SUMMARY
Plumas County
Local Hazard Mitigation Plan (LHMP) Update
HMPC Meeting #2 - Risk Assessment
April 15, 2020

Hazard Identification & Profiles: Plumas County

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

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence

Geographic Extent	**Magnitude/Severity**
Limited: Less than 10% of planning area	Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Significant: 10-50% of planning area	Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Extensive: 50-100% of planning area	
Likelihood of Future Occurrences	
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.	Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.	Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.	**Significance**
	Low: minimal potential impact
	Medium: moderate potential impact
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.	High: widespread potential impact
	Climate Change Influence
	Low: minimal potential impact
	Medium: moderate potential impact
	High: widespread potential impact

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

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

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low**: The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low**: Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.

- **Medium**: Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**: Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High**: Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Plumas County Planning Area

Avalanche

- The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement create an avalanching episode.
- There have been no disaster declarations or NCDC events associated with avalanche in Plumas County.
- An avalanche occurred in the winter of 2012 near Sloat. No injuries or deaths were reported. Timber stock in the avalanche area was damaged, though no damage estimates were available.
- OTHERS? CAN THE COUNTY PROVIDE INFORMATION ON PAST OCCURRENCES OR SPECIFIC AREAS/CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Low
- Non-Priority Hazard

Climate Change

- The 2018 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- OTHERS? CAN THE COUNTY PROVIDE INFORMATION ON EVIDENCE OF PAST OCCURRENCES OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal OES, National Performance of Dam's data, and DSOD, there are 22 dams in Plumas County. Of these 22 dams; 2 were rated as extremely high, 14 rated as High Hazard, 4 as Significant Hazard, and 2 as Low Hazard.
- There is 1 (High Hazard) dam of concern to Plumas in Lassen County – Indian Ole
- The most significant dams of concern include the Extremely High and High Hazard where loss of life is possible.
- According to multiple sources, there have been no past dam failure events or issues of concern.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High
- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Plumas County Planning Area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack at 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels were the highest they've been in 22 years. But then back down again in early 2018, only to be back up again in late 2018/2019. 2019/2020 is continuing to see a fair amount of rain.
- 2 state (1977, 2014) disaster declarations and 1 federal declaration (1977) for Plumas County since 1950. There have been 2 NCDC drought events in Plumas County, all related to events in the 2014 to 2016 drought.
- The 2035 Plumas County General Plan Water Resources Element noted that the amount of precipitation received throughout the watershed varies but greatly contributes to the significant amount of water available in the County and throughout the region.
- WHAT CAN YOU ADD ON WATER SUPPLY SOURCES AND RELIABILITY?
- HMPC – CAN YOU PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED IN THE COUNTY RECENTLY DUE TO THE MOST RECENT DROUGHT. WHAT HAS BEEN IMPACTED THE MOST?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: Medium
- Priority Hazard

Earthquake

- Plumas County is located in a relatively aseismic area with respect to other more seismically active areas in California. Several potentially active faults pass through Plumas County. The Almanor Fault, Butt Creek Fault Zone, and the Mohawk Valley Fault traverse the County. The Indian Valley Fault is also considered an active fault located within the County. Additionally, the Honey Lake and Fort Sage Faults are two active faults located east of the County
- The USGS National Seismic Hazard Maps provides acceleration and probabilities for various time periods. Plumas County falls within an area of mostly low to moderate seismic risk.
- USGS identified 41, 5.0 or greater earthquakes have occurred within 90 miles of Quincy.
- A series of earthquakes occurred near Lake Almanor on May 24, 2013. This included a 5.7 magnitude earthquake near Canyon Dam, near the southern end of Lake Almanor. Injuries were reported and damage to infrastructure and homes were sustained. Lake Almanor Mutual Water Company sustained a water main rupture which resulted in water supply loss, and 600 PG&E customers on the Lake Almanor peninsula lost power.
- OTHERS? FELT OCCURRENCES? PAST DAMAGES?
- HAVE ANY STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES? DO COMMUNITIES HAVE A URM OR OTHER INVENTORY?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: High
- Priority Hazard

Flood Hazards

100/500 year

- Historically, portions of Plumas County have always been at risk to flooding because of its annual percentage of rainfall in the winter and the number of watercourses that traverse the County. According to the 2005 Flood Insurance Study for Plumas County Flooding in Plumas County may be caused by either general rainstorms or cloudburst storms. Cloudbursts are high intensity floods and can produce peak flows substantially larger than those of general rainstorms.
- 16 state and 15 federal declarations from 1950-present were for heavy rains and flooding. 13 NCDC Flood Events.
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- NEED SUMMARY OF IMPACTS FROM THE (2) 2017 FLOOD EVENTS (THAT RESULTED IN DISASTER DECLRATIONS) AND OTHERS SINCE THE 2014 PLAN.
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- CAN THE HMPC PROVIDE DETAILS ON PROBLEM AREAS? PAST OCCURRENCES?
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Landslides, Mudslides, and Debris Flows

- The 2035 Plumas County General Plan Public Health & Safety Element noted that areas with steep slopes in the County could be prone to landslides, mud slides and avalanches.
- There have been no disaster declarations associated with landslides in Plumas County. The NCDC contains no records of landslides in the County.
- Landslide mapping indicate that a couple portions of the southwestern County are at moderate risk for landslides. The rest of the County is at low risk.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES? 6 EVENTS NOTED FROM 2006-2013.
- CAN THE COUNTY PROVIDE INFORMATION ON PAST LANDSLIDE EVENTS SINCE 2013?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard?

Levee Failure

- A search of the National Levee Database identified 3 leveed areas in Plumas County. None of these 3 levees are certified as providing protection from the 1% annual chance or other flood. These levees include: 1) Plumas County Levee 1 (near Taylorsville); 2) Plumas County Levee 2 (near Greenville); and 3) North Fork Feather River at Chester (near Chester) – East and West levees

- DOES ANYONE HAVE ADDITIONAL INFORMATION ON THESE LEVEES?
- No disaster declarations associated with levee failures; the NCDC does not identify any levee failure events.
- ANY PAST LEVEE FAILURE EVENTS/ISSUES/CONCERNS TO NOTE?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Priority Hazard

Pandemic

- The 20th Century had 3 Pandemics (WHO): 1918-1919 Influenza Pandemic (H1N1),1957-1958 Influenza Pandemic (H2N2), and the 1968 Influenza Pandemic (H3N2). The 21st Century had 2 Pandemics (WHO): 2009 Swine Flu (H1N1) and 2020 Covid-19.
- One 2020 federal declaration for Covid-19; the NCDC does not track pandemics.
- CAN WE GET A SUMMARY OF COVID-19 IN PLUMAS COUNTY (STATISTICS/ IMPACTS/ RESPONSE)? WHAT ABOUT THE 2009 SWINE FLU?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Tree Mortality

- On October 30, 2015, California proclaimed a State of Emergency and included provisions to expedite the removal and disposal of dead and dying hazardous trees. As a result, costs related to identification, removal, and disposal of dead and dying trees caused from drought conditions may be eligible for California Disaster Assistance Act (CDAA) reimbursement.
- There have been four (multi-year) tree mortality events in the County since 1980.
- WHAT ARE THE PRIMARY ISSUES/CONCERNS/IMPACTS? DOES THE COUNTY HAVE STATS ON THE ACRES OF TREE MORTALITY? WHAT IS THE COUNTY DOING TO MITIGATE?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Severe weather

Extreme Heat

- Annual occurrences of hot temperatures. The highest recorded daily extreme was 110°F in August 1981 and September 1988 in Plumas (Quincy). In a typical year, maximum temperatures exceed 90°F on 45.3 days in Plumas.
- No extreme heat events (NCDC) since 1993; No state or federal disaster declarations
- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS/MAJOR CONCERNS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard?

Heavy rains and storms (Hail, Lightning)

- Significant County history: annual occurrences; High intensity cloudburst and heavy rains occur in the Plumas County Planning Area. Severe storms/heavy rains are the primary cause of most major flooding
- The NCDC data recorded 19 hail, 47 rain, and 1 lightning event for Plumas County since 1950, for a total of 67 NCDC events.
- There have been 16 federal and 15 state declarations since 1950 for flooding, including heavy rains and storms.
- CAN THE HMPC PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS IN THE COUNTY SINCE 2014. PA SHEEETS? EOC ACTIVATIONS? OTHER?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes – non reported
- The NCDC data recorded 92 high wind events; no events for tornadoes since 1955.
- Biggest issues are associated with wind fueling fires and also triggering PSPS events.
- CAN THE HMPC PROVIDE INFORMATION ON PAST HIGH WINDS AND TORNADO EVENTS AND DAMAGES? WHAT ARE THE PRIMARY CONCERNS TO THE COUNTY?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Winter Storms and Freeze

- Annual occurrences of cold temperatures. The lowest recorded daily extreme was -28°F in January 1937. In a typical year, minimum temperatures fall below 32°F on 166.9 days in Plumas, with 1.5 days falling below 0°.
- Average snowfall in Plumas is 55.1 inches with record snowfall in 1952 of 167.2 inches.
- The County has no state or federal disaster declarations for extreme cold and freeze. NCDC identified 3 extreme cold or freeze events as well as 431 winter weather, snow and snow storms.
- PLEASE PROVIDE DETAILS ON EXTREME COLD, FREEZE, AND WINTER STORM (SNOW) EVENTS IN THE COUNTY. WHAT ARE THE MOST SIGNIFICANT ISSUES/CONCERNS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Volcano

- Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Lassen Peak is the closet potential threat to Plumas County.
- Lassen Peak experienced a significant eruption in 1915.
- DOES THE COUNTY HAVE RECORDS OF PAST ISSUES/ DAMAGES TO PLUMAS, IF ANY?
- No federal or state disaster declaration. No NCDC events for volcanoes.
- WHAT ARE THE COUNTY'S CONCERNS FROM LASSEN PEAK/OTHERS?
- Likelihood of Future Occurrence: Unlikely

- Vulnerability: Medium
- Non-Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Plumas County Planning Area.
- Any ignition has the potential to become an out of control wildfire. Wildfire is one of the most significant hazard the County faces.
- 2 state and 3 federal disaster declarations for Wildfire since 1950: 1960 -unnamed fire; 1987 -Clarks Fire; 1999 –Bucks Fire; 2008 BTU Lightning Complex Fire.
- Other large fires to note: 2019 Walker Fire (54,612); 2018 Camp Fire (153,336); 2012 Chips Fire (76,350); 2007 Moonlight Fire (64,960); 2007 Wheeler Fire (22,332); 2000 Storrie Fire (56,076); 1951 Milk Ranch Fire (21,979); OTHERS?
- 10 NCDC wildfire events since 1993; 1 of these for smoke.
- CAN THE COUNTY IDENTIFY THE MOST SIGNIFICANT HSITORIC WILDFIRES AND PAST DAMAGES/ IMPACTS/ ISSUES?
- DOES THE COUNTY HAVE INFORMATION ON 2019 PSPS EVENTS AFFECTING PLUMAS? ANY?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Data Needs

Review of Key Items to date:

- Hazard-specific data
    - Historic Hazard Worksheets or list of past hazard occurrences and impact to County
- Risk Assessment Worksheets (Need for all)
- 2014 Mitigation Action Status Update (Need for all)
- Fill in information on past occurrences/impacts/problem areas for all hazards to address above questions for each hazard

Other Data Items:

General:

- Historic Hazard Data and Key areas affected in the County (items identified in today's meeting)
- EOC Activations
- Public Assistance (PA) Summaries
- After Action Reports -
- Critical Facilities - Updated definition and GIS layer of facilities
- Future Development Areas for County