The following questions focus on your household's preparedness for a disaster event.</p>																																		
<p>6. The following questions focus on your household's preparedness for a disaster event.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%; padding: 5px;">In your household, have you or someone in your household:</th> <th style="width: 10%; padding: 5px;">Have Experienced</th> <th style="width: 10%; padding: 5px;">Plan To Do</th> <th style="width: 10%; padding: 5px;">Not Done</th> <th style="width: 10%; padding: 5px;">Unable To Do</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Attended meetings or received written information on natural and human-caused disasters or emergency preparedness?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Talked with members of your household about what to do in case of natural and human-caused disasters or emergency?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					In your household, have you or someone in your household:	Have Experienced	Plan To Do	Not Done	Unable To Do	Attended meetings or received written information on natural and human-caused disasters or emergency preparedness?					Talked with members of your household about what to do in case of natural and human-caused disasters or emergency?					Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?					Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?					In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?				
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Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?																																		
In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?																																		
<p>7. What steps, if any, have you or someone in your household taken to prepare for natural and human-caused disasters?</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Food <input type="checkbox"/> Water <input type="checkbox"/> Flashlight(s) <input type="checkbox"/> Batteries <input type="checkbox"/> Battery-Powered Radio <input type="checkbox"/> Make a Fire Escape Plan <input type="checkbox"/> Fire Extinguisher </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Prepared a Disaster Supply Kit <input type="checkbox"/> Medical Supplies (First Aid Kit) <input type="checkbox"/> Received First Aid/CPR/AED Training <input type="checkbox"/> Developed a Reconnection Plan (Where to Go and Who to Call) <input type="checkbox"/> Discussed Utility Shutoffs <input type="checkbox"/> Smoke Detector on Each Level of the Home <input type="checkbox"/> Other (please specify): _____ </td> </tr> </table>					<input type="checkbox"/> Food <input type="checkbox"/> Water <input type="checkbox"/> Flashlight(s) <input type="checkbox"/> Batteries <input type="checkbox"/> Battery-Powered Radio <input type="checkbox"/> Make a Fire Escape Plan <input type="checkbox"/> Fire Extinguisher	<input type="checkbox"/> Prepared a Disaster Supply Kit <input type="checkbox"/> Medical Supplies (First Aid Kit) <input type="checkbox"/> Received First Aid/CPR/AED Training <input type="checkbox"/> Developed a Reconnection Plan (Where to Go and Who to Call) <input type="checkbox"/> Discussed Utility Shutoffs <input type="checkbox"/> Smoke Detector on Each Level of the Home <input type="checkbox"/> Other (please specify): _____																												
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<p>8. Have you ever received information about how to make your household and home safer from natural and human-caused disasters?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No (IF "NO" Skip to Question 10)</p> <p>If "YES", how recently?</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Within the Last 6 Months <input type="checkbox"/> Between 6 to 12 Months <input type="checkbox"/> Between 1 to 2 Years </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Between 2 to 5 Years <input type="checkbox"/> 5 Years or More </td> </tr> </table>					<input type="checkbox"/> Within the Last 6 Months <input type="checkbox"/> Between 6 to 12 Months <input type="checkbox"/> Between 1 to 2 Years	<input type="checkbox"/> Between 2 to 5 Years <input type="checkbox"/> 5 Years or More																												
<input type="checkbox"/> Within the Last 6 Months <input type="checkbox"/> Between 6 to 12 Months <input type="checkbox"/> Between 1 to 2 Years	<input type="checkbox"/> Between 2 to 5 Years <input type="checkbox"/> 5 Years or More																																	



MITIGATION QUESTIONNAIRE

9. From whom did you receive information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> News Media | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> University or Research Institution | <input type="checkbox"/> Health District |
| <input type="checkbox"/> Insurance Agent or Company | <input type="checkbox"/> Other Government Agency |
| <input type="checkbox"/> Utility Company | <input type="checkbox"/> Not Sure |
| <input type="checkbox"/> American Red Cross | <input type="checkbox"/> Other : _____ |

10. Who would you most trust to provide you with information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> News Media | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> University or Research Institution | <input type="checkbox"/> Health District |
| <input type="checkbox"/> Insurance Agent or Company | <input type="checkbox"/> Other Government Agency |
| <input type="checkbox"/> Utility Company | <input type="checkbox"/> Not Sure |
| <input type="checkbox"/> American Red Cross | <input type="checkbox"/> Other : _____ |

11. What is the most effective way for you to receive information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| Newspapers: | Other Methods (cont.): |
| <input type="checkbox"/> Newspaper Stories | <input type="checkbox"/> Magazines |
| <input type="checkbox"/> Newspaper Ads | <input type="checkbox"/> Internet |
| Television: | <input type="checkbox"/> Outdoor Advertisements (Billboards, etc.) |
| <input type="checkbox"/> Television Stories | <input type="checkbox"/> Fact Sheet/Brochure |
| <input type="checkbox"/> Television Ads | <input type="checkbox"/> School |
| Radio: | <input type="checkbox"/> University or Research Institution |
| <input type="checkbox"/> Radio Stories | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> Radio Ads | <input type="checkbox"/> Chamber of Commerce |
| Other Methods: | <input type="checkbox"/> Public Workshops/Meetings |
| <input type="checkbox"/> Books | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Postal Mail | |
| <input type="checkbox"/> Email | |

Other Comments:

Please return this questionnaire by mail or drop off to Brian Peters, Community Development Director
Alpine County Community Development 50 Diamond Valley Road, Markleeville, CA 96120
by March 24, 2016. *Thank you*

Alpine County Hazard Mitigation Questionnaire

General Comments:

2. The Alpine County Hazard Mitigation Questionnaire was designed to help the Alpine County Local Hazard Mitigation Planning Members identify the community's concerns about natural and human-caused hazards. The questionnaire was considered an essential development tool to the County's 2016 update to the current Multi-Jurisdictional Hazard Mitigation Plan document.
3. It was decided, by the committee, to have the questionnaire available on the County's Planning Department, Hazard Mitigation Website, through press release and hard copies of the questionnaire were available at the public workshop, held March 15, 2016. Approximately 6 questionnaire responses were returned via the workshop and online. Questionnaire responses were tallied and reviewed.
4. The concerns (rated at Low, Med, High) of citizens residing in Alpine County are indicated below, highest to lowest:
 - a. Drought & Water Shortage
 - b. Communication/Utility Loss
 - c. Wildland Fire
 - d. Flood
 - e. Severe Weather
 - f. Landslide
 - g. Earthquake
 - h. Dam Failure
 - i. Avalanche
 - j. Hazardous Materials Events
5. The questionnaire revealed that the majority of Alpine County citizens wish to receive information about how to make their homes safer from natural disasters from the Fire Department/Emergency Management, the American Red Cross, and the Utility companies. Less effective was receiving information from the News Media, Institutions and other Government Agencies.
6. Having water, a flashlight and checking smoke detectors annually was 83.33% of the results received. Having batteries, battery powered radio, fire extinguishers, medical supplies and discussing utility shutoffs, were 66.67% of the results received. Some have developed a plan and some plan to do so. In addition, 66.67% of the responses received said that they have been trained in First Aid/CPR and AED. With half of the responses planning to do so.
6. The questionnaire provided excellent feedback from the community concerning hazard mitigation issues and was used during the update to the Alpine County Multi-

Survey Question	#5 Were aware of the Plan		#6 Were aware of FEMA requirements		#7 Disaster preparedness actions																					
	Yes	No	Yes	No	Attended Meetings on Disasters or Preparedness				Talked About What to Do				Developed a Plan				Prepares a Kit				Training				Other	
					Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do		
Survey Source	Yes	No	Yes	No	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Have Experienced	Plan to Do	Not Done	Unable to Do	Other	
Total Online Survey	0	0	0	2	0	0	1	0	0	3	0	0	2	0	1	0	2	0	0	0	0	0	0	0	1	0
Overall	0	0	0	2	0	0	1	0	0	3	0	0	2	0	1	0	2	0	0	0	0	0	0	0	1	0

Survey Question	#8 Steps taken to prepare for a disaster													#9 Safety information received from					#11 Information Sources												
	Food	Water	Flashlights	Batteries	Battery Powered Radio	Fire Escape Plan	Fire Extinguisher	Disaster Supply Kit	Medical Supply Kit	Received Training	Reconnection Plan	Utility Shutoffs	Smoke Detectors	Other	Yes	No	IF YES, how often					News	Institution	Insurance	Utility	Red Cross	Fire Department/Emergency Manager	Health District	Other Government Agencies	Not Sure	Other
																	<6 Months	6-12 Months	1-2 Years	2-5 Years	5+ Years										
Survey Source	Food	Water	Flashlights	Batteries	Battery Powered Radio	Fire Escape Plan	Fire Extinguisher	Disaster Supply Kit	Medical Supply Kit	Received Training	Reconnection Plan	Utility Shutoffs	Smoke Detectors	Other	Yes	No	<6 Months	6-12 Months	1-2 Years	2-5 Years	5+ Years	News	Institution	Insurance	Utility	Red Cross	Fire Department/Emergency Manager	Health District	Other Government Agencies	Not Sure	Other
Total Online Survey	2	5	0	4	4	3	0	0	0	0	1	4	0	0	0	1	0	2	1	1	1	0	0	1	4	2	3	0	1	1	0
Overall	2	5	0	4	4	3	0	0	0	0	1	4	0	0	0	1	0	2	1	1	1	0	0	1	4	2	3	0	1	1	0

Survey Question	#12 Most Trusted Sources										#13 Most Effective Way to Receive Information																			
Survey Source	News	Institution	Insurance	Utility	Red Cross	Fire Department/Emergency Manager	Health District	Other Government Agencies	Not Sure	Other	<small>Newspaper</small> Stories	<small>Television</small> Ads	<small>Radio</small> Stories	<small>Radio</small> Ads	Books	Postal Mail	Email	Magazines	Internet	Outdoor Ads	Fact Sheets	School	Institutions	Fire/Rescue	Fire Department/Emergency Manager	Chamber of Commerce	Workshops/Meetings	Other		
Total Online Survey	0	0	1	4	2	3	1	1	1	0	0	0	2	0	1	0	1	3	2	0	0	0	4	0	0	0	4	0	3	0
Overall	0	0	1	4	2	3	1	1	1	0	0	0	2	0	1	0	1	3	2	0	0	0	4	0	0	0	4	0	3	0

Appendix E
Meeting Agendas & Handouts

**Alpine County Hazard Mitigation Plan Update
Local Planning Team**

10:00am – 12:00noon, Monday June 29, 2015

Community Development
50 Diamond Valley Road
Markleeville, CA 96120

AGENDA

Meeting One

- **Welcome & Introduction** *Brian Peters*
- **Planning Process Overview** *Stephanie Hicks*
 - *General Information*
 - *Alpine County Emergency Management/LEPC's Role*
 - *Purpose of the Plan*
 - *Public Participation*
- **Incorporation of Existing Plans** *Stephanie Hicks*
- **Hazard Identification Table & Hazard Ranking** *Tammy Kinsley*
- **Formation of Team Leaders** *Tammy Kinsley*
- **What are the next Steps?** *Stephanie Hicks*
- **Announcement of Future Meetings:** *Tammy Kinsley*

Future meetings are scheduled tentatively as follows:

July 27, 2015 – Planning Committee Meeting
September 14, 2015 – Planning Committee Meeting
October 19, 2015 – Planning Committee Meeting
November 16, 2015 – Planning Committee Meeting

Alpine County HMP
June 29, 2015
Local Planning Team Meeting

Name	Firm/Agency	Phone Number	Email
TONY CRETER	A.C. COMM. DEV. - BLDG. SAFETY	X428 530-694-2140	tereten@alpinecountycs.gov
Brian Peters	A.C. COMM. DEV.	530-694-1361	bpeters@alpinecountycs.gov
JIM HILTON	South Tahoe Public Utility Dist.	530-543-6286	jhilton@stpd.dst.ca.us
TAMMY KINGSLEY	ROADWISE	(775) 215-5013	tkingsley@ROADWISE.COM
Euphonia Hicks	RO ANDERSON	(775) 215-5042	shickseranderson.com
Zach Wood	Alpine Co Com Dev	530 694 1371	zwood@alpinecountyca.gov
Steve Howell	USFS HTNF	775-884-8114	schowell@fs.fed.us
ANNA BELLE MONTI	USFS : HTNF	775-884-8103	amonti@fs.fed.us
KES HASTNET	ALPINE FIRE SAFE COUNCIL	(530) 694-1877	KHASTNET@HOTMAIL.COM
Ed James	ELWSD	775-887-7456	edjames@elwsp.org
Rob Betramo	Washoetribe	775/205-9600	rob.betramo@washoetribe.us

Alpine County

Hazard Mitigation Planning



Prepared by:
RO Anderson

What is Hazard Mitigation Planning?

- A Hazard is
 - Any event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, or other types of harm and/or loss.
 - Natural or manmade
 - Every community is susceptible



Prepared by:
RO Anderson

What is Hazard Mitigation Planning?



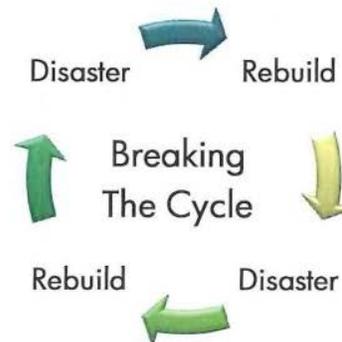
- A hazard mitigation plan:
 - Is a planning document to reduce community's vulnerability to hazards
 - Contains data from a variety of experts
 - Required by Disaster Mitigation Act of 2000 (Stafford Act 1988)
 - Provide legal basis for reducing hazard risks
 - Requires approval by local, DEM and FEMA
 - Primary requirement for FEMA funding
 - Communities qualify for other post disaster assistance
 - Mitigation funding for natural hazard events only

Prepared by:
RO Anderson

What is Hazard Mitigation Planning?



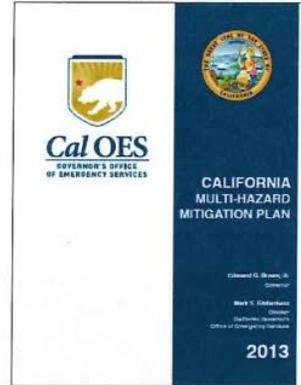
- Mitigation is
 - Any sustained action taken to reduce or eliminate long-term risks to people and their property from hazards.
 - Reactive to pro-active
 - NOT an emergency action plan
 - Mitigation breaks the cycle



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RO Anderson

What is Hazard Mitigation Planning?

- Who needs a plan?
 - States must have a plan for jurisdictions to qualify for federal funding
 - Standard vs. enhanced plans
 - State of California has an enhanced hazard mitigation plan
 - 15% vs. 20% available mitigation funding
 - Provides hazard information for local plans
 - Update, readopt and reapprove every 5 years



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What is the Planning Process?



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What is Hazard Mitigation Planning?

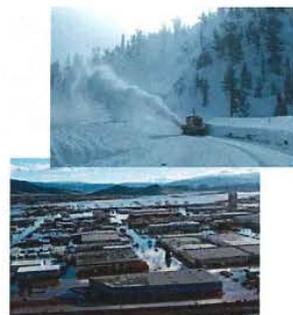
- Examples of mitigation
 - Public education and awareness
 - Planning and regulations
 - Natural resources
 - Structural



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R O Anderson

What is Hazard Mitigation Planning?

- Mitigation is necessary because
 - Disasters cost too much
 - Every \$1 spent in mitigation = \$4 saved in future damages
- Other reasons mitigation is necessary
 - Increase community pride
 - Improve quality of life
 - Prevent damages
 - Saves lives



Prepared by:
R O Anderson

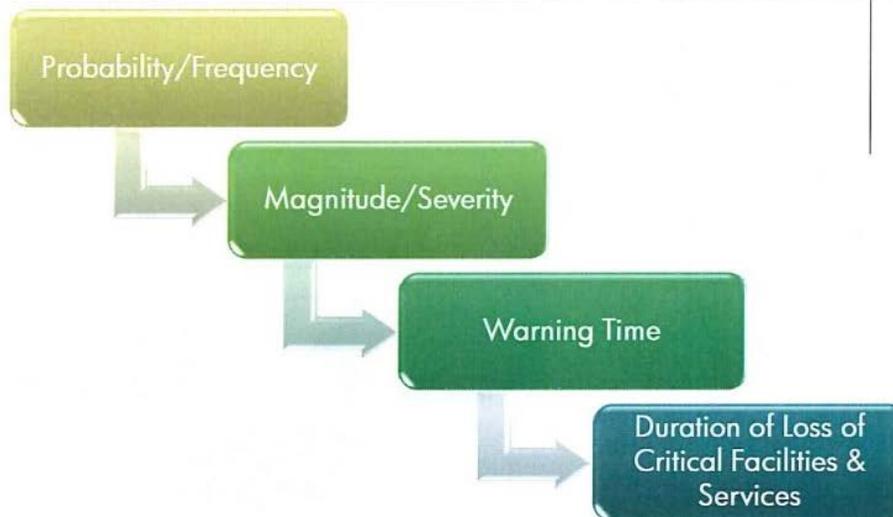
What is the Planning Process?



- Identify Hazards
 - Avalanche
 - Dam Failure
 - Drought
 - Earthquake
 - Flood
 - Landslides
 - Severe Weather
 - Wildland Fire

Prepared by:
R O Anderson

What is the Planning Process?



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What is the Planning Process?

- Vulnerability Assessment
 - Predicts the event of exposure from a hazard
 - Quantitative analysis that estimates loss of assets
 - Assets include population and building stock as well as critical facilities and infrastructure



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RO Anderson

What is the Planning Process?

- Mitigation Strategy
 - Mitigation Goals
 - Mitigation Actions
- Capabilities Assessment
- Public Participation
 - Questionnaire
 - On-line Survey
 - Public Workshop



Prepared by:
RO Anderson

Plan Maintenance Process

- Monitoring, evaluating, and updating the Plan
- Implementation through existing planning mechanisms
- Continued public involvement



Prepared by:
R O Anderson

the hazard mitigation planning process

Hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards. Four basic phases are described for the hazard mitigation planning process as shown in this diagram.

For illustration purposes, this diagram portrays a process that appears to proceed sequentially. However, the mitigation planning process is rarely a linear process. It is not unusual that ideas developed while assessing risks should need revision and additional information while developing the mitigation plan, or that implementing the plan may result in new goals or additional risk assessment.



foreword

STATE AND LOCAL MITIGATION PLANNING how-to guide: **Getting Started**

Funding Impacted by the Plan

<p>Individual Assistance After a disaster, Federal funds are provided to qualified individuals to facilitate recovery. Assistance comes in the form of low interest loans (SBA), housing assistance, cash grants etc.</p>	<p style="text-align: center;">↑</p>	<p>Not impacted by plan</p>
<p>Public Assistance Categories A&B: Emergency measures and debris removal</p>	<p style="text-align: center;">↑</p>	<p>Not impacted by plan</p>
<p>Categories C-G: Reconstruction of public facilities and infrastructure to current codes and standards.</p>	<p style="text-align: center;">↑</p>	<p>An approved State or Tribal plan is required in order to receive funding.</p>
<p>Mitigation <u>Hazard Mitigation Grant Program (HMGP)</u>: Up to 15% (20% for States with an approved Enhanced Mitigation Plan) of the total disaster grants awarded by FEMA to implement long-term hazard mitigation measures after a major disaster declaration. <u>Pre-Disaster Mitigation Program (PDM)</u>: An annual competitive grant not tied to disaster.</p>	<p style="text-align: center;">}</p>	<p>An approved State or Tribal and Local, Multi-jurisdictional or Local Tribal plan is required in order to received funding for projects. Funding support for planning remains available.</p>
<p>Wildfire Fire Management Assistance Grants (FMAG): Financial assistance in the form of grants to the state for firefighting costs.</p>	<p style="text-align: center;">}</p>	<p>An approved State or Tribal and Local, Multi-jurisdictional or Local Tribal plan is required in order to received funding for projects. Funding support for planning remains available.</p>
<p>Flood Management Assistance Grants Flood Management Assistance program (FMA), Repetitive Flood Claim program (RFC), Severe Repetitive Loss Claim program (SRL): An annual competitive grant program.</p>	<p style="text-align: center;">}</p>	<p>An approved State or Tribal and Local, Multi-jurisdictional or Local Tribal plan is required in order to received funding for projects. Funding support for planning remains available.</p>



Name: _____ Date: _____

Agency: _____ Specialty: _____

Hazard Profiling Worksheet

Legend: 1 = lowest; 5 = highest

Hazard Type	Probability/ Frequency	Magnitude/ Severity	Warning Time	Duration of loss of critical facilities and services	Total
Natural Hazards					
Avalanche					
Dam Failure					
Drought					
Earthquakes					
Floods					
Landslides					
Severe Weather					
Wildland Fire					

CHAPTER 6 - OTHER HAZARDS: RISKS AND MITIGATION

CHAPTER CONTENT

<p>6.1 Levee Failure</p> <p>6.1.1 Identifying Levee Hazards</p> <p>6.1.2 Profiling Levee Hazards</p> <p>6.1.3 Assessment of State and Local Vulnerability and Potential Losses</p> <p>6.1.4 Current Levee Failure Hazard Mitigation Efforts</p> <p>6.2 Landslides and Other Earth Movements</p> <p>6.2.1 Identifying Landslide Hazards</p> <p>6.2.2 Profiling Landslide Hazards</p> <p>6.2.3 Assessment of Vulnerability and Potential Losses</p> <p>6.2.4 Current Landslide Hazard Mitigation Efforts</p> <p>6.3 Tsunami Hazards</p> <p>6.3.1 Identifying Tsunami Hazards</p> <p>6.3.2 Profiling Tsunami Hazards</p> <p>6.3.3 Assessment of State Vulnerability and Potential Losses</p> <p>6.3.4 Assessment of Local Vulnerability and Potential Losses</p> <p>6.3.5 Current Tsunami Hazard Mitigation Efforts</p> <p>6.3.6 Opportunities for Enhanced Tsunami Mitigation</p> <p>6.4 Climate-Related Hazards</p> <p>6.4.1 Air Pollution</p> <p>6.4.2 Avalanches</p> <p>6.4.3 Coastal Flooding, Erosion and Sea Level Rise</p> <p>6.4.4 Droughts and Water Shortages</p> <p>6.4.5 Energy Shortage and Energy Resilience</p> <p>6.4.6 Extreme Heat</p>	<p>6.4.7 Freeze</p> <p>6.4.8 Insect Pests and Diseases</p> <p>6.4.9 Severe Weather and Storms</p> <p>6.5 Volcanoes</p> <p>6.5.1 Identifying Volcano Hazards</p> <p>6.5.2 Profiling Volcano Hazards</p> <p>6.5.3 Assessment of State Vulnerability and Potential Losses</p> <p>6.5.4 Assessment of Local Vulnerability and Potential Losses</p> <p>6.5.5 Current Volcano Hazard Mitigation Efforts</p> <p>6.5.6 Opportunities for Enhanced Volcano Hazard Mitigation</p> <p>6.6 Other Hazards</p> <p>6.6.1 Agriculture Pests and Diseases</p> <p>6.6.2 Dam Failure</p> <p>6.6.3 Epidemic/Pandemic/Vector Borne Diseases</p> <p>6.6.4 Hazardous Materials Release</p> <p>6.6.5 Marine Invasive Species</p> <p>6.6.6 Natural Gas Pipeline Hazards</p> <p>6.6.7 Oil Spills</p> <p>6.6.8 Radiological Accidents</p> <p>6.6.9 Terrorism</p> <p>6.6.10 Cyber Threats</p> <p>6.7 Additional Hazards</p> <p>6.7.1 Airline Crashes</p> <p>6.7.2 Civil Disturbances</p> <p>6.7.3 Metal Theft in California</p> <p>6.7.4 Train Accidents, Explosions and Chemical Releases</p> <p>6.7.5 Well Stimulation and Hydraulic Fracturing</p>
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6.1 LEVEE FAILURE

About Chapter 6

Chapter 6 assesses a variety of hazards and risks other than the three primary hazards of earthquakes, floods, and wildfires examined in Chapter 5. Levee failure is one of several phenomena identified as secondary or cascading hazards triggered by the primary hazards. Other secondary hazards include landslides, tsunamis, climate-related impacts, and volcanoes. In addition to secondary hazards, two other

HAZARD PRIORITIZATION CRITERIA			
Criterion	Value	Category	Description
Probability/Frequency	1	Very Low	Occurs less than once in 1000 years.
	2	Low	Occurs less than once in 100 to once in 1000 years.
	3	Medium	Occurs less than once in 10 to once in 100 years.
	4	High	Occurs less than once in 5 to once in 100 years.
	5	Very High	Occurs more frequently than once in 5 years.
Magnitude/Severity (includes Economic Impact, Area Affected and Vulnerability)	1	Very Low	<ul style="list-style-type: none"> Negligible property damages (less than 5% of all buildings and infrastructure). No deaths and injuries/illnesses treatable with first aid and do not require hospitalization. Negligible loss of quality of life. Economic and geographic effects are localized.
	2	Low	<ul style="list-style-type: none"> Slight property damages (5% to 15%) of all buildings and infrastructure). No deaths and few injuries/illnesses require hospitalization. Slight loss of quality of life. Economic and geographic effects felt at the city or community.
	3	Medium	<ul style="list-style-type: none"> Moderate property damages (15% to 30% of all buildings and infrastructure). Fewer than 5 deaths and multiple injuries/illnesses require hospitalization. Some loss of quality of life. Economic and geographic effects felt countywide.
	4	High	<ul style="list-style-type: none"> Moderate property damages (30% to 50% of all buildings and infrastructure). More than 5 deaths and considerable injuries/illnesses require hospitalization in multiple facilities with some resulting in permanent disability. Moderate loss of quality of life. Economic and geographic effects felt statewide.
	5	Very High	<ul style="list-style-type: none"> Moderate property damages (30% to 50% of all buildings and infrastructure). Significant number of deaths and injuries/illnesses requiring hospitalization in multiple facilities with some resulting in permanent disability. Significant loss of quality of life. Economic and geographic effects felt at the Region IX level.
Warning Time	1	Very Low	Greater than 48 hrs
	2	Low	24 to 48 hrs
	3	Medium	12 to 24 hrs
	4	High	6 to 12 hrs
	5	Very High	Less than 6 hrs
Duration of Loss of Critical Facilities and Services	1	Very Low	1 to 3 days
	2	Low	4 to 7 days
	3	Medium	8 to 14 days
	4	High	15 to 20 days
	5	Very High	More than 20 days

**Alpine County Hazard Mitigation Plan Update
Local Planning Team**

10:00am – 12:00noon, Monday July 27th, 2015

Board Chambers
County Administration Building
99 Water Street
Markleeville, CA 96120

AGENDA

Meeting Two

- **Welcome & Introduction** *Brian Peters*
- **Review Planning Process Overview for New Attendees** *Stephanie Hicks*
- **Discuss New Plan Document Format** *Stephanie Hicks*
- **Hazard Ranking Results** *Tammy Kinsley*
(Compiled from the June 29th meeting)
- **Review Sections 1-4** *Stephanie Hicks*
- **Review Section 5 including:** *Stephanie Hicks*
 - **Avalanche**
 - **Communication/Utility Loss**
 - **Dam Failure**
 - **Drought & Water Shortage**
 - **Earthquake**
- **Review Mitigation Actions** *Stephanie Hicks*
- **Vulnerability Assessment** *Stephanie Hicks/Zach Wood*
- **What are the next Steps?** *Stephanie Hicks*
- **Announcement of Future Meetings:** *Tammy Kinsley*

Future meetings are scheduled tentatively as follows:

September 14, 2015 – Planning Committee Meeting

October 19, 2015 – Planning Committee Meeting

November 16, 2015 – Planning Committee Meeting

Alpine County HMP
July 27, 2015
Local Planning Team Meetings

Name	Firm/Agency	Phone Number	Email
Brian Peters	Alpine County	530 694-1361	bpeters@alpinecounty.ca.gov
Ed James	CUUSD	775-887-7456	edjames@cuusd.org
Terry Hughes	Eastern Alpine Fire	775-684-9815	ATHUGLOS75@hotmail.com
LINDA GUY	Humboldt - NF USFS TONGUE RIVER	775-771-4776	lguy@fs.fed.us
KAS KORTNER	ALPINE FIRE SAFE COUNCIL	530) 694-1879	khavtraet@hotmail.com
Lisa Christensen	Wasnoe Tribe of NV & Calif.	775-790-7354	lisa.christensen@wasnoetribal.org
ROB BELTRAMO	WASHOE TRIBE OF NV & CA	775/450-1509	rob.beltramo@washoetribal.org
JIM HILTON	South Tahoe PUD	530/543-6286	jhlilton@stpuud.dst.ca.us
TAMMY KINSLEY	ROANDERSON ENG.	(775) 215-8013	tkinsley@roanderson.com
Tony creter	A.P. Baulow	(530) 694-2140	teret@alpinecounty.ca.gov
ZACH WOOD	A.C. PLANNING	(530) 694-1371	zwood@alpinecounty.ca.gov
ZACK ANSEL	KIRKWOOD Meadows PUD	(209) 258-4444 x103	ransel@kmpud.com
Stephanie Hicker	RO Anderson	775.215.5042	shicker@roanderson.com

Mitigation Action	Lead Jurisdiction	Year of Action	Status
Develop a homeowner's guide to earthquake preparedness techniques to educate homeowners on earthquake preparedness.	Alpine County Health & Human Services	2005	
Retrofit all County buildings to withstand earthquake events.	Alpine County Building Department	2005	
Have all school buildings in the district surveyed by a structural engineer to make certain that all structures meet state earthquake standards.	Alpine County School District	2005	
Strengthen the earthen walls of the evaporation ponds to make them more earthquake resistant.	Markleeville Public Utility District	2005	
Replace old World War II surplus pipeline with new piping designed to withstand earthquake stresses.	Markleeville Water Company	2005	
Install flexible connectors between water tanks and water lines to provide a measure of elasticity between infrastructural elements in the water delivery system.	Markleeville Water Company	2005	
Floods			
Review and update County ordinance to ensure no construction takes place in recognized flood-prone areas in the future.	Alpine County Planning Department	2005	
Ensure that all bridges within Alpine County are structurally safe from failure during peak flow scenarios by inspecting the bridges in the County.	Alpine County Public Works Department; CalTrans	2005	
Relocate the United States Forest Service Guard Station to rehabilitate the section of constricted flow on Hot Springs/Markleeville Creek.	Alpine County Public Works Department; USFS	2005	

Revision 7-27-15

Mitigation Action	Lead Jurisdiction	Year of Action	Status
Stockpile sandbags in order to ensure an adequate supply to combat erosion during flood events.	Alpine County Public Works Department	2005	
Increase the capacity of the drainage systems servicing district campuses.	Alpine County School District Buildings and Grounds staff	2005	
Protect main pump station equipment from flood damage by elevating the equipment and/or providing a perimeter barrier to hold back flood water from intruding into the pump station building.	Bear Valley Water Company	2005	
Retrofit district manholes to be water-tight.	Bear Valley Water Company	2005	
Replace old manholes with water-tight products.	Kirkwood Meadows Public Utility District	2005	
Remove 1300 feet of existing sewer main lying along Markleeville Creek and connect customers to an existing main located outside of the stream channel.	Markleeville Public Utility District	2005	
Protect the collection gallery and the supply line from the gallery to the water treatment facility from potential flood damages by reinforcing the collection gallery and relocating the supply line out of the stream channel.	Markleeville Water Company	2005	
Drill one or more back-up wells to ensure a reliable source of water during severe storm and flood events.	Markleeville Water Company	2005	
Construct a facility to provide emergency effluent storage.	South Tahoe Public Utility District	2005	

Revision 7-27-15

Mitigation Action	Lead Jurisdiction	Year of Action	Status
Convert/replace network of ditches with pipeline.	South Tahoe Public Utility District	2005	
Landslide			
As part of road maintenance, inspect road cuts and fills for signs of slope failure. Stabilize slopes as necessary.	Alpine County Public Works Department & Caltrans	2005	
Draft and adopt a County grading ordinance.	Alpine County Public Works Department	2005	
Within a County grading ordinance, ensure cut and fill techniques provide for finished slopes at the angle of repose.	Alpine County Public Works Department	2005	
Within a County grading ordinance, ensure that all disturbed slopes are revegetated after grading to reduce erosion potential while promoting slope stabilization.	Alpine County Public Works Department	2005	
Within County zoning ordinance, draft and adopt measures that limit construction on steep slopes where extensive cut and fill would be necessary.	Alpine County Planning Department	2005	
Severe Storms			
Review and update County ordinance to facilitate adequate snow storage and drainage easements.	Alpine County Public Works, Building, & Planning	2005	
Dedicate snow storage and drainage easements within all new development.	Alpine County Public Works, Building, & Planning	2005	

Revision 7-27-15

Mitigation Action	Lead Jurisdiction	Year of Action	Status
Develop partnerships with concerned citizen groups to identify and implement neighborhood-specific fire safety programs.	Citizens & Alpine County Planning Department	2005	
Develop a fuels reduction program around school campuses to include removal of dead and dying trees and vegetation.	Alpine County School District Buildings and Grounds staff	2005	
Construct a water line and hydrants to provide fire protection to the Kirkwood Inn area of the Kirkwood valley.	Kirkwood Meadows Public Utility District	2005	
Replace old fire hydrants and associated pipe within the Kirkwood valley to assure reliable and adequate firefighting water supply to the Kirkwood service area.	Kirkwood Meadows Public Utility District	2005	
Upgrade the fire resistance of the equipment building.	Markleeville Public Utility District	2005	
Relocate the lift station controls to the equipment building.	Markleeville Public Utility District	2005	
Install a sprinkler system on the water company treatment plant roof to protect it from fire.	Markleeville Water Company	2005	
Retrofit water treatment plant house and pump houses with fire-resistant exterior siding.	Markleeville Water Company	2005	
Procure a generator to allow for service during power-outage conditions.	Markleeville Water Company	2005	

Revision 7-27-15

Mitigation Action	Lead Jurisdiction	Year of Action	Status
Drill one or more back-up wells to provide alternative water sources if the current surface water collection system is rendered unusable due to fire.	Markleeville Water Company	2005	
Control vegetation growth within and around STPUD facilities.	South Tahoe Public Utility District	2005	
Provide reclaimed water for use in fire fighting.	South Tahoe Public Utility District	2005	
Implement a fuels reduction program to provide for defensible space against any potential wildland fire.	Washoe Tribe	2005	

Revision 7-27-15

Hazard Profile Review Check Sheet

Alpine County Hazard Mitigation Plan Update

Hazard Reviewed: _____

Name of Department/Jurisdiction: _____

Prepared by: _____

Phone: _____ Email: _____

- Is the definition of the hazard under **Nature** correct?

- Did you read the section?

- Are there any other existing plans that contain data we should incorporate into this hazard profile? If so, please bring a copy to subcommittee meeting or email to shicks@roanderson.com.

- Please fill out *Historic Hazard Event Worksheet* for any events that have occurred since the 2010 plan update.

- Please provide photographs or any newspaper articles for any events that have occurred since the 2010 plan update.

- Are updated maps available? Accurate?

- Is the frequency (probability of future events) accurate?

- Are there any other inaccuracies or corrections that need to be made?



Historic Hazard Event Worksheet

Alpine County Hazard Mitigation Plan Update

Name of Department/Jurisdiction: _____

Prepared by: _____

Phone: _____ Email: _____

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, or any 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

 RO Anderson

Please return worksheets to:
Stephanie Hicks, AICP, CFM
Email: shicks@roanderson.com

Alpine County HMP Comparison

CA SHMP Chptrs	HAZARD	2004 Hazard Mitigation Plan	Assessment from 06.29.15 Mtg
6.4.2	AVALANCHE	LOW	LOW
6.6.2	DAM FAILURE	LOW	LOW
6.4.4	DROUGHT	MOD	MOD
5.2	EARTHQUAKE	MOD	HIGH
5.3	FLOOD	HIGH	MOD
6.6.4	HAZARDOUS MATERIALS EVENTS		MOD*
6.2	LANDSLIDES	MOD	MOD
6.4.9	SEVERE WEATHER	HIGH	HIGH
6.4.5	UTILITY LOSS		HIGH*
5.4	WILDLAND FIRE	HIGH	HIGH

****New to this Update***

Alpine County Hazard Mitigation Plan Update Local Planning Team

10:00am – 12:00noon, Monday September 14, 2015

Board Chambers
County Administration Building
99 Water Street
Markleeville, CA 96120

AGENDA

Meeting Two

- **Welcome & Introduction** *Brian Peters*
- **Review previously distributed Sections 1-4 & Section 5 Hazards** *Stephanie Hicks*
- **Review Section 5 including:** *Stephanie Hicks*
 - **Floods**
 - **Hazardous Materials Events**
 - **Landslide**
 - **Severe Weather**
 - **Wildland Fire**
- **Review Mitigation Actions** *Stephanie Hicks*
- **Vulnerability Assessment** *Stephanie Hicks/Zach Wood*
- **Public Outreach and Questionnaire** *Tammy Kinsley*
- **What are the next steps?** *Stephanie Hicks*
- **Announcement of Future Meetings:** *Tammy Kinsley*

Future meetings are scheduled tentatively as follows:

October 19, 2015 – Local Planning Team Meeting

November 16, 2015 – Local Planning Team Meeting

January 18, 2016 - Local Planning Team Meeting

Alpine County HMP
September 14, 2015
Local Planning Team Meeting

Name	Firm/Agency	Phone Number	Email
JIM HILTON	STPUD	530-543-6286	
Zach Wood	Alpine COM DEV	694-1571	
Brian Peters	"	694-1341	
Rob Beltramo	WestTribes of Nevada CA	775/265-8600 x10704	rob.beltramo@westtribes.us
Patrick Traynor	ACUSC/ACOE	530.694.2230	PTraynor@AlpineCOE.K12.CO.US
TAMMY KINSLEY	ROANDERSON ENGINEERING	(775) 215-5013	tkinsley@roanderson.com
Stephanie Hicks	ROANDERSON Eng.	775-215-5042	shicks@roanderson.com



MITIGATION QUESTIONNAIRE				
<p>A county partnership has recently been formed to address natural and human-caused hazards that may occur in Alpine County. A local planning team has been selected to oversee this process. In order to identify and plan for future natural and human-caused disasters, we need assistance from the residents of Alpine County. This questionnaire is designed to gauge the level of knowledge local citizens have about natural and human-caused disaster issues and areas vulnerable to any type of natural and human-caused disasters. The information you provide will help coordinate activities to reduce the risk of injury or property damage in the future.</p> <p>This questionnaire consists of 11 questions and will take approximately 5 minutes to complete.</p>				
GENERAL HOUSEHOLD INFORMATION				
<p>The following requested demographic information will aid the Local Planning Team in determining the hazard mitigation needs of our community. For example, indicating whether you own a house or are a tenant will help determine the needs for both renters and homeowners. The answers provided in this action will be treated as confidential, will be used solely for the preparation of this plan, and will not be provided to any other group or interest.</p>				
<p>1. Please indicate your zip code: _____</p> <p>2. Please check all that apply.</p> <p>Do you own a home in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If you do not own a home, do you rent a residence in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own a business located in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own a business outside of Alpine County, but operate your business in the County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own or operate a vehicle in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>				
NATURAL AND HUMAN-CAUSED HAZARD INFORMATION				
<p>The following requested demographic information will aid the Local Planning Team in determining needs and desires for educating and preparing our community for natural and human-caused disasters. The answers provided in this action will be treated as confidential and will be used solely for the preparation of this plan and will not be provided to any other group or interest.</p>				
<p>3. In the past 10 years which of the following types of natural and human-caused hazard events have you or someone in your household experienced within Alpine County, and indicate your level of concern for the hazards impact on Alpine County? (Please check all that apply.)</p>				
Natural and Human-caused Hazards	Have Experienced Y/N	Low Concern	Moderate Concern	High Concern
Avalanche				
Dam Failure				
Drought and Water Shortage				
Earthquakes				
Flood				
Hazardous Materials Events				
Landslides				
Severe Weather				
Communication/Utility Loss				
Wildland Fire				



MITIGATION QUESTIONNAIRE																																		
Other _____																																		
<p>4. Prior to receiving this questionnaire, were you aware of your County's Hazard Mitigation Plan (HMP)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5. Prior to receiving this questionnaire, were you aware that the Federal Emergency Management Agency (FEMA) requires your City to update the HMP every five years in order for your County to be eligible for federal pre- and post-disaster hazard mitigation funds? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>																																		
PREPAREDNESS ACTIVITIES IN YOUR HOUSEHOLD																																		
<p>Households can do many things to prepare for natural and human-caused disasters or emergencies. What you have on hand or are trained to do when a disaster strikes can make a big difference in your comfort and safety in the hours and days following natural and human-caused disasters or emergencies. Basic services, such as electricity, gas, water, and telephones, may be cut off, or you may have to evacuate at a moment's notice. The following questions focus on your household's preparedness for a disaster event.</p>																																		
<p>6. The following questions focus on your household's preparedness for a disaster event.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">In your household, have you or someone in your household:</th> <th style="width: 10%;">Have Experienced</th> <th style="width: 10%;">Plan To Do</th> <th style="width: 10%;">Not Done</th> <th style="width: 10%;">Unable To Do</th> </tr> </thead> <tbody> <tr> <td>Attended meetings or received written information on natural and human-caused disasters or emergency preparedness?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Talked with members of your household about what to do in case of natural and human-caused disasters or emergency?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					In your household, have you or someone in your household:	Have Experienced	Plan To Do	Not Done	Unable To Do	Attended meetings or received written information on natural and human-caused disasters or emergency preparedness?					Talked with members of your household about what to do in case of natural and human-caused disasters or emergency?					Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?					Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?					In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?				
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<p>8. Have you ever received information about how to make your household and home safer from natural and human-caused disasters?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No (IF "NO" Skip to Question 10)</p> <p>If "YES", how recently?</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Within the Last 6 Months</td> <td><input type="checkbox"/> Between 2 to 5 Years</td> </tr> <tr> <td><input type="checkbox"/> Between 6 to 12 Months</td> <td><input type="checkbox"/> 5 Years or More</td> </tr> <tr> <td><input type="checkbox"/> Between 1 to 2 Years</td> <td></td> </tr> </table>					<input type="checkbox"/> Within the Last 6 Months	<input type="checkbox"/> Between 2 to 5 Years	<input type="checkbox"/> Between 6 to 12 Months	<input type="checkbox"/> 5 Years or More	<input type="checkbox"/> Between 1 to 2 Years																									
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MITIGATION QUESTIONNAIRE

9. From whom did you receive information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> News Media | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> University or Research Institution | <input type="checkbox"/> Health District |
| <input type="checkbox"/> Insurance Agent or Company | <input type="checkbox"/> Other Government Agency |
| <input type="checkbox"/> Utility Company | <input type="checkbox"/> Not Sure |
| <input type="checkbox"/> American Red Cross | <input type="checkbox"/> Other : _____ |

10. Who would you most trust to provide you with information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> News Media | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> University or Research Institution | <input type="checkbox"/> Health District |
| <input type="checkbox"/> Insurance Agent or Company | <input type="checkbox"/> Other Government Agency |
| <input type="checkbox"/> Utility Company | <input type="checkbox"/> Not Sure |
| <input type="checkbox"/> American Red Cross | <input type="checkbox"/> Other : _____ |

11. What is the most effective way for you to receive information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| Newspapers: | Other Methods (cont.): |
| <input type="checkbox"/> Newspaper Stories | <input type="checkbox"/> Magazines |
| <input type="checkbox"/> Newspaper Ads | <input type="checkbox"/> Internet |
| Television: | <input type="checkbox"/> Outdoor Advertisements (Billboards, etc.) |
| <input type="checkbox"/> Television Stories | <input type="checkbox"/> Fact Sheet/Brochure |
| <input type="checkbox"/> Television Ads | <input type="checkbox"/> School |
| Radio: | <input type="checkbox"/> University or Research Institution |
| <input type="checkbox"/> Radio Stories | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> Radio Ads | <input type="checkbox"/> Chamber of Commerce |
| Other Methods: | <input type="checkbox"/> Public Workshops/Meetings |
| <input type="checkbox"/> Books | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Postal Mail | |
| <input type="checkbox"/> Email | |

Other Comments:

Please return this questionnaire by mail or drop off to Brian Peters, Community Development Director
Alpine County Community Development 50 Diamond Valley Road, Markleeville, CA 96120
by February 28, 2016. Thank you

**Alpine County Hazard Mitigation Plan Update
Local Planning Team**

10:00am – 12:00noon, Monday October 19, 2015

Board Chambers
County Administration Building
99 Water Street
Markleeville, CA 96120

AGENDA

Meeting Four

- ***Welcome & Introduction*** *Stephanie Hicks*
- ***Review previously distributed Sections 1-4 & Section 5 Hazards*** *Stephanie Hicks*
- ***Vulnerability Assessment*** *Stephanie Hicks/Zach Wood*
- ***Review Section 7 Capabilities Assessment*** *Stephanie Hicks*
- ***Review Section 8 Mitigation Strategy*** *Stephanie Hicks*
- ***Review Section 9 Plan Maintenance*** *Stephanie Hicks*
- ***Public Outreach and Questionnaire*** *Tammy Kinsley*
- ***What are the next steps?*** *Stephanie Hicks*
- ***Announcement of Future Meetings:*** *Tammy Kinsley*

Future meetings are scheduled tentatively as follows:

November 16, 2015 – Local Planning Team Meeting

January 18, 2016 - Local Planning Team Meeting

February 15, 2016 - Local Planning Team Meeting

Alpine County HMP
October 19, 2015
Local Planning Team Meeting

Name	Firm/Agency	Phone Number	Email
JIM HILTON	STPUD		
KIMI JOHNSON	Lake Alpine Water BV	753-2409 (209)	info@lakealpinewater.com
Stephanie Hicks	ROANDERSON	775 215 5042	shicks@randerson.com
TAMMY KINSLEY	ROANDERSON	(775) 215-5013	tkinsley@randerson.com
Zach Wood	Alpine County - Com Dev	530 694 2140	zwoode@alpinecounty.ca.gov
TONY CREETER	ALPINE COUNTY C.I.D	" "	tony@alpinecounty.ca.gov
Isa Christensen	Woshoe Tribe	775-790-7354	isa.christensen@washoetribe.us
Rob Beltramo	Washoe Tribe	775/450-1509	rob.beltramo@washoetribe.us
Patrick Taylor	ALOE	530.694.2230	Patrick@AlpineCOE R.I.E.A.us
Kas Hansen	ALPINE FIRE SAFE COUNCIL	530) 694-1879	

Mitigation Action	Lead Jurisdiction	Year of Action	Status
Avalanche			
Initiate an avalanche warning information system to inform and warn backcountry users of the current level of avalanche danger.	Alpine County Sheriff's Office	2005	No Action. Sierra Avalanche Center initiates warning. Modify action to state, "Initiate or tie into existing Sierra Avalanche Center warning information system..."
Work with the ski resorts of the County on educating skiers on avalanche hazards.	Ski Resort Personnel	2005	Ongoing. Warning signs are posted throughout the back country, there are gates, and information is available on the website.
Develop and expand a backcountry patrol to enforce and fine snowmobile out-of-bounds violations to reduce backcountry avalanche potential.	USFS	2005	Ongoing. Modify action to state, "Maintain a backcountry patrol..."
Dam Failure			
Improve communication with the California Department of Water Resources to ensure that the larger dams in the County have been and continue to be inspected per law.	Alpine County	2005	Ongoing. Alpine County has strong lines of communication and a good relationship with California Division of Water Resources. Dams are inspected annually.
Develop a "Living with Dams" pamphlet to inform potentially affected citizens about dam safety and being prepared in the event of a dam emergency.	Alpine County	2005	There is a low probability of a dam emergency. Only Bear valley would be of issue. A FEMA "Living with Dams" pamphlet was distributed to the Local Planning team for use. Modify action to state, "Develop <u>education and outreach</u> to inform potentially affected..."
Drought & Water Shortage			
Develop a homeowner's guide to water conservation techniques.	Alpine County Health & Human Services	2005	Information is available through California Division of Water Resources for water conservation. Washoe Tribe is currently working on a drought plan. KMPUD discusses conservation techniques in their newsletter. Modify action to state, "Develop <u>education and outreach</u> for water conservation techniques."
Review and update County ordinance concerning septic system installation and maintenance to protect County groundwater reserves from potential septic system contamination.	Alpine County Health & Human Services	2005	No action, but still valid.
Earthquake			

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Mitigation Action	Lead Jurisdiction	Year of Action	Status
Review and update the County Building Code to ensure the construction of seismically safe buildings in Alpine County.	Alpine County Building Department	2014	The Alpine County Building Code is the adopted and amended 2013 California Building Code (CBC) and California Fire Code (CFC) and their adopted appearances. The various "Codes" are typically amended on a 3 year cycle.
Develop a homeowner's guide to earthquake preparedness techniques to educate homeowners on earthquake preparedness.	Alpine County Health & Human Services	2015	Brochures as developed by DisasterSafety.org are available for pickup at the CD office. CD staff is in the process of posting more links on our web page.
Retrofit all County buildings to withstand earthquake events.	Alpine County Building Department	2014	The recently constructed Community Development Dept. office, Sheriff Storage and Government Center & Sheriff's Office meets the 2013 CBC for seismic design standards. The Health Dept. building was constructed circa 2000 and is considered to be substantially compliant. The Courthouse and Library are registered historical buildings. Seismic retrofitting may involve other state agencies. The Bear Valley Community Services building was constructed in 1995 and met adopted standards at that time. Other miscellaneous buildings will be inventoried as resources allow.
Have all school buildings in the district surveyed by a structural engineer to make certain that all structures meet state earthquake standards.	Alpine County School District	2005	Public School buildings and their accessory buildings are subject to the authority of the Dept. of the State Architect and are not under the authority of the County of Alpine Building Safety Div. for structural design.
Strengthen the earthen walls of the evaporation ponds to make them more earthquake resistant.	Markleeville Public Utility District	2005	Evaporation ponds for public utility districts may be subject to the authority of the CA Public Utilities Commission and other agencies. The evaporation ponds are not under the authority of the County of Alpine Building Safety Div. for structural design.
Replace old World War II surplus pipeline with new piping designed to withstand earthquake stresses.	Markleeville Water Company	2005	Water main and lateral supply piping main from private water companies are subject to the authority of state certified environmental health specialists and inspectors. The subject installations are not under the authority of the County of Alpine Building Safety Div.
Install flexible connectors between water tanks and water lines to provide a measure of elasticity between infrastructural elements in the water delivery system.	Markleeville Water Company	2005	Water main and lateral supply piping main from private water companies are subject to the authority of state certified environmental health specialists and inspectors. The subject installations are not under the authority of the County of Alpine Building Safety Div.

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Mitigation Action	Lead Jurisdiction	Year of Action	Status
Floods			
Review and update County ordinance to ensure no construction takes place in recognized flood-prone areas in the future.	Alpine County Planning Department	2005	Carson Water Subconservancy District has initiated a project to update the flood ordinances in 4 counties including Alpine. The process will begin after they select a consultant.
Ensure that all bridges within Alpine County are structurally safe from failure during peak flow scenarios by inspecting the bridges in the County.	Alpine County Public Works Department; CalTrans	2005	Ongoing. Caltrans completes inspections regularly and reports.
Relocate the United States Forest Service Guard Station to rehabilitate the section of constricted flow on Hot Springs/Markleeville Creek.	Alpine County Public Works Department; USFS	2005	Completed. Can remove from list.
Stockpile sandbags in order to ensure an adequate supply to combat erosion during flood events.	Alpine County Public Works Department	2005	Ongoing.
Increase the capacity of the drainage systems servicing district campuses.	Alpine County School District Buildings and Grounds staff	2005	Work done is 2013. Ongoing.
Protect main pump station equipment from flood damage by elevating the equipment and/or providing a perimeter barrier to hold back flood water from intruding into the pump station building.	Bear Valley Water Company	2005	Completed in 2011.
Retrofit district manholes to be water-tight.	Bear Valley Water Company	2005	Ongoing.
Replace old manholes with water-tight products.	Kirkwood Meadows Public Utility District	2005	Check with KMPUD

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Mitigation Action	Lead Jurisdiction	Year of Action	Status
Remove 1300 feet of existing sewer main lying along Markleeville Creek and connect customers to an existing main located outside of the stream channel.	Markleeville Public Utility District	2005	Ongoing. Design is 90% complete; however, construction is pending funding.
Protect the collection gallery and the supply line from the gallery to the water treatment facility from potential flood damages by reinforcing the collection gallery and relocating the supply line out of the stream channel.	Markleeville Water Company	2005	Check with Chris
Drill one or more back-up wells to ensure a reliable source of water during severe storm and flood events.	Markleeville Water Company	2005	An additional well was constructed in 2009 or 2010 for a total of 2. Check with Chris
Construct a facility to provide emergency effluent storage.	South Tahoe Public Utility District	2005	Project is slated for 2020 construction but is dependent on funding.
Convert/replace network of ditches with pipeline.	South Tahoe Public Utility District	2005	Ongoing & funding dependent.
Landslide			
As part of road maintenance, inspect road cuts and fills for signs of slope failure. Stabilize slopes as necessary.	Alpine County Public Works Department & Caltrans	2005	Ongoing
Draft and adopt a County grading ordinance.	Alpine County Public Works Department	2005	No action, but still valid.
Within a County grading ordinance, ensure cut and fill techniques provide for finished slopes at the angle of repose.	Alpine County Public Works Department	2005	Ongoing.

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Mitigation Action	Lead Jurisdiction	Year of Action	Status
Within a County grading ordinance, ensure that all disturbed slopes are revegetated after grading to reduce erosion potential while promoting slope stabilization.	Alpine County Public Works Department	2005	Ongoing.
Within County zoning ordinance, draft and adopt measures that limit construction on steep slopes where extensive cut and fill would be necessary.	Alpine County Planning Department	2005	Ongoing.
Severe Storms			
Review and update County ordinance to facilitate adequate snow storage and drainage easements.	Alpine County Public Works, Building, & Planning	2005	Code has been updated. Modify to state, " Review County ordinance.."
Dedicate snow storage and drainage easements within all new development.	Alpine County Public Works, Building, & Planning	2005	Ongoing. Modify to state, "Dedicate snow storage and drainage easements within all new development when necessary or applicable and retrofit old snow storage areas."
<i>NEW ACTION – Design and install new roof on the Hung-A-Lel-Ti Wellness Center which is used for a shelter for evacuations and mass casualty.</i>	Washoe Tribe	2015	<i>During high wind events, the roof has been damaged.</i>
Wildland Fire			
Review and update County ordinance to ensure the construction of fire-resistant homes in the future.	Alpine County Public Works, Building, & Planning	2005	Ongoing. The State of California has mandated areas of high and very high risk must use ignition resistant and fire resistant materials. WUJ Code.
Enforce County ordinance relating to road construction to facilitate emergency vehicle ingress and egress.	Alpine County Public Works, Building, & Planning	2005	Ongoing. CalFire standards have been incorporated into development standards.

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Mitigation Action	Lead Jurisdiction	Year of Action	Status
Identify wildland interface buffer areas surrounding established communities in the county.	Alpine County Fire Safe Council & Calaveras-Foothill Fire Safe Council	2005	Ongoing.
Reduce fuel loading within identified wildland interface buffer areas.	Individual property owners, Alpine Fire Safe Council, the California Conservation Corp. and affected government agencies.	2005	Ongoing.
Promote improved forest health within the National Forests of the County to reduce fuel loading in the forests of the County.	USFS	2005	Ongoing.
Endorse "firewood sales" by the Forest Service as a method of fuel load reduction in the National Forests of the County.	USFS	2005	Ongoing.
Sponsor a community "burn pile" to promote the removal of refuse from private parcels.	Alpine County Public-Works Community Development Department	2005	Ongoing. Modify action to state, "Sponsor a community "biomass collection" to promote..."

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Mitigation Action	Lead Jurisdiction	Year of Action	Status
Develop a homeowner guide for reducing the threat of wildland fire to private homes.	Alpine Fire Safe Council, Calaveras-Foothill Fire Safe Council, & Eastern Alpine Fire Safe Council	2005	Ongoing. Modify action to state, "Develop Continue a homeowners guide...."
Develop partnerships with concerned citizen groups to identify and implement neighborhood-specific fire safety programs.	Citizens & Alpine County Planning Department Fire Safe Councils & Partners in Prevention	2005	Ongoing. Fire Safe Council works with neighborhood groups and has regular meetings.
Develop a fuels reduction program around school campuses to include removal of dead and dying trees and vegetation.	Alpine County & Sebec District Buildings and Grounds-staff Fire Safe Councils	2005	Ongoing. Recently done by STPUD, Fire Safe Council and U.S. Forest Service.
Construct a water line and hydrants to provide fire protection to the Kirkwood Inn area of the Kirkwood valley.	Kirkwood Meadows Public Utility District	2005	No action, but still valid.
Replace old fire hydrants and associated pipe within the Kirkwood valley to assure reliable and adequate firefighting water supply to the Kirkwood service area.	Kirkwood Meadows Public Utility District	2005	Ongoing.
Upgrade the fire resistance of the equipment building.	Markleeville Public Utility District	2005	No action, but still valid.

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**Alpine County Hazard Mitigation Plan Update
Local Planning Team**

10:00am – 12:00noon, Monday November 16, 2015

Board Chambers
County Administration Building
99 Water Street
Markleeville, CA 96120

AGENDA

Meeting Five

- ***Welcome & Introduction*** *Stephanie Hicks*
- ***Review previously distributed Sections 1-5, and 7*** *Stephanie Hicks*
- ***Vulnerability Assessment*** *Stephanie Hicks/Zach Wood*
- ***Review Section 8 Mitigation Strategy*** *Stephanie Hicks*
- ***Review Section 9 Plan Maintenance*** *Stephanie Hicks*
- ***Public Outreach and Questionnaire*** *Tammy Kinsley*
- ***What are the next steps?*** *Stephanie Hicks*
- ***Announcement of Future Meetings:*** *Tammy Kinsley*

Future meetings are scheduled tentatively as follows:

January 18, 2016 - Local Planning Team Meeting
February 22, 2016 - Local Planning Team Meeting
February 25, 2016 – Local Planning Team Meeting

Alpine County HMP
November 16, 2015
Local Planning Team Meeting

Name	Firm/Agency	Phone Number	Email
LINDA A. GUY	USFS HTNF	775.355.5376 (0) 775.771.4776 (0)	lguy@fs.fed.us
JIM HILTON	STPUD		
Brida Peters	Alpine County		
Kimberly Coranz	Cal OES	916-616-1403	Kimberly.Coranz@caloes.ca.gov
Kels Herbert	ARCC	530)694-1879	kherbert@hotmail.com
TONY CREGER	AC CD	694-2140 x 428	tonycr@alpinecounty.ca.gov
Rob Belfrage	Washe Tide	775/265-9100	rob.belfrage@washe-tide.com
Dennis Gumpson John Wood	Environmental Health AC CD	530-694-2146	DGumpson@AlpineCounty.ca.gov
TAMMY KINSLAY	ROANDERSON ENGINEERING	(775) 215-5013	tkinslay@roanderson.com
Stephanie Hicks	RO Anderson	(775) 215-5042	shickseroanderson.com



MITIGATION QUESTIONNAIRE				
<p>A county partnership has recently been formed to address natural and human-caused hazards that may occur in Alpine County. A local planning team has been selected to oversee this process. In order to identify and plan for future natural and human-caused disasters, we need assistance from the residents of Alpine County. This questionnaire is designed to gauge the level of knowledge local citizens have about natural and human-caused disaster issues and areas vulnerable to any type of natural and human-caused disasters. The information you provide will help coordinate activities to reduce the risk of injury or property damage in the future.</p> <p>This questionnaire consists of 11 questions and will take approximately 5 minutes to complete.</p>				
GENERAL HOUSEHOLD INFORMATION				
<p>The following requested demographic information will aid the Local Planning Team in determining the hazard mitigation needs of our community. For example, indicating whether you own a house or are a tenant will help determine the needs for both renters and homeowners. The answers provided in this action will be treated as confidential, will be used solely for the preparation of this plan, and will not be provided to any other group or interest.</p>				
<p>1. Please indicate your zip code: _____</p> <p>2. Please check all that apply.</p> <p>Do you own a home in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If you do not own a home, do you rent a residence in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own a business located in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own a business outside of Alpine County, but operate your business in the County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Do you own or operate a vehicle in Alpine County? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>				
NATURAL AND HUMAN-CAUSED HAZARD INFORMATION				
<p>The following requested demographic information will aid the Local Planning Team in determining needs and desires for educating and preparing our community for natural and human-caused disasters. The answers provided in this action will be treated as confidential and will be used solely for the preparation of this plan and will not be provided to any other group or interest.</p>				
<p>3. In the past 10 years which of the following types of natural and human-caused hazard events have you or someone in your household experienced within Alpine County, and indicate your level of concern for the hazards impact on Alpine County? (Please check all that apply.)</p>				
Natural and Human-caused Hazards	Have Experienced Y/N	Low Concern	Moderate Concern	High Concern
Avalanche				
Dam Failure				
Drought and Water Shortage				
Earthquakes				
Flood				
Hazardous Materials Events				
Landslides				
Severe Weather				
Communication/Utility Loss				
Wildland Fire				



MITIGATION QUESTIONNAIRE																																		
Other _____																																		
<p>4. Prior to receiving this questionnaire, were you aware of your County's Hazard Mitigation Plan (HMP)? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>5. Prior to receiving this questionnaire, were you aware that the Federal Emergency Management Agency (FEMA) requires your City to update the HMP every five years in order for your County to be eligible for federal pre- and post-disaster hazard mitigation funds? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>																																		
PREPAREDNESS ACTIVITIES IN YOUR HOUSEHOLD																																		
<p>Households can do many things to prepare for natural and human-caused disasters or emergencies. What you have on hand or are trained to do when a disaster strikes can make a big difference in your comfort and safety in the hours and days following natural and human-caused disasters or emergencies. Basic services, such as electricity, gas, water, and telephones, may be cut off, or you may have to evacuate at a moment's notice. The following questions focus on your household's preparedness for a disaster event.</p>																																		
<p>6. The following questions focus on your household's preparedness for a disaster event.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">In your household, have you or someone in your household:</th> <th style="width: 10%;">Have Experienced</th> <th style="width: 10%;">Plan To Do</th> <th style="width: 10%;">Not Done</th> <th style="width: 10%;">Unable To Do</th> </tr> </thead> <tbody> <tr> <td>Attended meetings or received written information on natural and human-caused disasters or emergency preparedness?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Talked with members of your household about what to do in case of natural and human-caused disasters or emergency?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					In your household, have you or someone in your household:	Have Experienced	Plan To Do	Not Done	Unable To Do	Attended meetings or received written information on natural and human-caused disasters or emergency preparedness?					Talked with members of your household about what to do in case of natural and human-caused disasters or emergency?					Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?					Prepared a "Disaster Supply Kit" (stored extra food, water, batteries, or other emergency supplies)?					In the last year, has anyone in your household been trained in First Aid, Cardio-Pulmonary Resuscitation (CPR) or Automated External Defibrillator (AED)?				
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<p>7. What steps, if any, have you or someone in your household taken to prepare for natural and human-caused disasters?</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Food <input type="checkbox"/> Water <input type="checkbox"/> Flashlight(s) <input type="checkbox"/> Batteries <input type="checkbox"/> Battery-Powered Radio <input type="checkbox"/> Make a Fire Escape Plan <input type="checkbox"/> Fire Extinguisher </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Prepared a Disaster Supply Kit <input type="checkbox"/> Medical Supplies (First Aid Kit) <input type="checkbox"/> Received First Aid/CPR/AED Training <input type="checkbox"/> Developed a Reconnection Plan (Where to Go and Who to Call) <input type="checkbox"/> Discussed Utility Shutoffs <input type="checkbox"/> Smoke Detector on Each Level of the Home <input type="checkbox"/> Other (please specify): _____ </td> </tr> </table>					<input type="checkbox"/> Food <input type="checkbox"/> Water <input type="checkbox"/> Flashlight(s) <input type="checkbox"/> Batteries <input type="checkbox"/> Battery-Powered Radio <input type="checkbox"/> Make a Fire Escape Plan <input type="checkbox"/> Fire Extinguisher	<input type="checkbox"/> Prepared a Disaster Supply Kit <input type="checkbox"/> Medical Supplies (First Aid Kit) <input type="checkbox"/> Received First Aid/CPR/AED Training <input type="checkbox"/> Developed a Reconnection Plan (Where to Go and Who to Call) <input type="checkbox"/> Discussed Utility Shutoffs <input type="checkbox"/> Smoke Detector on Each Level of the Home <input type="checkbox"/> Other (please specify): _____																												
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<p>8. Have you ever received information about how to make your household and home safer from natural and human-caused disasters?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No (IF "NO" Skip to Question 10)</p> <p>If "YES", how recently?</p> <table style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Within the Last 6 Months <input type="checkbox"/> Between 6 to 12 Months <input type="checkbox"/> Between 1 to 2 Years </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Between 2 to 5 Years <input type="checkbox"/> 5 Years or More </td> </tr> </table>					<input type="checkbox"/> Within the Last 6 Months <input type="checkbox"/> Between 6 to 12 Months <input type="checkbox"/> Between 1 to 2 Years	<input type="checkbox"/> Between 2 to 5 Years <input type="checkbox"/> 5 Years or More																												
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MITIGATION QUESTIONNAIRE

9. From whom did you receive information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> News Media | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> University or Research Institution | <input type="checkbox"/> Health District |
| <input type="checkbox"/> Insurance Agent or Company | <input type="checkbox"/> Other Government Agency |
| <input type="checkbox"/> Utility Company | <input type="checkbox"/> Not Sure |
| <input type="checkbox"/> American Red Cross | <input type="checkbox"/> Other : _____ |

10. Who would you most trust to provide you with information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| <input type="checkbox"/> News Media | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> University or Research Institution | <input type="checkbox"/> Health District |
| <input type="checkbox"/> Insurance Agent or Company | <input type="checkbox"/> Other Government Agency |
| <input type="checkbox"/> Utility Company | <input type="checkbox"/> Not Sure |
| <input type="checkbox"/> American Red Cross | <input type="checkbox"/> Other : _____ |

11. What is the most effective way for you to receive information about how to make your household and home safer from natural and human-caused disasters? (Please check all that apply.)

- | | |
|---|--|
| Newspapers: | Other Methods (cont.): |
| <input type="checkbox"/> Newspaper Stories | <input type="checkbox"/> Magazines |
| <input type="checkbox"/> Newspaper Ads | <input type="checkbox"/> Internet |
| Television: | <input type="checkbox"/> Outdoor Advertisements (Billboards, etc.) |
| <input type="checkbox"/> Television Stories | <input type="checkbox"/> Fact Sheet/Brochure |
| <input type="checkbox"/> Television Ads | <input type="checkbox"/> School |
| Radio: | <input type="checkbox"/> University or Research Institution |
| <input type="checkbox"/> Radio Stories | <input type="checkbox"/> Fire Department/Emergency Manager |
| <input type="checkbox"/> Radio Ads | <input type="checkbox"/> Chamber of Commerce |
| Other Methods: | <input type="checkbox"/> Public Workshops/Meetings |
| <input type="checkbox"/> Books | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Postal Mail | |
| <input type="checkbox"/> Email | |

Other Comments:

Empty box for other comments.

Please return this questionnaire by mail or drop off to Brian Peters, Community Development Director
Alpine County Community Development 50 Diamond Valley Road, Markleeville, CA 96120
by March 24, 2016. *Thank you*

Alpine County Hazard Mitigation Plan Update Local Planning Team

10:00am – 12:00noon, Wednesday January 20, 2016

Board Chambers
County Administration Building
99 Water Street
Markleeville, CA 96120

AGENDA

Meeting Six

- **Welcome & Introduction** *Stephanie Hicks*
- **Review Draft Plan** *Stephanie Hicks*
- **Vulnerability Assessment** *Stephanie Hicks/Zach Wood*
- **Prioritize Mitigation Actions using STAPLE+E** *Stephanie Hicks/
Tammy Kinsley*
- **Public Outreach at Workshop and Questionnaire** *Tammy Kinsley*
- **What are the next steps?** *Stephanie Hicks*

Future meetings are scheduled tentatively as follows:

Workshop

ALPINE COUNTY HMP
LOCAL PLANNING TEAM
MEETING JAN 20, 2016

SIGN-IN-SHEET

<u>NAME</u>	<u>CONTACT EMAIL</u>
Stephanie Hicks, R.O. Anderson	shicks@roanderson.com
TAMMY KINSLEY, R.O. ANDERSON, ENR	tkinsley@roanderson.com
JIM HILTON STPUD	
Amy Broddhunt Alpine County Behavioral Health Service	
Patrick Traynor Alpine COE	PTraynor@AlpineCOE.ca.us
Jessica Young ACOE	jyoung@alpinecoe.ca.us
Kimberly Lorenz Cal OES	kimberly.lorenz@caloes.ca.us
Lisa Christensen Washoe Tribe	Lisa.Christensen@washotribe.us
Erl James CWSD	erl.james@cwso.org

Below is the STAPLE+E evaluation criteria developed by FEMA. Each of the potential actions will be scored by using rankings of 1 for the lowest and 5 for the highest priority, acceptance, feasibility, etc.

Please insert your numeric ranking in the separate STAPLE+E form and calculate the priority totals.

Table 8-3: STAPLE+E Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider..."	Considerations
Social	The public Support for the overall mitigation strategy and specific mitigation actions	Community acceptance; adversely affects population
Technical	If the mitigation action is technically feasible and if it is the whole or partial solution	Technical feasibility; Long-term solutions; Secondary impacts
Administrative	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing; Funding allocation; Maintenance/operations
Political	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support; Local champion; Public support
Legal	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations	Local, State, and Federal authority; Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit Cost Analysis	Benefit/cost of action; Contributes to other economic goals; Outside funding required; FEMA Benefit Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy community	Effect on local flora and fauna; Consistent with community environmental goals; Consistent with local, State and Federal laws

STAPLE + E Evaluation Table

	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)					E (Environmental)					PT
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total	
<p>Considerations ↑↑</p> <p>Mitigation Actions →</p>																									
<p>1.A Enhance/Develop the Seasonal Multi-Hazard Public Awareness Program</p> <p>1.B Review/update the General Plan to integrate components of the LHMP.</p> <p>1.C Adopt CBC 2016 code and local facts and findings.</p> <p>2.A Develop, enhance, and implement education programs aimed at mitigating natural hazard, and reducing the risk to citizens, public agencies, private property owners, business, and schools.</p> <p>2.B Increase interagency coordination and cooperation.</p> <p>2.C Obtain additional data needed for GIS</p>																									

STAPLE + E Evaluation Table

	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)					PT
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
<p>Considerations ↑</p> <p>Mitigation Actions →</p>																								
<p>mapping to understand and improve knowledge about Alpine County's vulnerabilities.</p> <p>2.D Utilize the county website and social media as a communication tool, as well as an education tool for hazard loss prevention.</p> <p>2.E Conduct a minimum of one disaster exercise each year.</p> <p>3. A. Initiate or tie into existing Sierra Avalanche Center avalanche warning information system to inform and warn backcountry users of the current level of avalanche danger.</p> <p>3.B Work with the ski resorts of the County on educating skiers on avalanche hazards.</p>																								

STAPLE + E Evaluation Table

	S (Social)	T (Technical)	A (Administrative)	P (Political)			L (Legal)			E (Economic)				E (Environmental)					PT
				Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	
<p>Considerations ↑</p> <p>Mitigation Actions →</p>	Community Acceptance Effect on Segment of Population	Technical Feasibility Long-term Solution Secondary Impacts	Staffing Funding Allocated Maintenance/ Operations	Political Support Local Champion Public Support	State Authority Existing Local Authority Potential Legal Challenge	Benefit of Action Cost of Action Contributes to Economic Goals Outside Funding Required	Effect on Land/Water Effect on Endangered Species Effect on HAZMAT/Waste Sites Consistent with Native Habitat Consistent with Local / Federal Laws											Priority Total	
3.C. Maintain a backcountry patrol to enforce and fine snowmobile out-of-bounds violations to reduce backcountry avalanche potential.																			
4.A. Improve communication with the California Department of Water Resources to ensure that the larger dams in the County have been and continue to be inspected per law.																			
4.B. Develop education and outreach to inform potentially affected citizens about dam safety and being prepared in the event of a dam emergency.																			
5.A. Develop education and outreach for water conservation techniques.																			
5.B. Review and update County ordinance																			

STAPLE + E Evaluation Table

	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)					E (Environmental)					PT
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total	
<p>Considerations ↑</p> <p>Mitigation Actions →</p>																									
<p>concerning septic system installation and maintenance to protect County groundwater reserves from potential septic system contamination.</p> <p>6.A Review and update the County Building Code to ensure the construction of seismically safe buildings in Alpine County.</p> <p>6.B Develop a homeowner's guide to earthquake preparedness techniques to educate homeowners on earthquake preparedness.</p> <p>6.C Retrofit all County buildings to withstand earthquake events</p> <p>6.D Have all school buildings in the district surveyed by a structural</p>																									

STAPLE + E Evaluation Table

	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)					PT
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/ Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws	Priority Total
<p>Considerations ↑</p> <p>Mitigation Actions →</p>																								
<p>10.A Review and update County ordinance to ensure the construction of fire-resistant homes in the future.</p> <p>10.B Enforce County ordinance relating to road construction to facilitate emergency vehicle ingress and egress.</p> <p>10.C Identify wildland interface buffer areas surrounding established communities in the county.</p> <p>10.D Reduce fuel loading within identified wildland interface buffer areas.</p>																								

STAPLE + E Evaluation Table

	S (Social)	T (Technical)	A (Administrative)	P (Political)			L (Legal)			E (Economic)				E (Environmental)				PT
				Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/ Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	
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<p>10.M Upgrade the fire resistance of the equipment building.</p> <p>10.N Relocate the lift station controls to the equipment building.</p> <p>10.O Install a sprinkler system on the water company treatment plant roof to protect it from fire.</p> <p>10.P Retrofit water</p>																		

STAPLE + E Evaluation Table

	S (Social)	T (Technical)	A (Administrative)	P (Political)			L (Legal)			E (Economic)				E (Environmental)					PT					
				Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT/Waste Sites	Consistent with Native Habitat	Consistent with Local / Federal Laws						
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reclaimed water for use in firefighting.																								
10.U Implement a fuels reduction program to provide for defensible space against any potential wildland fire.																								
10.V Explore feasibility of a second ingress/egress at Marble Village for evacuation and emergency services.																								
10.W Prepare feasibility study to determine whether a biomass-to-bioenergy facility is viable for fuels reduction and forest thinning in Alpine County. The																								

STAPLE + E Evaluation Table

PT	E					L	P			A			T			S									
	(Environmental)						(Legal)	(Political)			(Administrative)			(Technical)			(Social)								
Priority Total	Consistent with Local / Federal Laws	Consistent with Native Habitat	Effect on HAZMAT/Waste Sites	Effect on Endangered Species	Effect on Land/ Water	Potential Legal Challenge	Outside Funding Required	Contributes to Economic Goals	Cost of Action	Benefit of Action	Potential Legal Challenge	Existing Local Authority	State Authority	Public Support	Local Champion	Political Support	Maintenance/ Operations	Funding Allocated	Staffing	Secondary Impacts	Long-term Solution	Technical Feasibility	Effect on Segment of Population	Community Acceptance	<p>Considerations ↑</p> <p>Mitigation Actions →</p> <p>project may be infeasible due to any number of economic conditions.</p>

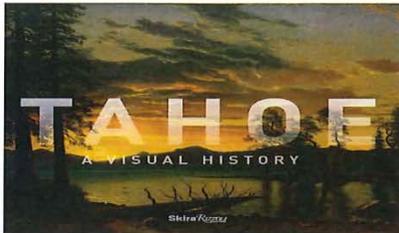


50+ Club Potluck

Thursday March 10, 2016 5pm

(new time this month only)

The Learning Center 100 Foothill Rd.



VIEWING 30 MINUTE DVD

TAHOE: A VISUAL HISTORY

FROM EXHIBIT AT NV MUSEUM OF ART

CORNED BEEF & CABBAGE PROVIDED

PLEASE BRING SALAD OR DESSERT TO SHARE.

Representatives will be on-site with information about Alpine County's
Local Hazard Mitigation Plan

Reserve your spot March 10th for outing to Shakespeare on the Lake, "A Comedy of Errors"
on August 11th . Performance starts at 7:30pm, we will provided bus transportation from
Learning Center at 4:30pm. Space is limited, Cost \$20 and food is on your own.



For more information please call Amy Broadhurst
694.1320, or abroadhurst@alpinecountycalifornia.gov



Appendix F
Plan Maintenance Documents

Sample Press Release for
Annual Maintenance Meeting

Alpine County, California is meeting to review and maintain its Local Hazard Mitigation Plan to assess risks posed by natural and human caused disasters and identify ways to reduce those risks. This plan is required under the Federal Disaster Mitigation Act of 2000 as a prerequisite for receiving certain forms of Federal disaster assistance.

The plan can be found on the County's website at website address:
www.alpinecountyca.gov

Public comments and participation are welcomed.
For additional information or to request to participate, or to submit comments, please contact Brian Peters, Director
Alpine County Community Development Department,
at (530) 694-2140 or email address: bpeters@alpinecountyca.gov



COUNTY OF ALPINE
Community Development

Brian Peters, Director

May 27, 2015

Dear Neighboring Community,

We would like to invite you to participate in the update of our Alpine County Hazard Mitigation Plan update.

Over the next few months, we will conduct a planning effort to update our Regional Hazard Mitigation Plan for Alpine County. This updated plan will be developed to facilitate compliance with federal requirements and to provide a tool for local government, industry, and private venues to help reduce the impact of these threats. Further, the plan will help our community develop infrastructure to lessen potential damage.

One of the major components of the plan development is having a good cross-section of community input and participation by neighboring communities, and that is the reason for this invitation. I am hoping that you will agree to be included on the Local Planning Team. The level of commitment will involve a few meetings, plus a review of the components of the plan as they are written. I anticipate meeting five times over the next eight to ten months. Generally, much of the work can be completed via email.

I am hoping that you can participate as a representative of your profession. If you are willing to join our team, please RSVP to me at bpeters@alpinecountyca.gov or at 530-694-1361.

Cordially,

Brian Peters,
Community Development Director

50 Diamond Valley Road, Markleeville, CA 96120 (530) 694-2140 / Fax (530) 694-2149
www.alpinecountyca.gov

Annual Review Questionnaire

PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
PLANNING PROCESS	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action?			
	Are there procedures (e.g., meeting announcement, plan updates) that can be done more efficiently?			
	Has the Steering committee undertaken any public outreach activities regarding the HMP or implementation of mitigation actions?			
HAZARD PROFILES	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazards studies available? If so, what have they revealed?			
VULNERABILITY ANALYSIS	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
MITIGATION STRATEGY	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning?			
	Are the goals still applicable?			
	Should new mitigation actions be added to a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			

Plan Goal(s) Address

Goal: _____

Indicator of Success: _____

Project Status

Project on schedule

Project completed

Project delayed*

*explain _____

Project Cancelled

Project Cost Status

Cost unchanged

Cost overrun*

*explain _____

Cost underrun*

*explain _____

Summary of progress on project for this report:

A. what was accomplished during this reporting period?

B. What obstacles, problems, or delays did you encounter, if any?

C. How was each problem resolved?

Next Steps: What are the next step(s) to be accomplished over the next reporting period?

Annexes A - D

Jurisdictional Annexes

For this 2016 update to the Alpine County MJHMP, the Jurisdictional Annexes, are working together with the Alpine County overall plan to detail the hazard mitigation planning elements specific to each participating jurisdiction. Each Annex is intended to append, supplement and to be incorporated in the overall plan for Alpine County. The Annexes do not stand alone for each of the jurisdictions. They are to be utilized as a reference. The plan Chapters 1 – 10 of the overall plan, which includes the planning process, the hazard analysis, the vulnerability analysis, the capability assessment, mitigation strategies and the plan maintenance apply to and were met by each participating jurisdiction. This annex section focuses on providing any additional details on the risk assessment and mitigation strategies specific to the jurisdiction and beyond the overall plan. The following jurisdictions have requested to be annexed to the Alpine County Multi-Jurisdictional Hazard Mitigation update:

- Annex A: Alpine County Unified School District and Office of Education
- Annex B: Bear Valley Water District
- Annex C: Kirkwood Meadows Public Utility District
- Annex D: Markleeville Public Utility District