

data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire Sacramento County Planning Area.

This LHMP Update involved a comprehensive review and update of each section of the risk assessment. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this updated risk assessment are summarized in Chapter 2 What's New and are also detailed in this Chapter 4 Risk Assessment portion of the plan.

4.1 Hazard Identification: Natural Hazards

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

The Sacramento County Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification assessment to determine the hazards that threaten the Planning Area. This section details the methodology and results of this effort.

Data Sources

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

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

4.1.1. Results and Methodology

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

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

hazards were updated from the previous plan. All hazards from the 2011 plan were profiled in this plan, with the wind hazard being moved from heavy rain and storms to the discussion on tornado. The agricultural hazard was modified to focus more on severe weather impacts. Water shortage was added to the drought hazard. New hazards include climate change as a stand-alone hazard.

Table 4-1 Sacramento County Hazard Identification and Comparison

2016 Hazards	2011 Hazards	Comment
Agricultural Hazards	Agricultural Hazards: Insects/Pests	The hazard significance was changed. As a result, a vulnerability assessment was added. Added focus on severe weather impacts. Climate change impacts were expanded upon.
Bird Strike	Bird Strike	Similar analysis was performed.
Climate Change	–	New stand-alone hazard. Climate change influence on other hazards was touched on in the last plan.
Dam Failure	Dam Failure	Similar analysis was performed on updated parcel and assessor data. Climate change impacts were expanded upon.
Drought and Water Shortage	Drought	Water shortage was added to the hazard. Climate change impacts were expanded upon.
Earthquake	Earthquake	Similar analysis was performed.
Earthquake: Liquefaction	Earthquake: Liquefaction	Similar analysis was performed.
Flood: 100/200/500-year	Flood: 100/200/500-year	Updated Digital Flood Insurance Rate Map (DFIRM) and assessor’s data was used to perform updated and enhanced analysis, to include flooded acres. Climate change impacts were expanded upon.
Flood: Localized Stormwater Flooding	Flood: Localized Stormwater Flooding	Similar analysis was performed. Climate change impacts were expanded upon.
Landslides	Landslides and Debris Flows	Similar analysis was performed.
Levee Failure	Levee Failure	Updated DFIRM and assessor’s data was used to perform updated analysis. Climate change impacts were expanded upon.
River/Stream/Creek Bank Erosion	River/Stream/Creek Bank Erosion	Similar analysis was performed. Climate change impacts were expanded upon.
Severe Weather: Extreme Temperatures - Heat	Severe Weather: Heat	Similar analysis was performed. Climate change impacts were expanded upon.
Severe Weather: Extreme Temperatures – Cold/Freeze	Severe Weather: Freeze	Similar analysis was performed. Climate change impacts were expanded upon.
Severe Weather: Fog	Severe Weather: Fog	Similar analysis was performed. Climate change impacts were expanded upon.
Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning)	Severe Weather: Heavy Rains and Storms (Thunderstorms/Hail, Lightning/Wind)	Wind was removed and added to the tornado profile. Climate change impacts were expanded upon.

2016 Hazards	2011 Hazards	Comment
Severe Weather: Wind and Tornadoes	Severe Weather: Tornadoes	Wind was added to this profile. Climate change impacts were expanded upon.
Subsidence	Subsidence	Due to recent drought conditions, a greater discussion of groundwater subsidence impacts was added. Climate change impacts were expanded upon.
Volcano	Volcano	Similar analysis was performed.
Wildfire (Burn Area/Smoke)	Wildfire	This hazard was expanded upon to further address the smoke hazard. Similar analysis was performed using updated parcel and assessor's data. Climate change impacts were expanded upon.

Table 4-2 was completed by the County and HMPC to identify, profile, and rate the significance of identified hazards, specific to the Sacramento County Planning Area and unincorporated Sacramento County. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment. Table 4-38 in Section 4.2.22 Natural Hazards Summary provides an overview of these significant hazards.

Table 4-2 Sacramento County Planning Area/Unincorporated County Hazard Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Agricultural Hazards	Significant	Highly Likely	Critical	Medium	Medium
Bird Strike	Limited	Highly Likely	Critical	Medium	Low
Climate Change	Extensive	Highly Likely	Critical	High	–
Dam Failure	Significant	Unlikely	Catastrophic	Medium	High
Drought and Water Shortage	Extensive	Likely/Occasional	Limited	High	High
Earthquake	Limited	Occasional	Critical	Medium	None
Earthquake: Liquefaction	Significant	Occasional	Limited	Medium	None
Flood: 100/200/500-year	Significant	Occasional/Unlikely	Catastrophic	High	High
Flood: Localized Stormwater Flooding	Limited	Highly Likely	Limited	Medium	High
Landslides	Limited	Unlikely	Negligible	Low	Medium
Levee Failure	Significant	Occasional	Catastrophic	High	High
River/Stream/Creek Bank Erosion	Limited	Highly Likely	Limited	Medium	High
Severe Weather: Extreme Temperatures – Cold/Freeze	Extensive	Likely	Limited	Low	High
Severe Weather: Extreme Temperatures – Heat	Extensive	Highly Likely	Critical	High	High
Severe Weather: Fog	Extensive	Highly Likely	Limited	Low	Medium
Severe Weather: Heavy Rains and Storms (Thunderstorms, Hail, and Lightning)	Extensive	Highly Likely	Critical	Medium	High
Severe Weather: Wind and Tornadoes	Limited	Highly Likely	Limited	Low	Medium
Subsidence	Significant	Highly Likely	Limited	Low	Medium
Volcano	Limited	Unlikely	Limited	Low	None
Wildfire (Burn Area/Smoke)	Significant	Highly Likely	Limited	Medium	High
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		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			
Probability of Future Occurrences		Significance			
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.		Low: minimal potential impact			
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.		Medium: moderate potential impact			
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.		High: widespread potential impact			
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.					

4.1.2. Disaster Declaration History

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

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). USDA declarations are discussed in Section 4.2.7. FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors. Sacramento County received 17 federal and 28 state declarations since 1950. Of the 17 federal declarations 12 were for flood, rains and severe storm events, 2 for earthquake, 2 for levee break, 1 was for drought, and 1 was for Hurricane Katrina evacuations (all counties in the United States were declared). Of the 11 remaining state declarations, 8 were for flood, rains and severe storm events. 1 was for drought, 1 was for energy emergency, and 1 was related to a railroad explosion.

Based on the disaster declaration history provided in Table 4-3, Sacramento County is among the many counties in California susceptible to disaster. Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and Cal OES and compiled in chronological order, from present, in Table 4-3.

Table 4-3 Sacramento County State and Federal Disasters Declaration, 1950-2015

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
2014	Napa Earthquake	Natural	Earthquake	EM4193	–	9/17/2014
Drought	California Drought	GP 2014-13	1/17/2014	–	–	–
2008	Central Valley Drought	Drought	Drought	GP 2008-03	6/12/2008	–
2008	2008 January Storms	Flood	Storms	GP 2008-01	1/5/2008	–
2005/2006	2005/06 Winter Storms	Flood	Storms	DR-1628	-	2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	EM-3248 2005	-	9/13/2005
2001	Energy Emergency	Economic	Greed	GP 2001	1/1/2001	–

Year	Disaster Name	Disaster Type	Disaster Cause	Disaster #	State Declaration #	Federal Declaration #
1998	1998 El Nino Floods	Flood	Storms	DR-1203	Proclaimed	2/19/1998
1997	1997 January Floods	Flood	Storms	DR-1155	1/2/97-1/31/97	1/4/1997
1996	Torrential Winds and Rain	Flood	Storms	GP 96-01	1/21/1996	–
1995	1995 Late Winter Storms	Flood	Storms	DR-1046	Proclaimed	1/10/1995
1995	1995 Severe Winter Storms	Flood	Storms	DR-1044	1/6/95-3/14/95	1/13/1995
1989	Loma Prieta Earthquake	Earthquake	Earthquake	DR-845	10/18/89-10/30/89	10/18/1989
1986	1986 Storms	Flood	Storms	DR-758	2/18-86-3/12/86	2/18/1986
1983	Winter Storms	Flood	Flood	DR-677	12/8/82-3/21/83	2/9/1983
1982	High Tides and Rains	Flood	Storms	-	12/8/1982	–
1982	Heavy Rains and Flooding	Flood	Storms	DC 82-03	4/1/1982	–
1980	Delta Levee Break	Flood	Levee break	EM-3078	1/23/1980	1/23/1980
1977	1977 Drought	Drought	Drought	EM-3023	-	1/20/1977
1973	Southern Pacific Railroad Fires and Explosions (Roseville)	Fire	Explosion	-	4/30/1973	–
1972	Andrus Island Levee Break	Flood	Levee break	DR-342	6/21/1972	6/27/1972
1969	1969 Storms	Flood	Storms	DR-253	1/23/69-3/12/69	1/26/1969
1964	1964 Late Winter Storms	Flood	Storms	DR-183	-	12/24/1964
1963	1963 Floods	Flood	Storms	-	2/14/1964	–
1958	1958 April Storms and Floods	Flood	Storms	DR-52	4/5/1958	4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	CDO 58-03	2/26/1958	–
1955	1955 Floods	Flood	Flood	DR-47	12/22/1955	12/23/1955