

City of Lakeport Local Hazard Mitigation Plan July 2019





Executive Summary

The City of Lakeport, in coordination with the Lakeport Fire Protection District (LFPD), prepared this Local Hazard Mitigation Plan (LHMP) to guide hazard mitigation planning to better protect the people and property of the City and LFPD Planning Area from the effects of natural disasters and hazard events. This LHMP demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This Plan was also developed in order for the City and LFPD to be eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) Program, and the Flood Mitigation Assistance (FMA) Program.

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

LHMP Plan Development Process

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

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

Table ES-1 Local Hazard Mitigation Planning Process

| DMA Process | Modified CRS Process |
|------------------------------|---|
| 1) Organize Resources | |
| 201.6(c)(1) | 1) Organize the Planning Effort |
| 201.6(b)(1) | 2) Involve the Public |
| 201.6(b)(2) and (3) | 3) Coordinate with Other Departments and Agencies |
| 2) Assess Risks | |
| 201.6(c)(2)(i) | 4) Identify the Hazards |

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

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

Risk Assessment

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

The City and LFPD are vulnerable to numerous hazards that are identified, profiled, and analyzed in this Plan. Wildfires, floods, earthquakes, drought, liquefaction, landslides, dam failure, and other severe weather events are among the hazards that can have a significant impact on the City and LFPD. Table ES-2 details the hazards identified for this LHMP.

Table ES-2 Lakeport Hazard Identification Assessment

| Hazard | Geographic Extent | Likelihood of Future Occurrences | Magnitude/Severity | Significance | Climate Change Influence |
|--|-------------------|----------------------------------|--------------------|--------------|--------------------------|
| Aquatic Biological Hazards: cyanobacterial bloom | Significant | Highly Likely | Critical | High | Medium |
| Aquatic Biological Hazards: quagga mussel | Significant | Highly Likely | Critical | High | Low |
| Climate Change | Extensive | Likely | Limited | Medium | – |
| Dam Failure | Limited | Unlikely | Critical | Medium | Medium |
| Drought and Water Shortage | Extensive | Likely | Critical | High | High |
| Earthquake (major/minor) | Extensive | Unlikely/Highly Likely | Catastrophic | Medium | Low |
| Flood: 1%/0.2% Annual Chance | Significant | Likely | Critical | High | Medium |
| Flood: Localized/Stormwater | Significant | Highly Likely | Limited | Medium | Medium |
| Hazardous Materials Transport | Significant | Likely | Critical | Medium | Low |
| Landslide and Debris Flows | Limited | Highly Likely | Limited | Medium | Medium |
| Levee Failure | Limited | Unlikely | Negligible | Low | Low |
| Seiche | Limited | Unlikely | Limited | Low | Low |
| Severe Weather: Extreme Cold and Freeze | Extensive | Likely | Limited | Low | Medium |
| Severe Weather: Extreme Heat | Extensive | Highly Likely | Limited | Medium | High |
| Severe Weather: Heavy Rains, Snow, and Storms | Extensive | Highly Likely | Limited | Medium | Medium |
| Severe Weather: High Winds | Extensive | Highly Likely | Critical | Medium | Low |
| Volcano and Geothermal Gas Release | Extensive | Unlikely/ Highly Likely | Critical | Low | Low |
| Wildfire | Extensive | Highly Likely | Catastrophic | High | High |
| <p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> <p>Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> <p>Climate Change Influence: Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> | | | | | |

Mitigation Strategy

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

The goals and objectives of this LHMP are:

Goal 1: Minimize risk and vulnerability of Lakeport to hazards and protect lives and prevent losses to property, economy, and the environment

- Provide protection for existing and future development
- Provide protection for critical facilities, utilities, and services and minimize disruption
- Provide protection for public health and safety

Goal 2: Improve Lakeport's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event

- Reduce the number of emergency incidents and disaster occurrences
- Improve local capacity to prepare for disasters
- Continued improvements to infrastructure, equipment, facilities, etc. to meet public safety needs
- Improve and maintain emergency communications for community residents and visitors
- Increase the use of shared resources, data sharing, mutual aid and jurisdictional cooperation
- Upgrade and maintain disaster/emergency plans, with a long-term focus to address changing community needs to prevent, minimize, and recover from disasters
- Develop/improve warning, evacuation, and sheltering procedures and information for residents, businesses, visitors, individuals with access and functional needs, and animals risk areas

Goal 3: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote preparedness and self-responsibility to reduce hazard-related losses

- Enhance hazard mitigation and preparedness programs
- Establish a Citywide public information program that utilizes a variety of outreach strategies and mechanisms to reach all Lakeport residents and visitors
- Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.

Goal 4: Increase and maintain wildfire prevention and protection in Lakeport

- Reduce the wildfire risk and vulnerability in Lakeport
- Focus on fuels/vegetation management throughout the community
- Improve coordination of mitigation efforts throughout the community

Goal 5: Improve community resiliency to flooding in Lakeport

- Reduce the flood risk and vulnerability in Lakeport
- Identify and implement development plan for City floodplains

Actions to support these goals are shown on Table ES-3 and Table ES-4.

Table ES-3 City of Lakeport's Mitigation Actions

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Multi-Hazard Mitigation Actions | | | | | |
| Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan | Lakeport | X | X | | Prevention |
| Action 2.Public Awareness, Education, Outreach, and Preparedness Program Enhancements. | Lakeport and LFPD | X | X | X | Public Information |
| Action 3.EOP Update | Lakeport and LFPD | X | X | | Prevention Emergency Services |
| Action 4.Establish Back Up Power/Generators for Critical Facilities | Lakeport and LFPD | X | X | | Property Protection Emergency Services |
| Action 5.Sirens Project - Community Warning System Designed to Ensure Sound Reaches all Incorporated Areas | Lakeport and LFPD | X | X | | Emergency Services Public Information |
| Action 6.Continuity of Operations Planning | Lakeport | X | X | | Prevention Emergency Services |
| Action 7.Training and Exercise | Lakeport and LFPD | X | X | | Prevention Emergency Services |
| Action 8.Update Local Emergency Services Ordinance | Lakeport | X | X | | Prevention Emergency Services |
| Action 9.Update Development Requirements for Undergrounding Utilities Associated with New Development | Lakeport | | | | Prevention Property Protection |
| Action 10. Mass Care Planning | Lakeport and LFPD | X | X | | Prevention Emergency Services |
| Action 11. In Low-lying Flood-prone Areas Strengthen Base Under Pavement to Prevent Deterioration of Pavement/Asphalt Areas | Lakeport | X | X | X | Property Protection Natural Resource Protection |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Action 12. Establish a Post-Disaster Recovery Action Plan | Lakeport | X | X | | Emergency Services Public Information |
| Aquatic Biological Hazards: Cyanobacterial Bloom Actions | | | | | |
| Action 13. Install Water Aerators in Stagnant Areas | Lakeport | X | X | | Property Protection Natural Resource Protection |
| Action 14. Establish Additional Testing Areas within Key Areas of the City (e.g., swimming area) and Training of Staff | Lakeport | | | | Property Protection Natural Resource Protection Public Information |
| Action 15. Establish Nutrient Management Program; Consider Dredging, Paving Roads, Erosion Control, Runoff Basins, Sewer Collection Systems, Etc. | Lakeport | X | X | | Prevention Property Protection Natural Resource Protection |
| Aquatic Biological Hazards: Quagga Mussel Actions | | | | | |
| Action 16. Quagga/Zebra Mussel Threat to Clear Lake: Enhance Public Education | Lakeport | X | X | | Prevention Natural Resource Protection Public Information |
| Action 17. Quagga Mussel Training | Lakeport | X | X | | Prevention Natural Resource Protection Public Information |
| Dam Failure Actions | | | | | |
| Action 18. WWTP Dam - Increase Reservoir Capacity | Lakeport and LFPD | X | X | X | Prevention Property Protection Structural Projects |
| Drought and Water Shortage Actions | | | | | |
| Action 19. Implement Intertie Projects in Annexation Areas | Lakeport and LFPD | X | X | | Property Protection |
| Action 20. Adoption of State Model Water Efficiency Landscape Ordinance (MWELO) | Lakeport | | | | Prevention |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|---|
| Earthquake Actions | | | | | |
| Action 21. Develop and Implement Non-Structural Mitigation Program | Lakeport | X | X | | Property Protection |
| Action 22. Unreinforced Masonry (URM) and Soft Story Inventory and Retrofits | Lakeport | X | X | | Property Protection Structural Projects |
| Action 23. Retrofit 302 N Main St | Lakeport | X | X | | Property Protection Structural Projects |
| Flood Actions | | | | | |
| Action 24. Flood Insurance Promotion | Lakeport | X | X | X | Public Information |
| Action 25. Armor Streambeds & Lakefront | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 26. Stormwater Projects: Box Culvert/Drainage Enhancements Multiple Areas | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 27. Elevation Projects - Repetitive Loss and Other Areas | Lakeport | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 28. Continue Headwall (Redirock) 100 feet to east from Main Street | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 29. Evaluate and Mitigate Erosion Shoreline Erosion Impacts from High Winds/Wave Action (Possible Seawall) | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 30. Safety Surfacing Library Park | Lakeport | X | X | X | Property Protection Natural Resource Protection |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|---|
| Action 31. Continuation of Sea Wall at Boat Ramp Parking (North of 5th to 3rd Street) | Lakeport | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 32. Identify and Implement Drainage/Streambed Clearance Projects | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Localized Flood Actions | | | | | |
| Action 33. Enclose Open Ditches | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 34. Stormwater Projects: Upsize Project Improvements to Provide More Volume to Increase Drainage Capacities | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 35. Storm Drainage Related Flooding | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Hazardous Materials Transport Actions | | | | | |
| Action 36. Multi-Agency Spill Response Plan | Lakeport and LFPD | | | | Prevention Emergency Services |
| Severe Weather: Extreme Heat and Climate Change Actions | | | | | |
| Action 37. Heat Contingency Plan | Lakeport and LFPD | | | | Prevention Emergency Services |
| Wildfire Actions | | | | | |
| Action 38. Defensible Space/ Fuel Reduction Projects | Lakeport and LFPD | X | X | | Prevention Property Protection Structural Projects Natural Resource Protection |
| Action 39. Establish Goat Mitigation Plan | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Action 40. Establish a Local Firewise Community | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |
| Action 41. Roofing/Eve Vent Retrofit and Adopt More Restrictive Wildfire Codes | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |
| Action 42. Public Safety Power Shutoff (PSPS) Multi-jurisdictional Task Force, Training, and Exercises | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |

Table ES-4 Lakeport Fire Protection District's Mitigation Actions

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Multi-Hazard Mitigation Actions (Climate Change, Drought and Water Shortage, Earthquake, Hazardous Materials Transport, Localized Flood, Wildfire) | | | | | |
| Action 43. Relocate and Replace Fire Station 50 | LFPD and Lakeport | X | X | | Prevention Structural Projects Emergency Services |
| Action 44. Community Wildfire Protection Plan (CWPP) | LFPD and Lakeport | X | X | | Prevention Structural Projects Emergency Services |
| Action 45. Community Wildfire Action Plan | LFPD and Lakeport | X | X | | Prevention Property Protection Natural Resource Protection |



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Abbreviations and Acronyms

| Acronym | Definition |
|---------|--|
| AB | Assembly Bill |
| AGL | Above Ground Level |
| AHJ | Authorities Having Jurisdiction |
| AHPS | Advanced Hydrologic Prediction Service |
| ALERT | Automated Local Evaluation in Real Time |
| APG | California Adaptation Planning Guide |
| AQI | Air Quality Index |
| BAM | Best Available Map |
| BLM | Bureau of Land Management |
| BMP | Best Management Practices |
| CA | California |
| CAC | Community Assistance Contact |
| CAV | Community Assistance Visit |
| CA-DWR | California Department of Water Resources |
| Cal OES | California Office of Emergency Services |
| CAP | Climate Adaptation Plan |
| CAS | Climate Adaptation Strategy |
| CBC | California Business Code |
| CCHPR | Climate Change and Health Profile Report |
| CDAA | California Disaster Assistance Act |
| CDBG | Community Development Block Grant |
| CDEC | California Data Exchange Center |
| CDFA | California Department of Food & Agriculture |
| CDFW | California Department of Fish and Wildlife |
| CEC | California Energy Commission |
| CEQA | California Environmental Quality Act |
| CERT | Community Emergency Response Training |
| CFR | Code of Federal Regulations |
| CGS | California Geologic Survey |
| CHP | California Highway Patrol |
| CIP | Capital Improvements Plan |
| CIRA | Climate Change Impacts and Risk Analysis |
| CLOMR | Conditional Letter of Map Revision |
| COPD | Chronic Obstructive Pulmonary Disease |
| CNPS | California Native Plant Society |
| CNRA | California Natural Resource Agency |
| CRS | (National Flood Insurance Program's) Community Rating System |

| Acronym | Definition |
|---------|---|
| CRV | Content Replacement Values |
| CVP | Central Valley Project |
| CWPP | Community Wildfire Protection Plan |
| DAC | Disadvantaged Community |
| DMA | Disaster Mitigation Act of 2000 |
| DOF | Department of Finance |
| DOT | Department of Transportation |
| DSOD | Division of Safety of Dams |
| EAS | Emergency Alert System |
| EF | Enhanced Fujita |
| EOC | Emergency Operations Center |
| EOP | Emergency Operations Plan |
| EPS | Economic Planning Systems |
| EWP | Emergency Watershed Protection Program |
| F | Fujita |
| FEMA | Federal Emergency Management Agency |
| FHSZ | Fire Hazard Severity Zone |
| FIRM | Flood Insurance Rate Map |
| FIS | Flood Insurance Study |
| FMA | Flood Mitigation Assistance Program |
| FRA | Federal Responsibility Area |
| FRAP | Fire and Resource Assessment Program |
| FWS | US Fish and Wildlife Service |
| GHG | Greenhouse Gases |
| GIS | Geographic Information Systems |
| HAB | Harmful Algal Bloom |
| HMGP | Hazard Mitigation Grant Program |
| HI | Heat Index |
| IBC | International Business Code |
| ICC | Increased Cost of Compliance |
| IPCC | Intergovernmental Panel on Climate Change |
| IRC | International Residential Code |
| LCFPD | Lake County Fire Protection District |
| LCHD | Lake County Health Department |
| LFPZ | Levee Flood Protection Zone |
| LHMP | Local Hazard Mitigation Plan |
| LOMA | Letter of Map Amendment |
| LOMR | Letter of Map Revision |
| LRA | Local Responsibility Area |

| Acronym | Definition |
|----------|---|
| MGD | Million Gallons per Day |
| MHDP | Multi Hazards Demonstration Project |
| MHI | Median Household Income |
| MMHW | Mean Higher High Water |
| MMI | Modified Mercalli Intensity Scale |
| MSL | Mean Sea Level |
| NASA | National Aerospace and Science Agency |
| NAVD 88 | North America Vertical Datum 1988 |
| NCDC | National Climactic Data Center |
| NDMC | National Drought Mitigation Center |
| NEHRP | National Earthquake Hazards Reduction Program |
| NEPA | National Environmental Policy Act |
| NFIP | National Flood Insurance Program |
| NGVD 29 | National Geodetic Vertical Datum 1929 |
| NIDIS | National Integrated Drought Information System |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| NPDP | National Performance of Dams Program |
| NPS | National Park Service |
| NWS | National Weather Service |
| OHP | Office of Historic Preservation |
| PDM | Pre-Disaster Mitigation Program |
| PM | Particulate Matter |
| PMR | Physical Map Revision |
| PPI | Program for Public Information |
| PRE-WERT | Pre-Watershed Emergency Response Team |
| PRP | Preferred Risk Policy |
| RAWS | Remote Automated Weather Stations |
| RCP | Representative Concentration Pathway |
| RL | Repetitive Loss |
| SB | Senate Bill |
| SBA | Small Business Administration |
| SDC | Seismic Design Category |
| SEMS | Standardized Emergency Management System |
| SFHA | Special Flood Hazard Area |
| SGMA | Sustainable Groundwater Management Act |
| SHBC | State Historical Building Code |
| SOI | Sphere of Influence |
| SOP | Standardized Operations Procedures |

| Acronym | Definition |
|---------|--|
| SRA | State Responsibility Area |
| SRL | Severe Repetitive Loss |
| SWAMP | Surface Water Ambient Monitoring Program |
| SWP | State Water Project |
| SWRCB | State Water Resources Control Board |
| TMDL | Total Maximum Daily Load |
| UCERF | Uniform California Earthquake Rupture Forecast |
| UHI | Urban Heat Island |
| ULDC | Urban Levee Design Criteria |
| ULOP | Urban Level of Protection Criteria |
| USACE | US Army Corp of Engineers |
| USGS | United States Geologic Survey |
| USDA | United States Department of Agriculture |
| UWMP | Urban Water Management Plan |
| VAR | Values at Risk |
| VHFHSZ | Very High Fire Hazard Severity Zone |
| VOG | Volcanic Smog |
| WMP | Wildlife Hazard Management Plan |
| WRCC | Western Regional Climate Center |
| WUI | Wildland Urban Interface |



Chapter 1 Introduction

1.1 Purpose

The City of Lakeport, in conjunction with the Lakeport Fire Protection District (LFPD), both participating jurisdictions to this Plan, prepared this Local Hazard Mitigation Plan (LHMP) to guide hazard mitigation planning to better protect the people and property of the City and LFPD from the effects of hazard events. This LHMP demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP was also developed so the City and LFPD can be eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, and the Flood Mitigation Assistance (FMA) program.

1.2 Background and Scope

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

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$6 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2017 Interim Report).

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

The Lakeport LHMP is a multi-jurisdictional plan that geographically covers the entire area within the City's jurisdictional boundaries, as well as covering the areas adjacent to the City that are protected by the Lakeport Fire Protection District. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) This planning effort also follows FEMA's most current

Plan Preparation and Review Guidance. While the DMA 2000 emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the City is subject to many kinds of hazards, access to these programs is vital.

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

1.3 Plan Organization

The City of Lakeport's Local Hazard Mitigation Plan is organized as follows:

- Chapters
 - ✓ Chapter 1: Introduction
 - ✓ Chapter 2: Community Profile
 - ✓ Chapter 3: Planning Process
 - ✓ Chapter 4: Risk Assessment
 - ✓ Chapter 5: Mitigation Strategy
 - ✓ Chapter 6: Plan Adoption
 - ✓ Chapter 7: Plan Implementation and Maintenance
- Annexes
 - ✓ Annex A: Lakeport Fire Protection District
- Appendices
 - ✓ Appendix A: Planning Process
 - ✓ Appendix B: References
 - ✓ Appendix C: Mitigation Strategy
 - ✓ Appendix D: Adoption Resolution
 - ✓ Appendix E: Critical Facilities



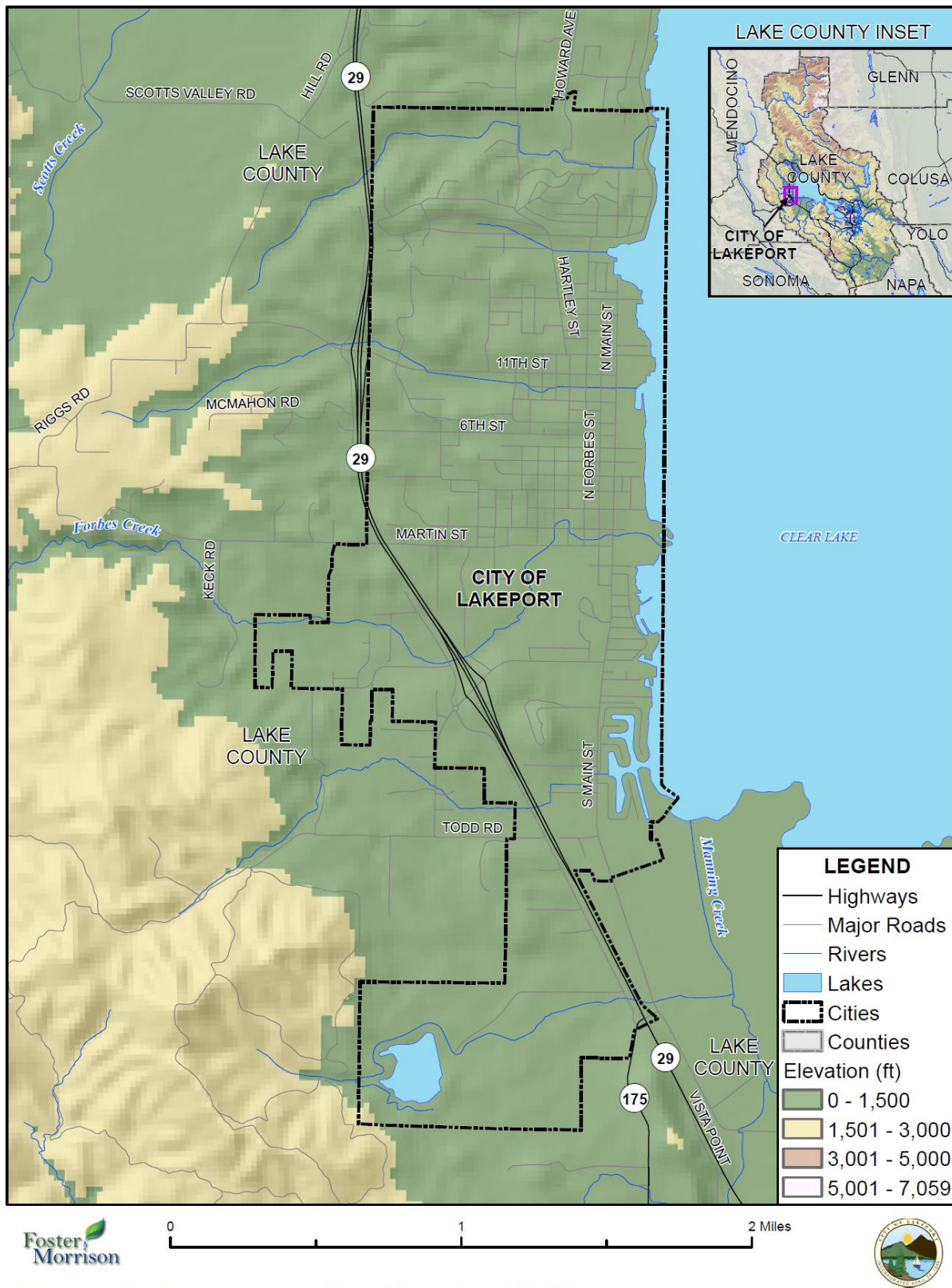
Chapter 2 Community Profile

2.1 City of Lakeport

The City of Lakeport is located on the western shore of Clear Lake, in west- central Lake County, in northwestern California. It is approximately 7 miles northwest of Kelseyville, 9 miles south of Upper Lake, and 45 miles north of Santa Rosa, the closest major metropolitan area. San Francisco is approximately 90 miles to the south and Sacramento, the State Capital, is approximately 80 miles to the southeast. The City sits on the western shore of Clear Lake, the largest natural freshwater lake entirely within the State. Highway 29 runs along the western edge of the City. The 2018 population estimate for the City is 5,134. Lakeport serves as the County seat for Lake County.

The City can be seen on Figure 2-1 below.

Figure 2-1 City of Lakeport



Data Source: City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

2.2 History

Incorporated in 1888, Lakeport is Lake County's oldest town. However, Lakeport's history dates back at least another 40 years to the Gold Rush Era of the 1840s. Miners coming and going through Northern California gold fields began passing through Lake County as early as 1847. At the conclusion of the Gold Rush, many miners returned to the County to settle permanently.

With attractive farmland, temperate climate, and an abundant water supply, pioneers began staking their claims at the northeast end of Clear Lake in the 1850s. Among them was William Forbes, credited by County historians as being the "father" of Lakeport. Forbes was the first person in the County to settle in what would eventually become Lakeport and became the first undertaker, served as the settlement's postmaster for a number of years, and with partner James Parish founded the first business in Lakeport—a blacksmithing and wagon making shop.

Originally named "Forbestown" after Forbes, Lakeport was initially a part of Napa County. In 1861, after the settlement broke away from Napa, Forbes deeded 40 acres of his land to the local government in exchange for Forbestown becoming the County seat. Soon after the acceptance of the offer, a two-story wooden courthouse and separate jailhouse were constructed on Main Street between Second and Third. Following the approval of Forbestown to become the County seat came another change. At the suggestion of Woods Crawford, an attorney, the town's name was officially changed from Forbestown to Lakeport to recognize the natural port on Clear Lake.

In 1867, the original County courthouse burned to the ground in a fire that was later attributed by many to be arson. Shortly after, the County seat was moved to the south of the County in Lower Lake. In a series of hotly contested events that followed this move, the County seat was eventually returned back to Lakeport by a vote of the people in 1871.

By 1888, Lakeport had grown from the first settler, William Forbes, to a town of about 700 residents with an estimated 500 people living in the outlying areas. The downtown area of Lakeport had also grown to include a drug store, general store, bakery, restaurant, and a saloon. In all, 35 businesses operated in the town, with three doctors and several dentists and attorneys holding practices in Lakeport as well.

On April 30, 1888, Lakeport officially became an incorporated town by a vote of 154-8. Up until March 17, 1952, Lakeport continued to operate as an incorporated town when an ordinance was passed declaring the area a city. Since then, the City has continued to grow in size and population.

2.3 Geography and Climate

The City of Lakeport is located on the western shore of Clear Lake, in west-central Lake County, in northwestern California. The City is 125 miles northwest of Sacramento. The City sits at 1,355 feet of elevation. Lakeport is generally flat in topography. To the west of the City the terrain rises quickly

The climate of the Lakeport area is classified as temperate and semiarid. Summers are dry and warm, and winters are wet and mild. Average monthly temperatures vary from the 80°F range in July to the 40°F range in January. Annual precipitation averages 25 inches in the Lakeport vicinity; more than 50 percent

of the annual precipitation normally occurs from December through February. The area's economy is based primarily on agriculture and water-oriented recreation. The seasonal population is often more than twice the permanent resident population and the demand for services increases accordingly.

2.4 Economy and Tax Base

The City of Lakeport 2025 General Plan noted that the City of Lakeport supports approximately 45% of all jobs in Lake County. Additionally, the majority of Lake County Government offices are located within the City of Lakeport. There are six business centers in the Lakeport area, including the historic downtown area which is designated as a California Main Street City. The City's permanent retail trade area population is approximately 30,000, and per capita sales figures are among the highest in the region, and generally higher than the State average. This can be attributed to at least three characteristics of the Lakeport area: a high level of spendable income by residents; the recognition of Lakeport as a local retailing center; and the impact of tourism.

Lakeport is known as a regional recreational destination, and this attribute is generally maximized in any effort undertaken by the City to encourage and foster economic development. The clean air, natural beauty, and the multitude of recreational opportunities afforded by Clear Lake and the surrounding areas are great assets to the community and provide an economic advantage to visitor serving businesses.

The largest business sector (in terms of number of businesses) in Lakeport's economy is services (45 percent), followed by retail trade (19 percent), and then finance, insurance and real estate (9 percent). These three sectors account for 639 businesses or 73 percent of all businesses in Lakeport.

Lakeport's commercial base is spread widely throughout the City in multiple shopping centers, at small commercial nodes, and in dozens of free-standing business locations such as: Shoreline Center, Bruno's Foods, K-Mart, Vista Point Center, Hamburger Hill, Nylander Neighborhood Center, and Willow Tree Plaza.

The US Census Bureau tracks economic statistics for the City of Lakeport. These are shown in Table 2-1.

Table 2-1 City of Lakeport Civilian Employed Population 16 years and Over

| Industry | Estimated Employment | Percent |
|---|----------------------|---------|
| Agriculture, forestry, fishing and hunting, and mining | 144 | 7.2% |
| Construction | 111 | 5.6% |
| Manufacturing | 33 | 1.7% |
| Wholesale trade | 16 | 0.8% |
| Retail trade | 348 | 17.4% |
| Transportation and warehousing, and utilities | 60 | 3.0% |
| Information | 32 | 1.6% |
| Finance and insurance, and real estate and rental and leasing | 138 | 6.9% |

| Industry | Estimated Employment | Percent |
|--|----------------------|---------|
| Professional, scientific, and management, and administrative and waste management services | 77 | 3.9% |
| Educational services, and health care and social assistance | 484 | 24.2% |
| Arts, entertainment, and recreation, and accommodation and food services | 172 | 8.6% |
| Other services, except public administration | 82 | 4.1% |
| Public administration | 300 | 15.0% |

Source: US Census Bureau American Community Survey 2016 Estimates

According to the California Employment Development Department, the largest employers in the City are shown in Table 2-2.

Table 2-2 City of Lakeport Largest Employers

| Employer | Industry |
|-------------------------------|------------------|
| Ameri Gas | Gas Companies |
| Brunos Shop Smart | Grocer |
| Evergreen Lakeport Healthcare | Nursing Home |
| Kmart | Department Store |
| Konocti Vista Casino Resort | Casino |
| People Services Inc | Social Services |
| Rocky Point Care Center | Nursing Home |
| Sutter Lakeside Hospital | Hospital |

Source: California Employment Development Department – Labor Market Information

The City of Lakeport noted that they present employment information differently. The City of Lakeport Finance Department provided labor market information, as shown on Figure 2-2.

Figure 2-2 Largest Employers

| Employer | 2017-18 | | |
|-------------------------------------|--------------|------|---------------------------------|
| | Employees | Rank | Percentage of Top 10 Employment |
| County of Lake | 795 | 1 | 22.5% |
| Sutter Lakeside Hospital | 406 | 2 | 11.5% |
| Konocti Unified School District | 398 | 3 | 11.3% |
| St. Helena Hospital | 371 | 4 | 10.5% |
| Robinson Rancheria Resort & Casino | 325 | 5 | 9.2% |
| Twin Pine Casino | 283 | 6 | 8.0% |
| Calpine Corp. | 280 | 7 | 7.9% |
| Wal-Mart | 251 | 8 | 7.1% |
| Kelseyville Unified School District | 226 | 9 | 6.4% |
| Middletown Unified School District | 192 | 10 | 5.4% |
| Total | 3,527 | | 100.0% |

Source: City of Lakeport Finance Department

The City has a wide and varied tax base. Table 2-3 shows the breakdown of the City's taxable values.

Table 2-3 Lakeport – Tax Base by Property Use

| Property Use Category | Parcels | Net Taxable Value | Percentage of Total Value |
|--------------------------|--------------|----------------------|---------------------------|
| Commercial | 415 | \$137,444,305 | 28.8% |
| Government | 27 | \$0 | 0.0% |
| Open Space / Rural Lands | 26 | \$667,547 | 1.4% |
| Residential | 1,963 | \$338,568,101 | 69.8% |
| Grand Total | 2,431 | \$476,679,953 | 100.0% |

Source: Lake County Assessor's Office

2.5 Population and Socioeconomic Makeup

According to 2018 California Department of Finance estimates, the population of the City is 5,134. This represents an increase in population from the 2000 US Census, which estimated the City population at 4,820. Select social and economic information for the City is shown in Table 2-4.

Table 2-4 Lakeport– Select Social and Economic Statistics

| Statistic | Number |
|--------------------|--------|
| Populations | |
| Population under 5 | 6.1% |
| Population over 65 | 20.1% |

| Statistic | Number |
|-------------------------------------|----------|
| Populations | |
| Median Age | 44.2 |
| Racial Makeup | |
| White | 82.7% |
| Black or African American | 1.0% |
| American Indian or Alaska Native | 3.1% |
| Asian | 2.1% |
| Native Hawaiian or Pacific Islander | 0.1% |
| Other Races | 7.1% |
| Two or more races | 3.9% |
| Income and Poverty | |
| Median income | \$55,859 |
| Mean Income | \$72,713 |
| Poverty rate | |
| All families | 16.9 |
| All people | 20.7 |
| Unemployment Rate (September 2018) | 4.4% |

Source: 2010 US Census, 2016 US Census American Community Survey, Bureau of Labor Statistics



Chapter 3 Planning Process

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

- 1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- 2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
- 3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

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

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

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA) of 2000;
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program's (NFIP) and the Flood Mitigation Assistance (FMA) program;
- Facilitate the entire planning process;
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data;
- Assist in facilitating the public input process;
- Produce the draft and final Plan documents; and
- Coordinate with the California Office of Emergency Services (Cal OES) and FEMA Region IX plan reviews.

3.1 Local Government Participation

Lakeport and the Lakeport Fire Protection District (LFPD) made a commitment to the development of this 2019 multi-jurisdictional LHMP, as the two participating jurisdictions seeking FEMA approval of this

LHMP. The DMA planning regulations and guidance stress that each local government (participating jurisdiction) seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

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

For this Lakeport LHMP, “participation” meant the following:

- Providing facilities for meetings;
- Providing printed materials for meeting attendees;
- Attending and participating in the HMPC meetings;
- Completing and returning the Data Collection Worksheets;
- Collecting and providing other requested data (as available);
- Coordinating information sharing between internal and external agencies;
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the Plan;
- Reviewing and providing comments on drafts of the Plan;
- Providing hardcopy Draft documents of LHMP for public review;
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the Plan by the Lakeport City Council and LFPD governing board.

Lakeport and the LFPD seeking FEMA approval of this LHMP met all of these participation requirements. Multiple representatives from the City and LFPD attended the HMPC meetings described in Table 3-3 and also brought together internal planning teams to help collect data, identify mitigation actions and implementation strategies, and to review and provide data on Plan drafts. Appendix A provides additional information and documentation of the planning process, including members of the HMPC. Other jurisdictions and public and private stakeholders supported the planning process through representation on the HMPC, providing data and input for the risk assessment and mitigation strategy; and reviewing and providing input on plan drafts prior to finalization and submittal to Cal OES and FEMA.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for the City of Lakeport 2019 LHMP using the DMA planning requirements and FEMA’s associated guidance. This guidance is structured around a four-phase process:

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

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

Table 3-1 shows how the modified 10-step process fits into FEMA’s four-phase process. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Processes Used to Develop the Lakeport Local Hazard Mitigation Plan

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

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With Lakeport’s and the LFPD’s commitment to participate in the DMA planning process, Foster Morrison worked with Lakeport’s Public Works Department, as overall project lead, to establish the framework and organization for development of this LHMP. An initial call was held with key City representatives in October 2018 to discuss the organizational and process aspects of this LHMP development process.

The initial kick-off meeting was held on November 28, 2018. Invitations to the kickoff meeting were extended to key City departments, the county, other incorporated communities, tribes, special districts, as well as to other federal, state, and local stakeholders that might have an interest in participating in the planning process. Representatives from the City and key community stakeholders participated in this

LHMP project with additional invitations extended as appropriate throughout the planning process. The list of invitees is included in Appendix A.

The HMPC, comprising key City and LFPD staff and other government and stakeholder representatives developed the Plan with leadership from the Lakeport Public Works Department and facilitation by Foster Morrison. Table 3-2 shows who participated on the HMPC.

Table 3-2 HMPC Participant List

| Department and Title | Name |
|--|-------------------|
| Clearlake Public Works | Adeline Brown |
| Lakeport Public Works - Utilities | Alex Sharp |
| Hidden Valley Lake CSD | Alyssa Gordon |
| Lakeport Public Works | Andrew Britton |
| Public | Betsy Cawn |
| Ledoc | Bill Eaton |
| Lakeport FPD | Bill Gabe |
| Lakeport Police Chief | Brad Rasmussen |
| Howell Consulting | Brenna Howell |
| Lake County OES | Dale Carnathan |
| HPUL Tribe | Damon Jones |
| Lakeport Community Development Depart. | Daniel Chance |
| Lake County Water Resources | David Cowan |
| Lakeport Public Works | Doug Grider |
| Former Lakeport Fire Chief | Doug Hutchison |
| Lake County Public Health | Erin Gustafson |
| Hidden Valley Lake CSD | Ernesto Ruvalcaba |
| Public | George Spark |
| Cal Fire | Jake Hannan |
| Foster Morrison | Jeanine Foster |
| City of Lakeport Public Works | Jim Kennedy |
| Lakeport Administrative Services | Kelly Brendia |
| Lakeport Community Development Dir. | Kevin Ingram |
| Habematolel Pomo of Upper Lake | Linda Rose |
| Lake County GIS | Lon Sharp |
| Lakeport City Manager | Margaret Silveria |
| Cal Fire | Matt Ryan |
| Small Business Consultant | Melanie Garrett |
| Hidden Valley Lake CSD | Michael Burley |
| Lakeport Public Works | Michelle Humphrey |

| Department and Title | Name |
|--|-----------------|
| Lakeport Finance Director | Nicholas Walker |
| Public | Oliver Kleven |
| Lakeport Public Works - Utilities | Paul Harris |
| Lakeport FPD | Rick Bergem |
| Lakeport Public Works | Ron Ladd |
| Lake County OES | Teresa Stewart |
| Lake County BOD | Tina Scott |
| City of Lakeport Community Development | Tom Carlton |
| Lake County Water Resources | Yuliya Osetrova |

This list includes all HMPC members that attended one or more HMPC meetings detailed in Table 3-3, as well as those who provided key input into the Plan development process. In addition to providing representation on the HMPC, the City and LFPD further formulated an internal planning team to collect and provide requested data and to conduct timely reviews of the draft documents. The internal planning teams include both those participating on the HMPC and other City and District staff.

Meetings

The planning process officially began with an internal project planning meeting held in October 2018 followed by an HMPC kick-off meeting held in Lakeport on November 28, 2018. The meetings covered the scope of work and an introduction to the DMA requirements. During the HMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the LHMP. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to the City and District, quantify values at risk to identified hazards, inventory existing capabilities, and to identify possible mitigation actions. A copy of the worksheets for this project are included in Appendix A. The City of Lakeport and the LFPD seeking FEMA approval of this LHMP completed and returned the worksheets to Foster Morrison for incorporation into this LHMP.

During the planning process, the HMPC communicated through face-to-face meetings, email, telephone conversations, Dropbox websites, and through a City developed webpage dedicated to the plan development process. This later website was developed to provide information to the HMPC, the public and all other stakeholders on the LHMP process. Draft documents were also posted on this website so that the HMPC members and the public could easily access and review them. The LHMP website (shown on Figure 3-1) can be accessed at: https://www.cityoflakeport.com/news_detail_T14_R21.php

The HMPC met formally five times during the planning period (November 2018 – July 2019) which adequately covers the four phases of DMA and the 10-Step CRS planning process. The formal meetings held and topics discussed are described in Table 3-3. Invitations, agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-3 HMPC Meetings

| Meeting Type | Meeting Topic | Meeting Date(s) | Meeting Location(s) |
|-----------------------------|---|-------------------|--------------------------------------|
| HMPC #1 Kick-off Meeting | 1) Introduction to DMA and the planning process 2) Overview of current LHMP; 3) Organize Resources: the role of the HMPC, planning for public involvement, coordinating with other agencies/stakeholders 4) Introduction to Hazard Identification | November 28, 2018 | Lakeport City Hall, Council Chambers |
| HMPC #2 | 1) Risk assessment overview and work session - Assess the Hazard - Assess the Problem | February 20, 2019 | Lakeport City Hall, Council Chambers |
| HMPC #3 | 1) Review of risk assessment summary 2) Review and update of mitigation goals 3) Intro to Mitigation Action Strategy - Set Goals - Review possible activities | April 2, 2019 | Lakeport City Hall, Council Chambers |
| HMPC #4 | 1) Review of mitigation alternatives 2) Review and update of mitigation actions from the 2012 Plan 3) Identify updated list of mitigation actions by hazard 4) Review of mitigation selection criteria 5) Update and prioritize mitigation actions 6) Mitigation Action Strategy Implementation and Draft Action Development - Review possible activities - Draft an Action Plan | April 3, 2019 | Lakeport City Hall, Council Chambers |
| HMPC #5 | 1) Review of final HMPC, jurisdictional and public comments and input to plan 2) Review and documentation of changed conditions, vulnerabilities and mitigation priorities 3) Draft an Action Plan 4) Plan maintenance and Implementation Procedures | July 11, 2019 | Lakeport City Hall, Council Chambers |

Planning Step 2: Involve the Public

Up-front coordination discussions with the City of Lakeport established the initial plan for public involvement. Public involvement activities for this LHMP Update included press releases, social media communications, stakeholder and public meetings, development of an LHMP webpage and associated website postings, and the solicitation of public and stakeholder comments on the draft plan through a variety of mechanisms. Information provided to the public included an overview of the LHMP process, including a review of the hazard risk assessment and proposed mitigation strategies for this LHMP. At the planning team kick-off meeting, the HMPC discussed additional strategies for public involvement and agreed to an approach using established public information mechanisms and resources within the City.

Public Outreach Activities

Public outreach for this LHMP began at the beginning of the plan development process with the development of a webpage and outreach document on the LHMP development process through a variety of mechanisms as described below:

- Posts on City Facebook Page
- Posts on Lakeport Police Department Twitter Page
- Posts and Public Notices on Nixle site
- Posts on Nextdoor.com
- Articles in Lake County Record Bee
- Articles in Lake County News
- Invitations on City website
- Poster put up in Lake County Chamber
- Posters put up in City Hall and Library
- Press Releases

Images and text for all of these outreach activities can be found in Appendix A.

The purpose of this outreach was to inform the public and other stakeholders of the City's LHMP development project and how they could get involved. The initial outreach also invited the public and stakeholders to the public kickoff meeting for the project. Information on these outreach efforts can be seen in Appendix A to this Plan.

Public Meetings

Three public meetings for the Lakeport LHMP were held during key times of the LHMP development process:

Public Meeting #1: LHMP Kickoff

Public outreach for this LHMP began at the beginning of the Plan development process with a multitude of outreach methods to inform the public of the purpose of the DMA and the hazard mitigation planning process for the City of Lakeport. A press release was issued at the beginning of the project to invite the public to a public meeting for the kick-off the LHMP project on November 28, 2018 at the City Hall Council Chambers. In addition, outreach was performed on the City website, Facebook page, Lakeport Police Twitter account, and articles published in the Lake County News and the Lake County Record Bee.

Public Meeting #2: Risk Assessment Overview

A second public meeting was held to provide an overview of the hazard risk assessment portion of the LHMP. This meeting was held the evening of the HMPC risk assessment in the Lakeport City Hall. This meeting was advertised through the City website and through direct emails to those members of the public expressing an interest in the LHMP planning process.

Public Meeting #3: Meeting on the Draft LHMP

The first draft of the Plan was provided to the HMPC in May of 2019, with a public review draft provided in June of 2019. A public meeting was held on July 10, 2019 to present the draft LHMP and to collect public comments on the Plan prior to finalization and submittal to Cal OES/FEMA. The public meeting on the draft LHMP was advertised in a variety of ways to maximize outreach efforts to the public and included an advertisement in the Lake County News. The advertisement in the local newspaper included information on the date, location and time of the meeting, where the draft plan could be accessed in the community, and how to provide comments on the draft plan. These meetings were announced on the City website, City Facebook page, on Twitter, and through other mechanisms as shown in Appendix A. In addition to a copy of the draft plan being placed on the City website in advance of these meetings, hard copies of the draft of the plan were made available to interested parties at the Lakeport City Hall.

Documentation to support the public meetings can be found in Appendix A. In addition to advertisement for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders with an interest in the Lakeport LHMP project.

The formal public meetings for this project are summarized in Table 3-4.

Table 3-4 Public and Stakeholder Meetings

| Meeting Type | Meeting Topic | Meeting Date | Meeting Locations |
|-------------------|---|-------------------|-------------------------------------|
| Public Meeting #1 | 1) Intro to DMA and mitigation planning 2) The Lakeport LHMP Development Process | November 28, 2018 | Lakeport City Hall Council Chambers |
| Public Meeting #2 | 1) Risk Assessment Overview | February 19, 2019 | Lakeport City Hall Council Chambers |
| Public Meeting #3 | 1) Presentation of Draft LHMP and solicitation of public and stakeholder comments | July 10, 2019 | Lakeport City Hall Council Chambers |

As appropriate, stakeholder and public comments and recommendations are incorporated into the LHMP throughout the plan development process, including the sections that address mitigation goals and strategies. However, no public comments were received on the Draft Plan. All newspaper advertisements, website postings, and public outreach efforts are on file with Lakeport Public Works Department and are included in Appendix A.

The draft LHMP is currently available online on the Lakeport website at: https://www.cityoflakeport.com/news_detail_T14_R21.php. This can be seen on Figure 3-1.

Figure 3-1 Lakeport Local Hazard Mitigation Plan Website

Local Hazard Mitigation Plan Draft



FEMA defines **Hazard Mitigation** as any action taken to reduce or eliminate the long-term risk to human life and property from hazards. Hazard mitigation planning is a process for state and local governments to identify community-level policies and actions to mitigate and thus reduce the impacts of natural hazards.

In accordance with the Disaster Mitigation Act of 2000, the City of Lakeport is developing a Local Hazard Mitigation Plan (LHMP). The purpose of the LHMP development process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in the City. Wildfire, drought, flood, and other severe weather hazards are just a few of the hazards to the Lakeport community. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with a DMA-compliant, FEMA- approved LHMP are eligible for FEMA pre- and post-disaster grant funding and are better positioned to respond and recover when disasters occur.

Opportunities for Input

Members of the community have a very important role in this process. A draft of the 2019 LHMP Update will be available on this website in early summer of 2019 for review and comment by the public and all interested stakeholders.

Planning team and public meetings will also be held as part of the plan development process. In addition to plan participation by the City of Lakeport and stakeholders from other local, state and federal agencies, the public is encouraged to attend and participate in our upcoming public meetings. Information on specific meeting times and locations are detailed below.

Upcoming Meetings

| Upcoming Meetings | Date/Time/Location |
|---------------------|--|
| LHMP Public Meeting | Wednesday, July 10, 2019 1pm-3pm Lakeport City Hall – City Council Chambers |

You can download the Lakeport Public Review Draft at https://www.dropbox.com/sh/w2k7do5l1wbxrg8/AAA2kdnV3lL5wq_MU1ftxcDra?dl=0

Source: City of Lakeport

Planning Step 3: Coordinate with Other Departments and Agencies

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

- Big Valley Band of Pomo Indians
- Big Valley Rancheria
- Cal Fire
- Cal OES Mitigation
- City of Clearlake PD
- Clearlake Public Works
- Elem Indian Colony
- Elem Indian Colony Drinking Water
- Former Lakeport Fire Chief
- Habematolel Pomo of Upper Lake
- Hidden Valley Lake CSD

- Koi Nation
- Lakeport Public Works - Utilities
- Lake County
- Lake County Air Quality
- Lake County Assessor
- Lake County Community Development
- Lake County Director of Public Works
- Lake County Environmental Health
- Lake County GIS
- Lake County Health Services
- Lake County OES
- Lake County Office of Education
- Lake County Planning
- Lake County Sheriff
- Lake County Sheriff's Department
- Lake County Special Districts
- Lake Pillsbury FPD
- Lakeport City Manager
- Lakeport Community Development Depart.
- Lakeport Finance Director
- Lakeport Police Chief
- Lakeport Public Works
- Lakeport Public Works - Utilities
- Middletown Rancheria
- National Weather Service
- North Shore Fire - Chief
- PG&E
- Public
- Robinson Rancheria
- Scotts Valley Band of Pomo Indians
- Siegler Springs Firewise

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Coordination involved contacting these agencies and informing them on how to participate in the LHMP development process and if they had any expertise or assistance they could lend to the planning process, risk assessment, or specific mitigation strategy. These groups and agencies were solicited asking for their assistance and input, telling them how to become involved in the LHMP, and inviting them to HMPC meetings.

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

- Cal DWR
- CAL FIRE
- Cal OES
- Cal Trans
- California Department of Water Resources

- City of Clearlake and other jurisdictions in Lake County
- CGS - Earthquake Program
- FEMA Region IX - Hazard Mitigation
- FEMA Region IX - Planning
- Fire Departments
- Fish and Wildlife
- Lake County Office of Emergency Services
- Lake County Fire Protection District
- Lake County Fire Safe Council
- National Weather Service
- Pacific Gas & Electric
- Red Cross
- United States Corps of Engineers
- USGS

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to some of these groups to actively participate on the HMPC. Others assisted in the process by providing data directly as requested in the Data Worksheets or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public meeting and to review and comment on the LHMP prior to submittal to CAL OES and FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this LHMP. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Lakeport and the LFPD use a variety of comprehensive planning mechanisms, such as general and master plans, local ordinances, and state requirements, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this LHMP establishes a credible and comprehensive plan that ties into and supports other City programs. The development of this LHMP incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions. More detail can be found in Appendix B.

- Cal-Adapt
- Cal-DWR
- CAL OES
- CAL FIRE
- CalTrans
- California Department of Conservation
- California Department of Finance
- California Department of Water Resources
- California Geological Survey
- California Office of Historic Places
- FEMA Region IX
- Lake County
- Lake County Fire Protection District
- Library of Congress

- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Response Center
- National Weather Service
- United States Army Corps of Engineers
- United States Bureau of Land Management
- United States Bureau of Reclamation
- United States Geological Survey
- Western Regional Climate Center

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

3.2.2. Phase 2: Assess Risks

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

Foster Morrison led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact the Lakeport Planning Area. The HMPC relied on information from the City's Safety Element to the General Plan, the 2018 Lake County LHMP, the 2018 State of California Hazard Mitigation Plan, and other sources to establish the hazards list for this LHMP. Data collection worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

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

3.2.3. Phase 3: Develop the Mitigation Plan

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

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

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, a complete first draft of the LHMP was developed. This complete draft was provided for HMPC review and comment via a Dropbox web link. HMPC comments were integrated into the second public review draft, which was placed on the City website and advertised to collect public input and comments. The HMPC integrated comments and issues from the public, as appropriate and as detailed above, along with additional internal review comments and produced a third draft for review and approval by CAL OES and FEMA Region IX, contingent upon final adoption by the Lakeport City Council and the LFPD board.

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the LHMP, the Plan was adopted by the Lakeport City Council and LFPD governing board using the sample resolutions contained in Appendix D.

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

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7 Plan Implementation and Maintenance.

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



Chapter 4 Risk Assessment

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

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

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

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

1. Identify hazards
2. Profile hazard events
3. Inventory assets
4. Estimate losses

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

- **Section 4.1 Hazard Identification: Natural Hazards** identifies the natural hazards that threaten the City and LFPD and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Hazard Profiles** discusses the threat to the City and LFPD and describes the hazard location, extent, previous occurrences of hazard events, and the likelihood of future occurrences.
- **Section 4.3 Vulnerability Assessment** assesses the City’s exposure to natural hazards, considering assets at risk, critical facilities, populations, and future development trends.
- **Section 4.4 Capability Assessment** inventories existing mitigation activities and policies, regulations, and plans that pertain to mitigation in the City and can affect net vulnerability.

This risk assessment covers the entire geographical extent of the City of Lakeport, the Lakeport Planning Area. Supplementing this base risk assessment, additional risk assessment data and analyses have been developed to fully address the Lakeport Fire Protection District (LFPD), which covers the City Planning Area and a portion of the unincorporated county. Additional risk assessment information specific to the LFPD can be found in Annex A.

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 HMPC conducted a hazard identification study to determine the hazards that threaten the City. This section details the methodology and results of this effort.

Data Sources

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

- HMPC input
- National Oceanic and Atmospheric Administration
- City of Lakeport 2025 General Plan Safety Element
- City of Lakeport Emergency Operations Plan
- 2018 State of California Hazard Mitigation Plan
- 2018 Lake County Local Hazard Mitigation Plan
- FEMA Disaster Declaration Database

4.1.1. Methodology and Results

Using existing natural hazards data and input gained through the kickoff planning meeting, the HMPC agreed upon a list of natural hazards that could affect Lakeport. Hazards data from the California Office of Emergency Services (Cal OES), FEMA, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the City. Significance of each identified hazard 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.

As a starting point, the updated 2018 State of California Multi-Hazard Mitigation Plan (2018 State Plan) was consulted to evaluate the applicability of State hazards of concern to the City. Building upon this effort, hazards from the 2018 Lake County LHMP and the City of Lakeport Safety Element from the 2025 General Plan were also identified and considered.

Certain hazards were excluded from consideration for this Plan. They are shown in Table 4-1.

Table 4-1 City of Lakeport – Excluded Hazards

| Hazard Excluded | Why Excluded |
|-----------------|--|
| Tsunami | The City is not on the coast. |
| Avalanches | The City does not have sufficient snowfall to have avalanche as a hazard. |
| Air Pollution | The City did consider this a hazard for the LHMP; it is dealt with in other planning mechanisms. |

| Hazard Excluded | Why Excluded |
|--|---|
| Coastal Flooding, Erosion, and Sea Level Rise | The City is not on the coast. |
| Energy Shortage and Energy Resilience | The City did consider this a hazard for the LHMP; it is dealt with in other planning mechanisms. |
| Freeze | The City has relatively low numbers of days that fall below 32°F. |
| Insects Pests and Diseases | The City did consider this a hazard for this LHMP; it is dealt with in other planning mechanisms. |
| Epidemic/Pandemic/Vector Borne Disease Hazards | The City did consider this a hazard for this LHMP; it is dealt with in other planning mechanisms. |
| Natural Gas Pipeline Hazards | The City did not consider this a hazard due to the low number of gas pipelines traversing the City. |
| Oil Spills | The City did not consider this a hazard, as there are few pipelines or oil wells in the City. |
| Radiological Accidents | There are no areas in the City at risk to this hazard. |
| Terrorism | The City did consider this a hazard for this LHMP; it is dealt with in other planning mechanisms. |
| Cyber Threats | The City did consider this a hazard for this LHMP; it is dealt with in other planning mechanisms. |
| Airline Crashes | There have been few past occurrences in the City of airplane crashes. The City did consider this a hazard for this LHMP |
| Civil Disturbance | The City did consider this a hazard for this LHMP; it is dealt with in other planning mechanisms. |
| Well Stimulation and Hydraulic Fracking | This is not occurring in the City. |

The worksheet below was completed by the HMPC to identify, profile, and rate the significance of identified hazards. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment. Table 4-36 in Section 4.2.20 Natural Hazards Summary provides an overview of these significant hazards.

Table 4-2 City of Lakeport Hazard Identification

| Hazard | Geographic Extent | Likelihood of Future Occurrences | Magnitude/Severity | Significance | Climate Change Influence |
|--|-------------------|----------------------------------|--------------------|--------------|--------------------------|
| Aquatic Biological Hazards: cyanobacterial bloom | Significant | Highly Likely | Critical | High | Medium |
| Aquatic Biological Hazards: quagga mussel | Significant | Highly Likely | Critical | High | Low |
| Climate Change | Extensive | Likely | Limited | Medium | – |
| Dam Failure | Limited | Unlikely | Critical | Medium | Medium |
| Drought and Water Shortage | Extensive | Likely | Critical | High | High |
| Earthquake (major/minor) | Extensive | Unlikely/Highly Likely | Catastrophic | High | Low |
| Flood: 1%/0.2% Annual Chance | Significant | Likely | Critical | High | Medium |
| Flood: Localized/Stormwater | Significant | Highly Likely | Limited | Medium | Medium |
| Hazardous Materials Transport | Significant | Likely | Critical | Medium | Low |
| Landslide and Debris Flows | Limited | Highly Likely | Limited | Medium | Medium |
| Levee Failure | Limited | Unlikely | Negligible | Low | Low |
| Seiche | Limited | Unlikely | Limited | Low | Low |
| Severe Weather: Extreme Cold and Freeze | Extensive | Likely | Limited | Low | Medium |
| Severe Weather: Extreme Heat | Extensive | Highly Likely | Limited | Medium | High |
| Severe Weather: Heavy Rains, Snow, and Storms | Extensive | Highly Likely | Limited | Medium | Medium |
| Severe Weather: High Winds | Extensive | Highly Likely | Critical | Medium | Low |
| Volcano and Geothermal Gas Release | Extensive | Unlikely/ Highly Likely | Critical | Low | Low |
| Wildfire | Extensive | Highly Likely | Catastrophic | High | High |
| <p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area</p> <p>Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> <p>Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid</p> <p>Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> <p>Climate Change Influence: Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> | | | | | |

Source: City of Lakeport

4.1.2. Disaster Declaration History

One method to identify hazards based upon past occurrences is to look at what events triggered federal and/or state disaster declarations within the City (although disaster declarations are declared on a county basis). Disaster declarations are granted when the severity and magnitude of the event's impact surpass 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, following the local agency's declaration, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state government's capacity is exceeded, a federal disaster declaration may be issued allowing for the provision of federal disaster assistance.

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

Lake County has experience 27 federal and 22 state declarations since 1950. 15 of the federal declarations were associated with flood events (including heavy rain and storms), 10 with wildfire, and 1 with hurricane (for evacuations stemming from Hurricane Katrina in 2005). Regarding state disaster declarations, 2 of the state declarations were associated with drought, 2 were economic, 1 with fire, 14 with flood (including heavy rain and storms), 2 with freeze, and 1 was from road damage. Details of each federal and state disaster declaration are detailed in Table 4-3. A summary of federal and state disaster declarations is shown in Table 4-4.

Table 4-3 Lake County Disaster Declarations 1950-2019

| Year | Disaster Name | Disaster Type | Disaster Cause | Disaster # | State Declaration # | Federal Declaration # |
|------|--|---------------|----------------|------------|---------------------|-----------------------|
| 2019 | California Severe Winter Storms, Flooding, Landslides, And Mudslides | Storms | Storms | DR-4434 | — | 5/17/2019 |
| 2018 | Mendocino Complex Fires | Fire | Fire | DR-4382 | — | 8/4/2018 |
| 2017 | California Wildfires | Fire | Fire | DR-4344 | — | 10/10/2017 |
| 2017 | Sulphur Fire | Fire | Fire | FM-5221 | — | 10/9/2017 |
| 2017 | California Severe Winter Storms, Flooding, Mudslides | Flood | Storms | DR-4308 | — | 4/1/2017 |

| Year | Disaster Name | Disaster Type | Disaster Cause | Disaster # | State Declaration # | Federal Declaration # |
|-----------|--|---------------|----------------|--------------|---------------------|-----------------------|
| 2017 | California Severe Winter Storms, Flooding, Mudslides | Flood | Storms | DR-4301 | – | 2/14/2017 |
| 2016 | Clayton Fire | Fire | Fire | FM-5145 | – | 8/14/2016 |
| 2015 | Valley Fire and Butte Fire | Fire | Fire | DR-4240 | – | 8/22/2015 |
| 2015 | Valley Fire | Fire | Fire | FM-5112 | – | 9/12/2015 |
| 2015 | Rocky Fire | Fire | Fire | FM-5093 | – | 7/29/2015 |
| 2014 | California Drought | Drought | Drought | GP 2014-13 | 1/17/2014 | – |
| 2012 | Wye Fire | Fire | Fire | FM-5004 | – | 8/13/2012 |
| 2006 | 2006 June Storms | Flood | Storms | DR 1646 | – | 6/5/2006 |
| 2005/2006 | 2005/06 Winter Storms | Flood | Storms | DR-1628 | – | 2/3/2006 |
| 2005 | Hurricane Katrina Evacuations | Economic | Hurricane | EM-3248 2005 | – | 9/13/2005 |
| 2003 | State Road Damage | Road Damage | Flood | GP 2003 | 1/1/2003 | – |
| 2001 | Energy Emergency | Economic | Greed | GP 2001 | 1/1/2001 | – |
| 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 | Lake County Fire | Fire | Fire | DC-96-03 | – | 8/1/1996 |
| 1995 | California Severe Winter Storms, Flooding, Landslides, Mud Flows | Flood | Storms | DR-1046 | Proclaimed | 3/12/1995 |
| 1995 | 1995 Severe Winter Storms | Flood | Storms | DR-1044 | 1/6/95-3/14/95 | 1/13/1995 |
| 1987 | 1987 Fires | Fire | Fire | GP | 9/10/87, 9/3/87 | – |
| 1986 | 1986 Storms | Flood | Storms | DR-758 | 2/18-86-3/12/86 | 2/18/1986 |
| 1985 | Hidden Valley Lake Fire | Fire | Fire | FM-2055 | – | 7/11/1985 |

| Year | Disaster Name | Disaster Type | Disaster Cause | Disaster # | State Declaration # | Federal Declaration # |
|------|-----------------------------------|---------------|----------------|------------|---|-----------------------|
| 1983 | Winter Storms | Flood | Flood | DR-677 | 12/8/82-3/21/83 | 2/9/1983 |
| 1980 | April Storms | Flood | Storms | — | 4/1/1980 | — |
| 1979 | Gasoline Shortage | Economic | OPEC | — | 5/8/1979-11/13/79 | — |
| 1977 | 1977 Drought | Drought | Drought | EM-3023 | 1/20/1977 | — |
| 1972 | 1972 Freeze | Freeze | Freeze | — | 7/13/1972 | — |
| 1970 | 1970 Freeze | Freeze | Freeze | — | 5/1/70, 5/19/70, 6/8/70, 6/10/70, 7/24/70 | — |
| 1970 | 1970 Northern California Flooding | Flood | Flood | DR 283 | 1/27/1970 - 3/2/1970 | 2/16/1970 |
| 1964 | 1964 Late Winter Storms | Flood | Storms | DR-183 | — | 12/24/1964 |
| 1963 | 1963 Floods and Rains | Flood | Storms | DR-145 | 2/7/63, 2/26/63, 2/29/63, & 4/22/63 | 2/25/63 |
| 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 |
| 1950 | 1950 Floods | Flood | Flood | OCD 50-01 | 11/21/1950 | — |

Source: Cal OES, FEMA

Table 4-4 Lake County Disaster Declarations 1950-2019 Summarized by Disaster Type

| Disaster Type | Federal Declarations | | State Declarations | |
|--|----------------------|---|--------------------|--|
| | Count | Years | Count | Years |
| Drought | 0 | — | 2 | 1977, 2014 |
| Economic | 0 | — | 2 | 1979, 2001 |
| Fire | 10 | 1985, 1996, 2012, 2015 (three times), 2016, 2017(twice), 2018 | 1 | 1987 |
| Flood (including heavy rains and storms) | 16 | 1955, 1958, 1963, 1964, 1970, 1983, 1986, 1995 (two times), 1997, 1998, 2005/2006, 2006, 2017 (two times), 2019 | 14 | 1950, 1955, 1958 (twice), 1963 (twice), 1970, 1980, 1983, 1986, 1995 (twice), 1997, 1998 |

| Disaster Type | Federal Declarations | | State Declarations | |
|---------------|----------------------|-------|--------------------|------------|
| | Count | Years | Count | Years |
| Freeze | 0 | — | 2 | 1970, 1972 |
| Hurricane | 1 | 2005 | 0 | — |
| Road Damage | 0 | — | 1 | 2003 |
| Totals | 27 | — | 22 | — |

Source: Cal OES, FEMA

4.2 Hazard Profiles

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

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

Each hazard is profiled in the following format:

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

Section 4.2.20 Natural Hazards Summary provides an initial assessment of the profiles and assigns a level of significance or priority to each hazard. Those hazards determined to be of medium or high

significance were characterized as priority hazards that required further evaluation in Section 4.3 Vulnerability Assessment. Those hazards that occur infrequently or have little or no impact on the City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the City, enabling Lakeport to focus resources where they are most needed.

The following sections provide profiles of the natural hazards that the HMPC identified in Section 4.1 Hazard Identification. Given that most disasters that affect the City are directly or indirectly related to severe weather events, severe weather hazards begin this section, and the other individual hazard profiles follow alphabetically.

Data Sources

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

- 2008 Lake County Community Wildfire Protection Plan
- 2014 California Climate Adaptation Strategy
- 2017 Sulphur Fire WERT Report
- 2018 State of California Multi-Hazard Mitigation Plan
- Baynature.org Clear Lake Algae Problems (<https://baynature.org/article/satellites-to-the-rescue-for-clear-lake-algae-problems/>)
- CAL FIRE
- Cal-Adapt
- California Department of Water Resources Best Available Maps
- California Department of Water Resources Division of Safety of Dams
- California Division of Mines and Geology
- California Geologic Survey
- California Natural Resource Agency
- California State Water Resources Control Board
- California's Adaptation Planning Guide: Understanding Regional Characteristics
- California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources
- California's Fourth Climate Change Assessment
- Caltrans Truck Network
- City of Lakeport Emergency Operations Plan
- City of Lakeport General Plan
- City of Lakeport General Plan Environmental Impact Report
- City of Lakeport General Plan Safety Element
- Climate Change and Health Profile Report – Lake County
- Climate Institute
- Climate.org website (<http://climate.org/algae-cyanobacteria-blooms-and-climate-change/>)
- Federal Emergency Management Agency
- FEMA Lake County Flood Insurance Study 9/30/2005
- FEMA Lake County Preliminary Flood Insurance Study 6/18/2014

- FEMA Multi-Hazard Identification and Risk Assessment
- FEMA National Flood Insurance Program
- Final Clear Lake Watershed Sanitary Survey 2012 Update
- Harmful Cyanobacteria Blooms and Their Toxins in Clear Lake and The Sacramento-San Joaquin Delta
- HMPC Input
- Intergovernmental Panel on Climate Change
- Lake County 2008 General Plan
- Lake County Emergency Operations Plan
- Lake County News: *Updated U.S. Volcanic Threat Assessment puts Clear Lake Volcanic Field in 'high' risk category.* October 28, 2018.
- Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.
- NASA
- National Center for Atmospheric Research in Boulder, Colorado
- National Climate Assessment
- National Drought Mitigation Center
- National Integrated Drought Information System
- National Interagency Fire Center
- National Levee Database
- National Oceanic and Atmospheric Administration's National Climatic Data Center
- National Performance of Dams Program at Stanford University
- National Weather Service
- NOAA Storm Prediction Center
- Science magazine
- Southern California Association of Governments
- Surface Water Ambient Monitoring Program Harmful Algal Bloom Field Guide
- United State Geologic Survey, Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977
- United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's Office of Hazardous Materials Safety
- United States Geological Survey Open File Report 2015-3009
- University of California, Davis
- University of California, Santa Cruz
- US Army Corps of Engineers
- US Bureau of Land Management
- US Environmental Protection Agency
- US Geological Survey
- US Geological Survey - Biological Resources Division
- US Geological Survey: Volcanic Ash: Effect & Mitigation Strategies.
<http://volcanoes.usgs.gov/ash/properties.html>
- US National Park Service
- US Occupational Safety and Health Administration
- USDA Climate Change and Invasive Mussels Project
(<https://portal.nifa.usda.gov/web/crisprojectpages/1003732-climate-change-and-invasive-mussels-interacting-effects-on-new-york-lakes.html>)
- USDA Forest Service Region 5

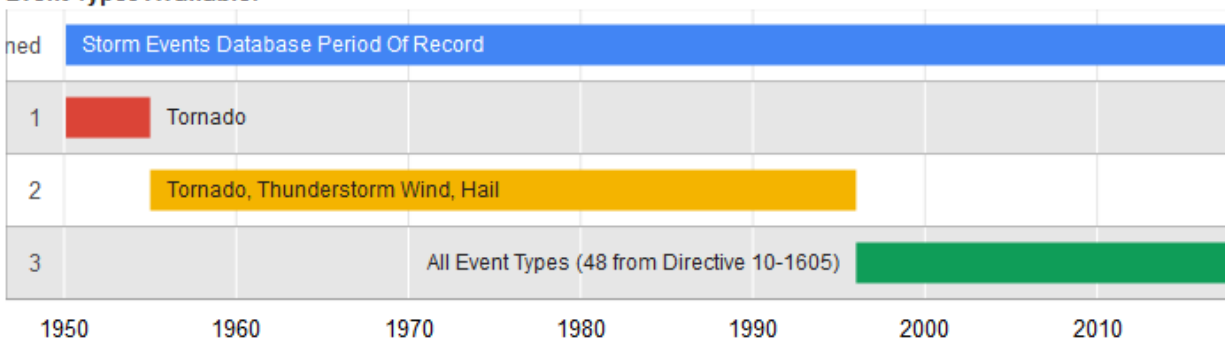
- USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=213)
- USGS (https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=214)
- USGS Publication 2014-3120
- Vaisala National Lightning Detection Network
- Western Regional Climate Center
- World Health Organization

4.2.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs throughout the City as localized storms that bring heavy rain, lightning, and strong winds. The NOAA's National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following events shown on Figure 4-1.

Figure 4-1 NCDC Storm Events Database Period of Record

Event Types Available:



Event Types Available:

Add more info about event types here. Link to collections page/tab when referencing data collection source.

1. Tornado: From 1950 through 1954, only tornado events were recorded.

2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the [Unformatted Text Files](#).

3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in [NWS Directive 10-1605](#).

Source: NCDC

This database contains severe weather events that occurred in Lake County between January 1, 1950, and July 31, 2018. These events affected the County as a whole, and most likely had some effect on the City as well. Table 4-5 summarizes these events.

*Table 4-5 Lake County NCDC Storm Events 1/1/1950-6/31/2018**

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|----------------|------------------|----------|-------------------|-----------|---------------------|---------------------|-------------|
| Blizzard | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Debris Flows | 2 | 0 | 0 | 0 | 0 | \$300,000 | \$0 |
| Drought | 15 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Flash Flood | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Flood | 10 | 1 | 0 | 1 | 0 | \$23,410,000 | \$0 |
| Frost/Freeze | 2 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Hail | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heat | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heavy Rain | 5 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heavy Snow | 3 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| High Wind | 12 | 0 | 0 | 0 | 0 | \$168,000 | \$0 |
| Strong Wind | 1 | 0 | 0 | 0 | 0 | \$1,000 | \$0 |
| Wildfire | 12 | 5 | 0 | 25 | 5 | \$1,500,000 | \$0 |
| Winter Storm | 62 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Winter Weather | 6 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Total | 134 | 6 | 0 | 26 | 5 | \$25,379,000 | \$0 |

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the City of Lakeport and outside of Lake County.

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

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

- Extreme Cold and Freeze
- Extreme Heat
- Heavy Rains, Snow, and Storms
- High Winds

4.2.2. Severe Weather: Extreme Cold and Freeze

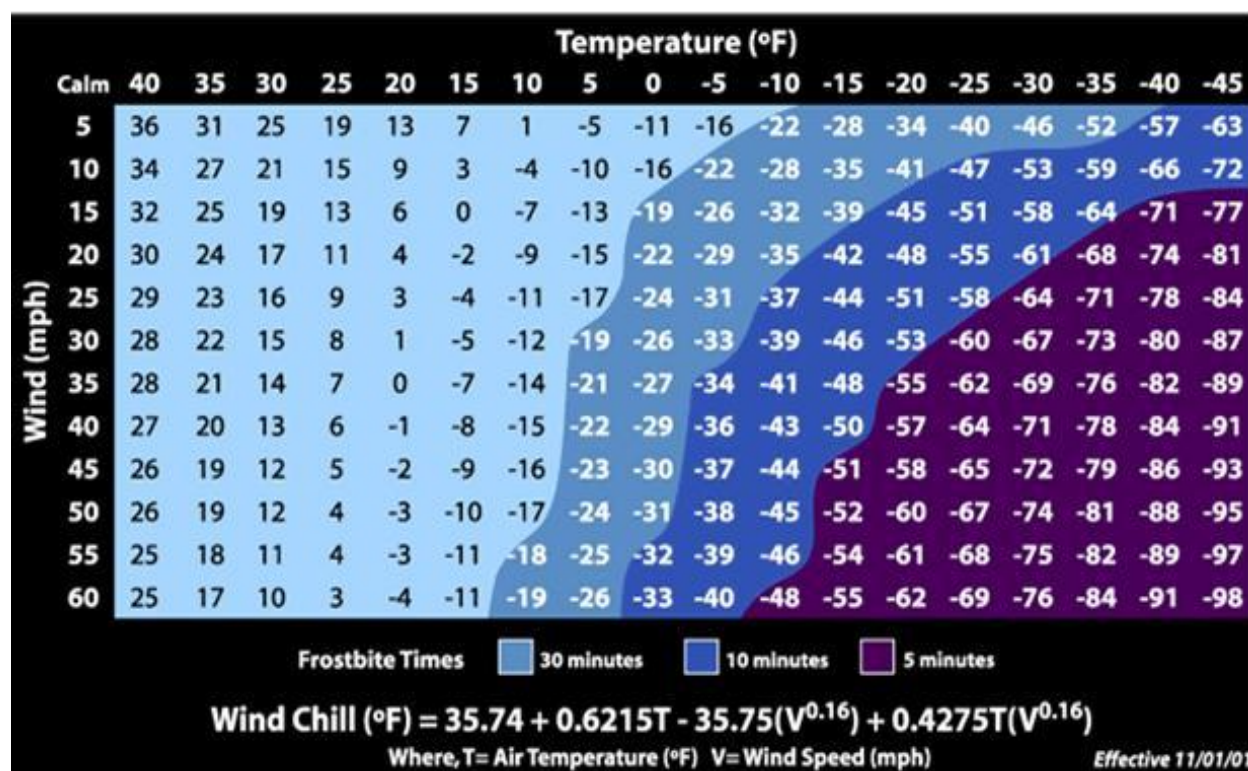
Hazard/Problem Description

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to cold can cause

frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-2), which is reproduced below. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-2 Wind Chill Temperature Chart



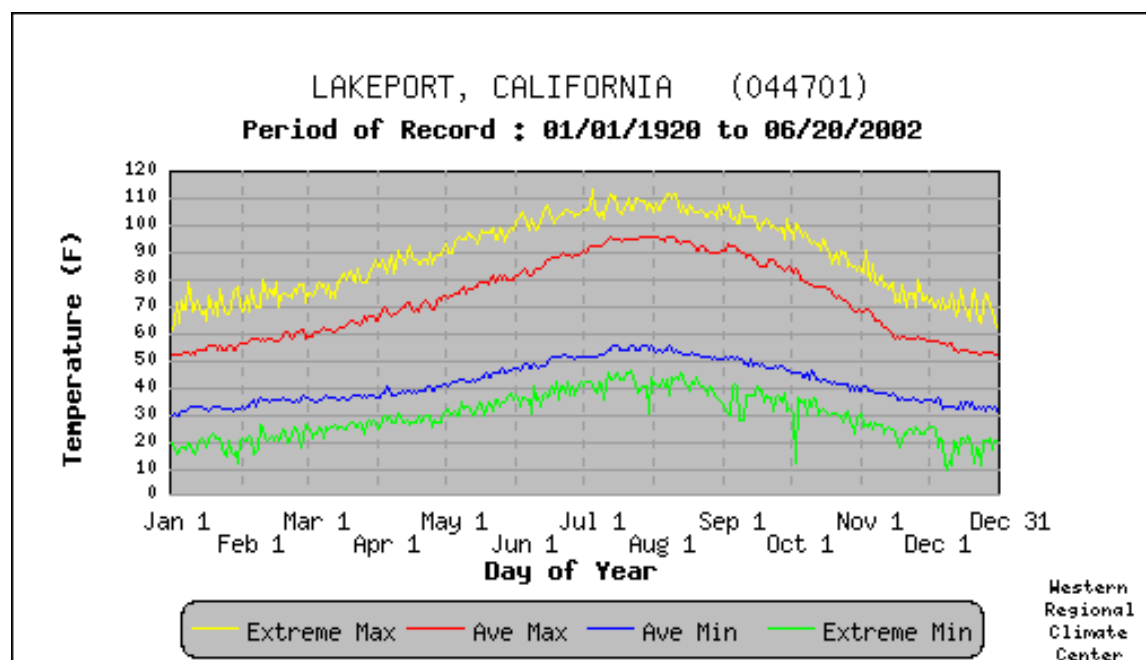
Source: National Weather Service

Information on cold from the Western Regional Climate Center’s coop station for the City is summarized below and in Figure 4-6 and Table 4-6. This weather station was chosen due to its location near the City. While its period of record stops in 2002, data for the previous 83 years was available.

City of Lakeport Weather Station, Period of Record 1920 to 2002

According to the WRCC, in the City of Lakeport monthly average minimum temperatures from November through April range from the low-30s to mid-40s. The lowest recorded daily extreme was 9°F on December 9, 1972. In a typical year, minimum temperatures fall below 32°F on 75.5 days with no days falling below 0°F. Table 4-6 shows the record low temperatures by month for Lakeport. Average daily temperatures for Colusa County are shown in Figure 4-3. Snowfall is rare in the City but has occurred in the past. Snowfall is discussed in more detail in Section 4.2.4.

Figure 4-3 City of Lakeport – Daily Temperature Averages and Extremes



Source: Western Regional Climate Center

Table 4-6 City of Lakeport – Record Low Temperatures 1920 to 2002

| Month | Record Low | Date | Month | Record Low | Date |
|----------|------------|-----------|-----------|------------|------------|
| January | 12° | 1/8/1975 | July | 35° | 7/10/1953 |
| February | 15° | 2/6/1989 | August | 34° | 8/31/1982 |
| March | 21° | 3/3/1966 | September | 12° | 9/28/1982 |
| April | 24° | 4/1/1976 | October | 23° | 10/29/1971 |
| May | 29° | 5/13/1942 | November | 20° | 11/17/1961 |
| June | 30° | 6/8/1950 | December | 9° | 12/9/1972 |

Source: Western Regional Climate Center

Location

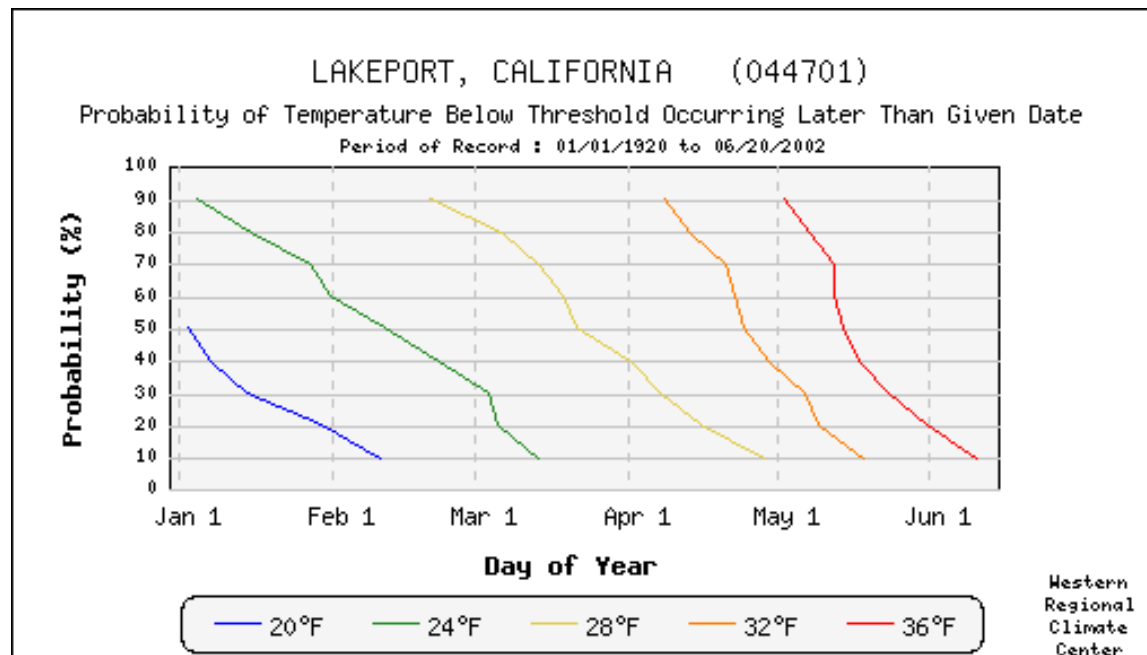
Extreme cold and freeze events occur on a regional basis. Extreme cold can occur in any location of the City, with little variation.

Extent

While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data from the County from the WRCC indicates that there are 75.5 days that fall below 32°F. Freeze has a slow onset and can be generally be predicted in advance for the City. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Figure 4-4 and Figure 4-5 show the probabilities in the City of

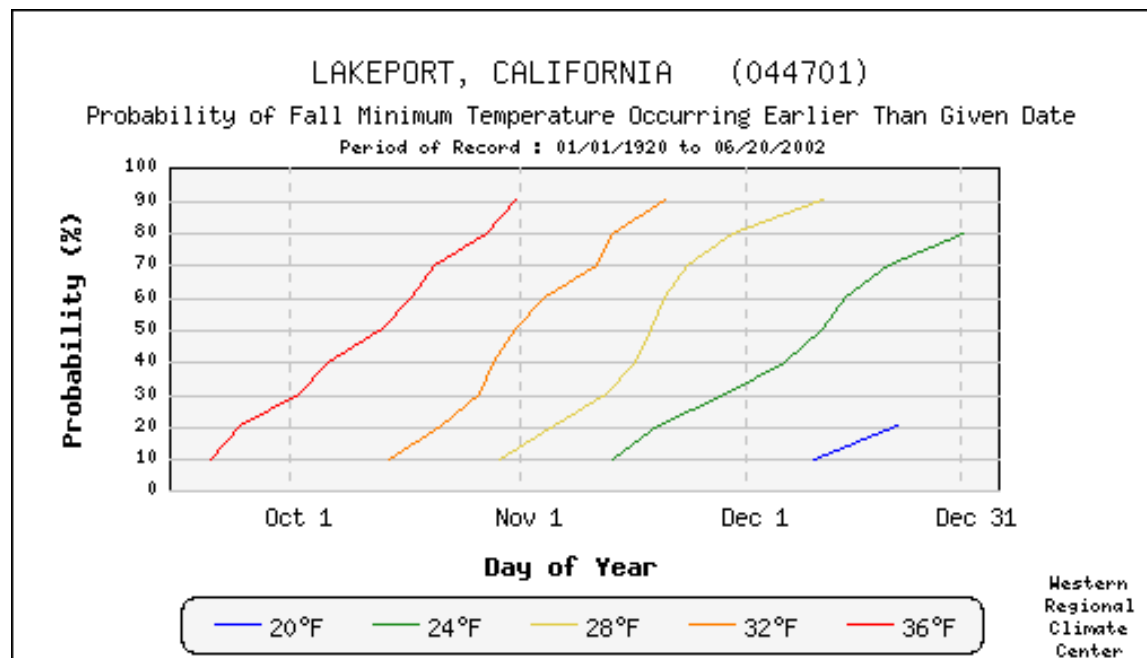
freeze for both spring and fall. There has not been a past occurrence of freeze in the months of May through September.

Figure 4-4 City of Lakeport – Spring Freeze Probabilities



Source: Western Regional Climate Center

Figure 4-5 City of Lakeport – Fall Freeze Probabilities



Source: Western Regional Climate Center

Past Occurrences

Disaster Declaration History

The County has had no past federal and two past state disaster declarations for extreme cold and freeze. Table 4-7 shows the dates of the disaster declarations.

Table 4-7 Lake County – State and Federal Disaster Declarations for Freeze 1950-2019

| Disaster Type | Federal Declarations | | State Declarations | |
|---------------|----------------------|-------|--------------------|------------|
| | Count | Years | Count | Years |
| Freeze | 0 | – | 2 | 1970, 1972 |

Source: Cal OES, FEMA

NCDC Events

The NCDC reports only two events of past extreme cold and freeze for Lake County in their database. This is most likely due to underreporting of these events to the NCDC database. Freeze events in the County are shown in Table 4-8.

*Table 4-8 Lake County NCDC Freeze and Frost Events 1/1/1950-6/31/2018**

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|--------------|------------------|--------|-------------------|----------|---------------------|-----------------|-------------|
| Frost/Freeze | 2 | 0 | 0 | 0 | 0 | \$0 | \$0 |

Source: NCDC

HMPC Events

While the HMPC noted that cold and freeze events occur on a regular basis in the winter months in the County, the HMPC recalled that in 1971 or 1972, cold persisted for an extended period, and temperatures fell to -15°F in areas. Water and wastewater systems froze during these events, and there was no potable water for a time in the City. No other specific events causing damages outside of the federal and state disaster declaration years could be recalled.

Likelihood of Future Occurrence

Highly Likely—Extreme cold and freeze are likely to continue to occur annually in the City. In a typical year, minimum temperatures fall below 32°F on 75.5 days. This equates to a likelihood of future occurrences being considered highly likely.

Climate Change and Freeze and Snow

According to the CAS, freezing spells are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health

effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

4.2.3. Severe Weather: Extreme Heat

Hazard/Problem Description

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. According to the US Center for Disease Control, in a normal year, about 658 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. Extreme heat can also affect the agricultural industry and can increase the risk of wildfires.

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

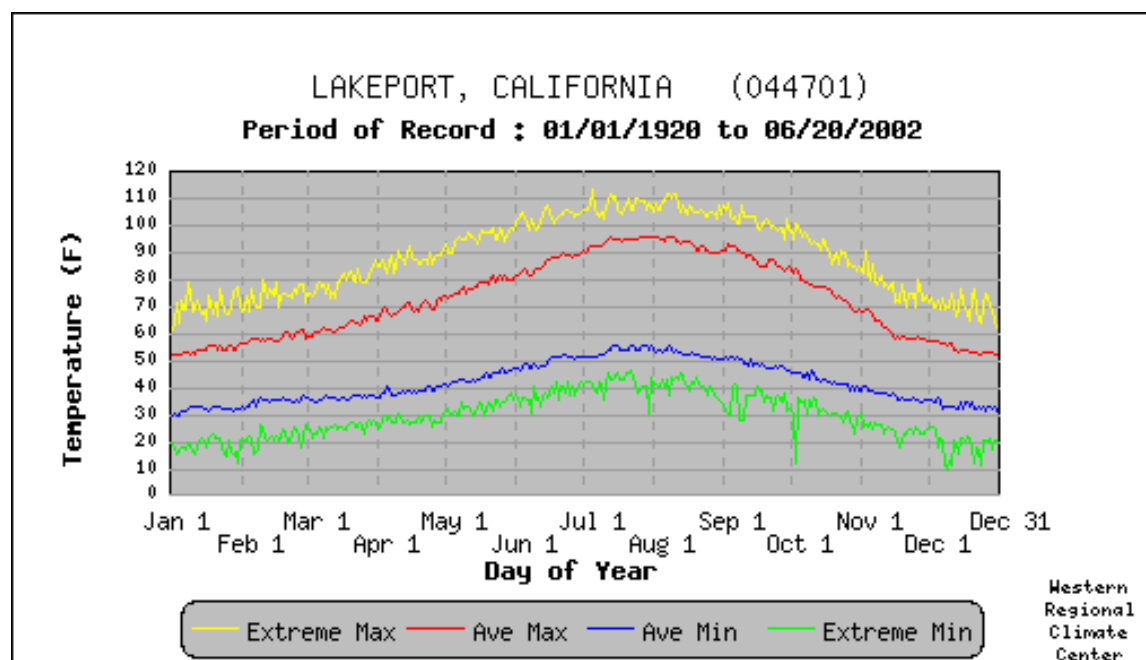
Location

Extreme heat events occur on a regional basis. The Lakeport area has many extreme heat days due to its location. Extreme heat can occur in any location of the City. All portions of the City are at risk to extreme heat. Extreme heat occurs throughout the City primarily during the summer months. The WRCC maintains data on weather normal and extremes in the western United States. WRCC data for the City is summarized below.

City of Lakeport Weather Station, Period of Record 1920 to 2002

According to the WRCC, in Lakeport, monthly average maximum temperatures in the warmest months (June through September) range from the mid-80s to the low 90s. The highest recorded daily extreme was 114°F on June 30, 1977. In a typical year, maximum temperatures exceed 90°F on 77.5 days. Figure 4-6 shows the average daily high temperatures and extremes for the City. Table 4-9 shows the record high temperatures by month for the City.

Figure 4-6 City of Lakeport — Daily Temperature Averages and Extremes



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

Table 4-9 City of Lakeport – Record High Temperatures 1920 to 2002

| Month | Record High | Date | Month | Record High | Date |
|----------|-------------|-----------|-----------|-------------|-----------|
| January | 79° | 1/8/1962 | July | 112° | 7/13/1972 |
| February | 80° | 2/10/1954 | August | 112° | 8/10/1971 |
| March | 87° | 3/31/1966 | September | 108° | 9/3/1998 |
| April | 92° | 4/15/1947 | October | 101° | 10/3/2080 |
| May | 99° | 5/30/1950 | November | 91° | 11/3/1950 |
| June | 107° | 6/15/1966 | December | 78° | 12/6/1957 |

Source: Western Regional Climate Center

Extent

Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios. While heat waves are obviously less dramatic, they are potentially deadlier. According to the 2018 California State Hazard Mitigation Plan, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths.

The National Weather Service (NWS) has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected

severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Table 4-10.

Table 4-10 National Weather Service HeatRisk Categories

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

Source: National Weather Service

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

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

Extreme heat is made worse when it is experienced over a longer duration of time.

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disaster declarations in Lake County related to extreme heat, as shown in Table 4-3.

NCDC Events

The NCDC has tracked heat and extreme heat events since 1996 for Lake County. 1 event was recorded for Lake County, as shown in Table 4-11. More events have likely occurred, without being reported to the NCDC database. Specifics on damages in the City were not included in the database.

*Table 4-11 Lake County Heat Events 1/1/1996-6/30/2018**

| Event Type | Date | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|------------|----------|--------|-------------------|----------|---------------------|-----------------|-------------|
| Heat | 7/29/200 | 0 | 0 | 0 | 0 | \$0 | \$0 |

Source: NCDC

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

Hazard Mitigation Planning Team Events

The HMPC noted that heat events occur each year, but could not recall damages or injuries from extreme heat. It was noted that extreme heat increases wildfire risk in and around the City.

Likelihood of Future Occurrences

Highly Likely—Temperature extremes are likely to continue to occur annually in the City Planning Area. According to the WRCC, temperatures at or above 90°F occur on 77.5 summer days in the City each year.

Climate Change and Extreme Heat

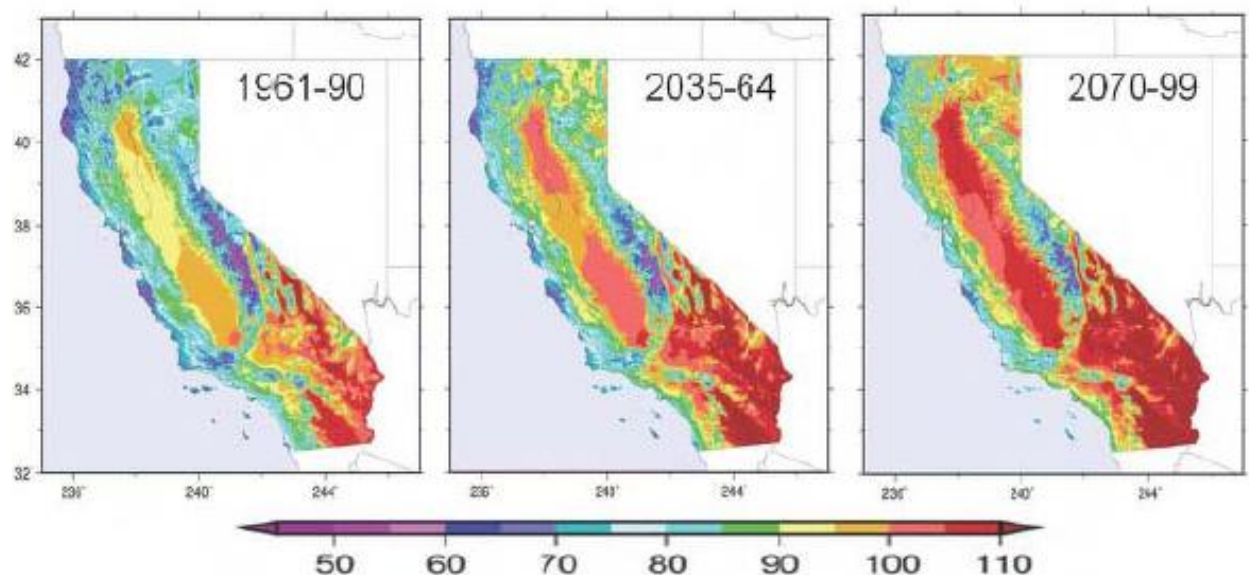
Climate change and its effect on flood near the City has been discussed by three sources:

- California Climate Adaptation Strategy (CAS) – 2014
- Climate Change and Health Profile Report (CCHPR) – Lake County
- Cal-Adapt

Climate Adaptation Strategy

The 2014 CAS, citing a California Energy Commission study, states that “over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined.” This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-7.

Figure 4-7 California Historical and Projected Temperature Increases – 1961 to 2099



Source: Dan Cayan; California Climate Adaptation Strategy

As temperatures increase, California and the City will likely face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According

to the 2014 CAS report and the 2018 State Plan, by 2100, hotter temperatures are expected throughout the State, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in health issues and deaths related to extreme heat in the City.

Climate Change and Health Profile Report – Lake County

The CCHPR noted for Lake County and Lakeport that increased temperatures manifested as heat waves and sustained high heat days directly harm human health through heat-related illnesses (mild heat stress to fatal heat stroke) and the exacerbation of pre-existing conditions in the medically fragile, chronically ill, and vulnerable. Increased heat also intensifies the photochemical reactions that produce smog and ground level ozone and fine particulates (PM2.5), which contribute to and exacerbate respiratory disease in children and adults. Increased heat and carbon dioxide enhance the growth of plants that produce pollen, which are associated with allergies. Increased temperatures add to the heat load of buildings in urban areas and exacerbate existing urban heat islands adding to the risk of high ambient temperatures.

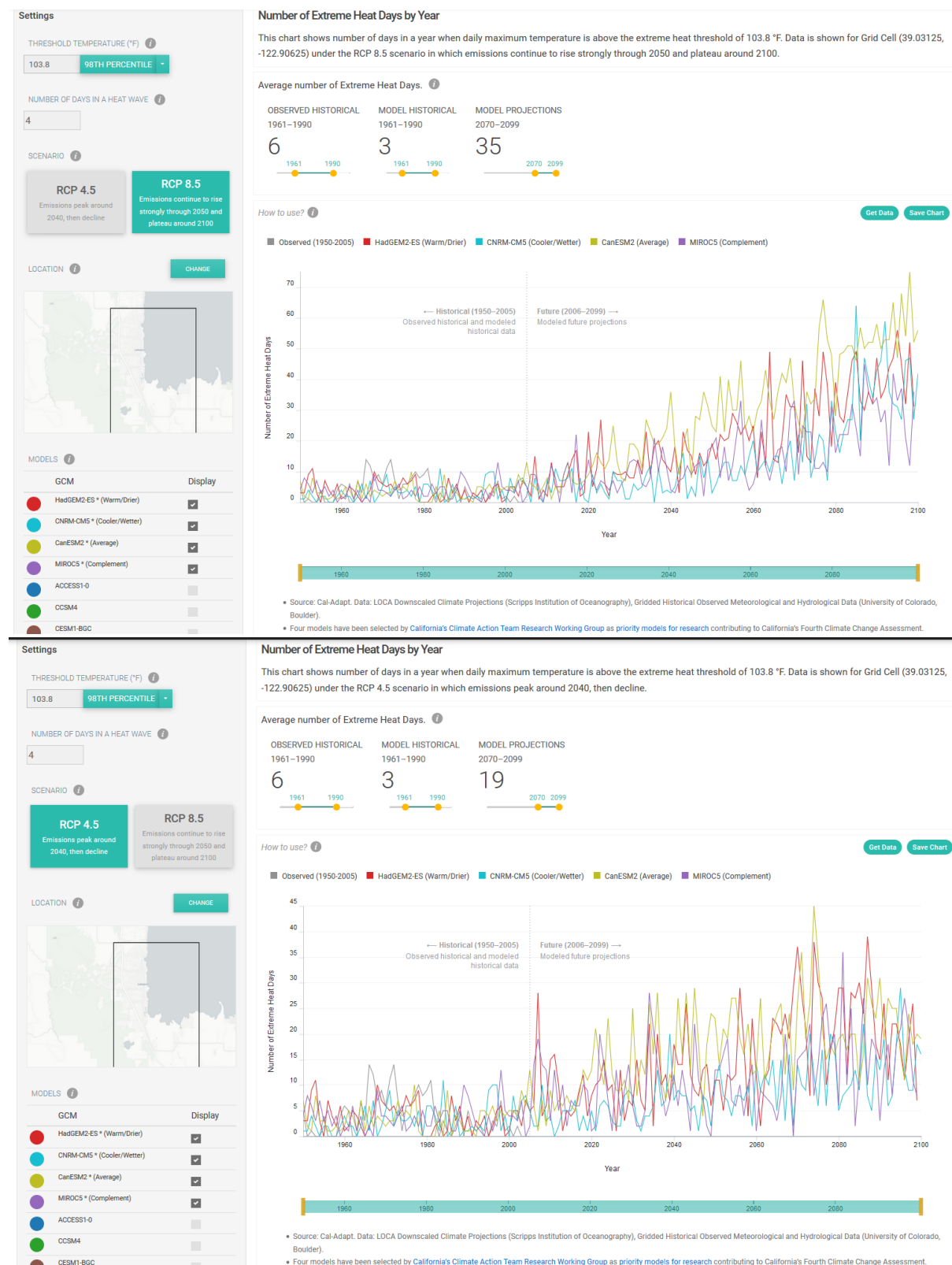
Cal-Adapt

Cal Adapt also noted that overall temperatures are expected to rise substantially throughout this century. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (RCP 8.5) are approximately twice as high as those projected in the lower emissions scenario (RCP 4.5).

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the State's ecosystem health, agricultural production, water use and availability, and energy demand. Future temperature estimates from Cal-Adapt for the City of Lakeport are shown in Figure 4-8. It shows the following:

- The upper chart shows number of days in a year when daily maximum temperature is above the extreme heat threshold of 90.0°F. Data is shown for Lakeport under the RCP 8.5 scenario in which emissions continue to rise strongly through 2050 and plateau around 2100.
- The lower chart shows number of days in a year when daily maximum temperature is above the extreme heat threshold of 90.0 °F. Data is shown for Lakeport under the RCP 4.5 scenario in which emissions peak around 2040, then decline.

Figure 4-8 City of Lakeport – Future Temperature Estimates in High and Low Emission Scenarios



Source: Cal-Adapt – Temperature: Decadal Averages Map, retrieved 1/6/2019

4.2.4. Severe Weather: Heavy Rains, Snow, and Storms

Hazard/Problem Description

Storms in the City Planning Area are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Lakeport area falls mainly in the fall, winter, and spring months. Winter storms can also bring very limited snowfall to the City.

Heavy Rain and Storms

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

The Lake County General Plan noted that for Lake County and the City of Lakeport, four climatic factors work together to develop the annual season of precipitation: geographical altitude, pacific coastal mountain range barriers, prevailing storm tracks, and air masses.

- The County's location in the Pacific Coastal mountain range naturally gives the County varying elevations. The coastal mountain elevations in the County range from an average of 1,200 feet to over 7,000 feet.
- Lake County is located in the center of the Pacific Coastal mountain range. The mountain range acts as a barrier to approaching air masses, which approach the mountains from the west, 30 miles inland from the Pacific Ocean coastline. The mountains act as a lifting mechanism as air masses migrate over them, increasing the chance for precipitation.
- The winter storm track for Lake 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 Lake 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.

According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees. Power outages are also a concern during severe storms.

Location

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City and County. All portions of the City are at risk to heavy rains. Most of these rains occur during the winter months, as discussed below.

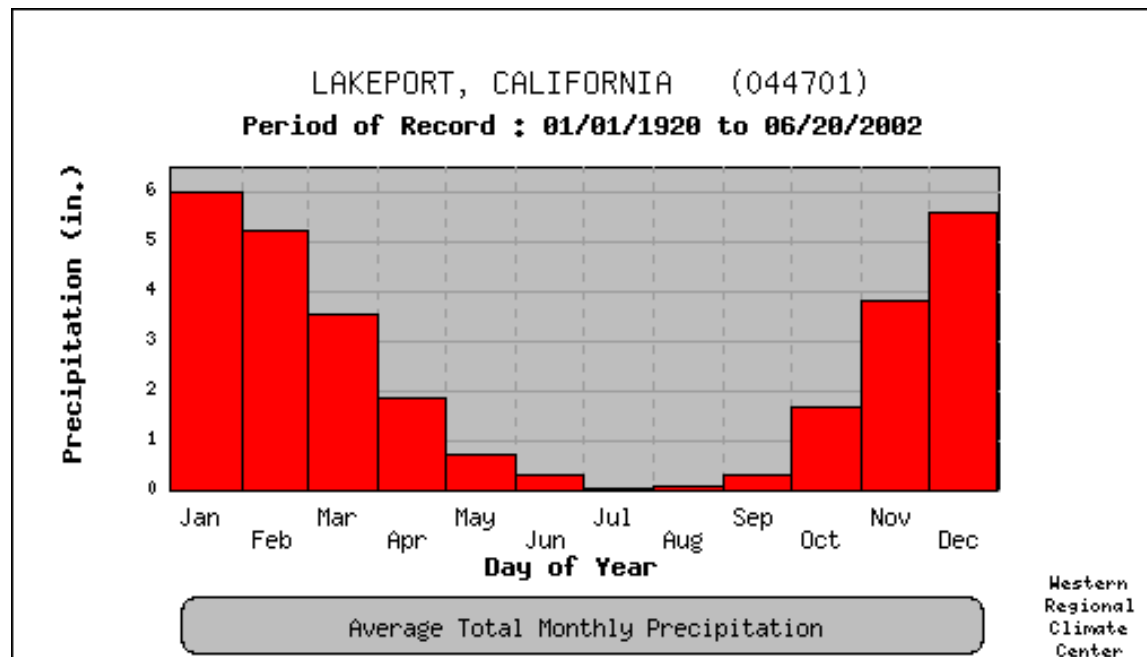
Extent

There is no scale by which heavy rain and storms are measured. Thunderstorms, lightning, and hail are rare in the City. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of heavy rain and storms in California is often short, ranging from minutes to hours. Information from the WRCC station is summarized below.

City of Lakeport Weather Station, Period of Record 1920 to 2002

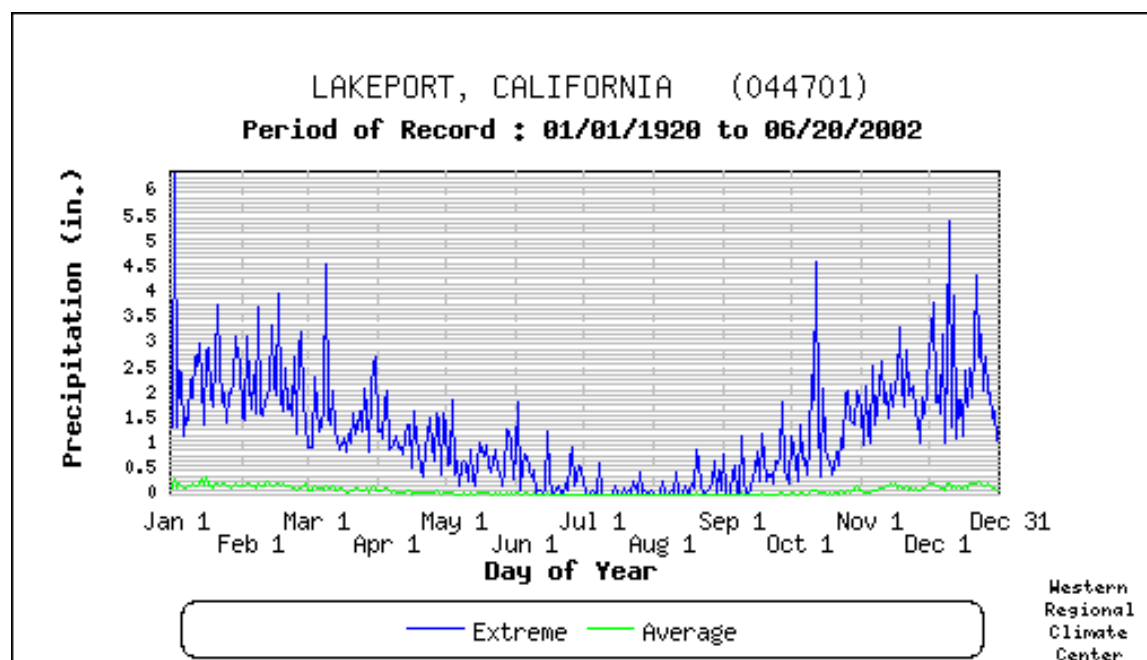
According to the WRCC, average annual precipitation in Lakeport is 28.36 inches per year. The highest recorded annual precipitation is 44.5 inches in 1973; the highest recorded precipitation for a 24-hour period is 5.43 inches on December 10, 1937. The lowest recorded annual precipitation was 9.96 inches in 1976. Average monthly precipitation for Lakeport is shown in Figure 4-9. Daily average and extreme precipitations are shown in Figure 4-10.

Figure 4-9 City of Lakeport – Monthly Average Total Precipitation



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

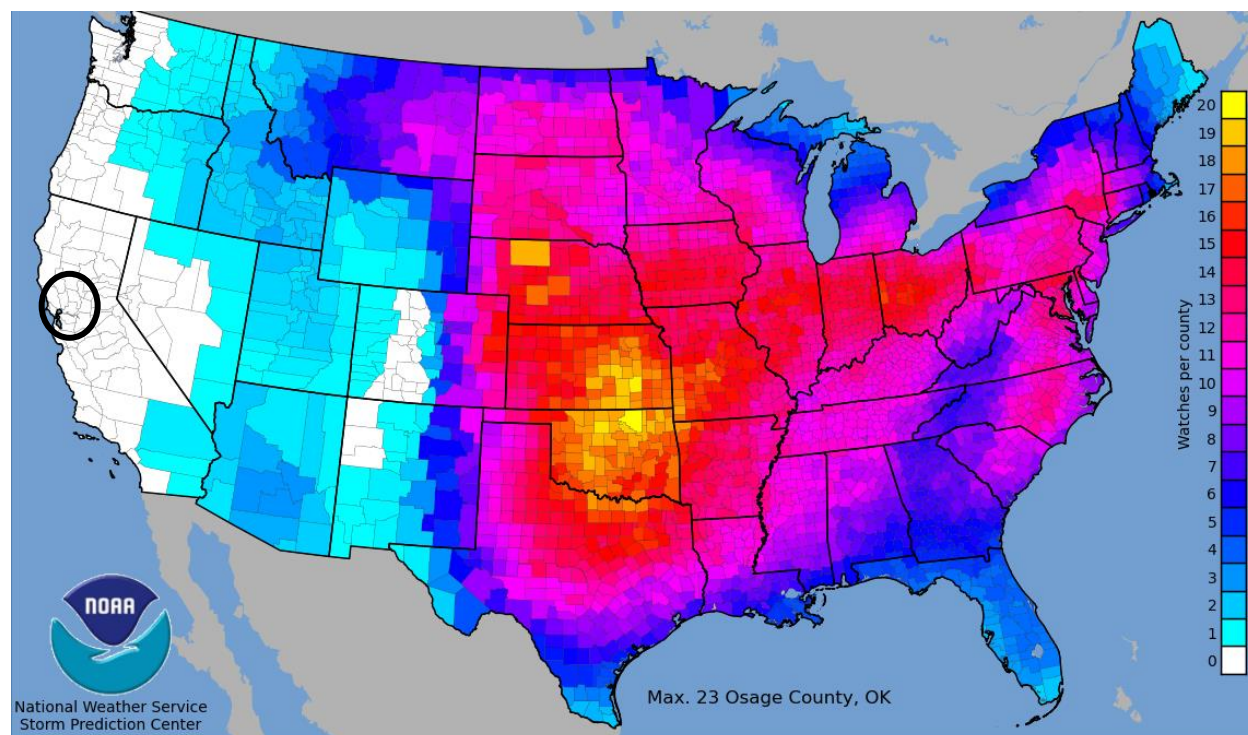
Figure 4-10 City of Lakeport – Daily Average and Extreme Precipitation



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

The NOAA Storm Prediction Center tracks US thunderstorm watches on a county basis. Figure 4-11 shows thunderstorm watches in the City and the United States for a 20-year period between 1993 and 2012.

Figure 4-11 City of Lakeport – Average Thunderstorm Watches per Year (1993 to 2012)



Source: NOAA Storm Prediction Center

Snow

During the winter months, the higher elevations of the County to the west of the City of Lakeport can experience snowfall. The City experiences snow occasionally. According to the NWS and the WRCC, winter snowstorms can include heavy snow, ice, and blizzard conditions. In Lakeport, snow has occurred in the past, but it is more of a nuisance than a hazard. Snowfall in the City is rare, often falls in small amounts, and melts quickly.

Location

Snow events occur on a regional basis. Snow can occur in any location of the City. All portions of the City are at risk to snow. Most snow in the City falls in negligible amounts that melt quickly. Snow occurs during the winter months, as discussed below.

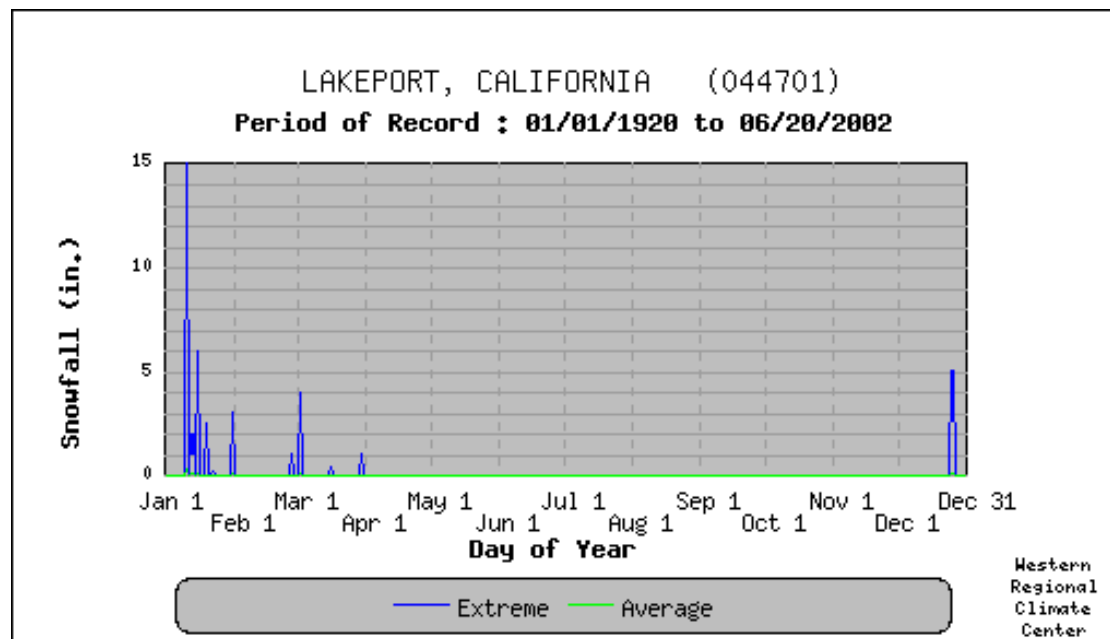
Extent

Extent and records on snowfall from the Lakeport weather station is shown below.

Lakeport Weather Station, Period of Record 1920 to 2002

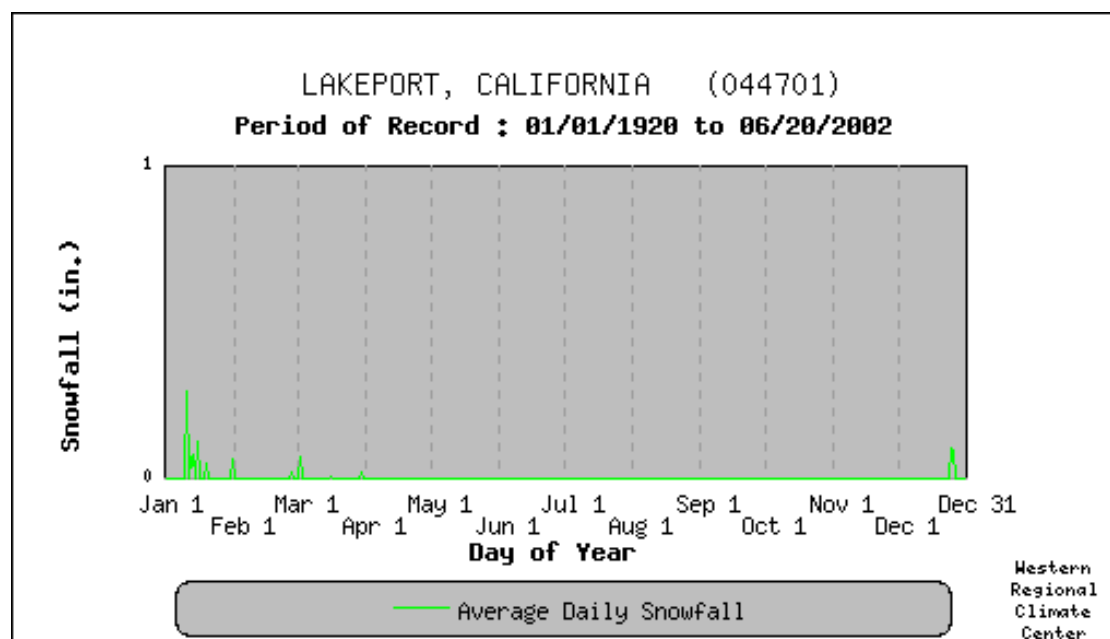
According to the WRCC, average snowfall is 1.0 inches, as shown in Figure 4-12. The highest annual snowfall fell in 1949, when 7.7 inches fell. Highest monthly snowfall accumulation came in January of 1937, when 15 inches fell. Average snowdepths in January through March fall at 0.1 inches. This can be seen in Figure 4-13.

Figure 4-12 City of Lakeport – Snowfall Averages and Extremes



Source: Western Regional Climate Center

Figure 4-13 City of Lakeport – Snowdepth Averages and Extremes



Source: Western Regional Climate Center

Hail

Hail events in the City are rare; however, hail can occur throughout the Planning Area during storm events. Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the City of Lakeport. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

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

Table 4-12 Hailstone Measurements

| Average Diameter | Corresponding Household Object |
|------------------|--------------------------------|
| .25 inch | Pea |
| .5 inch | Marble/Mothball |
| .75 inch | Dime/Penny |
| .875 inch | Nickel |
| 1.0 inch | Quarter |
| 1.5 inch | Ping-pong ball |
| 1.75 inch | Golf-Ball |
| 2.0 inch | Hen Egg |

| Average Diameter | Corresponding Household Object |
|------------------|--------------------------------|
| 2.5 inch | Tennis Ball |
| 2.75 inch | Baseball |
| 3.00 inch | Teacup |
| 4.00 inch | Grapefruit |
| 4.5 inch | Softball |

Source: National Weather Service

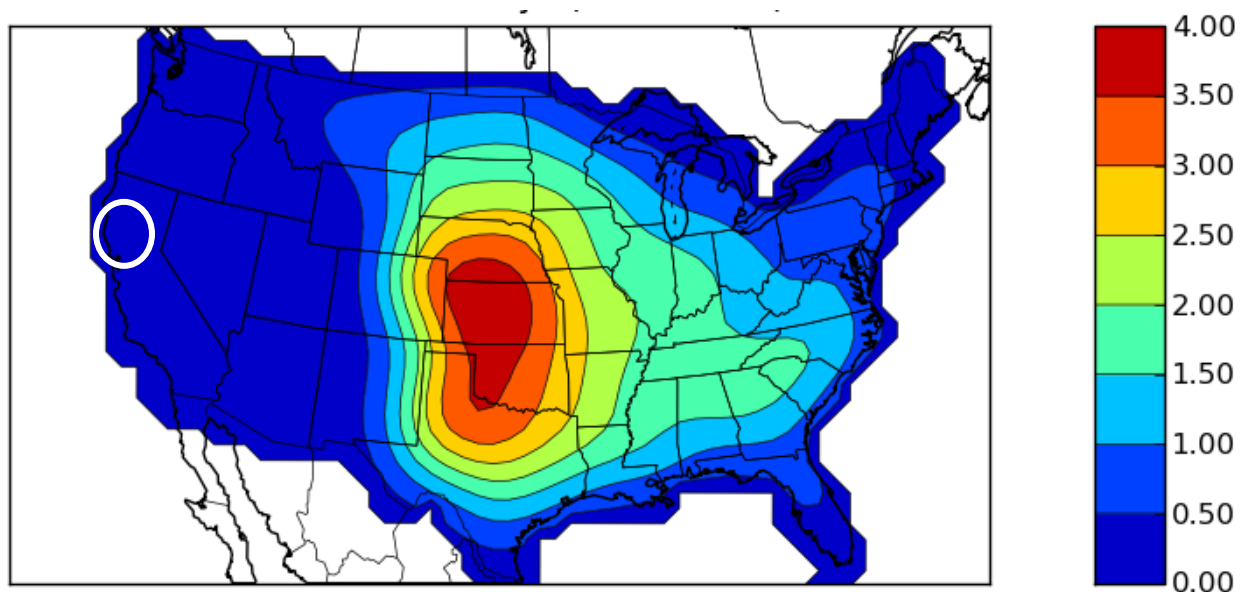
Location

Hail events can occur in any location of the City. All portions of the City are at risk to hail. Hail tends to be rare in the City and in Lake County, as discussed in the extent section below.

Extent

Hail tends to be rare in California and the City of Lakeport. There is no scale in which to measure hail, other than hail stone size. The speed of onset of hail can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms that can cause hail in California is often short, ranging from minutes to hours. Hail events last shorter than the duration of the total thunderstorm. The National Weather Service tracks hail events. Figure 4-14 shows the average days each year where hail of greater than 1" in diameter occurred during a 20-year period from 1990 to 2009. As shown in the figure, hail is rare in the City.

Figure 4-14 City of Lakeport – Average Hail Days per Year (1990 to 2009)



Source: National Weather Service

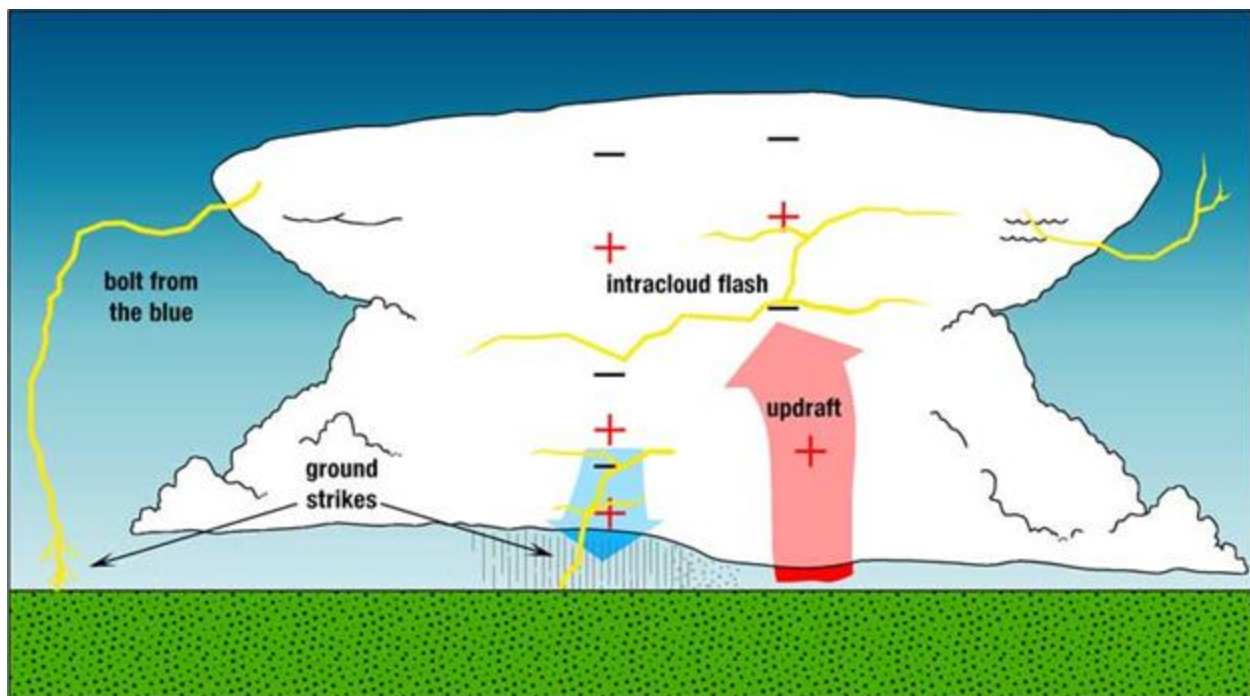
Lightning

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

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

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-15). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-15 Cloud to Ground Lightning



Source: National Weather Service

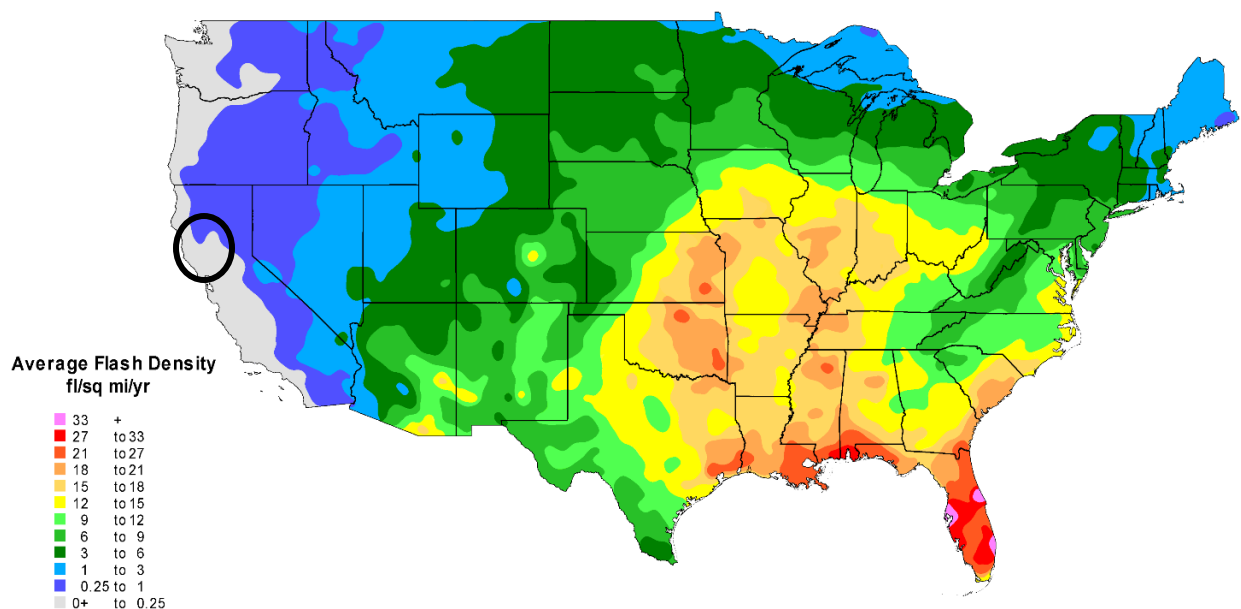
Location

Lightning events can occur in any location of the City and are often associated with thunderstorm. All portions of the City are at risk to lightning. Lightning tends to be rare in the City, as discussed in the extent section below.

Extent

Lightning in the City can occur during thunderstorms. The speed of onset of thunderstorms that can cause lightning can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. Thunderstorms and lightning are rare in the City. Vaisala maintains the National Lightning Detection Network. It tracks cloud to ground lightning incidences in the United States. Figure 4-16 shows lightning incidences in the City and the rest of the United States from 1997 to 2012.

Figure 4-16 City of Lakeport – Lightning Incidence Map 1997 to 2012



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Source: Vaisala National Lightning Detection Network

VAISALA

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. Heavy rains and storms have caused flooding in the County. Events where flooding resulted in a state or federal disaster declaration are shown in Table 4-13.

Table 4-13 Lake County – Disaster Declarations from Heavy Rain and Storms 1950-2019

| Disaster Type | Federal Declarations | | State Declarations | |
|---|----------------------|---|--------------------|--|
| | Count | Years | Count | Years |
| Flood (including heavy rain and storms) | 16 | 1955, 1958, 1963, 1964, 1970, 1983, 1986, 1995 (two times), 1997, 1998, 2005/2006, 2006, 2017 (two times), 2019 | 14 | 1950, 1955, 1958 (twice), 1963 (twice), 1970, 1980, 1983, 1986, 1995 (twice), 1997, 1998 |

Source: FEMA, Cal OES

NCDC Events

The NCDC data recorded 78 blizzard, hail, heavy rain, heavy snow, winter storm, and winter weather incidents for Lake County since 1950. Many of these events also affected the City. A summary of these events is shown in Table 4-14

*Table 4-14 NCDC Severe Weather Events in Lake County 1955-6/30/2018**

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|----------------|------------------|----------|-------------------|----------|---------------------|-----------------|-------------|
| Blizzard | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Hail | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heavy Rain | 5 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heavy Snow | 3 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Winter Storm | 62 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Winter Weather | 6 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Total | 78 | 0 | 0 | 0 | 0 | \$0 | \$0 |

Source: NCDC

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

Hazard Mitigation Planning Team Events

The HMPC noted many instances of heavy rain, most of which are discussed in the Flood profile in Section 4.2.12. The HMPC could not recall instances of snow causing issues in the City.

Likelihood of Future Occurrences

Highly Likely – Based on NCDC data and HMPC input, 78 heavy rain, hail, lightning, and thunderstorm wind incidents over a 64-year period (1955-2018) equates to a severe storm event every year. As noted, this database likely doesn't capture all heavy rain, hail, lightning, and winter weather events. Severe weather is a well-documented seasonal occurrence that will continue to occur often in the City of Lakeport Planning Area.

Climate Change and Heavy Rains and Storms

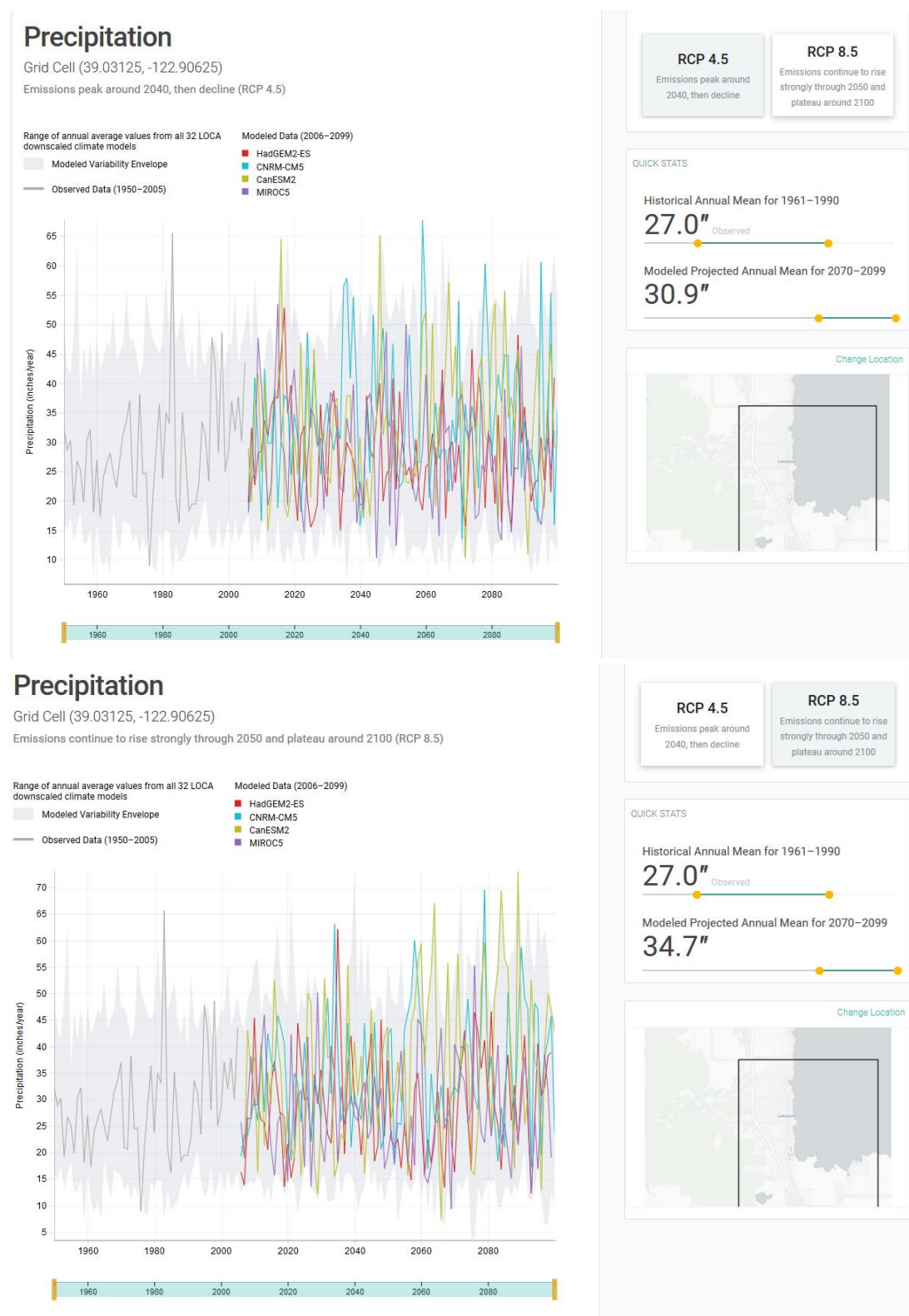
According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in the City. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate models projects slightly wetter winters, and another projects slightly drier winters with a 10 to 20 percent decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources that are nearly fully utilized. Future precipitation estimates for the City are shown in Figure 4-17. Figure 4-17 consists of two charts:

- The upper chart shows annual averages of observed and projected precipitation values for the selected area on the map under the RCP 8.5 scenario. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.
- The lower chart shows annual averages of observed and projected precipitation values for the selected area on map under the RCP 4.5 scenario. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.

These models have been selected by California state agencies as priority models for research contributing to California's Fourth Climate Change Assessment.

Figure 4-17 City of Lakeport – Future Precipitation Estimates in High and Low Emission Scenarios



Source: Cal-Adapt

4.2.5. Severe Weather: High Winds

Hazard/Problem Description

High Winds

High winds, often accompanying severe storms and thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms.

Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snowstorms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may push automobiles off roads, damage roofs and structures, cause utility outages, and cause secondary damage due to flying debris.

Location

The entire City is subject to significant, non-tornadic (straight-line) winds. Each area of the City is at risk to high winds.

Extent

Magnitude of winds is measured often in speed and damages. The speed of onset of both thunderstorm winds and high winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorm winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort wind force scale. Figure 4-18 shows the Beaufort wind scale.

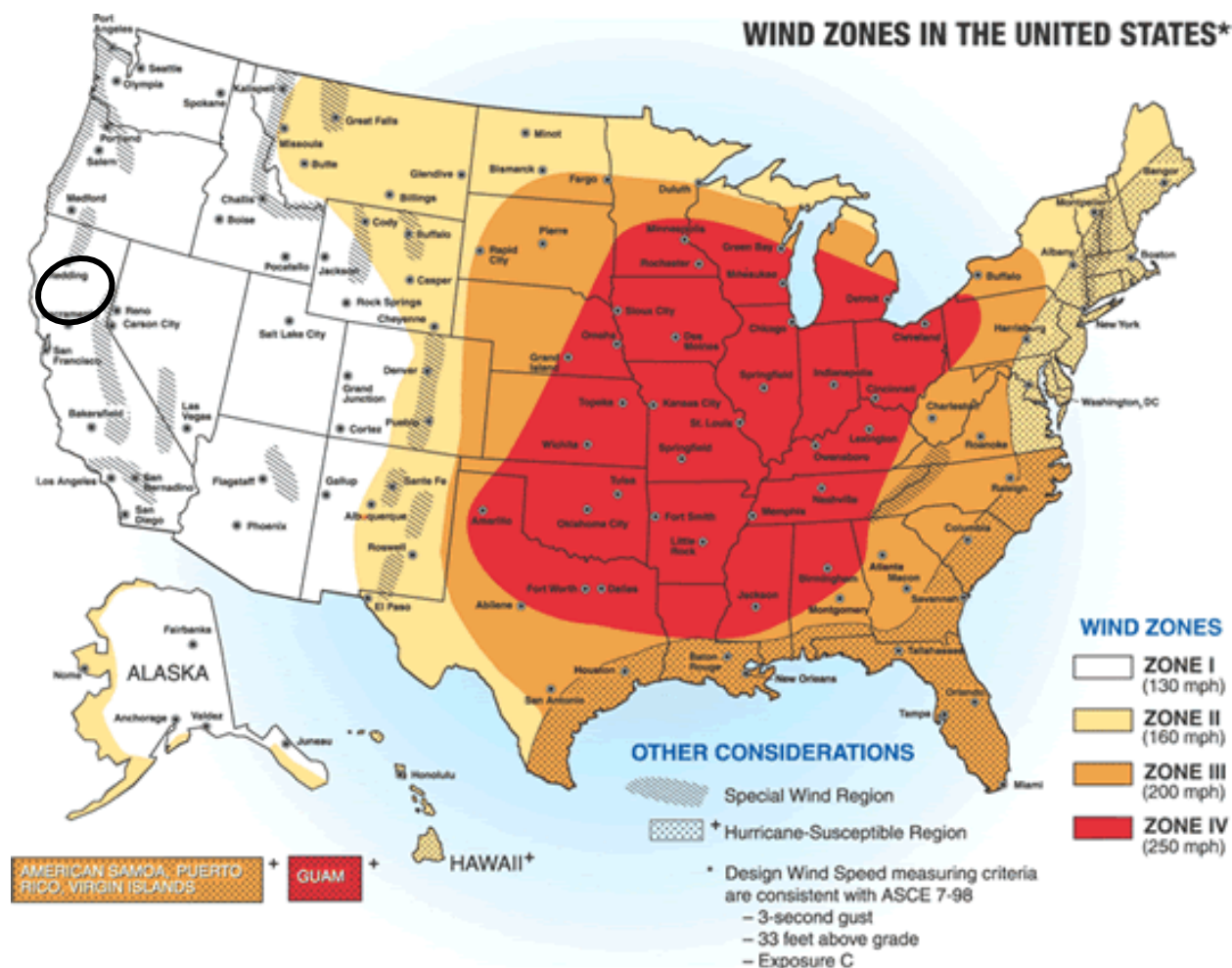
Figure 4-18 Beaufort Wind Scale

| Beaufort Number | Wind Speed (miles/hour) | Wind Speed (km/hour) | Wind Speed (knots) | Description | Wind Effects on Land |
|-----------------|-------------------------|----------------------|--------------------|-----------------|--|
| 0 | < 1 | < 1 | < 1 | Calm | Calm. Smoke rises vertically. |
| 1 | 1-3 | 1-5 | 1-3 | Light Air | Wind motion visible in smoke. |
| 2 | 4-7 | 6-11 | 4-6 | Light Breeze | Wind felt on exposed skin. Leaves rustle. |
| 3 | 8-12 | 12-19 | 7-12 | Gentle Breeze | Leaves and smaller twigs in constant motion. |
| 4 | 13-18 | 20-28 | 11-16 | Moderate Breeze | Dust and loose paper are raised. Small branches begin to move. |
| 5 | 19-24 | 29-38 | 17-21 | Fresh Breeze | Small trees begin to sway. |
| 6 | 25-31 | 39-49 | 22-27 | Strong Breeze | Large branches are in motion. Whistling is heard in overhead wires. Umbrella use is difficult. |
| 7 | 32-38 | 50-61 | 28-33 | Near Gale | Whole trees in motion. Some difficulty experienced walking into the wind. |
| 8 | 39-46 | 62-74 | 34-40 | Gale | Twigs and small branches break from trees. Cars veer on road. |
| 9 | 47-54 | 75-88 | 41-47 | Strong Gale | Larger branches break from trees. Light structural damage. |
| 10 | 55-63 | 89-102 | 48-55 | Storm | Trees broken and uprooted. Considerable structural damage. |
| 11 | 64-72 | 103-117 | 56-63 | Violent Storm | Widespread damage to structures and vegetation. |
| 12 | > 73 | > 117 | > 64 | Hurricane | Considerable and widespread damage to structures and vegetation. Violence. |

Source: National Weather Service

Figure 4-19 depicts wind zones for the United States. The map denotes that Lakeport falls into Zone I, which is characterized by high winds of up to 130 mph (above Beaufort Number 12).

Figure 4-19 Wind Zones in the United States



Source: FEMA

Past Occurrences

Disaster Declaration History

There have been no past federal or state disaster declarations due to high winds, according to Table 4-3.

NCDC Events

The NCDC data recorded 13 high wind incidents for Lake County since 1955. A summary of these events is shown in Table 4-15. None of these events have mapped coordinates.

Table 4-15 NCDC High Wind Events in Lake County 1955-6/30/2018*

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|------------|------------------|--------|-------------------|----------|---------------------|-----------------|-------------|
| High Wind | 12 | 0 | 0 | 0 | 0 | \$168,000 | \$0 |

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|--------------|------------------|----------|-------------------|----------|---------------------|------------------|-------------|
| Strong Wind | 1 | 0 | 0 | 0 | 0 | \$1,000 | \$0 |
| Total | 13 | 0 | 0 | 0 | 0 | \$169,000 | \$0 |

Source: NCDC

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

Hazard Mitigation Planning Team Events

The HMPC noted that high winds occur often in the City. No instances of significant damages or injuries from wind could be recalled. The HMPC noted it is often high winds, in conjunction with heat and drought, that cause wildfire risk in the City to increase. The HMPC did indicate that high winds and wave action contributed to the Clear Lake bank erosion in the Library Park area

Likelihood of Future Occurrences

Highly Likely – Based on NCDC data and HMPC input, 13 wind incidents over a 64-year period (1955-2018) equates to a severe wind event every 4.9 years. However, as noted, this database likely doesn't capture all wind events. High winds are a well-documented seasonal occurrence that will continue to occur annually in the City.

Climate Change and High Winds

According to the 2014 CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds.

4.2.6. Aquatic Biological Hazards: Cyanobacterial Bloom

Hazard/Problem Description

Cyanobacteria is a photosynthetic bacteria that is single-celled but often form colonies in the form of filaments, sheets, or spheres and are found in diverse environments. Cyanobacteria is also called blue-green algae. Cyanobacteria are a normal part of most aquatic ecosystems, including lakes, rivers, and oceans. Usually, cyanotoxin concentrations are low, and not harmful to animals and humans. However, when toxic algae are present in an ecosystem, or when there are "algal blooms" (the rapid, uncontrolled growth of algae) they can be harmful. There are factors that contribute to algal blooms, including limiting nutrients, climate change, and pollution.

Cyanobacteria are very diverse. They can be found in both freshwater and saltwater environments. Although these organisms' impressive success across such varied conditions is remarkable, it can also be a cause for concern. Algae is a normal and healthy part of many aquatic ecosystems; however, in large numbers, cyanobacteria blooms can cause chaos in an aquatic ecosystem and may even threaten human health. In fact, these bloom events can be so large that in some cases the resulting cyanobacteria cover can be seen from space.

Cyanobacteria bloom is a term used to describe the rapid growth of cyanobacteria, also called blue-green algae. A bloom essentially takes over parts of a body of water, or a full body of water, and changes the way in which the ecosystem functions. Blooms have been problematic in Clear Lake.

Clear Lake is California's largest freshwater lake, covering 43,000 acres (68 square miles) of surface area with 110 miles of shoreline. The lake's vast size gives it the ability to support large populations of waterfowl such as ducks, pelicans, grebes, blue herons, egrets, and osprey year-round and winter populations of bald eagles and white pelicans.

The average depth of the lake is about 25 feet. Historically, the natural level of Clear Lake was maintained by the Grigsby Riffle, a rock sill located at the confluence of Cache and Siegler Canyon Creeks. The Cache Creek Dam, controlled by the Yolo County Flood Control District, is about three miles downstream of the Riffle. The dam is capable of releasing far more water than the upstream channel to the riffle is physically capable of accommodating. Because of the limited discharge capacity of the upstream channel, it is possible for the lake to flood in the near-shore areas during extended periods of heavy rainfall.

Prevailing winds and the lake's modest depth facilitate vertical mixing. Submerged thermal springs and gas vents in the floor of the lake further promote mixing. These geologic features are not considered to impact the Clear Lake water utilities negatively. The lake stratifies during warm summer days, but generally recirculates during the cooler nights unless surface conditions are unusually calm.

Clear Lake has three distinct arms with distinct drainage basins: Upper Arm, Oaks Arm, and Lower Arm. Westerly winds push surface water from the Upper Arm into the Oaks Arm and Lower Arm, setting up a return flow of bottom water. "The Narrows" limits those exchanges. It takes about 100 days for water in the Lower Arm and Oaks Arm to be completely exchanged with the Upper Arm due to wind driven currents.

The growth of blue-green algae can cause considerable degradation of the lake shore and surface environment during summer and fall. Algal problems are typically most serious at the eastern end of the lake where prevailing winds can push floating algae into huge rotting mats that produce strong odors. Areas around Lakeport can see these odorous mats as well. Erosion of sediments from the upper watershed carries nutrients that contribute to algal growth.

The major manifestation of water pollution is the algae in Clear Lake. Although the problem appears to be largely a result of natural conditions conducive to algae growth, man's activities including land disturbance and fertilizing the soil no doubt contribute to the problem. Other pollutants, organic pesticides and mercury, found in Clear Lake are hazardous to the fish and, in significant enough concentration, result in fish kills.

Cyanobacteria is becoming an increasingly significant hazard in Clear Lake. Cyanobacteria can produce toxins that can be harmful for animals and people when consumed at high levels. Currently research is not clear on what levels of toxins are harmful, however, the Environmental Protection Agency (EPA) recently published conservative guidelines to ensure that human safety is preserved. While current water treatment processes appear to filter out toxins to safe levels, there is the possibility of contamination in the future. There is also an increased cost associated with treatment of toxins.

Figure 4-20 Cyanobacteria under Microscope and Example of Algal Bloom in Clear Lake



Source: Baynature.org

Clear Lake is identified as an impaired water body for nutrients and mercury on the State Water Resources Control Board CWA 303d list, and on its southeastern shoreline is the Sulphur Bank Mercury Mine, Superfund Site EPA #: CAD980893275, established in 1990. The Clear Lake Nutrient total maximum daily load (TMDL) was adopted in 2006 and the Clear Lake Mercury TMDL was adopted in 2003. California Office of Environmental Health Hazard Assessment issued a fish consumption advisory, most recently updated in 2014, for Clear Lake due to mercury levels in fish tissues. Extensive cyanobacteria harmful algal blooms including the cyanobacteria *Microcystis* spp. occur in Clear Lake. These are promoted by anthropogenic nutrient loading from runoff of sediment, storm and agricultural waters containing nutrients such as phosphates. Sewage overflows and leaking septic systems also contribute to the nutrient problem in Clear Lake.

According to the Surface Water Ambient Monitoring Program (SWAMP) Harmful Algal Bloom (HAB) Field Guide, there is a cyanobacterial chart and it details cyanobacteria groups and the toxins that they potentially produce. This is shown in Figure 4-21. These connections to potential toxin production are based on published research of laboratory cultures and cyanobacteria collected from the field. Note that research is still finding new connections and this chart is not an exhaustive review of all published cyanobacteria research; use this informational chart with caution and do not solely rely on it to determine risks from cyanobacteria. It is recommended to confirm toxin presence using an analytical method (field toxin detection kits, laboratory-based analysis).

The groups of cyanobacteria are identified to the taxonomic level of genus, among this genus are numerous species - it is not necessary to identify cyanobacteria down to the species level to assess potential toxin production. Species level identification takes more time and resources. When toxins production has been measured for an individual species, the entire genus that they belong to is assumed to produce toxins - this is a precautionary approach. This chart also highlights that cyanobacteria are capable of producing more than one toxin; therefore, toxin analysis should be planned accordingly.

Figure 4-21 Cyanobacteria and Known Toxins Chart

| Cyanobacteria Genus | Cyanotoxin Class | | | | | | | | | | References |
|------------------------------------|------------------|----|-----|-----|-----|-----|-----|------|-----|-----|--|
| | CYL | MC | NOD | ATX | SAX | NEO | LYN | BMAA | DAT | APL | |
| <i>Anabaenopsis</i> | | ✓ | | | | | | | | | Lanaras and Cook, 1994; Graham et al., 2010 |
| <i>Aphanizomenon</i> | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | Graham et al., 2010; Jacoby and Kann, 2007; Pilotto et al., 1997; Vezie et al., 1998; Graham et al., 2008 |
| <i>Aphanocapsa</i> | | ✓ | | | | | | | | | Graham et al., 2010 |
| <i>Calothrix</i> | | ✓ | | | | | | ✓ | | | Mohamed et al., 2006; Paerl and Otten, 2013 |
| <i>Coelomorion</i> | | ✓ | | | | | | | | | Dos S Vieira et al., 2005 |
| <i>Coelosphaerium</i> | | ✓ | | | | | | | | | Graham et al., 2010; Jacoby and Kann, 2007 |
| <i>Cylindrospermopsis</i> | ✓ | ✓ | | ✓ | ✓ | | | ✓ | | | Graham et al., 2010; Griffiths and Saker, 2002; Woods and Sterling, 2003; Graham et al., 2008; Paerl and Otten, 2013 |
| <i>Cylindrospermum</i> | | ✓ | | ✓ | ✓ | | | | | | Borges et al., 2015; Pandey and Tiwari, 2010; Sivonen et al., 1989 |
| <i>Dolichospermum (Anabaena)</i> | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | Bruno et al., 1994; Graham et al., 2010; Harada et al., 1991; Jacoby and Kann, 2007; Mohamed et al., 2006; Pilotto et al., 1997; Sivonen et al., 1989; Spoof et al., 2006; Vezie et al., 1998; Graham et al., 2008 |
| <i>Fischerella</i> | | ✓ | | | | | | | | | Otten and Paerl, 2015 |
| <i>Geitlerinema</i> | | ✓ | | | ✓ | | | | | | Aboal et al., 2005; Borges et al., 2015; Myers et al., 2007 |
| <i>Gloeotrichia</i> | | ✓ | | | | | | | | | Carey et al., 2007; Graham et al., 2010; Jacoby and Kann, 2007 |
| <i>Hapalosiphon</i> | | ✓ | | | | | | | | | Prinsep et al., 1992 |
| <i>Limnothrix</i> | | ✓ | | | | | | | | | Graham et al., 2010 |
| <i>Lyngbya</i> | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Berry et al., 2004; Dos S Vieira et al., 2005; Foss et al., 2012; Harr et al., 2008; Onodera et al., 1997; Stewart and Falconer, 2008; Paerl and Otten, 2013 |
| <i>Microcystis</i> | | ✓ | | | | | | ✓ | | | Botes et al., 1982; Graham et al., 2010; Jacoby and Kann, 2007; Miller et al., 2010; Oberholster et al., 2006; Pilotto et al., 1997; Ueno et al., 1996; Vezie et al., 1998; Graham et al., 2008 |
| <i>Nodularia</i> | | ✓ | ✓ | | | | | ✓ | | | Carmichael et al., 1988; McGregor et al., 2012; Pilotto et al., 1997; Graham et al., 2008 |
| <i>Nostoc</i> | | ✓ | | | | | | ✓ | | | Mohamed et al., 2006; Sivonen and Carmichael, 1990; Sivonen et al., 1992; Paerl and Otten, 2013 |
| <i>Oscillatoria (Planktothrix)</i> | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | | ✓ | Brittain et al., 2000; Carmichael and Li, 2006; Graham et al., 2010; Jacoby and Kann, 2007; Luukkainen et al., 1993; Mazmouz et al., 2010; Mez et al., 1997; Sivonen et al., 1989; Graham et al., 2008 |
| <i>Phormidium</i> | ✓ | ✓ | | ✓ | ✓ | | | ✓ | | | Borges et al., 2015; Guggen et al., 2005; Harland et al., 2013; Izaguirre et al., 2007; Mez et al., 1997; Mohamed et al., 2006; Skulberg et al., 1992; Smith, 2012 |
| <i>Planktolyngbya</i> | | | | | ✓ | | ✓ | | | | Graham et al., 2010 |
| <i>Prochlorococcus</i> | | | | | | | | ✓ | | | Paerl and Otten, 2013 |
| <i>Pseudanabaena</i> | | ✓ | | ✓ | | | | | | | Graham et al., 2010 |
| <i>Raphidiopsis</i> | ✓ | | | ✓ | ✓ | | | | | | Graham et al., 2008; Otten and Paerl, 2015 |
| <i>Rivularia</i> | | ✓ | | | | | | | | | Aboal et al., 2005 |
| <i>Schizothrix</i> | | | | ✓ | | | | | | ✓ | Sivonen and Jones, 1999; Paerl and Otten, 2013 |
| <i>Scytonema</i> | | | | | ✓ | | | ✓ | | | Smith et al., 2011; Otten and Paerl, 2013 |
| <i>Synechococcus</i> | | ✓ | | | | | | ✓ | | | Carmichael and Li, 2006; Graham et al., 2008 |
| <i>Synechocystis</i> | | ✓ | | | | | | ✓ | | | Graham et al., 2008 |
| <i>Trichodesmium</i> | | | | | | | | ✓ | | | Paerl and Otten, 2013 |
| <i>Tychonema</i> | | | | ✓ | | | | | | | Shams et al., 2015 |
| <i>Umezakia</i> | ✓ | | | | | | | | | | Paerl and Otten, 2013 |
| <i>Woronichinia</i> | | ✓ | | ✓ | | | | | | | Oberholster et al., 2006; Paerl and Otten, 2013 |

CYL = cylindrospermopsin MC = microcystin NOD = nodularin ATX = anatoxin-a and homoanatoxin SAX = saxitoxin and decarbamoylsaxitoxin NEO = neosaxitoxins BMAA = β-N-methylamino-L-alanine LYN = lyngbyatoxin-a DAT = debromoaplysiatoxin APL = aplysiatoxin

Source: SWAMP HAB Field Guide

Location

While it affects Clear Lake as a whole, cyanobacteria also affects the shoreline of Lakeport that abuts Clear Lake. No other locations of the City are physically affected. While only the shoreline of the Lake is physically affected, the economic extent of cyanobacterial blooms affect the whole of the City. Tourism from Clear Lake is a major driver of revenue for the City. Homes along the Lake also account for portions of the tax base for the City. Cyanobacterial blooms threaten both the tourism industry and the value of homes along the Lake. In addition, cyanobacterial blooms in the Lake affect the water intake systems where the water treatment plants draw from.

Extent

There is not established scientific scale for cyanobacteria blooms, outside of the toxicity of the water in Clear Lake. Magnitude is measured in terms of the amount of cyanobacteria blooming in Clear Lake at any given time, and their associated toxin level. The speed on onset and duration are determined by atmospheric and Clear Lake conditions. Speed of onset can be short, and duration can be long.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from aquatic biological hazards.

NCDC Events

The NCDC does not track aquatic biologic hazards.

Hazard Mitigation Planning Committee Events

The HMCP has noted a study that showed that Clear Lake has been a shallow, productive system, essentially similar to the modern Lake since the end of the Pleistocene Period – about 10,000 years ago. University of California Davis researchers found records of algae blooms as far back as 1873, well before the surrounding watersheds were seriously altered.

In 2009, Clear Lake experienced a heavy bloom of cyanobacteria, primarily *Lyngbya*. Data suggest that these visible blooms were most concentrated at the southern end of the lake where prevailing winds and geographic conditions support the accumulation algae mats. A similar bloom again occurred in 2010. In 2010, researchers from the University of California, Santa Cruz performed a series of toxicity investigations regarding the cyanobacteria in Clear Lake. During their 2010 sampling events, researchers noted that algal blooms were dominated by *Nitzschia*, *Melosira*, *Phormidium cinnatum*, *Oocystis*, *Anabaena spiroides* and *Microcystis aeruginosa*. Potentially harmful cyanobacteria that were found included: *Aphanizomenon*, *Microcystis aeruginosa*, *Anabaena spiroides*, and *Lyngbya cinnati* (also known as *Phormidium cinnatum*) during the summer. The two dominant “mat-forming” cyanobacteria found in their study were *Lyngbya cinnati* and *Anabaena spiroides*. They concluded that the Lake does not appear to have significant recreational risks to toxin exposures, but that the levels of the microcystins (a toxin to humans) would require further investigation.

From June to October 2011, UC Santa Cruz provided research and prepared the *Harmful Cyanobacteria Blooms and Their Toxins in Clear Lake and The Sacramento-San Joaquin Delta* (California) report as part of the California State Water Resources Control Board (SWRCB) SWAMP. This state funded research had specific objectives to address including:

- Monitor monthly discrete and continuous sampling stations located in critical habitats of the Sacramento-San Joaquin Delta and in each arm of Clear Lake in order to:
 - ✓ Perform an assessment of the toxicity of the cyanobacteria growing in Clear Lake and the Sacramento-San Joaquin Delta.
 - ✓ Identify and enumerate harmful cyanobacteria in these two systems using traditional microscopy and molecular methods.
- Provide a better understanding of the mechanisms underlying the source, occurrence and toxicity levels of harmful cyanobacteria in these systems.
- Investigate possible algae-related symptoms by Lake County residents, domestic animals and wildlife (Lake County Department of Health).
- Serve as a source of information that will direct and promote actions to improve water quality and enhance other monitoring programs.

Some highlights provided in the conclusions of the *Harmful Cyanobacteria Blooms and Their Toxins in Clear Lake and The Sacramento-San Joaquin Delta* report recommend taking into account the biological influence of translocation of nutrients between sediment and the water column, preventing or reducing *G. echinulata* at the sediment level rather than the water column to help prevent blooms, examination of internal nutrient cycling of nitrogen and phosphorus. Because there are toxins associated with blue-green algae, utilities can be affected in the future with more taste and odor issues. A possible remedy to the severe water quality issues introduced by blue-green algae near intakes could be to install a dual intake system with a switch or automation that allows for one intake to shut off and the other to turn by a limiting detection limit (e.g. pH) or another treatment factor.

The Big Valley Band of Pomo Indians began a cyanobacteria and cyanotoxin monitoring program on Clear Lake in 2014 with another shoreline Tribe, Elem Indian Colony. Together the two Tribes' Environmental Departments have collaborated with equipment, resources and time to test the water for toxins produced by cyanobacteria. Data from these monitoring programs from 2014 to 2018 is shown on Figure 4-22.

Figure 4-22 Clear Lake Cyanotoxin Monitoring Sites – Exceedance of Microcystin Threshold for Potential Health Risks 2014 to 2018

| SAMPLING SITE ID | ARM OF LAKE | PERCENTAGE OF TIMES SITE EXCEEDED 0.8 µg/L EACH YEAR (PUBLIC NOTIFICATION THRESHOLD FOR MICROCYSTIN) | | | | | HIGHEST MICROCYSTIN LEVEL RECORDED AT EACH SITE EACH YEAR * | | | | |
|------------------|-------------|---|-------------|-------------|-------------|-------------|--|-------------|-------------|-------------|-------------|
| | | 2014 | 2015 | 2016 | 2017 | 2018 | 2014 | 2015 | 2016 | 2017 | 2018 |
| BVCL6 | U | 17%, n=6 | 0%, n=20 | 0%, n=9 | 0%, n=8 | 0%, n=11 | 1.2 | ND | 0.14 | 0.21 | ND |
| CLV7 | U | 86%, n=7 | 0%, n=13 | 0%, n=9 | 13%, n=8 | 9%, n=11 | 105 | ND | 0.34 | 3.5 | 13 |
| M4 | U | 33%, n=6 | 0%, n=14 | not sampled | not sampled | not sampled | 8.3 | ND | not sampled | not sampled | not sampled |
| LPTNT | U | 83%, n=6 | 0%, n=12 | 0%, n=9 | 0%, n=8 | 0%, n=11 | 877.6 | ND | 0.17 | 0.14 | ND |
| RODS | U | not sampled | 0%, n=12 | 0%, n=9 | 0%, n=8 | 0%, n=9 | not sampled | ND | 0.15 | 0.11 | ND |
| CP | U | not sampled | 0%, n=11 | 0%, n=9 | 0%, n=9 | 11%, n=9 | not sampled | ND | 0.16 | ND | 2.9 |
| LS | U | not sampled | 0%, n=11 | 0%, n=9 | not sampled | not sampled | not sampled | Trace | 0.11 | not sampled | not sampled |
| LS2 | U | not sampled | not sampled | not sampled | 0%, n=3 | 0%, n=10 | not sampled | not sampled | not sampled | 0.12 | 0.11 |
| LUC01 | U | 67%, n=6 | 0%, n=13 | 0%, n=9 | 0%, n=8 | 0%, n=11 | 13 | ND | 0.14 | ND | ND |
| HB | U | not sampled | 0%, n=9 | 0%, n=8 | 0%, n=8 | 0%, n=10 | not sampled | Trace | 0.12 | 0.35 | 0.16 |
| KP01 | U | not sampled | 0%, n=12 | 0%, n=9 | 0%, n=8 | 11%, n=9 | not sampled | ND | 0.15 | 0.34 | 4 |
| ELEM01 | O | 50%, n=4 | 29%, n=14 | not sampled | 0%, n=7 | 27%, n=11 | 4.4 | 18.7 | not sampled | 0.38 | 4.9 |
| SBMME01 | O | 100%, n=7 | 20%, n=10 | 0%, n=9 | 25%, n=8 | 10%, n=10 | 5,311.70 | 278 | 0.67 | 2.4 | 4,880 |
| CLOAKS01 | O | 100%, n=7 | 31%, n=16 | 0%, n=9 | 13%, n=8 | 20%, n=10 | 16,920 | 21 | 0.16 | 46.00 | 480 |
| GH | O | not sampled | not sampled | not sampled | 0%, n=6 | 0%, n=10 | not sampled | not sampled | not sampled | 0.2 | 0.13 |
| BP | L | not sampled | 27%, n=11 | 0%, n=9 | 13%, n=8 | 0%, n=11 | not sampled | 9.4 | 0.16 | 1.3 | 0.36 |
| RP | L | not sampled | 33%, n=10 | 0%, n=9 | 13%, n=8 | 17%, n=6 | not sampled | 134 | 0.13 | 1.2 | 25 |
| SHADY01 | L | not sampled | 40%, n=10 | 0%, n=9 | 0%, n=8 | 27%, n=11 | not sampled | 36.1 | 0.34 | 0.39 | 8.7 |
| RED01 | L | not sampled | 33%, n=12 | 0%, n=9 | 0%, n=8 | 20%, n=10 | not sampled | 65.5 | 0.28 | 0.44 | 24 |
| AP01 | L | 100%, n=9 | 41%, n=17 | 0%, n=9 | 0%, n=9 | 9%, n=11 | 769.2 | 10,162 | 0.21 | 0.52 | 230 |
| JB | L | not sampled | not sampled | 0%, n=9 | 0%, n=8 | not sampled | not sampled | not sampled | 0.19 | 0.34 | not sampled |

n = number of times sampled

* = in µg/L

Big Valley Rancheria EPA and Elem Indian Colony EPA 2014 to 2018 Health Threshold Exceedances
<https://www.bvrancheria.com/clearlakecyanotoxins>

Source: Big Valley Rancheria EPA and Elem Indian Colony EPA

Likelihood of Future Occurrences

Highly Likely – Cyanobacterial bloom is an annual event in Clear Lake. The severity of it varies by year. Biologists predict that this phenomenon is likely to recur for an unknown period of time. Although a research project has demonstrated only low levels of cyanotoxins to date, the risk for toxin production in algal blooms is known to vary widely with time and location.

Climate Change and Cyanobacterial Bloom

The Climate Institute notes that climate change affects cyanobacterial blooms. This can be seen in Figure 4-23. Climate change contributes to excess cyanobacteria blooms by creating ideal conditions for cyanobacteria to grow. Cyanobacteria thrive in warm waters: as global temperatures rise, so too does global water temperatures. Cyanobacteria not only grow more rapidly in warm water from increased temperatures, but warmer waters also make it more difficult for water to mix, meaning the surface of the water remains much warmer than the rest of the body of water—and cyanobacteria grow more successfully on the surface. This is also disadvantageous because growing a thick cover on the surface of the water means that this photosynthetic organism can absorb sunlight easily, and grow even more rapidly.

Figure 4-23 *Climate Change and Cyanobacterial Bloom*

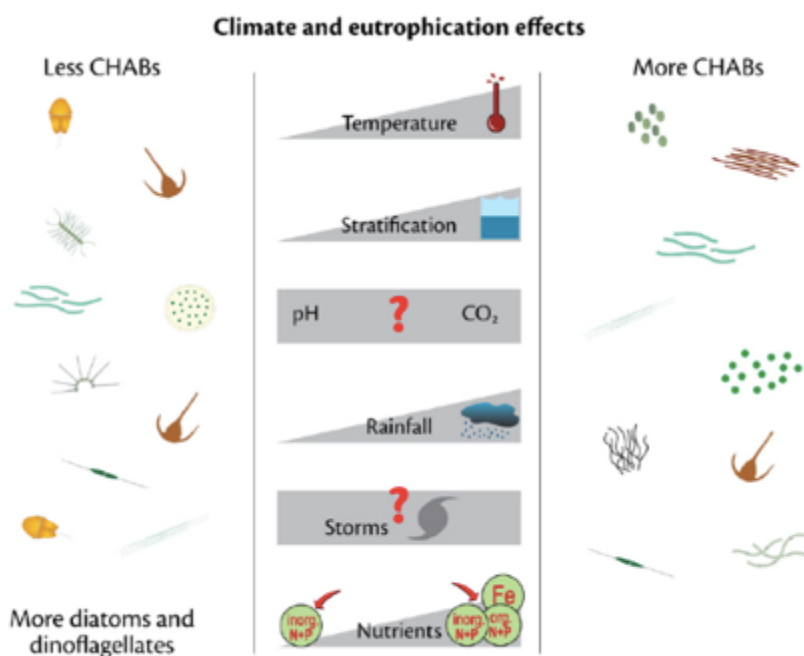


Fig. 2. Eutrophication and potential effects of climate change on Cyanobacterial Harmful Algal bloom (CHAB) abundance.

Source: Climate Institute

Furthermore, increasing concentrations of atmospheric carbon dioxide are also favorable to the growth of cyanobacteria. The combination of warmer water temperatures and carbon dioxide absorption further creates perfect conditions for cyanobacteria growth and blooms.

A change in climate also affects precipitation rates and patterns. According to NASA, “Rising temperatures will intensify the Earth’s water cycle, increasing evaporation. Increased evaporation will result in more storms, but also contribute to drying over some land areas.” This poses a problem when increased rainfall and storms causes more frequent nutrient pollution. Thus, fertilization of arable land, sewage discharging, industrial effluents, use of detergents, extensive livestock farming are some of the activities that are responsible for the anthropogenic input of nutrients.

4.2.7. Aquatic Biological Hazards: Quagga Mussels

Hazard/Problem Description

Clear Lake supports considerable growth of vascular aquatic plants. These include native species, and in the past, have included the exotic invasive Hydrilla, which formed mats so dense as to be unsuitable even for fish habitat. The lake is heavily used for recreational boating and supports sport fishing year around. Native fish have been largely replaced by introduced warm-water species, notably black bass, catfish, carp, and largemouth bass. Clear Lake is the source of drinking water for more than 45,000 community residents. The Lake is also home to many bass tournaments because of its prize fishing, and residents and tourists alike enjoy various forms of boating and recreation on the lake.

Quagga and zebra mussels are an invasive species of the same genus, *Dreissena*. The two species appear similar and can be mistaken for the other. These mussels are native to Eurasia and have spread across the United States. They have the ability to multiply rapidly and have no natural predator in the United States. When established in a waterbody the mussels become an ecological and economical threat. They can remove food and nutrients necessary for other species, clog pipes, damage boat motors. Quagga and zebra mussels are the size of a thumbnail (see Figure 4-24).

The introduction of quagga mussels (often referred to as Dreissenids) to the Pacific Southwest Region brings the potential to extend devastating impacts into a geographical area already challenged with water-related problems.

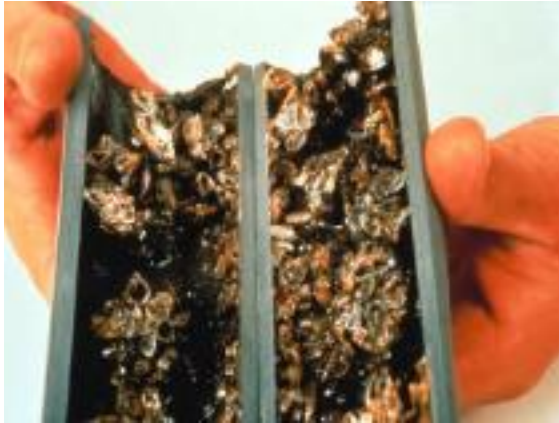
Figure 4-24 Quagga and Zebra Mussels



Source: US Fish and Wildlife Service

Zebra mussels are an invasive species first recognized in Lake St. Clair, near Detroit, Michigan, in 1988; shortly thereafter, the quagga mussel was identified. Since then, the Quagga mussel has rapidly spread across much of the western United States and in 2007 was detected at Lake Mead in Nevada. Later surveys found Quagga mussels in Lake Mohave in Nevada, Lake Havasu in Arizona, and the Colorado River Aqueduct System which serves Southern California. In California the first confirmed find of zebra mussels occurred at San Justo Lake in 2008. These mussels have the ability to survive for a number of days on land by their ability to retain moisture. As a result, there is concern these mussels can spread into Clear Lake by transportation on recreational boats. The mussels reproduce quickly, disrupting the ecosystem, and have the potential to clog drinking water intakes and motorboat engines, and litter beaches with jagged, foul smelling shells. Figure 4-25 is an example of mussels clogging a pipe.

Figure 4-25 Mussels Clogging a Pipe



Source: Don Schloesser, USGS, Biological Resources Division

Location

It should be noted that there have been no quagga or zebra mussels found in Clear Lake. If they were to be found, quagga mussels would affect the whole of Clear Lake. In the City, quagga mussels would affect the shoreline of Lakeport that abuts Clear Lake, as well as the location of the intake pipes for the water treatment plant. No other locations of the City would physically be affected. While only the shoreline of the Lake is physically affected, the economic extent of quagga would affect the whole of the City. Tourism from Clear Lake is a major driver of revenue for the City. Homes along the Lake also account for portions of the tax base for the City. A quagga mussel infestation threatens both the tourism industry and the value of homes within the City.

Extent

There is not established scientific scale for quagga mussels. Magnitude is measured by the presence and counts of mussels in the Lake. No quagga or zebra mussels have been found to date. Speed of onset can be short, as it takes only carelessness by a boater to introduce the mussel into Clear Lake. The duration of quagga mussel infestation is long. The whole of Clear Lake could be affected by these mussels.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from aquatic biological hazards.

NCDC Events

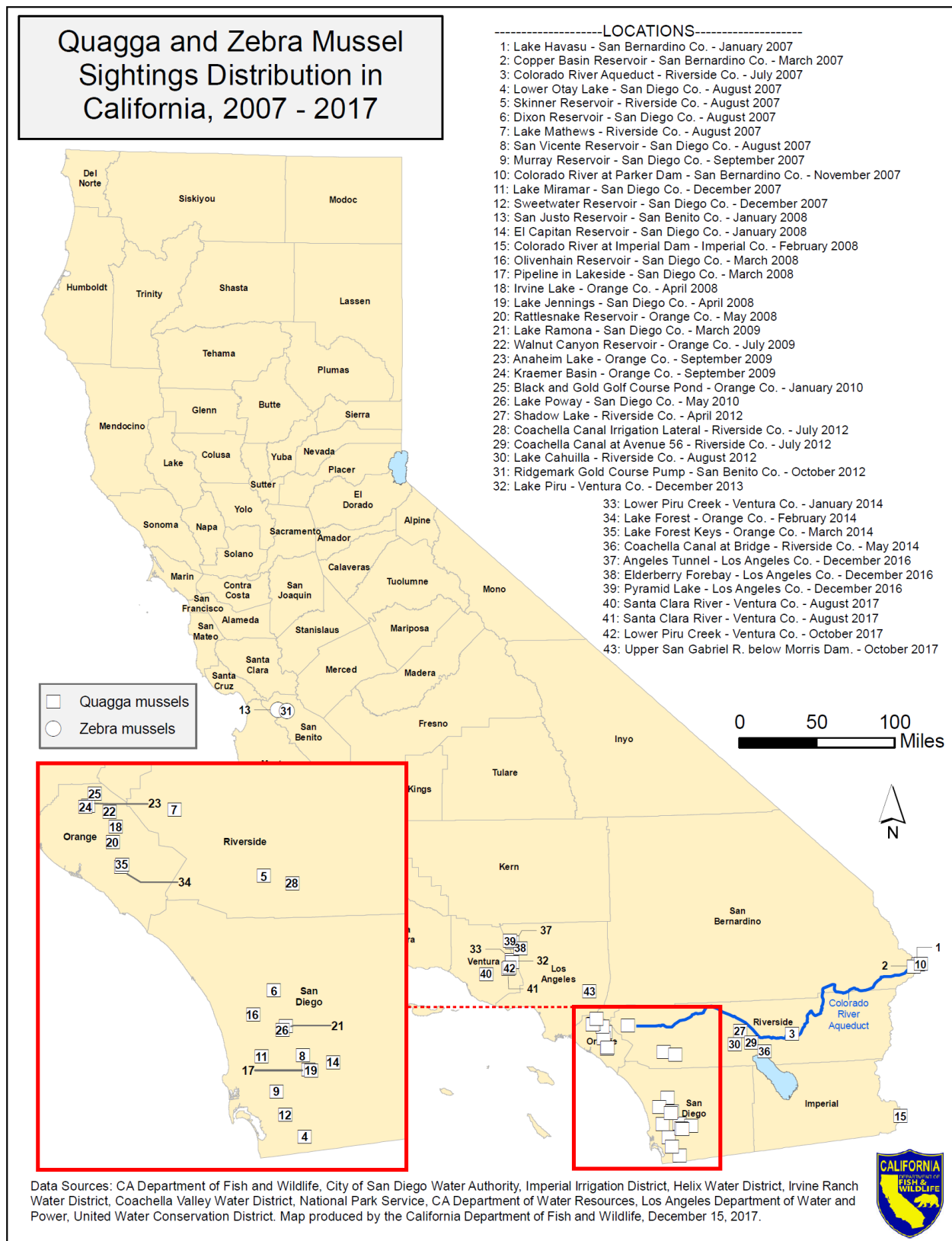
The NCDC does not track aquatic biologic hazards.

Hazard Mitigation Planning Committee Events

There have been no past occurrences of these mussels in the County, according to the HMPC. Figure 4-26 illustrates the quagga and zebra mussel sightings in California as of 2017. Most of the mussel sightings are

in Southern California. No mussel sightings have been officially detected in Clear Lake. The nearest known infected body of water to Clear Lake was reported in 2008 in the San Justo Lake located in San Benito County, about three miles southwest of Hollister. According to Lake County Water Resources Department and Lake County Special Districts, quagga and zebra mussels loom as potential problems in Clear Lake.

Figure 4-26 Quagga and Zebra Mussel Sightings in California 2007 to 2017



Source: California Department of Fish and Wildlife

Likelihood of Future Occurrences

Likely – The use of motorboats and registered watercraft can inadvertently lead to the spread of invasive mussels. Quagga and/or zebra mussels can enter into Clear Lake through transport on visiting or local watercraft. Should these mussels become established in Clear Lake, they would represent a potentially significant cost to water utilities as they have to similar water districts across the nation. If these mussels infect Clear Lake, there will be an increased risk of contaminating waterbodies downstream similar to how the Colorado River served as a carrier to Southern California. According to the 100th Meridian Initiative no practical technologies or biocides are available to remove these mussels once entered into a water body. As a result, preventing infected boats from entering Clear Lake appears to be the only countermeasure. However, any proposed countermeasures to prevent contaminated boats or restricting boat use from entering Clear Lake could affect the local economy and as a result should be considered carefully.

Climate Change and Quagga Mussels

A report by the USDA from Cornell University research note that quagga mussels are usually restricted to the bottom of the lake and therefore depend on sedimentation and water circulation to access food. Water circulation is in turn affected by the morphometry of lakes and by temperature increases associated with climate change. These two drivers of ecological change (invasive mussels and climate change) will interact, but the degree of interactions and the magnitude of ecological change to the lakes will depend on the morphometry of the lake. Therefore, ecological forecasting requires consideration of both lake physics and lake biology. Climate change will likely affect quagga mussel proliferation, if they ever enter Clear Lake.

4.2.8. Climate Change

Hazard/Problem Description

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

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

Through changes to oceanic and atmospheric circulation cycles and increasing heat, climate change affects weather systems around the world. Climate change increases the likelihood and exacerbates the severity

of extreme weather – more frequent or intense storms, floods, droughts, and heat waves. Consequences for human society include loss of life and injury, damaged infrastructure, long-term health effects, loss of agricultural crops, disrupted transport and freight, and more. Climate change is not a discrete event but a long-term hazard, the effects of which communities are already experiencing.

Climate change adaptation is a key priority of the State of California. The 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 earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

In Lakeport, the HMPC noted that each year it seems to get a bit warmer and snow in the County seems to start at higher levels. It was also noted that 2017 was one of the wettest years ever. California’s Adaptation Planning Guide: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. Lake County and the City of Lakeport falls within the North Coast Region characterized as a sparsely settled region where the region’s economy is primarily tourism and agriculturally based. In addition, the North Coast is home to sandy beaches and several estuaries that support rich biodiversity. Due to varied terrain, it is also home to several microclimates and distinct ecosystems. Table 4-16 provides a summary of Cal-Adapt Climate Projections for the North Coast Region.

Table 4-16 Lake County – Cal Adapt Climate Projections

| Effect | Ranges |
|-------------------------------|---|
| Temperature Change, 1990-2100 | January increase in average temperatures: 2°F by 2050 and up to 5°F by 2100. July increase in average temperatures: 3°F by 2050 and up to 6°F by 2100 (Modeled average temperatures; high emissions scenario) |
| Precipitation | Annual precipitation varies by location with a subtle decrease throughout the century in most areas. Areas of heavy rainfall (80 inches or more) are projected to lose 5 to 7 inches by 2050 and 11 to 15 inches by the end of the century. Slightly drier places are projected to see a decrease of around 3 to 4 inches by 2050 and 6 inches of precipitation by 2100. (Community Climate System Model 3 (CCSM3) climate model; high carbon emissions scenario) |
| Heat wave | Heat wave is defined as five consecutive days over 68°F over most of the coastal areas and as high as 93°F in some inland areas to the south. Little change is expected by 2050 with possibly one to three more heat waves projected in region. By 2100, projected heat waves are more variable. Along much of the coast eight to 15 more heat waves than currently occur are projected. Inland it is variable, but generally lower, between two and eight more waves per year. |
| Snowpack | March snow levels in the eastern, higher-elevation portion of the region will drop to almost zero by the 2090s, a decrease of 2 to 10 inches from 2010 levels. In areas with more snow, 3 to 5 inches of reduction will occur by 2050. In areas with currently little snow (<3 inches), the snowpack is projected to be near zero by 2050. (CCSM3 climate model; high carbon emissions scenario) |
| Wildfire | Substantial increase in fire risk is expected throughout the region. Modest increases in area burned are projected for 2050. By 2100, the projected frequency increases dramatically. Lake County is projected to have up to 2.5 times greater wildfire frequency. (Geophysical Fluid Dynamics Laboratory (GFDL) climate model; high carbon emissions scenario) |

Source: Cal-Adapt

Location

Climate change is a global phenomenon. It is expected to affect the whole of the City, Lake County, and State of California.

Extent

There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters, as shown in Table 4-3.

NCDC Events

The NCDC does not track climate change events.

Hazard Mitigation Planning Committee Events

While the HMPC noted that climate change is of concern, no specific impacts of climate change could be recalled. HMPC members noted that the strength of storms does seem to be increasing and the temperatures seem to be getting hotter.

Likelihood of Future Occurrence

Likely – Climate change is virtually certain to continue without immediate and effective global action. According to NASA, 2017 was on track to be one of the hottest years on record, and 15 of the 17 hottest years ever have occurred since 2000. Without significant global action to reduce greenhouse gas emissions, the IPCC concludes in its Fifth Assessment Synthesis Report (2014) that average global temperatures are likely to exceed 1.5 C by the end of the 21st century, with consequences for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges.

Climate Scenarios

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

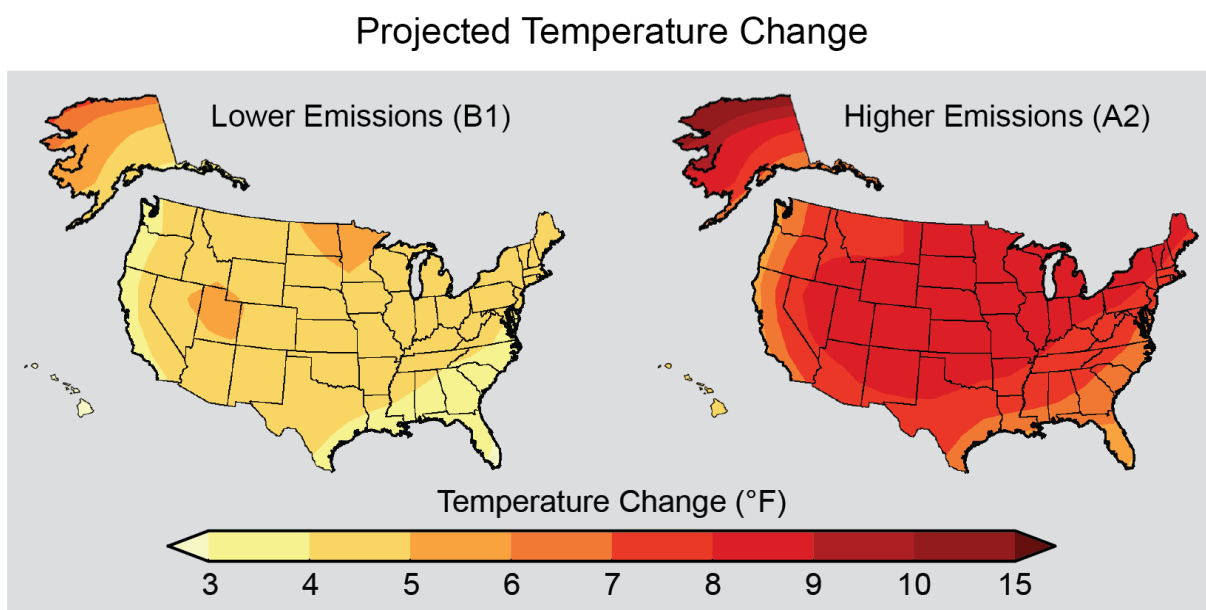
Key Uncertainties Associated with Climate Projections

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

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

Maps show projected change in average surface air temperature in the later part of this century (2071-2099) relative to the later part of the last century (1970-1999) under a scenario that assumes substantial reductions in heat trapping gases and a higher emissions scenario that assumes continued increases in global emissions. These are shown in Figure 4-27.

Figure 4-27 Projected Temperature Change – Lower and Higher Emissions Scenario



Source: National Climate Assessment

According to the California Natural Resource Agency (CNRA), climate change is already affecting California and is projected to continue to do so well into the foreseeable future. Current and projected changes include increased temperatures, sea level rise, a reduced winter snowpack altered precipitation patterns, and more frequent storm events. Over the long term, reducing greenhouse gases can help make these changes less severe, but the changes cannot be avoided entirely. Unavoidable climate impacts can

result in a variety of secondary consequences including detrimental impacts on human health and safety, economic continuity, ecosystem integrity and provision of basic services.

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

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Lakeport and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes may increase the probability of floods and levee and dam failures, along with creating issues related to saltwater intrusion.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

4.2.9. Dam Failure

Hazard/Problem Description

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

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

- Earthquake;
- Inadequate spillway capacity resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity;
- Improper design;
- Improper maintenance;

- Negligent operation; and/or
- Failure of upstream dams on the same waterway.

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

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

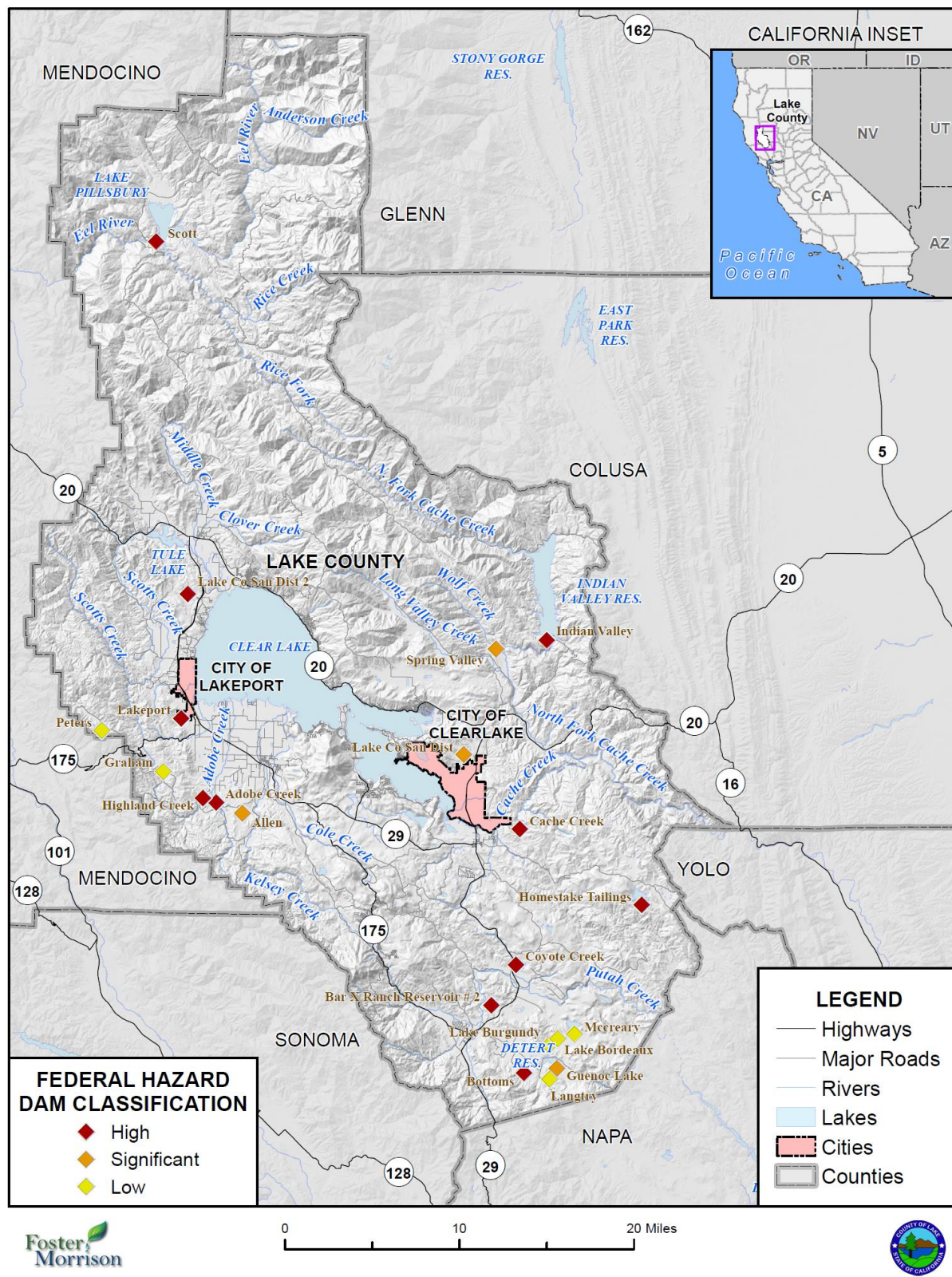
The California Department of Water Resources (Cal DWR) Division of Safety of Dams has jurisdiction over impoundments that meet certain capacity and height criteria. These are known as jurisdictional dams. Embankments that are less than six feet high and impoundments that can store less than 15 acre-feet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

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

Location

According to data provided by Cal DWR and Cal OES, there are 21 dams in Lake County that were constructed for flood control, storage, treatment impoundments, electrical generation, and recreational purposes. Of the 21 dams, 11 are rated as High Hazard, 4 as Significant Hazard, 6 as Low Hazard. Figure 4-28 identifies the dams in Lake County, which are also shown on Table 4-17.

Figure 4-28 Lake County Dam Inventory



Data Source: Cal OES Dam Status 10/2017, Lake County GIS, Cal-Atlas; Map Date: 10/25/2017.

Table 4-17 Lake County Dam Inventory

| Name | Owner | Hazard Classification | Dam Type | River/Stream | Structural Height (ft) | Maximum Storage (acre-ft) | EAP |
|---------------------------|---|-----------------------|----------|------------------------|------------------------|---------------------------|--------------|
| Adobe Creek | Lake County Watershed Protection District | High | Rockfill | Adobe Creek | 36 | 695 | Not reported |
| Allen | Richard and Wendy Reynolds | Significant | Rockfill | Tr Kelsey Cr | 33 | 85 | Not reported |
| Bar X Ranch Reservoir # 2 | Heart Consciousness Church | High | Rockfill | Crazy Creek | 30 | 147 | Not reported |
| Bordeaux, Lake | Langtry Farms, LLC | Low | Rockfill | Tr Bucksnot Creek | 42 | 538 | Not reported |
| Bottoms | Middletown Enterprises | High | Rockfill | Tr Helena Creek | 47 | 315 | Not reported |
| Burgundy, Lake | Langtry Farms, LLC | Low | Rockfill | Tr Bucksnot Creek | 27 | 200 | Not reported |
| Cache Creek | Yolo County Flood Control and Water Conservation District | High | Gravity | Cache Creek | 35 | 320,000 | Y |
| Coyote Creek | Hidden Valley Lake Association | High | Rockfill | Coyote Creek | 92 | 3,375 | Not reported |
| Graham | Sue Thomason | Low | Rockfill | Tr Highland Cr | 39 | 62 | Not reported |
| Guenoc Lake | Langtry Farms, LLC | Significant | Rockfill | Bucksnot Creek | 50 | 3,237 | Not reported |
| Highland Creek | Lake County Watershed Protection District | High | Rockfill | Highland Creek | 76 | 3,500 | Y |
| Homestake Tailings | Homestake Mining Company | High | Rockfill | Tr Hunting Cr | 171 | 0.4 | Y |
| Indian Valley | Yolo County Flood Control and Water Conservation District | High | Earth | North Fork Cache Creek | 210 | 261,000 | Y |
| Lake Co San Dist | Lake County Sanitation District | Significant | Rockfill | Tr Burns Val Creek | 40 | 530 | Not reported |

| Name | Owner | Hazard Classification | Dam Type | River/Stream | Structural Height (ft) | Maximum Storage (acre-ft) | EAP |
|--------------------|--|-----------------------|----------|------------------|------------------------|---------------------------|--------------|
| Lake Co San Dist 2 | Lake County Sanitation District | High | Rockfill | Tr Lyons Creek | 78 | 870 | Not reported |
| Lakeport | City of Lakeport Municipal Sewer District Number 1 | High | Rockfill | Tr Manning Cr | 51 | 650 | Not reported |
| Langtry | Langtry Farms, LLC | Low | Rockfill | Tr Cassidy Creek | 50 | 525 | Not reported |
| Mccreary | Langtry Farms, LLC | Low | Rockfill | Bucksnort Creek | 20 | 2,100 | Not reported |
| Peters | Stephen Cowan | Low | Rockfill | Benmore Creek | 33 | 112 | Not reported |
| Scott | Pacific Gas and Electric Company | High | Gravity | Eel River | 135 | 80,600 | Y |
| Spring Valley | County of Lake | Significant | Rockfill | Wolf Creek | 37 | 325 | Not reported |

Source: Cal OES, National Performance of Dams Program

*One acre foot equals 325,000 gallons

Dams of Concern

Of the 21 dams, only 1 has the possibility to impact the City of Lakeport – the Lakeport Wastewater Treatment Plant Dam.

The Lakeport Wastewater Treatment Plant is located approximately 1 mile southwest of the City of Lakeport. It can be reached from Highway 29/175 intersection. Lakeport Wastewater Treatment Plant Reservoir is an earthen structure. City of Lakeport is the Owner and Operator of the reservoir. Failure of the dam would result in extensive property damage to residential structures and agricultural properties along Linda Lane in Lakeport.

Extent

Dam failure 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 the natural disaster triggering the event. There is no scale with which to measure dam failure, only a scale to measure dam hazards based on size of dam and proximity to development as previously noted – the High, Significant, and Low Hazard classifications. While a dam may fill slowly with runoff from winter storms, a dam break can have a very quick speed of onset. The duration of dam failure is not long – only as long as it takes to empty the reservoir of water the dam held back.

Dam inundation affects discrete areas of the City. As previously mentioned, only the Lakeport Wastewater Treatment Plan Dam would affect the City. The HMPC noted that dam failure is most likely not going to be a total dam failure but likely would be a failure of part of the dam. This extent discussion focuses on a total dam failure, which the HMPC does not think will likely happen. Methodologies for this analysis and maps showing extent can be found in Section 4.3.6. GIS analysis was performed to determine what percentages of the City would be inundated (using Cal OES dam inundation data). 3.4% and 1.9% of all acreage in the City of Lakeport falls in the east breach and north breach dam inundation zones, respectively. This can be seen in Table 4-18.

Table 4-18 City of Lakeport – Dam Inundation Geographical Extents

| Dam Inundation Area | Total Acres | % of Total Acres |
|---|-------------|------------------|
| Lakeport Wastewater Treatment Plan Dam – East Breach Scenario | 74 | 3.4% |
| Lakeport Wastewater Treatment Plan Dam – East Breach Scenario | 40 | 1.9% |

Source: Cal OES

Past Occurrences

Disaster Declaration History

There have been no disasters declarations related to dam failure in Lake County, as shown in Table 4-3.

NCDC Events

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

National Performance of Dams Program Events

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

Hazard Mitigation Planning Team Events

The HMPC that there have been two issues in the past 10 years. One was a near overtopping event, and one was a near miss. The dam did not fail in either event.

- **April 2006:** Severe winter storms and related Clear Lake flooding inundated the City's sewage collection and storage systems (including the storage reservoir) resulting in an extended release of partially treated wastewater. Documentation of the related Cease and Desist Order from the State of California includes the following:

The largest of these spills occurred over an 11-day period in April 2006, when an estimated 3.6 to 6.6 million gallons of partially treated wastewater entered Clear Lake. As a result of the spills, four Notices of Violations (NOVs) were issued. The Discharger asserts that the April 2006 spill was due to Clear Lake's inundation of the Willow Point area, resulting in substantial inflow/infiltration into the collection system.

In 2007 the wastewater storage reservoir was expanded at the direction of the California Regional Water Quality Control Board to provide additional capacity. There were no known damages to the Lakeport Dam associated with this event.

- **March/April 2017:** Seasonal rainfall in 2016/2017 totaled nearly 50 inches in the Lakeport area---much higher than the historical average of around 30 inches. Severe winter rains in early 2017 resulted in significant Clear Lake flooding which led to very high levels at the City's wastewater storage reservoir. Fortunately, there was no overtopping at the reservoir or any related unauthorized release of treated wastewater. The Lakeport Dam did not suffer any known damages during this event; neither did any areas downstream of the dam.

Likelihood of Future Occurrences

Unlikely – There have been 2 recorded events of dam failure near miss events in or around Lakeport. Based on past occurrences, it is unlikely a dam failure will occur in the future that would impact the City of Lakeport.

Climate Change and Dam Failure

Normally, increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases on dams that could affect the City of Lakeport. However, since the dam that affects the City holds wastewater, it is unlikely that climate change will have an effect on the amount of water behind the dam.

4.2.10. Drought and Water Shortage

Hazard/Problem Description

Drought

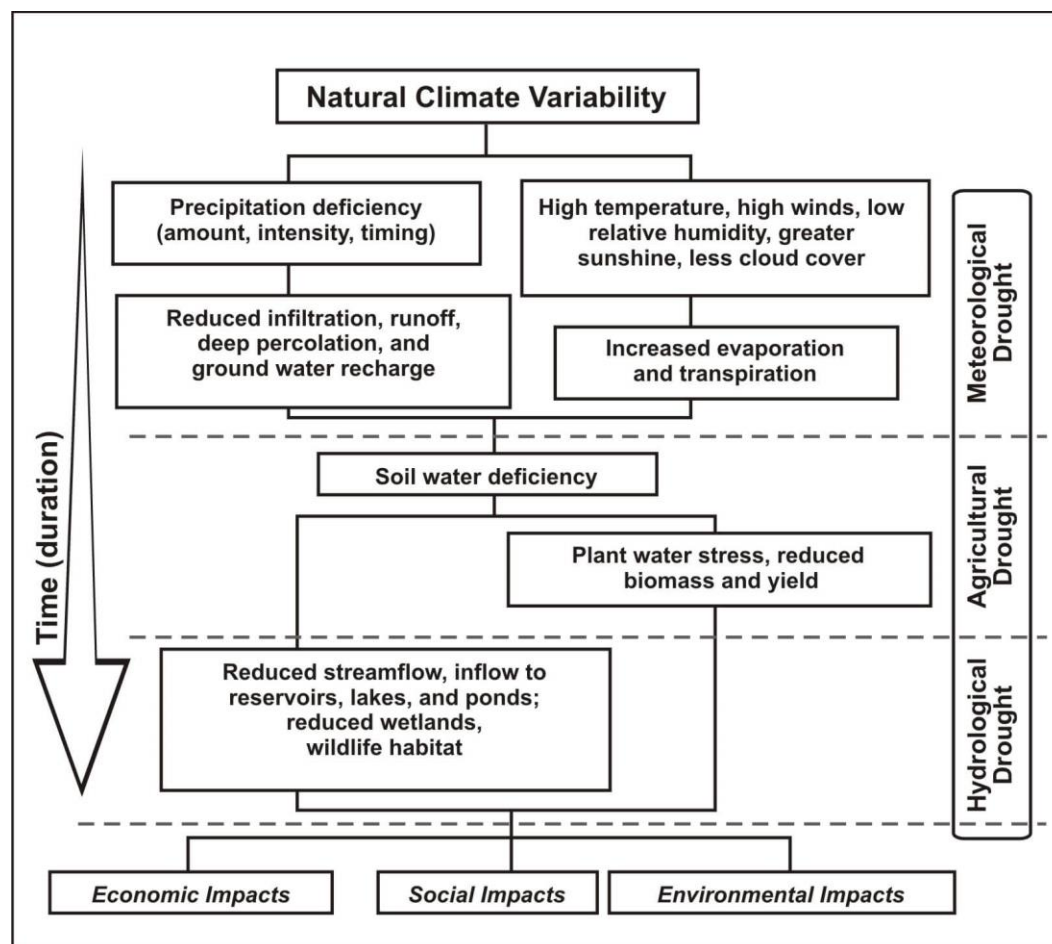
Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly,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

Drought is a complex issue involving (see Figure 4-29) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological drought** is usually defined by a period of below average water supply.
- **Agricultural drought** occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological drought** is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.

- **Socioeconomic drought** occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

Figure 4-29 Causes and Impact of Drought



Source: National Drought Mitigation Center (NDMC)

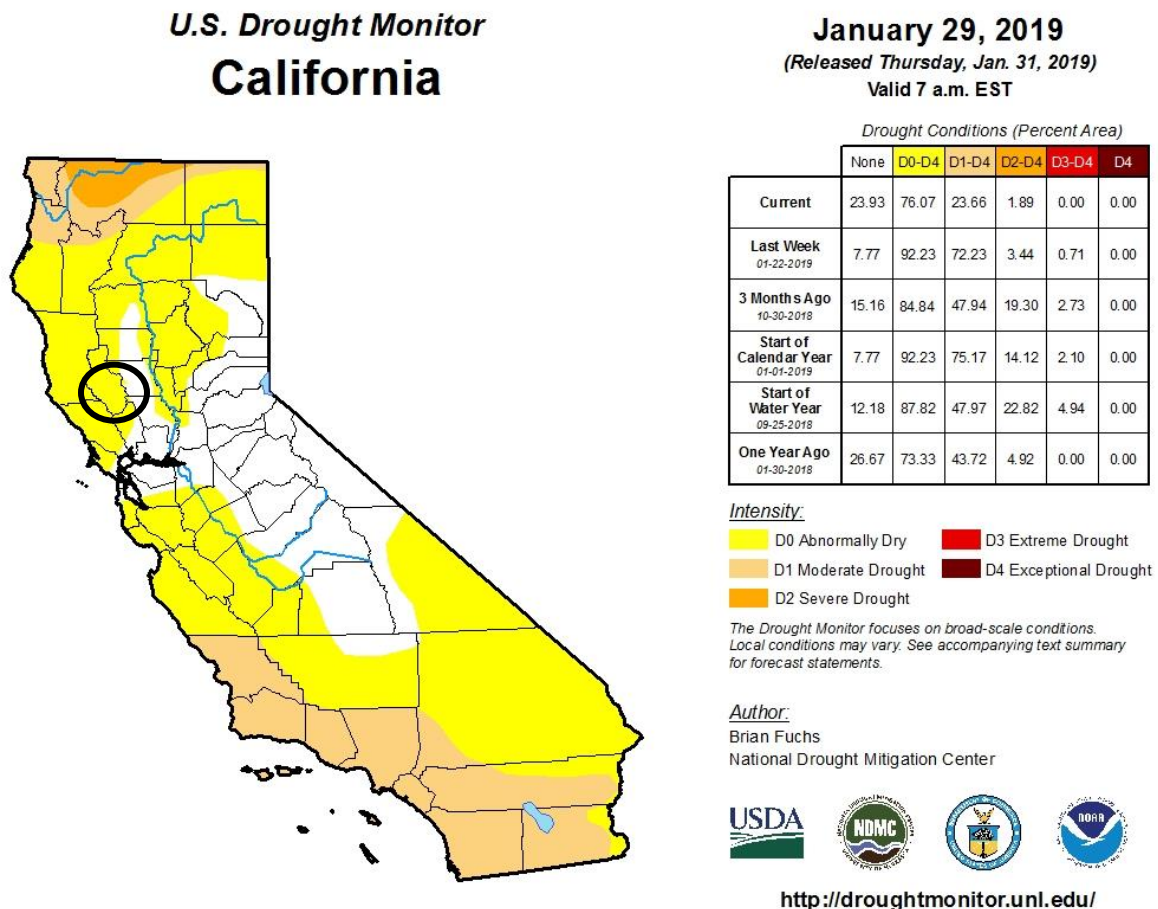
Drought can also cause increased wildfire risk. This is discussed in Section 4.2.15.

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

Location

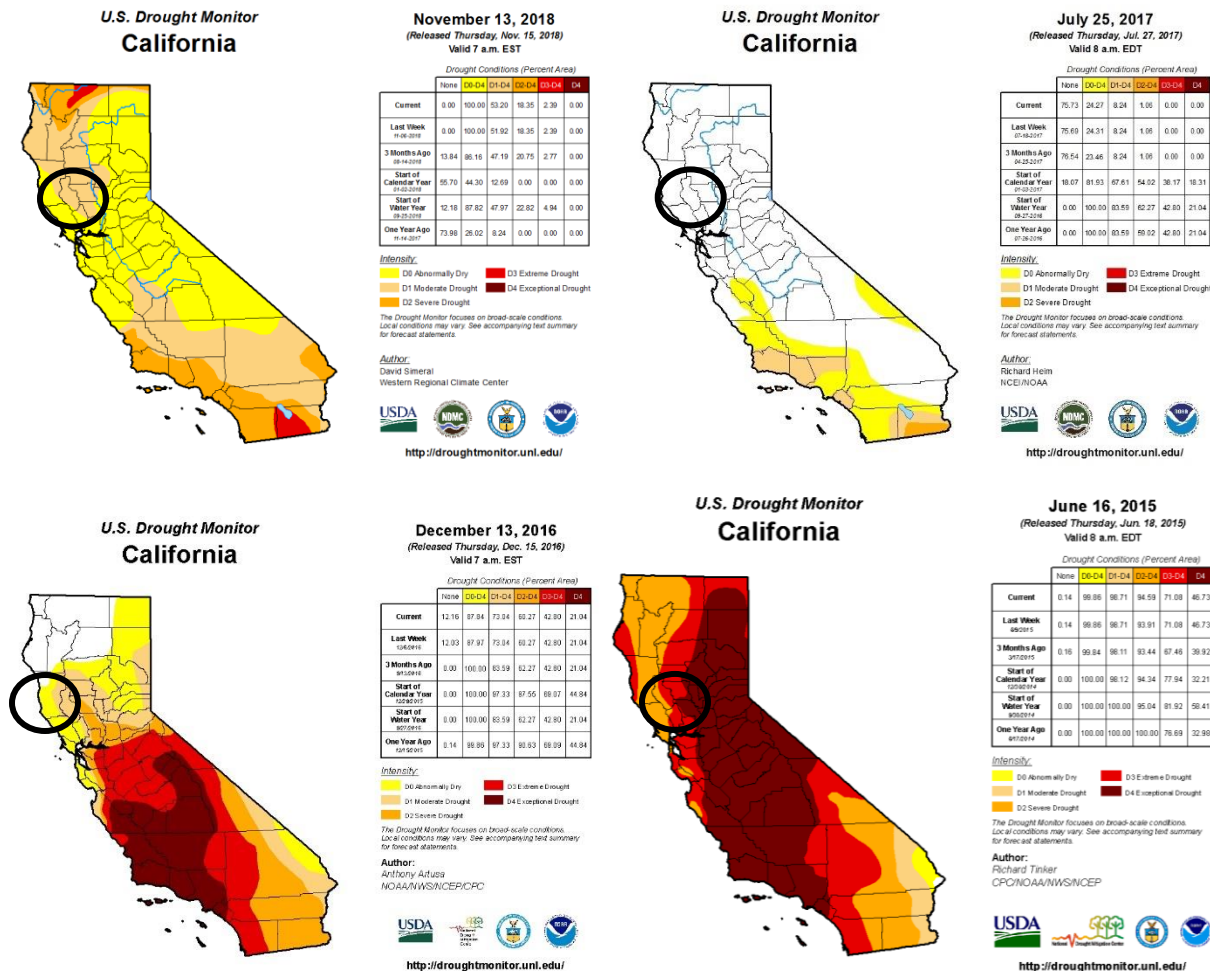
Drought is a regional phenomenon that affects the entire City. Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the drought conditions in California and the Planning Area can be found in Figure 4-30. Snapshots from 2015, 2016, 2017, and 2018 are shown in Figure 4-31.

Figure 4-30 Current Drought Status in the City of Lakeport



Source: US Drought Monitor

Figure 4-31 Previous Drought Status in the City of Lakeport



Source: US Drought Monitor

Cal DWR says the following about drought:

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

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

Extent

As shown on the previous figures, drought is tracked by the US Drought Monitor. The Drought Monitor includes a scale to measure drought intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Drought has a slow onset and long duration. Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer in Mediterranean climates, such as in California. This is particularly true in Northern California where drought impacts are delayed for most of the population by the wealth of stored surface and ground water. The drought complications normally appear more than a year after a drought begins. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in Lakeport. It can be assumed, however, that the loss of production in one sector of the economy would affect other sectors. Drought has the potential to affect the entire City.

Water Shortage

Northern California communities, including Lakeport, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought. For example, Northern California agencies, including those from Lake County, were major participants in the Governor's Drought Water Bank of 1991, 1992, and 1994. The City of Lakeport 2025 General Plan noted that Lakeport obtains its potable water from Clear Lake and from four wells located in the Planning Area. The HMPC estimated that the wells provide 70% of the water, while surface water provides 30%. Groundwater in the City is easier to treat to potable water standards, which reduces costs both to the water companies and the end users.

Potential sources of contamination of the City's drinking water from agricultural runoff, chemical spills, and groundwater contamination must be prevented. Ongoing monitoring of the quality of potable water supplies for both coliform as well as trace quantities of chemical pollutants must be carried out on a regular basis.

Location

Since water shortage happens on a regional scale, the entirety of the City is at risk.

Extent

There is no established scientific scale to measure water shortage. The speed of onset of water shortage tends to be lengthy. The duration of water shortage can vary, depending on the severity of the drought that accompanies it. Factors for extent include the nature, source, and reliability of water. The City has sufficient water supply, which reduces the extent of drought impacts in the City.

Past Occurrences

Disaster Declaration History

There have been two state and no federal disaster declarations for Lake County. These are shown on Table 4-19.

Table 4-19 Lake County – State and Federal Drought Disaster Declarations 1950-2019

| Disaster Type | State Declarations | | Federal Declarations | |
|---------------|--------------------|-------|----------------------|------------|
| | Count | Years | Count | Years |
| Drought | 0 | – | 2 | 1977, 2014 |

Source: Cal OES, FEMA

NCDC Events

There have been 15 NCDC drought events in Lake County. All of these were for the 2014-2016 drought, but no damages, injuries, or losses were reported in the NCDC database. This can be seen in Table 4-20.

*Table 4-20 Lake County NCDC Storm Events 1/1/1996-6/31/2018**

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|------------|------------------|--------|-------------------|----------|---------------------|-----------------|-------------|
| Drought | 15 | 0 | 0 | 0 | 0 | \$0 | \$0 |

Source: NCDC

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

Hazard Mitigation Planning Team Events

Historically, California has experienced multiple severe droughts. According to the DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Table 4-21 compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77, 1987-92, and 2007-09 droughts. Figure 4-32 depicts California's Multi-Year Historical Dry Periods, 1850-2000.

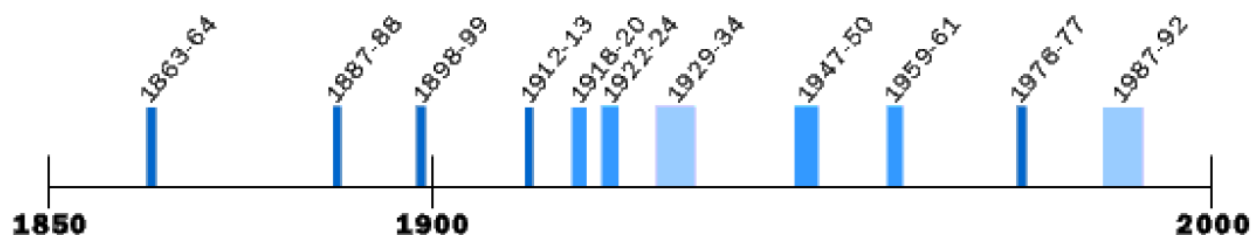
Table 4-21 Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

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

Source: California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources.

*maf=million acre feet

Figure 4-32 California's Multi-Year Historical Dry Periods, 1850-2000

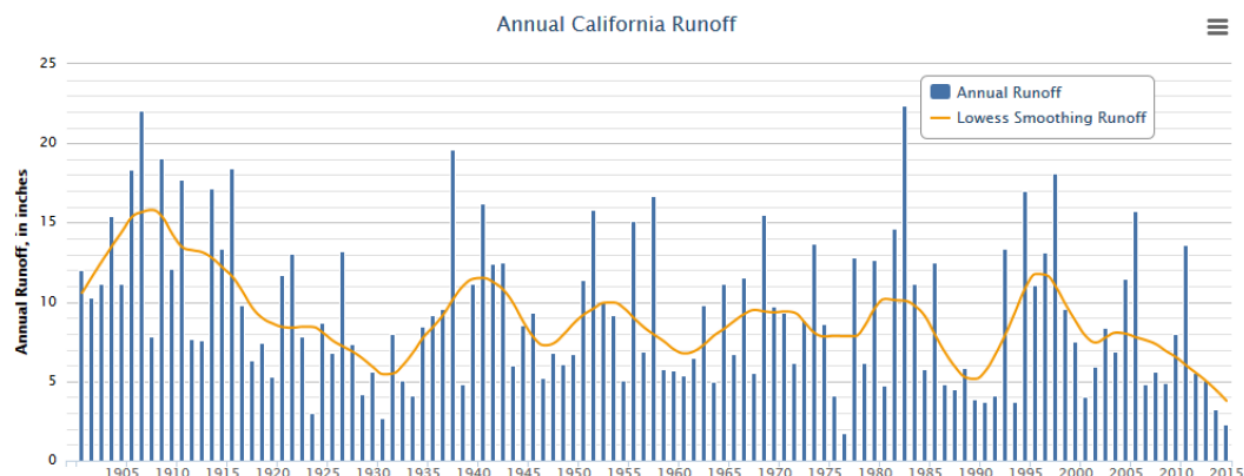


Source: Cal DWR

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

Figure 4-33 depicts runoff for the State from 1900 to 2015. This gives a historical context for the 2014-2015 drought to compare against past droughts.

Figure 4-33 Annual California Runoff—1900 to 2015



Source: Cal DWR

The 2018 California State Hazard Mitigation Plan discussed the major droughts from 1900 to 2017. This discussion below appends to the tables and figures above.

The 1975-1977 Drought

From November 1975 through November 1977, California experienced one of its most severe droughts. Although people in many areas of the state are accustomed to very little precipitation during the growing season (April to October), they expect it in the winter. In 1976 and 1977, the winters brought only one-half and one-third of normal precipitation, respectively. Most surface storage reservoirs were substantially drained in 1976, leading to widespread water shortages when 1977 turned out to be even drier. 31 counties were affected, resulting in \$2.67 billion in crop damage. The City noted that the Rumsey Gauge on Clear Lake was at -2. A lack of commercial activity resulted in declined tourism and lost revenue due to this drought.

The 1987-1992 Drought

From 1987 to 1992, California again experienced a serious drought due to low precipitation and run-off levels. The hardest-hit region was the Central Coast, roughly from San Jose to Ventura. In 1988, 45 California counties experienced water shortages that adversely affected about 30 percent of the state's population, much of the dry-farmed agriculture, and over 40 percent of the irrigated agriculture. Fish and wildlife resources suffered, recreational use of lakes and rivers decreased, forestry losses and fires increased, and hydroelectric power production decreased. In February 1991, DWR and Cal OES surveyed drought conditions in all 58 California counties and found five main problems: extremely dry rangeland, irrigated agriculture with severe surface water shortages and falling groundwater levels, widespread rural areas where individual and community supplies were going dry, urban area water rationing at 25 to 50 percent of normal usage, and environmental impacts.

Storage in major reservoirs had dropped to 54 percent of average, the lowest since 1977. The shortages led to stringent water rationing and severe cutbacks in agricultural production, including threats to survival of permanent crops such as trees and vines. Fish and wildlife resources were in critical shape as well. Not since the 1928-1934 drought had there been such a prolonged dry period. In response to those conditions, the Governor established the Drought Action Team. This team almost immediately created an emergency drought water bank to develop a supply for four critical needs: municipal and industrial uses, agricultural uses, protection of fish and wildlife, and carryover storage for 1992. The large-scale transfer program, which involved over 800,000 acre-feet of water, was implemented in less than 100 days with the help and commitment of the entire water community and established important links between state agencies, local water interests, and local governments for future programs. The City could provide no specific damages, extra costs, injuries, or deaths due to this drought.

The 2007-2009 Drought

Water years 2007-2009 were collectively the 15th driest three-year period for DWR's eight-station precipitation index, which is a rough indicator of potential water supply availability to the State Water Project (SWP) and Central Valley Project (CVP). Water year 2007 was the driest single year of that drought, and fell within the top 20 percent of dry years based on computed statewide runoff. In June 2008, a state emergency proclamation was issued due to water shortage in selected Central Valley counties. In February 2009, for the first time in its history, the State of California proclaimed a statewide drought. The

state placed unprecedented restrictions on CVP and SWP diversions from the Delta to protect listed fish species, a regulatory circumstance that exacerbated the impacts of the drought for water users.

The greatest impacts of the 2007–2009 drought were observed in the CVP service area on the west side of the San Joaquin Valley, where hydrologic conditions combined with reduced CVP exports resulted in substantially reduced water supplies (50 percent supplies in 2007, 40 percent in 2008, and 10 percent in 2009) for CVP south-of Delta agricultural contractors. Small communities on the west side highly dependent on agricultural employment were especially affected by land fallowing due to lack of irrigation supplies, as well as by factors associated with current economic recession. The coupling of the drought and economic recession necessitated emergency response actions related to social services, such as food banks and unemployment assistance. The City could provide no specific damages, extra costs, injuries, or deaths due to this drought.

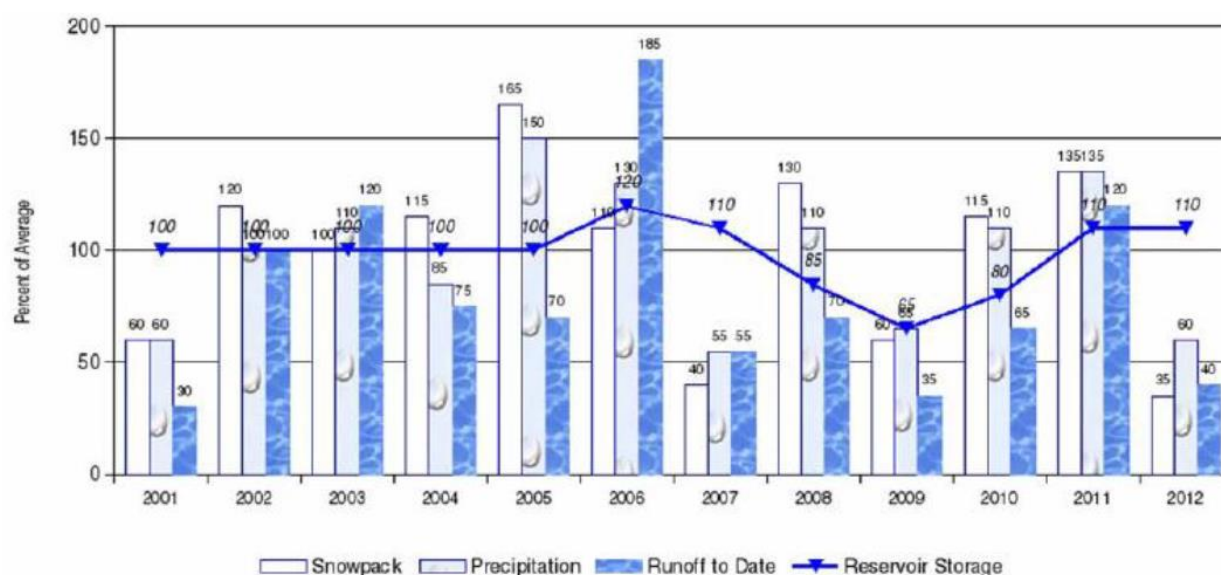
The 2012-2017 Drought

The statewide drought of 2012-2017 will be remembered as one of the most severe and costliest droughts of record in California. The drought that spanned water years 2012 through 2017 included the driest four-year statewide precipitation on record (2012-2015) and the smallest Sierra-Cascades snowpack on record (2015, with 5 percent of average). It was marked by extraordinary heat: 2014, 2015, and 2016 were California's first, second, and third warmest years in terms of statewide average temperatures. By the time the drought was declared officially over in April 2017, the state had expended \$6.6 billion in drought response and mitigation programs, and had been declared a federal disaster area. This drought led to the conditions in the wildfires that struck the County in 2015 and 2016, as well as in 2018. More information on these fires can be found in Section 4.2.15.

Water Shortage

Figure 4-34 illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 2007 and 2012. The chart illustrates the cyclical nature of weather patterns in California.

Figure 4-34 Water Supply Conditions, 2007 to 2012



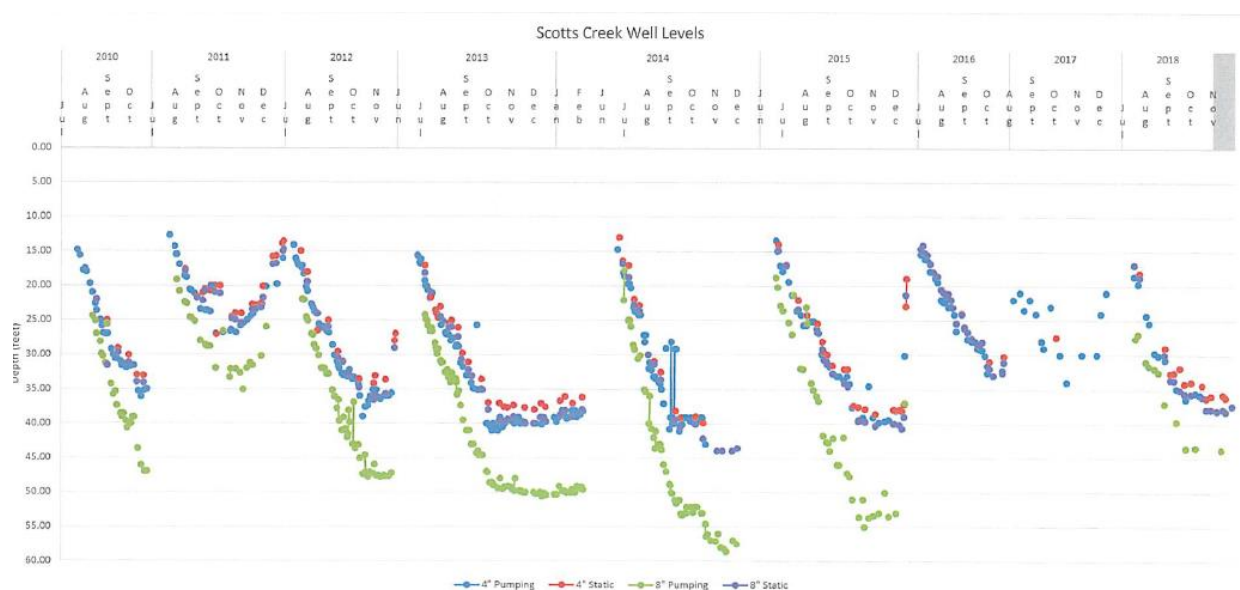
Source: 2018 State of California Hazard Mitigation Plan

Beginning in 2012, snowpack levels in California dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. Snowpack measurements have been kept in California since 1950 and nothing in the historic record comes close to 2015's severely depleted level. The previous record for the lowest snowpack level in California, 25 percent of normal, was set both in 1976-77 and 2013-2014. In "normal" years, the snowpack supplies about 30 percent of California's water needs, according to the California Department of Water Resources. Snowpack levels began to increase in 2016, and in 2017 snowpack increased to the largest in 22 years, according to the State Department of Water Resources. In late 2017 and through 2018 drought conditions have begun to return to southern California.

With a reduction in water, water supply issues based on water rights becomes more evident. Some agricultural uses, such as fruit and nuts, are severely impacted through limited water supply. Drought and water supply issues will continue to be a concern to the Planning Area. Irrigation of agricultural lands also continues to be a concern in the Planning Area. During periods of drought, the City cuts back on irrigation. Library Park is always irrigated by Clear Lake water.

One indicator used by the City for drought is the well levels in Scotts Creek. These well levels indicate periods of water shortage. This can be seen back to 2010 in Figure 4-35. Wells running fully dry is not an issue with the existing population in the City, but the HMPC noted that there is the potential once future development and annexation are complete.

Figure 4-35 City of Lakeport – Well Levels in Scotts Creek 2010 to 2018



Source: City of Lakeport

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for the Lakeport Planning Area and region indicate there have been 5 significant droughts in the last 85 years. This equates to a drought every 17 years on average or a 5.9 percent chance of a drought in any given year. However, based on this data and given the multi-year length of droughts, the HMPC determined that future drought occurrence in the City are likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that the City may at some time be at risk to both short and prolonged periods of water shortage. Based on this it is possible that water shortages will affect the City in the future during extreme drought conditions. Landscaping, road paving, and new development put stress on water resources. The supply of water is sufficient, but as population grows and land use patterns shift, it will be necessary to consider the added stress that new development will put on water demand and quality. During periods of water shortage, more Lake water can be treated. However, treating Lake water is more expensive for water companies than treating groundwater.

Climate Change and Drought and Water Shortage

Climate change and its effect on drought near the City has been discussed by three sources:

- CAS
- Climate Change and Health Profile Report – Lake County
- HMPC

Climate Adaptation Strategy

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2014 CAS stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that:

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

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

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

Climate Change and Health Profile Report – Lake County

The CCHPR note that the lack of moisture, already at a severe level in California due to a current multi-year drought and decades of fuel accumulation from historical forestry and fire suppression practices, increases the risk of wildfires. Devastating wildfires like the Rim Fire of 2013 impact watersheds and increase the risk of landslides or mudslides, and sediment in run-off that reduce water quality. In addition to fire-related injuries, local and regional transport of smoke, ash, and fine particles increases respiratory and cardiovascular risks.

Increasing temperatures and changes in precipitation may lead to intensified drought conditions. Drought decreases the availability and quality of water for humans. This includes reduced water levels to fight wildfires. Drought may increase exposure to health hazards including wildfires, dust storms, extreme heat events, flash flooding, degraded water quality, and reduced water quantity. Dust storms associated with drought conditions have been associated with increased incidents of Valley fever, a fungal pathogen.

HMPC

Members of the HMPC noted a report published in Science magazine in 2015 that stated:

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

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

4.2.11. Earthquake

Hazard/Problem Description

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

Ground Shaking

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

Actual ground breakage generally affects only those buildings directly over or nearby the fault. Ground shaking generally has a much greater impact over a greater geographical area than ground breakage. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater. As with most communities in Northern California near active faults, Lakeport could be susceptible to violent ground shaking, depending on the location of the event. The HMPC did note that the soft terrain in and around the City does cushion and reduce shaking.

Seismic Structural Safety

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

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

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

Liquefaction Potential

Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. This water exerts a pressure on the soil particles that influences how tightly the particles themselves are pressed together. Prior to an earthquake, the water pressure is relatively low. However, earthquake shaking can cause the water pressure to increase to the point where the soil particles can readily move with respect to each other. When liquefaction occurs, the strength of the soil decreases and, the ability of a soil deposit to support foundations for buildings and bridges is reduced. Liquefied soil also exerts higher pressure on retaining walls, which can cause them to tilt or slide. This movement can cause settlement of the retained soil and destruction of structures on the ground surface. Increased water pressure can also trigger landslides and cause the collapse of dams. Because liquefaction only occurs in saturated soil, its effects are most commonly observed in low-lying areas near bodies of water such as rivers, lakes, bays, and oceans. The City of Lakeport General Plan Safety Element noted that soils in and around Lakeport, especially near the lake shore, are susceptible to liquefaction during a seismic event.

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

Landslide/Debris Flows

Landslides can occur as a result of horizontal seismic inertia induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter. This is discussed in greater extent in Section 4.2.13.

Seiche

A seiche is the equivalent of a tsunami on a lake, which could occur in Lakeport following an earthquake either near or far from the City. Seiche is discussed in greater detail in Section 4.2.17.

Settlement

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

Location

According to the California Geological Survey (CGS) and US Geological Survey (USGS), no faults underlie the City of Lakeport. The City of Lakeport General Plan noted that the severity of damage to buildings from earthquakes is related to the intensity of groundshaking, soils and geologic characteristics, and the type of building construction used. The General Plan noted that high risk areas in Lakeport do not have any critical facilities such as high-occupancy buildings, hospitals, or schools. The land use pattern that has evolved in Lakeport has, in general, avoided high-risk areas.

Faults

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

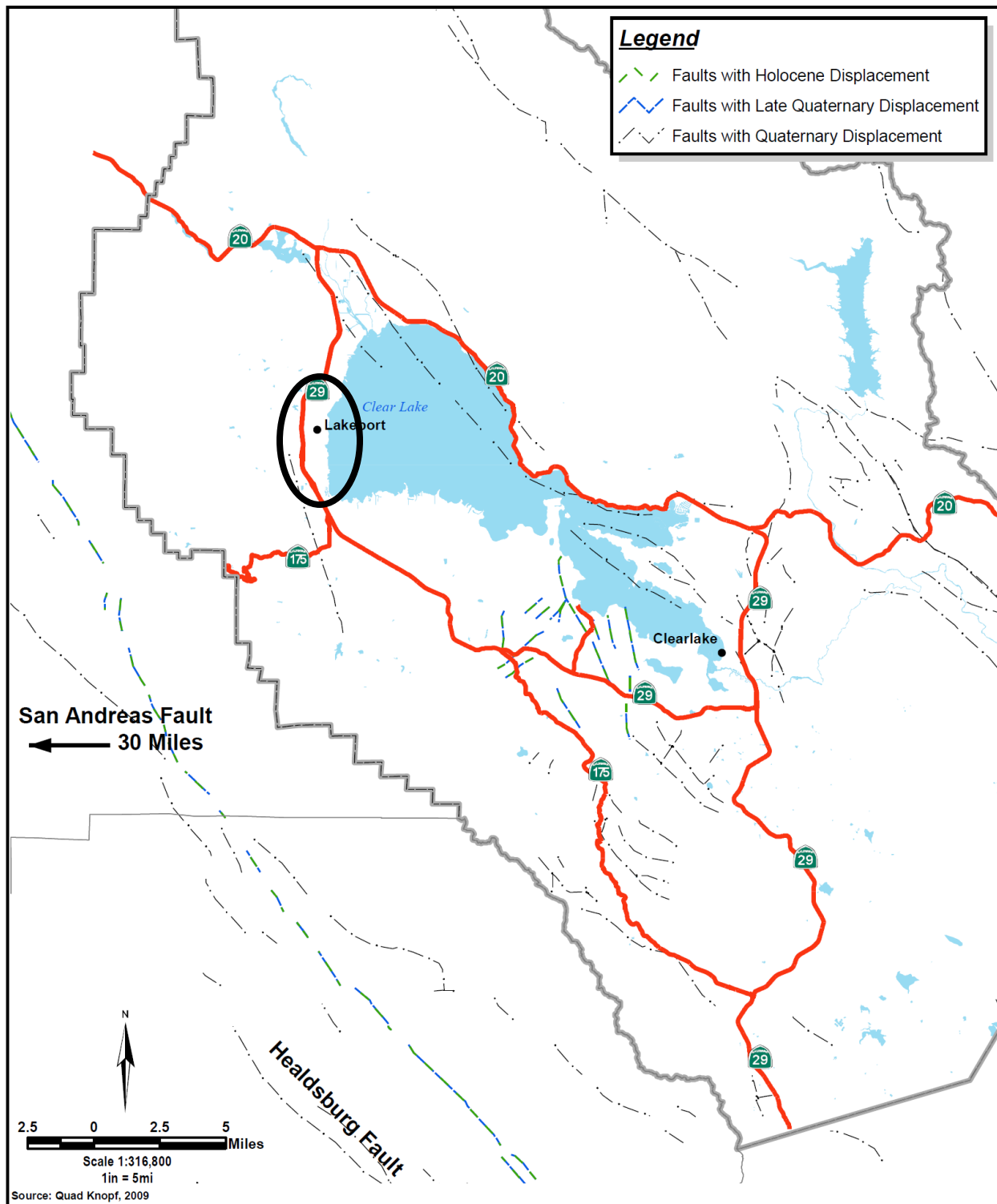
Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without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

The City of Lakeport General Plan Safety Element noted that Lakeport is located in a highly active earthquake area and the potential exists for a significant seismic event in the future. Immediately east of the City, between the City limits and Clear Lake, there is a potentially active rupture zone. Potentially active rupture zones are faults which have been active in the past 2,000 years. Little is known about this shoreline fault rupture zone, however, it represents a potentially significant hazard and must be taken into consideration when development occurs in the vicinity. Within the past 200 years, no major earthquakes

have occurred along faults in Lake County. To the west of the City lie the San Andreas fault and the Healdsburg fault, 30 and 15 miles away, respectively. Both of these faults have been responsible for moderate to major seismic events in the past. The maximum earthquake magnitudes observed to date are 8.5 for the San Andreas fault and 6.75 (Richter Scale¹) for the Healdsburg fault.

Faults in and near the City can be seen on Figure 4-36. This figure shows the 2001 Fault-Rupture Hazard Zones maps prepared by the California Geological Survey. Most of the ground shaking which has occurred in past years in the Lakeport area has come from faults in the Mayacamas and Mt. Konocti area. Additionally, fault zones run diagonally in a southeast to northwest direction through the Potato Hill, Lake Pillsbury and Sanhedrin areas. In the far southeastern corner of the County there is a fault zone in the Jericho Valley, an area that runs along the Lake/Napa County line.

Figure 4-36 City of Lakeport – Active Faults in or near the City



Source: City of Lakeport General Plan Safety Element

Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Table 4-22). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-22 Modified Mercalli Intensity (MMI) Scale

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

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

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declaration from earthquake, as shown in Table 4-3.

NCDC Events

The NCDC does not track earthquakes.

USGS Events

The USGS National Earthquake Information Center database contains data on earthquakes in the Lakeport area. Table 4-23 shows the approximate distances earthquakes can be felt away from the epicenter. According to the table, a magnitude 5.0 earthquake could be felt up to 90 miles away. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Lakeport. These results are detailed in Table 4-24.

Table 4-23 Approximate Relationships between Earthquake Magnitude and Intensity

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

*Modified Mercalli Intensity Scale.

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

*Table 4-24 Magnitude 5.0 Earthquakes or greater within 90 Miles of Lakeport**

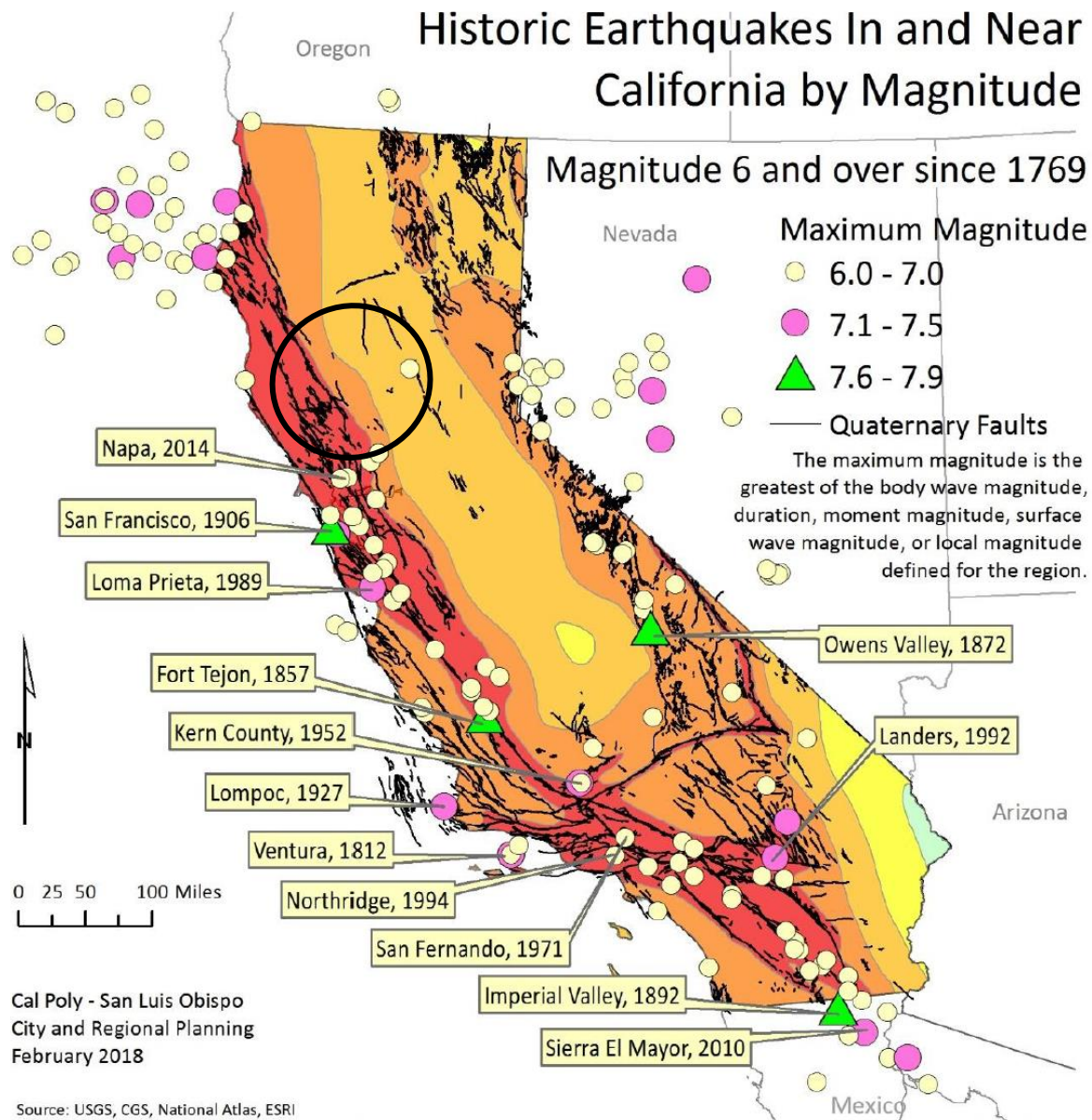
| Date | Richter Magnitude | Location |
|------------|-------------------|------------------------------------|
| 12/14/2016 | 5.01 | 8km NW of The Geysers, California |
| 8/10/2016 | 5.09 | 20km NNE of Upper Lake, California |
| 8/24/2014 | 6.02 | South Napa |
| 8/2/1975 | 5.2 | Northern California |
| 8/2/1975 | 5.1 | Northern California |
| 8/1/1975 | 5.7 | 0km WSW of Palermo, California |
| 4/18/1906 | 7.9 | The 1906 San Francisco Earthquake |

Source: USGS

*Search dates 1900 – January 1, 2019

Figure 4-37 shows major historical earthquakes in California from 1769 to 2017.

Figure 4-37 Historic Earthquakes in California 1769 to 2017



Source: USGS, CGS, National Atlas, ESRI

Shaking intensity on the background image is derived from the 2% in 50 year (2,500 year) peak ground acceleration on bedrock using ShakeMap criteria. The maximum magnitude is the greatest of the body wave magnitude, duration, moment magnitude, surface wave magnitude, or local magnitude defined for the region. Quaternary faults are believed to be sources of M>6 earthquakes during the last 1.6 million years.

Created by: C. Scholdt (draft 6.A-Historic Earthquakes in and Near California.mxd)

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

Source: 2018 State of California Multi-Hazard Mitigation Plan

Hazard Mitigation Planning Team Events

Seismic activity within the past 200 years has shown absence of any major damaging earthquake occurring along the identified fault lines within Lake County. The HMPC has identified several earthquakes that were felt by area residents and/or caused damaging shaking in Lakeport and Lake County by faults outside the County. Details on some of these events follow.

- There was an earthquake in 1808 along the Healdsburg/Rogers fault. There is little known about the damages in the Lake County or Lakeport area from this event.
- On April 18, 1906 following the San Francisco 8.0 + earthquake on the San Andreas, widespread damage and loss of life affected several Northern California counties including Lakeport and Lake County. This earthquake had the largest damage of all earthquakes experienced in Lakeport. The 1906 San Francisco earthquake damaged buildings in Lakeport including the Giselman and Lakeview hotels. At the Giselman, the quake threw 11-year-old Inez Green out of bed, and in later years she remembered the bricks falling past her bedroom window. Old photos show men cleaning up the bricks that fell from the Lakeview.
- The 1989 Loma Prieta earthquake had minor impacts in Lake County. The HMPC noted no damages in the City.
- As previously mentioned, there are daily small earthquakes in the Geysers geothermal field west of Middletown. Residents can feel these when the magnitude reaches 3.0 to 3.5, but no damages are associated with these quakes.
- There were events in 2014 and 2016, but the HMPC noted no structural damages in the City.

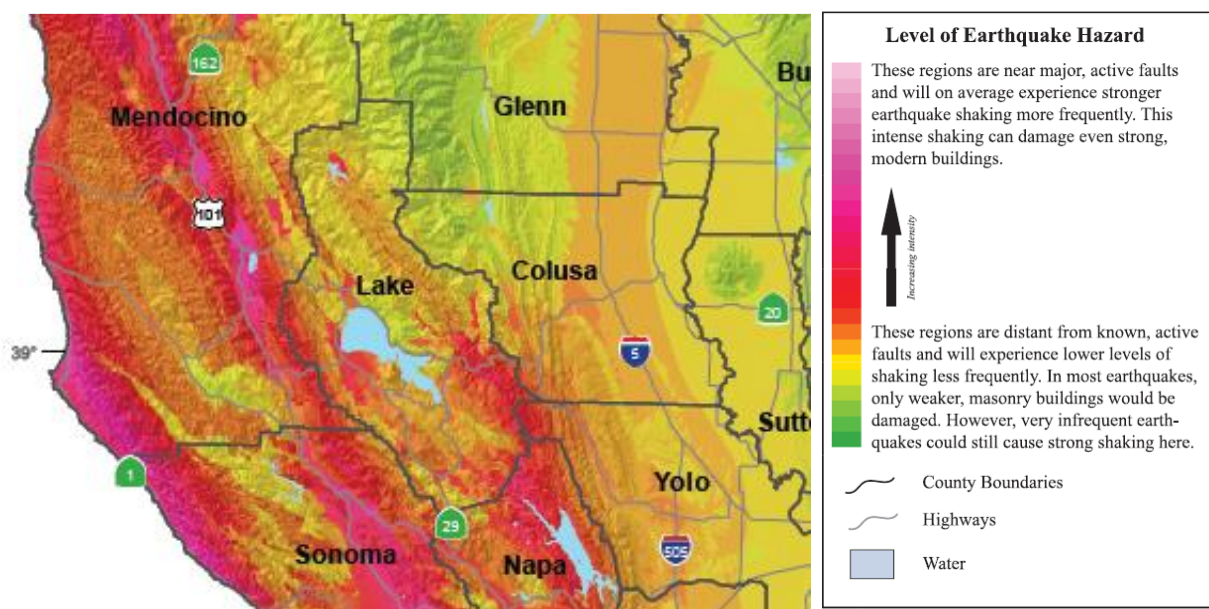
Likelihood of Future Occurrences

Occasional (major earthquake); Likely (minor earthquake)—Lakeport seismic activity within the past two hundred years has shown absence of any major or damaging earthquake occurring on identified fault lines within Lake County and Lakeport. However, the possibility of an earthquake is an ever-present phenomenon in Lake County. The combination of plate tectonics and associated California coastal mountain range geology essentially guarantees earthquake as a result of the periodic release of tectonic stresses. Lake 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 California north coastal mountain region. It is likely that Lakeport will be subject to minor earthquakes in the future. Major earthquakes are considered to be less likely in the City.

Mapping of Future Occurrences

Maps indicating the maximum expectable intensity of ground shaking for the County are available through several sources. Figure 4-38, prepared by the California Division of Mines and Geology, shows the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2,500-year average repeat time. Although the greatest hazard is in areas of highest intensity as shown on the map, no region is immune from potential earthquake damage.

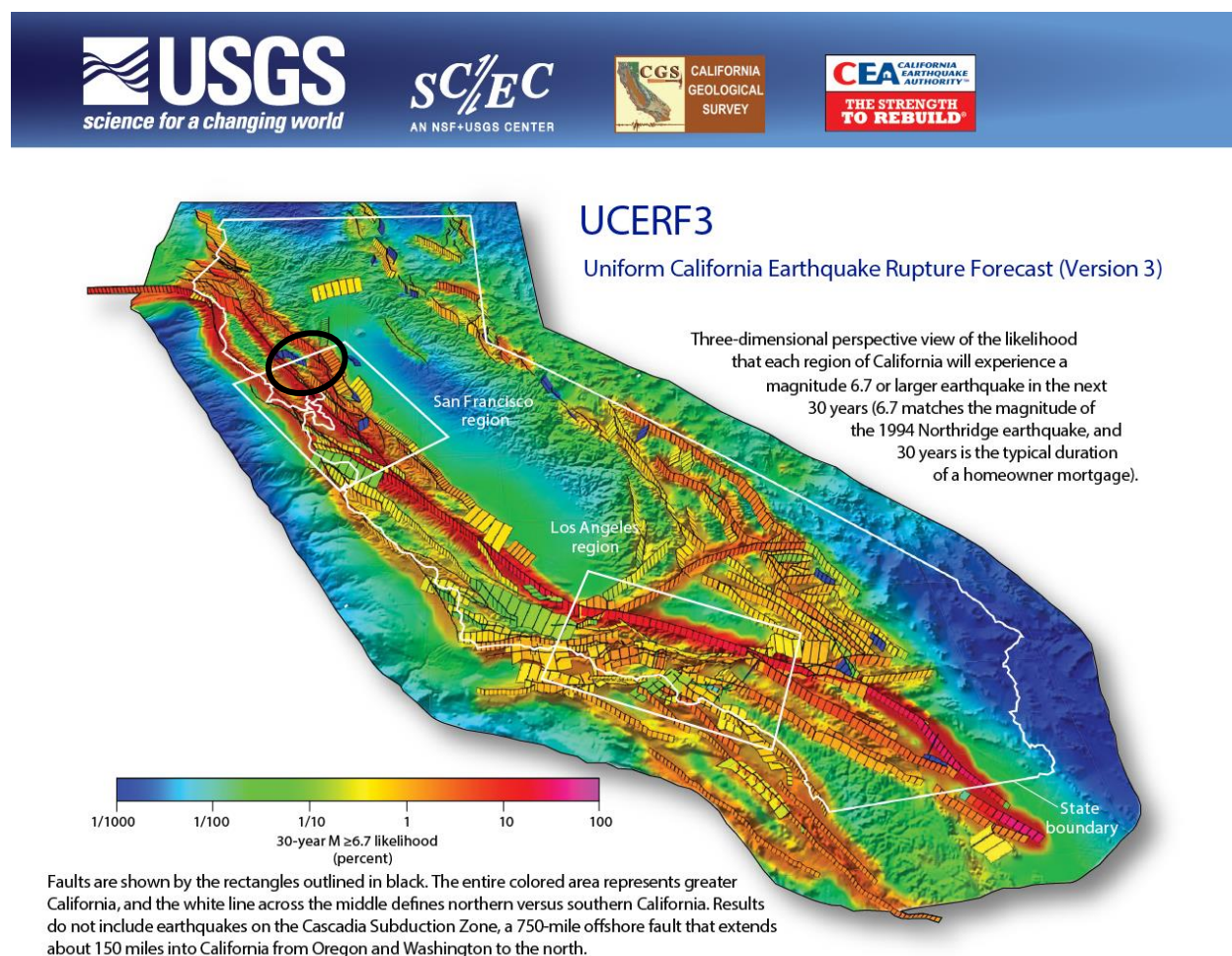
Figure 4-38 Maximum Expectable Earthquake Intensity – 2% Chance in 50 Years



Source: California Division of Mines and Geology

In 2014, the USGS and CGS released the time-dependent version of the Uniform California Earthquake Rupture Forecast (UCERF III) model. The UCERF III results have helped to reduce the uncertainty in estimated 30-year probabilities of strong ground motions in California. The UCERF map is shown in Figure 4-39 and indicates that Lakeport has a moderate to high risk of earthquake occurrence, which coincides with the likelihood of future occurrence rating of occasional.

Figure 4-39 Probability of Earthquake Magnitudes Occurring in 30 Year Time Frame



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

Climate Change and Earthquake

Climate changes is unlikely to increase earthquake frequency or strength.

4.2.12. Flood: (1% and 0.2% Annual Chance)

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. Due to its proximity to Clear Lake, history clearly highlights floods as one of the natural hazards impacting Lakeport. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities and can cause life safety issues. Floods can be extremely dangerous. Six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else.

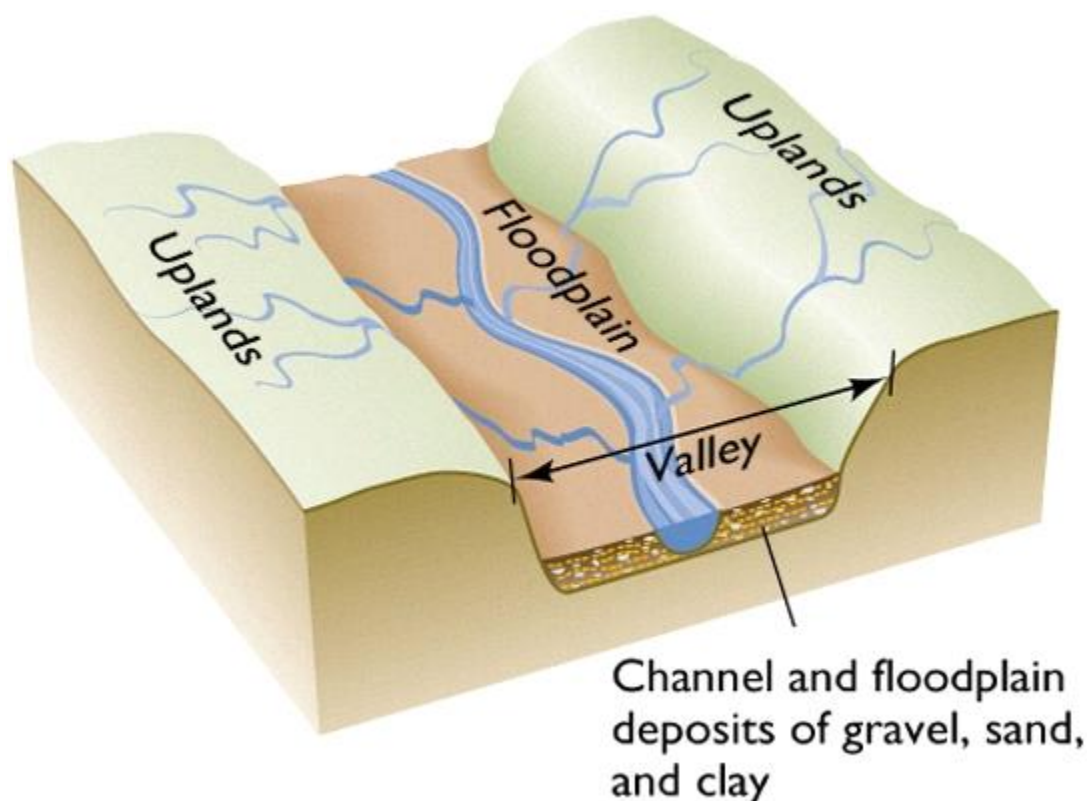
During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage.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

Major floods in Lakeport, caused by cloudbursts and high lake stages, generally inundate residential and commercial properties and recreation/vacation facilities. Agricultural land is inundated causing erosion, damaged or destroyed crops, and loss of production. Streets, roads, and highways are either overtopped, washed out, or covered with debris causing the temporary cessation of traffic flow. Flood- fighting activities (such as sandbagging) are necessary, and the evacuation of flooded areas is sometimes required.

Location

The area adjacent to a channel is the floodplain (see Figure 4-40). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded (1% annual chance flood). The 1% annual chance flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program. The 500-year flood is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year (0.2% annual chance flood). The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 4-40 Floodplain Schematic



Source: FEMA

There are three primary types of freshwater flood events in the Lakeport area: riverine and lake, flash, and urban stormwater. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reaches.

- **Riverine and lake flooding** is the most common type of flood event and occurs when a watercourse exceeds its “bank-full” capacity. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. The duration of riverine floods may vary from a few hours to many days. Clear Lake flooding occurs when there are large rains in the Clear Lake watershed basin. Lake flooding generally tends to last longer than riverine flooding due to the volume of water; however, since Clear Lake is so large flooding tends to be less intense, as it takes very large volumes of water to raise the level of Clear Lake. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. The warning time associated with slow rise floods assists in life and property protection.
- The term “**flash flood**” describes localized floods of great volume and short duration. In contrast to riverine flooding, this type of flood usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour.
- **Stormwater/Urban** flood events have increased as land has been converted from fields or woodlands to roads and parking lots and lost its ability to absorb rainfall. Urbanization increases runoff by two to six times that of natural terrain. This is discussed in the Section 4.2.12 below.

The City is also at risk to flooding resulting from dam failures. Dam failure flooding is discussed separately in Section 4.2.9 of this document. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reach.

The potential for flooding can change and increase through various land use changes and changes to land surface, resulting in a change to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The HMPC noted specific areas of flood risk in the City include the Esplanade area, the end of North Main/Clearlake Avenue north, and the 16th St area.

Hydrologic Regions

According to Cal DWR, California is divided into 10 hydrologic regions. The City of Lakeport is traversed by one hydrologic region:

- The Sacramento River hydrologic region covers approximately 17.4 million acres (27,200 square miles). The region includes all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa counties. Small areas of Alpine and Amador counties are also within the region. Geographically, the region extends south from the Modoc Plateau and Cascade Range at the Oregon border, to the Sacramento-San Joaquin Delta. The Sacramento Valley, which forms the core of the region, is bounded to the east by the crest of the Sierra Nevada and southern Cascades and to the west by the crest of the Coast Range and Klamath Mountains. The Sacramento metropolitan area and surrounding communities form the major population center of the region. With the exception of Redding, cities and towns to the north, while steadily increasing in size, are more rural than urban in nature, being based in major agricultural areas.

A map of the California's hydrological regions is provided in Figure 4-41.

Figure 4-41 California Hydrologic Regions



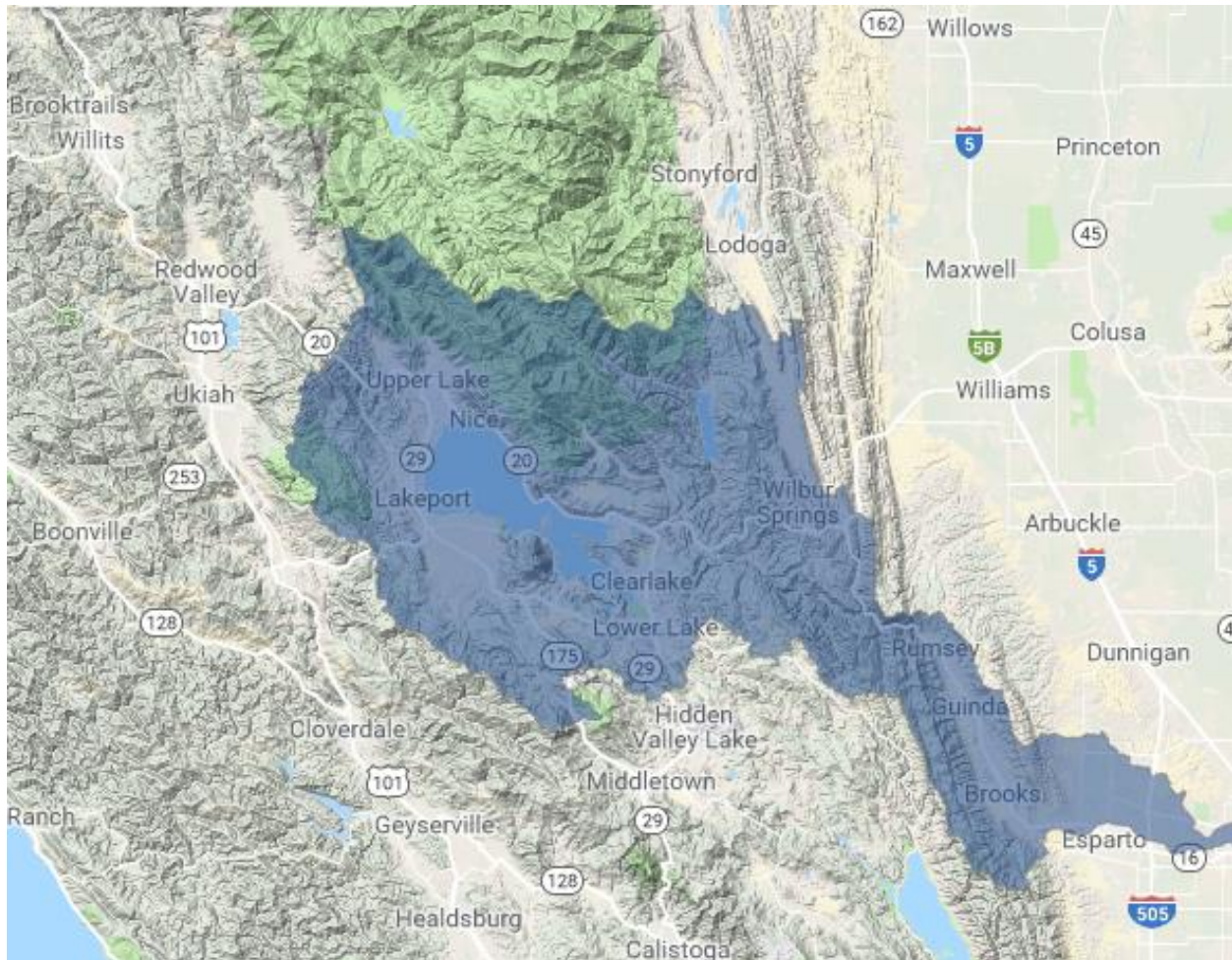
Source: California Department of Water Resources

Lakeport Watersheds and Streams

The City of Lakeport lies in the Cache Creek watershed. Cache Creek originates from and is the sole outlet of Clear Lake, the largest natural freshwater lake located entirely in California and among the world's oldest lakes. The Cache Creek Dam on the main fork, located 5 miles downstream from Clear Lake, was built to increase Clear Lake's capacity and to regulate outflow for downstream users of Cache Creek water. The dam later was modified to include a hydroelectric plant. The stream has a relatively small capacity—less than a quarter of the amount the dam is able to release. Additionally, a rock ledge 1.5 miles downstream of Clear Lake called the Grigsby Riffle restricts the flow at that point, making it difficult for excess flows

to drain from Clear Lake and increasing the chance of flooding for lakeside communities. The Cache Creek Watershed is shown in Figure 4-42.

Figure 4-42 Cache Creek Watershed Basin



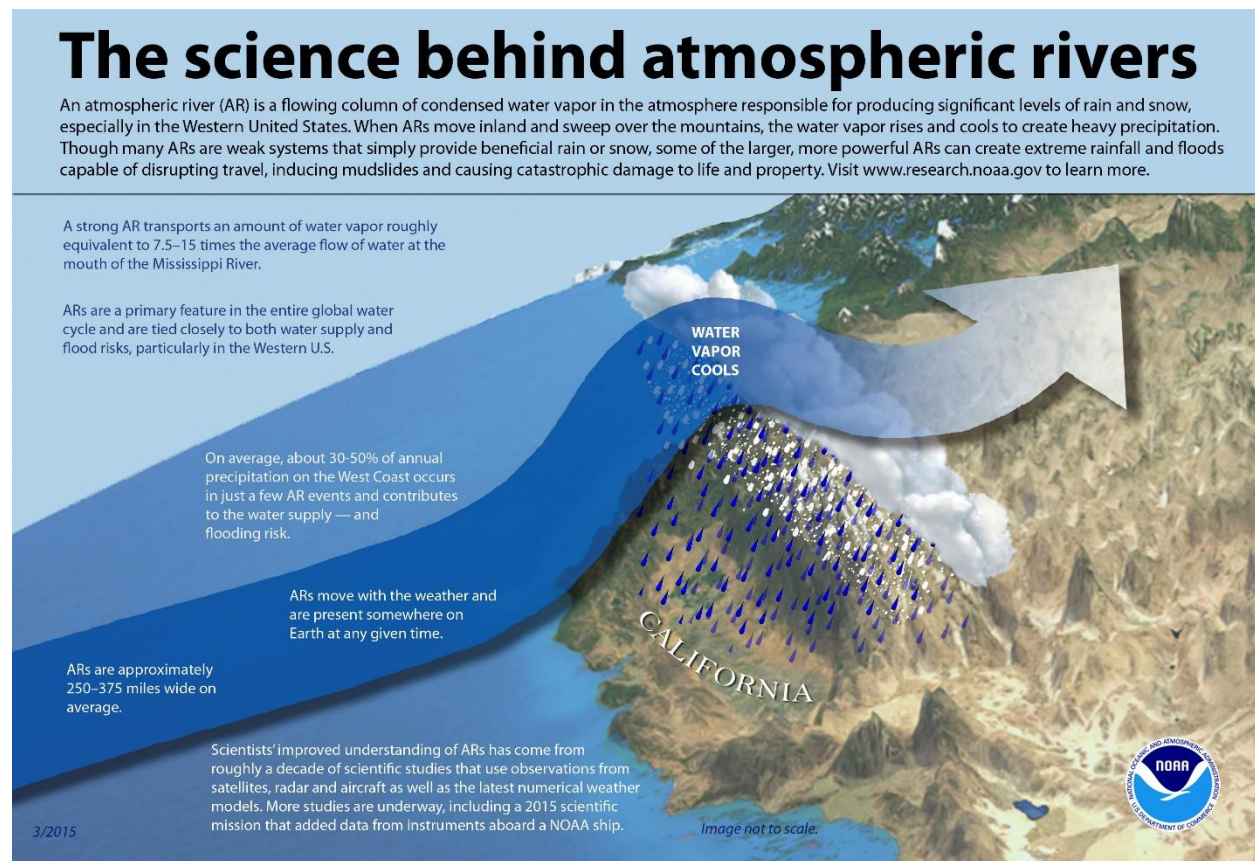
Source: Sacramento River Watershed Program

The General Plan Background Report noted that the largest body of water in Lake County is Clear Lake. Clear Lake is also the largest natural freshwater lake in California, with 110 miles of shoreline, 68 square miles of surface area and an average depth of 26 feet. Wind blows across Clear Lake from the west and northwest, bringing Pacific storms during the rainy season. The active storage capacity of Clear Lake is 314,000 acre feet with 150,000 acre-feet used for irrigation and other uses, and the remaining 164,000 acre feet lost to evaporation. Clear Lake drains southeast to the Sacramento River via Cache Creek. Although the Clear Lake Dam, located at southern edge of Cache Creek, has a high capacity to release lake overflow, the upper arms of Clear Lake are incapable of accommodating high volumes of water, and the lake frequently floods during periods of heavy rainfall.

Special Types of Flooding

Lakeport and much of Northern California can be affected by a phenomenon known as an atmospheric river. According to the NOAA, atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow. This can be seen in Figure 4-43.

Figure 4-43 Atmospheric Rivers



Source: NOAA

Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.

Not all atmospheric rivers cause damage; most are weak systems that often provide beneficial rain or snow that is crucial to the water supply. Atmospheric rivers are a key feature in the global water cycle and are closely tied to both water supply and flood risks — particularly in the western United States.

While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from Dec. 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by Dec. 22, the first full day of winter.

Floodplain Mapping

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

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The City of Lakeport is covered by the Lake County FIS. The current Lake County FIS is dated September 30, 2005. A preliminary FIS update for the County, dated June 18, 2014 has been released for the County, but not yet adopted.

Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA has been converting paper FIRMS to digital FIRMS (DFIRMs). These digital maps:

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

DFIRMs for Lake County have been developed, are dated September 30, 2005, and are being used for the flood analysis for this LHMP. This is shown in Section 4.3.9. A new DFIRM update is in process. A preliminary FIS and DFIRM, dated June 18, 2014 were released. This DFIRM data has not been finalized and was not used for analysis in this Plan. Information from the preliminary 2014 FIS was used.

Department of Water Resource (DWR) Floodplain Mapping

Also to be considered when evaluating the flood risks in Lakeport are various floodplain maps developed by Cal DWR for various areas throughout California, including Lake County and Lakeport.

DWR Best Available Maps

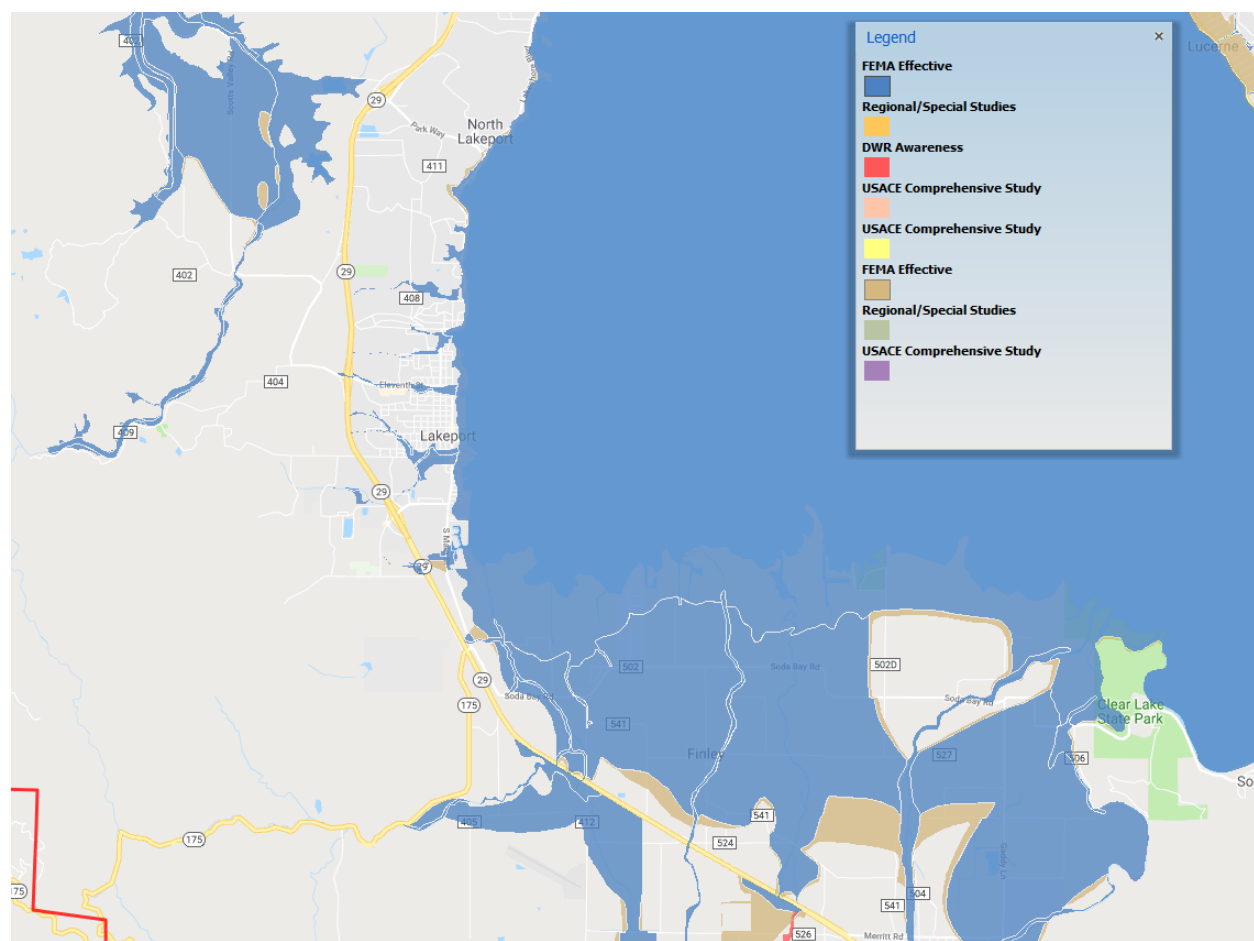
The FEMA regulatory maps provide just one perspective on flood risks in Lake County and Lakeport. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. SB 5 requires that these maps contain the best available information on flood hazards and be provided to cities and counties in the SAC-SJ Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100- and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM maps are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100- and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications. They are for the same flood frequency; however, they may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City of Lakeport than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 100-year floodplain, it also supports identification of the need and requirement for flood insurance.

These floodplain maps for Lakeport can be seen in Figure 4-44.

Figure 4-44 City of Lakeport – Best Available Map



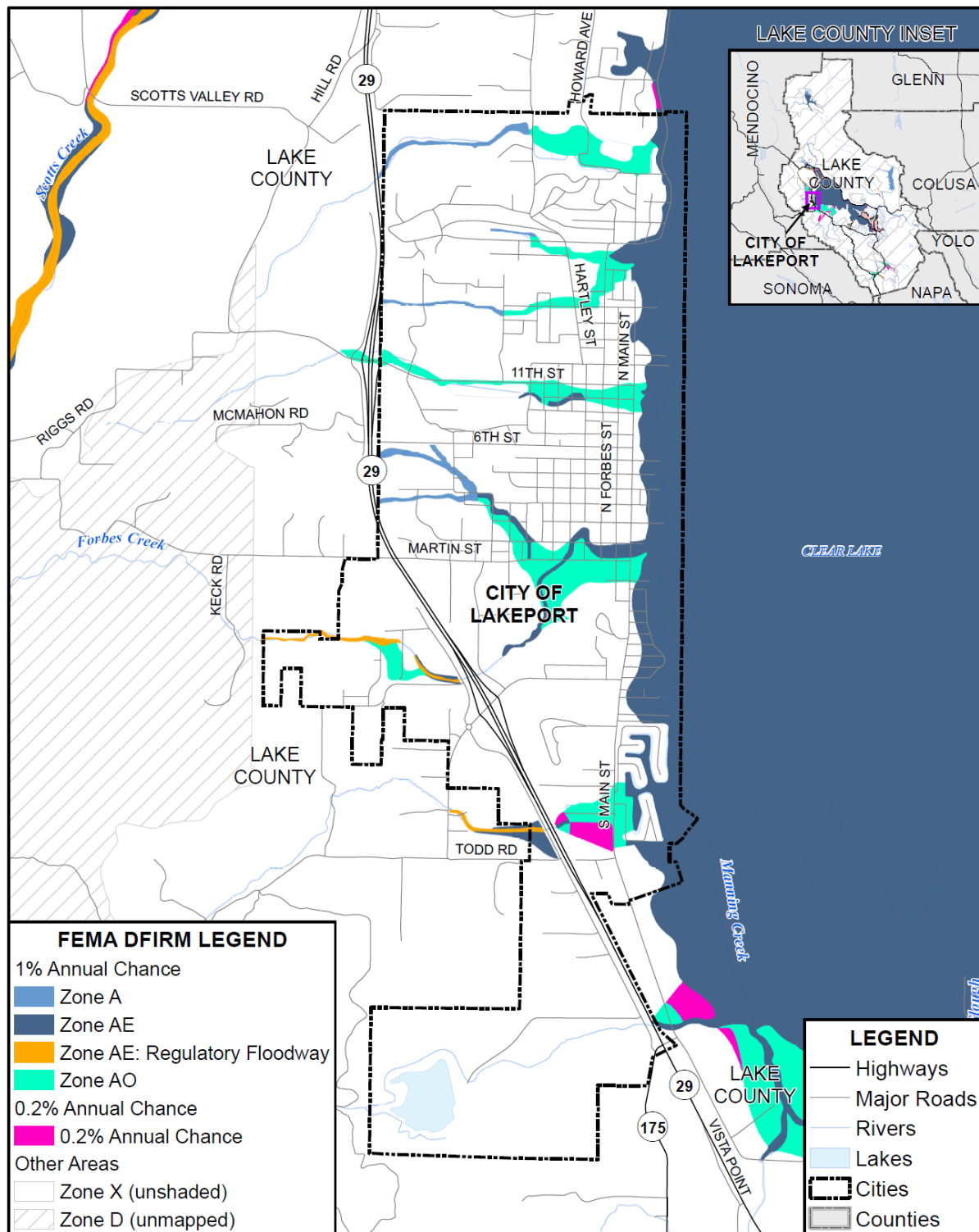
Source: California DWR, map created 1/21/2019

Legend explanation: Blue - FEMA 100-Year, Orange – Local 100-Year (developed from local agencies), Red – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), Pink – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), Purple – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Extent

Flood extents are usually measured in depths of flooding, aerial extent of the floodplain, as well as flood zones that a location falls in (i.e. 1% or 0.2% annual chance flood). Expected flood depths in the City vary and are not well defined. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Aerial flood extent from the FEMA DFIRMs is shown on Figure 4-45 and in Table 4-25. As shown in the table, 17.1% of the City lies in the 1% annual chance floodplain, while another 0.6% lies in the 0.2% annual chance floodplain.

Figure 4-45 City of Lakeport - FEMA DFIRM Flood Zones



0 1 2 Miles



Data Source: FEMA DFIRM 9/30/2005, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

Table 4-25 City of Lakeport –Flood Hazard Geographical Extents in FEMA DFIRM Flood Zones

| Flood Zone | Total Flooded Acres | % of Total Area |
|---------------------------------|---------------------|-----------------|
| 1% Annual Chance Flood Hazard | 289 | 17.1% |
| 0.2% Annual Chance Flood Hazard | 10 | 0.6% |
| Other Areas | 1,390 | 82.3% |
| Grand Total | 1,689 | 100.0% |

Source: FEMA September 30, 2005 DFIRM

Past Occurrences

Disaster Declaration History

There have been 16 state and 14 federal disaster declarations due to flooding, as shown in Table 4-26.

Table 4-26 Lake County Disaster Declarations 1950-2019 from Flood

| Disaster Type | State Declarations | | Federal Declarations | |
|--|--------------------|---|----------------------|--|
| | Count | Years | Count | Years |
| Flood (including heavy rains and storms) | 16 | 1955, 1958, 1963, 1964, 1970, 1983, 1986, 1995 (two times), 1997, 1998, 2005/2006, 2006, 2017 (two times), 2019 | 14 | 1950, 1955, 1958 (twice), 1963 (twice), 1970, 1980, 1983, 1986, 1995 (twice), 1997, 1998 |

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flood events for the County since 1996. These are shown on Table 4-36. Events that damaged the City are discussed below the table.

Table 4-27 Lake County NCDC Storm Events 1/1/1996-6/31/2018*

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|--------------|------------------|----------|-------------------|----------|---------------------|---------------------|-------------|
| Flash Flood | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Flood | 10 | 1 | 0 | 1 | 0 | \$23,410,000 | \$0 |
| Total | 11 | 1 | 0 | 1 | 0 | \$23,410,000 | \$0 |

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of the City of Lakeport and outside of Lake County.

- **December 11, 2014** – Flooding was reported in Lakeport, bringing significant and widespread damage. Neighborhoods were evacuated. Roads were damaged. Extensive road repair and debris removal was required.

FIS Events

Clear Lake, its tributaries, and other streams in Lake County have a long history of flooding. Several flood periods are documented during the last half of the 20th century, and many severe floods have occurred since 1900. Stage recordings for Clear Lake have been maintained since 1874 on a Rumsey Gage, which is located on a wharf in Lakeport. Zero Rumsey is equal to 1318.257 feet above mean sea level. A full lake, by definition, is reached when the lake measures 7.56 feet on the Rumsey Gage. The level of Clear Lake is controlled by Cache Creek Dam which was constructed on Cache Creek in 1914. This dam is owned and operated by Yolo County Flood Control and Water Conservation District and is operated in conformance with two court decrees. The Gopcevic Decree of 1920 stipulated that the lake shall be operated between Zero and 7.56 feet, except for unforeseen storms that raise the level faster than the Cache Creek channel capacity can draw down. In that event the level may go up to 9.0 feet, but not for a period of more than 10 consecutive days. It must be noted that with a full lake, the outlet capacity of Cache Creek is limited to 2,540 cubic feet per second. During the January 1995 storm, peak inflows of 37,400 cfs occurred. Due to the limited outlet capacity of Cache Creek, it is virtually impossible with this latter requirement.

These records show that a 7.56-foot stage on the Rumsey Gage has been exceeded 54 times and a 9-foot stage on the Rumsey Gage has been exceeded 27 times. Some of the most damaging floods of recent times have occurred in 1937-38, 1940, 1956, 1958, 1964-65, 1970, 1974, 1983, and 1986. The maximum known stage on Clear Lake, 13.66 feet, occurred in January 1890. The next highest stage, 13.38 feet, occurred in February 1909. Some of the higher lake stages that have occurred since construction of Clear Lake Dam in 1915 are shown in Table 4-28.

Table 4-28 Flood Stages for Clear Lake since 1915

| Date | Stage (feet) | Elevation (feet NGVD)* |
|---------------|--------------|------------------------|
| February 1938 | 10.25 | 1,328.84 |
| February 1942 | 9.60 | 1,328.19 |
| February 1956 | 9.53 | 1,328.18 |
| February 1958 | 10.86 | 1,329.51 |
| January 1965 | 9.03 | 1,327.68 |
| January 1970 | 10.37 | 1,329.02 |
| April 1974 | 9.10 | 1,327.75 |
| February 1980 | 9.61 | 1,328.26 |
| April 1982 | 9.17 | 1,327.82 |
| March 1983 | 11.32 | 1,329.58 |
| February 1986 | 11.34 | 1,329.60 |
| March 1995 | 10.73 | 1,328.99 |
| February 1998 | 11.44 | 1,329.70 |

Source: 2014 Preliminary FIS

*The elevation figure represents a combination of lake stage and appropriate gage elevation datum; gage datum (feet NGVD): 1,318.59 feet through 1947; 1,318.65 feet 1947 through 1982; 1,318.26 feet to present (U.S. Department of the Interior, Water Resources Data, Gage No. 11450000).

When Clear Lake is full it has a surface area of 43,790 acres and contains 1,155,000 acre-feet of water. At Zero on the Rumsey gage, the surface area is 39,170 acres with a capacity of 842,000 acre-feet. Statistically the following peak flood levels can be expected on Clear Lake, as noted by the Lake County Department of Water Resources:

- 10% chance each year 10.04 feet
- 2% chance each year 11.74 feet
- 1% chance each year 12.34 feet
- 0.2% chance each year 13.84 feet

The FIS noted some events that specifically affected the City of Lakeport. Between 1937 and 1986, Lakeport experienced six stream bank overflow flood events. The flooding occurred in December 1937, February 1940, December 1964, January 1970, January 1983, and February 1986.

- **1937** – A downpour in mid-December 1937 caused Forbes Creek to overflow its banks and flood easterly along Martin Street for several blocks and then northerly along Main Street. Flooding also occurred along Tenth Street from Tenth Street Drain overflow. Residential, commercial, and agricultural properties were flooded and damaged. Substantial streambank erosion was caused and roads throughout the area were closed due to inundation by floodwaters and the deposition of debris.
- **1940** – The February 1940 floodwaters inundated property at several locations in Lakeport, especially along Martin Street from Forbes Creek to Main Street and along Tenth Street. The floodwaters inundated agricultural, residential, and commercial properties, and overflowed roads causing short-term closures.
- **1964** – During the December 1964 cloudburst, flooding on Martin Street looked like a full-fledged river. Main Street was flooded and some businesses were inundated. Others were sandbagged to prevent flooding. City crews worked many hours pumping water and sandbagging. Numerous streets were closed by floodwaters, and south of the city, much of State Highway 29 was covered by floodwaters and debris.
- **1970** – In January 1970, extensive rainfall caused flooding of 1- to 2-foot depths in lower, eastern parts of the city. Resort areas, trailer parks, and campgrounds were inundated, and traffic on some roads was diverted. Residential and commercial areas and public facilities suffered damages.
- **1983** – In January 1983, floodwaters forced the closure of streets and roads in various locations around town for indefinite periods of time. Several blocks of Martin and Armstrong Streets were closed as were Main Street at Tenth and Eleventh Streets and portions of major county and state highways northwest and south of the city. Flood fighting and sandbagging efforts took place on Martin and South Main Streets.
- **1986** – In February 1986, flooding affected practically all sections of Lakeport. In the northeastern section, city firefighters sandbagged in the Lakeshore Boulevard area and helped in evacuation work there. In the east-central section, floodwaters covered much of Tenth Street. In the west-central section, Compton and Spun Streets were flooded. In the southeastern section, portions of Martin and South Main Streets were impassable and along Esplanade, city firemen evacuated some residents. In the eastern section (the lakefront), water was in the front yards of lakeside homes and much sandbagging was done to prevent further damage. Sandbagging activities were accomplished throughout the city to protect residences and businesses. Sewer pumps in many areas were working 24 hours a day for an extended period to alleviate further problems.

Hazard Mitigation Planning Team Events

The HMPC provided an article from 2017 that tracked Clear Lake levels from 1874 to 2017. This was tracked by Lake level on the Rumsey Gage. Levels above 7.56 are considered to be flood levels. Peak Lake levels by year are shown on Figure 4-46. Information on specific flooding by date follows the table.

Figure 4-46 City of Lakeport – Lake Levels 1874 to 2017

PEAK LAKE LEVELS BY YEAR

| | | | |
|-------------|-------------|-------------|---------------------------|
| 1874: 8.62 | 1920: -0.50 | 1966: 7.59 | 2012: 5.90 |
| 1875: 6.60 | 1921: 7.20 | 1967: 7.92 | 2013: 6.23 |
| 1876: 12.37 | 1922: 6.50 | 1968: 7.71 | 2014: 2.48 |
| 1877: 5.64 | 1923: 5.70 | 1969: 8.80 | 2015: 4.55 |
| 1878: 12.39 | 1924: 1.80 | 1970: 10.37 | 2016: 7.92 |
| 1879: 8.31 | 1925: 6.90 | 1971: 7.84 | 2017: 10.63* |
| 1880: 10.08 | 1926: 7.47 | 1972: 4.58 | The lake has reached 10.0 |
| 1881: 10.25 | 1927: 9.00 | 1973: 7.74 | or more on 19 occasions |
| 1882: 6.16 | 1928: 7.35 | 1974: 9.10 | since 1874. |
| 1883: 4.12 | 1929: 3.30 | 1975: 8.90 | |
| 1884: 5.58 | 1930: 6.00 | 1976: 2.32 | |
| 1885: 6.02 | 1931: 2.20 | 1977: -0.30 | |
| 1886: 8.94 | 1932: 3.78 | 1978: 8.10 | |
| 1887: 5.42 | 1933: 2.60 | 1979: 6.62 | |
| 1888: 4.86 | 1934: 3.60 | 1980: 9.61 | |
| 1889: 5.88 | 1935: 7.28 | 1981: 6.79 | |
| 1890: 13.66 | 1936: 8.20 | 1982: 9.17 | |
| 1891: 6.47 | 1937: 7.05 | 1983: 11.32 | |
| 1892: 5.08 | 1938: 10.25 | 1984: 7.93 | |
| 1893: 9.70 | 1939: 3.75 | 1985: 6.25 | |
| 1894: 8.66 | 1940: 8.33 | 1986: 11.34 | |
| 1895: 12.25 | 1941: 8.90 | 1987: 4.86 | |
| 1896: 7.75 | 1942: 9.60 | 1988: 5.94 | |
| 1897: 8.16 | 1943: 7.72 | 1989: 5.27 | |
| 1898: 3.41 | 1944: 5.03 | 1990: 3.39 | |
| 1899: 3.08 | 1945: 5.82 | 1991: 3.98 | |
| 1900: 5.66 | 1946: 7.23 | 1992: 4.54 | |
| 1901: 8.13 | 1947: 3.41 | 1993: 8.48 | |
| 1902: 9.98 | 1948: 4.62 | 1994: 4.39 | |
| 1903: 7.81 | 1949: 5.95 | 1995: 10.17 | |
| 1904: 11.91 | 1950: 4.65 | 1996: 8.05 | |
| 1905: 8.68 | 1951: 7.38 | 1997: 8.50 | |
| 1906: 9.66 | 1952: 8.08 | 1998: 11.44 | |
| 1907: 11.64 | 1953: 7.81 | 1999: 7.79 | |
| 1908: 7.53 | 1954: 7.67 | 2000: 7.69 | |
| 1909: 13.38 | 1955: 4.71 | 2001: 5.20 | |
| 1910: 6.95 | 1956: 9.53 | 2002: 6.89 | |
| 1911: 9.09 | 1957: 7.06 | 2003: 7.86 | |
| 1912: 3.78 | 1958: 10.86 | 2004: 8.85 | |
| 1913: 4.16 | 1959: 7.48 | 2005: 7.85 | |
| 1914: 11.12 | 1960: 6.71 | 2006: 8.77 | |
| 1915: 10.68 | 1961: 7.18 | 2007: 6.14 | |
| 1916: 8.53 | 1962: 7.75 | 2008: 7.11 | |
| 1917: 6.60 | 1963: 8.20 | 2009: 4.17 | |
| 1918: 3.03 | 1964: 6.83 | 2010: 8.07 | |
| 1919: 4.42 | 1965: 9.03 | 2011: 9.37 | |

HIGH POINTS BY MONTH

December: 1
January: 9
February: 25
March: 39
April: 52
May: 9
Multiple Months: 9

**COME SPEND
YOUR
TAX REFUND
WITH US!**

\$1

**BY MAIL W
SELECT KITC**

**\$200 REBATE ON 2
\$400 REBATE ON 4**

**KI
FOR 1**

Source: City of Lakeport

February 1998 – Heavy rains caused Clear Lake to rise to more than a foot above flood stage. Runoff from tributary creeks was flowing in faster than it could drain. More than 500 homeowners and renters around the Lake were warned to clear out. With water lapping at the foundations of treatment plants north and

south of the county seat of Lakeport, plant operators released once-treated sewage into the Lake in order to recycle it. The storms also created the threat of landslides, prompting county officials to raze one abandoned hillside home during the February rain storms, fearing it would slide down the hillside onto a highway below. An estimated \$12 million in damage was done to public and private property. Some 1,200 homes were affected, according to officials.

January and February 2017 - The HMPC noted a series of heavy rains in early February caused problems on Clear Lake. Rains fell in the first week of February, bringing the level of Clear Lake up. Heavier rains began falling on the 8th pushing the Lake to flood stages. The flood eventually brought the Lake level up to 10.58' on the Rumsey Gage. 2 separate disaster declarations (DR-4301 and DR-4308) were declared for these events. A timeline of these events is shown below.

- **1-6-17** - Lake level is 3.97 – Wave action due to easterly wind is beginning to undermine the 1st Street boat ramp area. Sandbags were placed to help stop erosion. Heavy rain and driving winds predicted for the weekend
- **1-9-17** - Lake level is 5.23 – Heavy rain and wind over the weekend caused the lake level to raise rapidly. Erosion between the 3rd Street boat ramp and the Yacht Club was noted.
- **1-10-17** - Lake level is 5.81 – Rain and wind continues to drive wave action. Damage to the floating dock system at the 5th Street Boat Ramp was noted.
- **1-23-17** - Lake level is 8.46- Water is beginning to crest over the seawall. Parks staff along with Public works staff installed a 600-foot Aqua Dam system to help protect Park Infrastructure from rising flood waters and intense wave action. Noted water coming up through the expansion joints of sidewalk that is connected to the seawall.
- **1-24-17** - Lake level is 8.58 - Parks and Public Works Staff Installed a temporary fencing system around the Aqua Dam. It was noted that undermining of the sea wall was occurring. Water continues to seep up through the expansion joints in the sidewalk. Standing water is accumulating in both Playground areas.
- **2-2-17** - Lake level is 7.98 – Strong winds out of the East were driving wave action into the seawall further undermining the sidewalks. Observed some separation in the expansion joints and more water shooting up through sidewalk several feet in from the sea wall.
- **2-9-17** - Lake level is 9.11 – Heavy rain and strong winds continue to add to the damage that is occurring at the sidewalk and seawall. Library Park is now closed to the public. The parking lots are beginning to flood. It was confirmed that there is some damage to the dock system at the 5th St.
- **2-10-17** - Lake level is 9.57 - The Playgrounds are completely flooded and the engineered wood fibers that are used for protective surfacing are being washed away. Parking lots are all underwater. The gazebo and all the park lights are in standing water. Decomposed granite from around all the picnic table areas is being washed away. The sidewalk and seawall are too deep underwater to inspect for further damage.
- **2-11-17** - Lake level is 9.77 – High winds and rising lake levels continue to compound all the issues at Library Park. All electricity was shut off to the lights, Gazebo and irrigation pump.
- **2-15-17** - Lake level is 9.57 – Gale force wind out of the east is driving waves over 4 feet high into the seawall and Aqua Dam. This intense wave action has destroyed the entire Aqua Dam system. 100 feet of a water wall system was borrowed from Lake County Public Works and we ordered 600 feet of our own.
- **2-16-17** - Lake level is 9.52 – Parks Staff along with Public Works installed the new Water Wall that was ordered yesterday.

- **2-17-17** - Lake level is 9.54 – Another round of extreme easterly winds has knocked over our new water wall and temporary fencing system. We have noted damage to most of the picnic tables. The concrete benches along the waterfront have been tossed around. Several of the globes that cover the park lights are missing. 3rd St. dock system is being severely damaged. There are concerns that the sidewalk and seawalls near the yacht club are sustaining damage.
- **2-18-17** - Lake level is 9.80 – Parks and Public works came in to replace and reinforce the new wave barrier and temporary fencing system.
- **2-23-17** - Lake level is 10.58 – This is the peak of the flood. Portions of the Park have now been submerged for almost a month.
- **3-1-17** - Lake level is 9.89 – The lake is receding, and some damage is now being confirmed.
- **3-6-17** - Lake level is 9.31 – Damage assessment continues. Begin debris removal in areas as the lake recedes.
- **3-15-17** - Lake level is 8.33 – Damage to Sidewalk and Seawall is visible. Severe undermining of the seawall and sidewalks.

It caused flooding in the low-lying areas of the City (see Figure 4-47). In addition, 550 feet of seawall were damaged and began separating from the sidewalk. 565' of sidewalk along the waterfront were undermined and failed. 125' of sidewalk along the center promenade were damaged from being submerged. 13,385 sq. ft. of decomposed granite were washed away. 2 playgrounds lost most of the wood mulch surrounding them (approximately 5,000 sq. ft.). The area between the 3rd St. boat ramp and Yacht Club had severe erosion. 400' of shoreline was eroded. Sod, boat docks, and boat ramps were also damage.

Figure 4-47 City of Lakeport - 2017 Flooding



Source: City of Lakeport

February and March 2019 – An atmospheric river brought heavy rains to the Lakeport Area. The Lake levels rose quickly, causing flooding in the City (see Figure 4-48). Clear Lake Rumsey gage levels are shown below by date.

- Monday Feb 25— 7.61
- Tuesday Feb 26 – 8.05
- Wednesday Feb 27 – 9.13
- Thursday Feb 28 – 9.66

The following roads were closed due to flooding:

- Hill Road: Currently single lane traffic from Lakeshore to Sutter Hospital. Traffic will not be able to drive from Sutter Hospital to Lakeshore Blvd – due to land slide movement.
- Lakeshore Blvd: Closed due to flooding from Altera to Park Way.
- Lakeshore Blvd is Open from Park Way to ½ Mile North of Park Way (Rainbow Mobile Home Park)
- Scotts Creek Road: single lane closure at MPM 1.35 due to slipout.
- Library Park: closed until further notice by the City of Lakeport due to flooding.
- The parking lots across from Library Park at Third, Fourth and Fifth streets: closed due to flooding.
- Esplanade Street in its entirety: closed to all traffic except residents due to flooding. Motorists in the area were advised to drive slowly so as to prevent “wave action” against homes, reported Lakeport Public Works.

Figure 4-48 City of Lakeport – 2019 Spring Flooding



Source: City of Lakeport

Likelihood of Future Occurrences

1% Annual Chance Flood

Occasional—This is the flood that has a 1- percent chance of being equaled or exceeded in any given year. Thus, the 1% annual chance flood could occur more than once in a relatively short period of time.

0.2% Annual Chance Flood

Unlikely—The flood has a 0.2 percent chance of being equaled or exceeded in any given year.

Climate Change and Flood

Climate change and its effect on flood near the City has been discussed by three sources:

- 2014 CAS
- Cal-Adapt
- National Center for Atmospheric Research

CAS

According to the CAS, climate change may affect flooding in the City. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams.

Cal Adapt

Cal Adapt future precipitation projections were shown in Figure 4-17 in Section 4.2.4. These could affect flooding in the City.

National Center for Atmospheric Research

Also according to the National Center for Atmospheric Research in Boulder, Colorado, atmospheric rivers are likely to grow more intense in coming decades, as climate changes warms the atmosphere enabling it to hold more water.

4.2.13. Flood: Localized/Stormwater

Hazard/Problem Description

According to the HMPC, localized, stormwater flooding also occurs throughout the City. Localized, stormwater flooding occurs throughout the City during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate

duration. Flooding is more severe when previous rainfall has created saturated ground conditions. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

The City of Lakeport General Plan Safety Element discusses localized flooding in the City. Stream bank flooding affects most drainage within the City. Cloudburst storms lasting as long as three hours can occur in the watersheds of Lakeport practically anytime during the fall, winter, and spring and may occur as an extremely severe sequence in a general rainstorm. Cloudbursts are high-intensity storms that can produce floods characterized by high peak flows, short duration, and relatively small volume of runoff. In small drainage basins, such as those existing in the Planning Area, cloudbursts can produce peak flows substantially larger than those of general rainstorm runoff.

Lakeport is traversed by several streams and drainage areas which flow into Clear Lake. The development that has occurred during the past twenty years has accentuated existing drainage problems and has increased the potential for localized flooding. Continued construction of new buildings increases the area of impermeable surface and thus the amount of storm water that flows through the City's storm drain system.

Location

According to the City, numerous parcels and roads throughout Lakeport not included in the FEMA 1% and 0.2% annual chance floodplains are subject to flooding in heavy rains. These are delineated in Table 4-30. In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, mudslides, debris areas, and downed trees. The frequency and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff.

Table 4-29 City of Lakeport – Localized Flooding Areas

| Road/Area Name | Rumsey Elevation Level | Flooding | Pavement Deterioration | Washouts | High Water/ Creek Crossing | Landslides/ Mudslides | Debris | Downed Trees |
|--------------------------------|------------------------|----------|------------------------|----------|----------------------------|-----------------------|--------|--------------|
| Esplanade and Konocti | 7.10 | X | | | | | | |
| Esplanade and Lupoyoma | 7.16 | X | | | | | | |
| Esplanade and Helena | 8.10 | X | | | | | | |
| Esplanade and Lily Cove | 7.96 | X | | | | | | |
| Esplanade and E St | 7.65 | X | | | | | | |
| Library Park Pier at Promenade | 8.61 | X | | | | | | |

| Road/Area Name | Rumsey Elevation Level | Flooding | Pavement Deterioration | Washouts | High Water/ Creek Crossing | Landslides/ Mudslides | Debris | Downed Trees |
|------------------------|------------------------|----------|------------------------|----------|----------------------------|-----------------------|--------|--------------|
| Third St Parking Drain | 9.3 | X | | | | | | |
| 2155 Lakeshore | 8.91 | X | | | | | | |
| Lakeshore and Jones | 8.71 | X | | | | | | |
| Lakeshore and Sayre | 9.16 | X | | | | | | |
| Lakeshore and Ashe | 8.93 | X | | | | | | |
| Scotts Valley* | – | X | X | X | X | | X | |
| Eickoff Road* | – | X | | | X | | | |
| Lakeshore Blvd.* | – | X | X | | X | | X | X |

Source: City of Lakeport

*Not located in the City, but located in the LCFPD area.

Extent

There is no established scientific scale or measurement system for localized flooding. Localized flooding is generally measured by depth of flooding, volume of water, runoff velocity, and the area affected. Localized flooding often happens quickly and has a short speed of onset and short duration, with flood waters receding when the storm drainage system can catch up.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations related to localized flooding in Lake County and the City of Lakeport, according to Table 4-3.

NCDC Events

The past occurrences of localized flooding are included in the 1%/0.2% annual chance flood hazard profile in Section 4.2.12.

Hazard Mitigation Planning Team Events

The HMPC noted that localized flooding in the City occurs often. These floods rarely cause sizable damages or injuries, and are more of a nuisance to the City and its residents. During the floods of 2017 – a large vulnerable population affected. For example, the Will-O-Point area is low income, Spanish speaking. During the floods, took multiple boat trips to evacuate community. The City found housing for

them. Once relocated, the City provided busing to get them to their schools. The Forbes Creek area is also extremely disadvantaged. Both Forbes Creek Area and Will-O-Point area to be flagged in low lying flood areas of concern

Likelihood of Future Occurrences

Highly Likely— Urban storm drainage systems have a finite capacity. When rainfall exceeds this capacity or systems clog, water accumulates in the street until it reaches a level of overland release. Due to aging and often undersized infrastructure, this type of flooding will continue to occur during heavy rains.

Climate Change and Localized Flood

Cal Adapt future precipitation projections were shown in Figure 4-17 in Section 4.2.4. While average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

4.2.14. Hazardous Materials Transport

Hazard/Problem Description

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

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

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

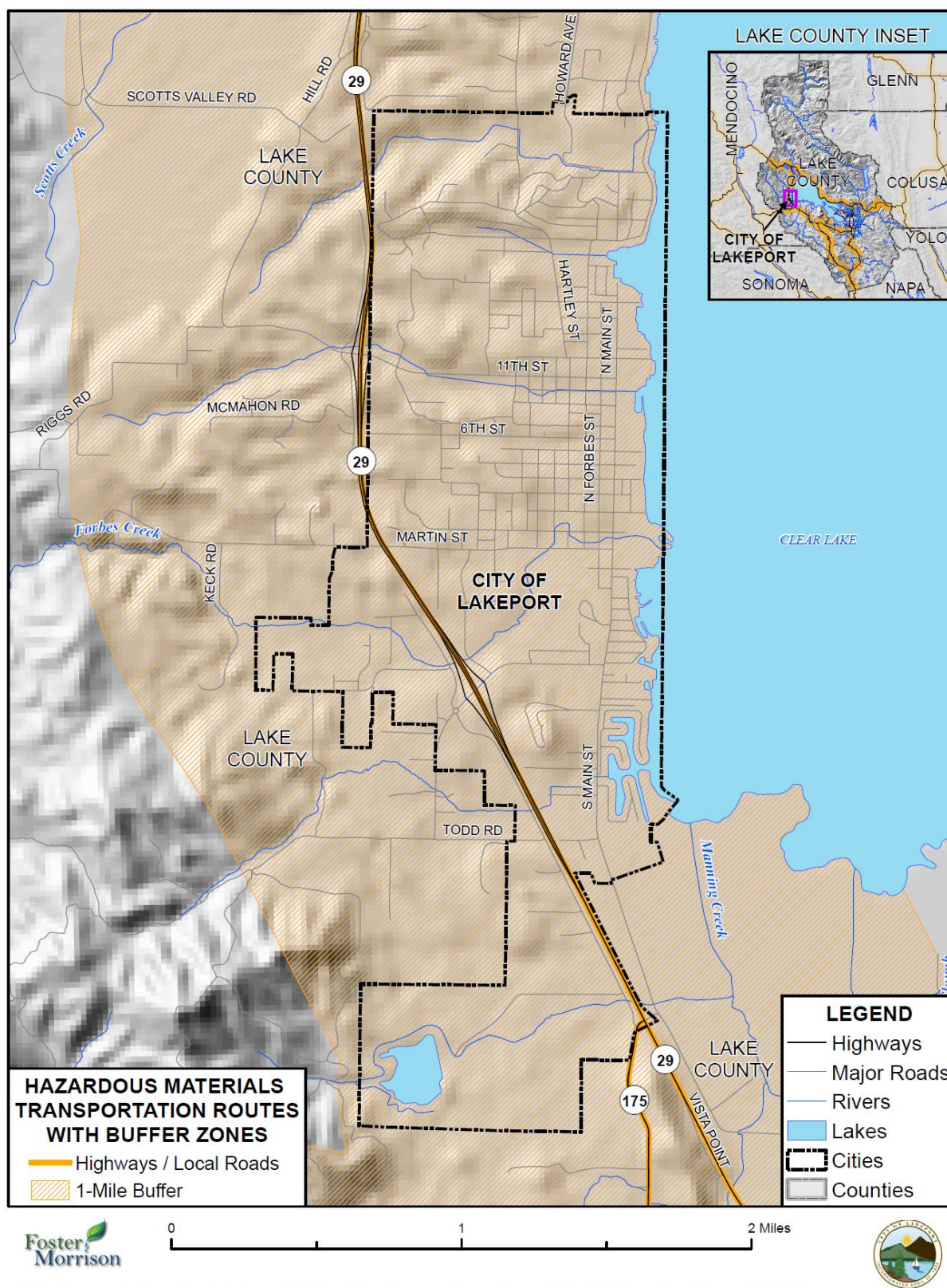
A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud or direct contamination of water, people, and property. The effects may involve a local site or many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual, such as the

development of cancer from a carcinogen. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Location

Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. In Lakeport, hazardous materials routes include Highways 29 and 175. These are shown in Figure 4-49 (with a one mile buffer zone, as discussed in greater detail in Section 4.3.11 below). In addition, while most routes are known, the City does not have a quantified amount of hazardous materials that are transported through it en route to local deliveries or to adjoining counties.

Figure 4-49 City of Lakeport – Hazardous Materials Transportation Routes and Buffer Zones



Data Source: CalTrans Truck Network 12/2016, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

Extent

Accidents involving the transportation of hazardous materials could be just as catastrophic as accidents involving stored chemicals, possibly more so, since the location of a transportation accident is not predictable. The U.S. Department of Transportation divides hazardous materials into nine major hazard classes. A hazard class is a group of materials that share a common major hazardous property, i.e., radioactivity, flammability, etc. These hazard classes include:

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

Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. Specifically, the Lake County Emergency Operations Plan addresses the transportation of hazardous materials, which applies to the City, as follows:

Due to extensive agricultural operating, the increasing development of geothermal power plants, gold mining operations and the fact that Highway 20 (the state-designated transportation route between Interstate 5 and Highway 101 for northern California) traverses the County, hazardous materials like to be encountered in Lake County are: pesticides, herbicides, and sundry toxins in solid, liquid, and gaseous form; explosives; petroleum products; flammables; geothermal wastes to include liquid form from drilling sumps and hydrogen sulfide from power plants; chemicals, cyanide and lime from gold mining operations; and low level radioactive wastes. Because of the state-designated route through Lake County, the majority of toxics and radioactive materials that travel from the coast to the central valley traverse Lake County and at several points actually border either Clear Lake or Blue Lakes, producing an extreme vulnerability to water quality.

In addition, while most routes are known, the City has not quantified the amount of hazardous materials that are transported through it en route to adjoining counties. However, with the recent fires in Lake and surrounding counties in the fall of 2017 and summer of 2018, the Lake County Landfill is receiving fire debris from inside and outside of the County. This fire debris which includes hazardous materials has recently increased the frequency and volume of hazardous materials being transported into the City or Clear Lake. Although it is important to keep in mind that the most dangerous materials during a hazardous materials transportation incident are not generally the solid waste, but instead, the high volumes of liquid waste.

Past Occurrences

Disaster Declaration History

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

NCDC Events

The NCDC does not track hazardous materials events.

PHMSA Events

The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety performs a range of functions to support the safe transport of hazardous material. One of these functions is the tracking of hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in Lake County. A summary of rail and highway incidents since 1970 in the Lakeport Planning Area are shown in Table 4-30. 19 separate events were contained in the database, 8 of which affected the City of Lakeport. Many of these events occurred at 1275 Craig Ave, which is the location of a UPS shipping center.

Table 4-30 Hazardous Materials Incidents in or near Lakeport – 1970 to 2018

| Date of Incident | Incident City | Incident Route | Mode of Transportation | Transportation Phase | Commodity Short Name | Quantity Released | Amount of Damages |
|------------------|---------------|-------------------|------------------------|----------------------|---------------------------|-------------------|-------------------|
| 7/2/1987 | Lakeport | – | Highway | N/A | Hydrochloric Acid | 15 gallons | \$0 |
| 12/5/1991 | Lakeport | 1275 Craig Ave | Highway | Unloading | Sulfuric Acid | 3 gallons | \$205 |
| 1/23/2001 | Lakeport | 5050 Brush Street | Highway | Unloading | Petroleum Gases Liquefied | 15 gallons | \$17 |
| 10/9/2001 | Lakeport | Hwy 29 | Highway | In Transit | Gasoline | 3,700 gallons | \$164,070 |
| 2/27/2002 | Lakeport | 1275 Craig Ave | Highway | Unloading | Corrosive Liquids N.O.S. | 1 gallon | \$201 |
| 9/16/2004 | Lakeport | Craig Avenue | Highway | In Transit | Alcohols N.O.S. | 0.03125 gallons | \$0 |
| 9/29/2006 | Lakeport | 1275 Craig Ave. | Highway | Unloading | Caustic Alkali Liquids | 1 gallon | \$0 |
| 1/17/2013 | Lakeport | 1275 Craig Ave. | Highway | Unloading | Hydrogen Peroxide | 1.98135 gallons | \$0 |
| Totals | | | | | | | \$164,493 |

Source: PHMSA Database – Search dates 01/01/1970 – 11/01/2018

Hazard Mitigation Planning Committee Events

The HMPC noted the following events:

January 2016 – While being hauled, some electric transformers tipped off the bed of a truck, causing a small oil spill in Lakeport. Five transformers tipped, containing 23 gallons of oil that may have carried PCBs. Aided by constant rain, it spread into a drainage ditch adjacent to Industrial Avenue that flows into Clear Lake through the lagoon housing complex at 1800 South Main St. Clean up included removing dirt that was contaminated and performing soil test to ensure that there was no remaining risk to Clear Lake or Lakeport citizens.

November 27, 2018 – A spill created an illicit discharge into the City’s storm drain system. A small amount of an unknown petroleum-based product combined with storm water was observed draining from the outfall of a 36” storm drain culvert directly into Clear Lake. It created a thin sheen on the surface of the water in the vicinity of the outfall. Reporting party noted sheen and petroleum odor. Upstream locations were investigated but no cause of the spill was determined. City of Lakeport Public Works staff launched their barge and deployed oil absorbent booms and mats in and around the affected area. Absorbent booms were deployed near the culvert outfall downstream of the suspected illicit discharge and were left in place to overnight to capture any additional contaminants resulting from discharge.

January 9, 2019 – a mechanical failure on a garbage truck resulted in a spill of 35 gallons hydraulic fluid onto a paved roadway on Giselman St near Sayre St. Steady rain at the time created an oil slick which migrated on the roadway and to the storm drainage system. The storm drain had nearby outfalls into Clear Lake. Absorbent booms and pads were deployed at the site and at all storm drain inlets.

The HMPC also noted that many local routes are used to deliver hazardous materials. Many of these roads come near Clear Lake, or through residential neighborhoods within the City.

Likelihood of Future Occurrence

Likely – Given that 11 reported hazardous materials incidents have happened in transport through the City in the past 47 years, future events are considered likely. It was noted by the HMPC that many releases go unreported to national databases. However, according to Caltrans, most incidences are related to releases during loading and unloading of cargo, and during transport of fluids from the transporting vehicles themselves and not the cargo. Thus, the likelihood of a significant hazardous materials release within the City is more limited and difficult to predict.

Climate Change and Hazardous Materials

Climate change is unlikely to affect hazardous materials transportation incidents.

4.2.15. Landslide and Debris Flows

Hazard/Problem Description

Like its earthquake-generating faults, California's mountainous terrain is also a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate.

According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this plan, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually, but can exacerbate landslide events.

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

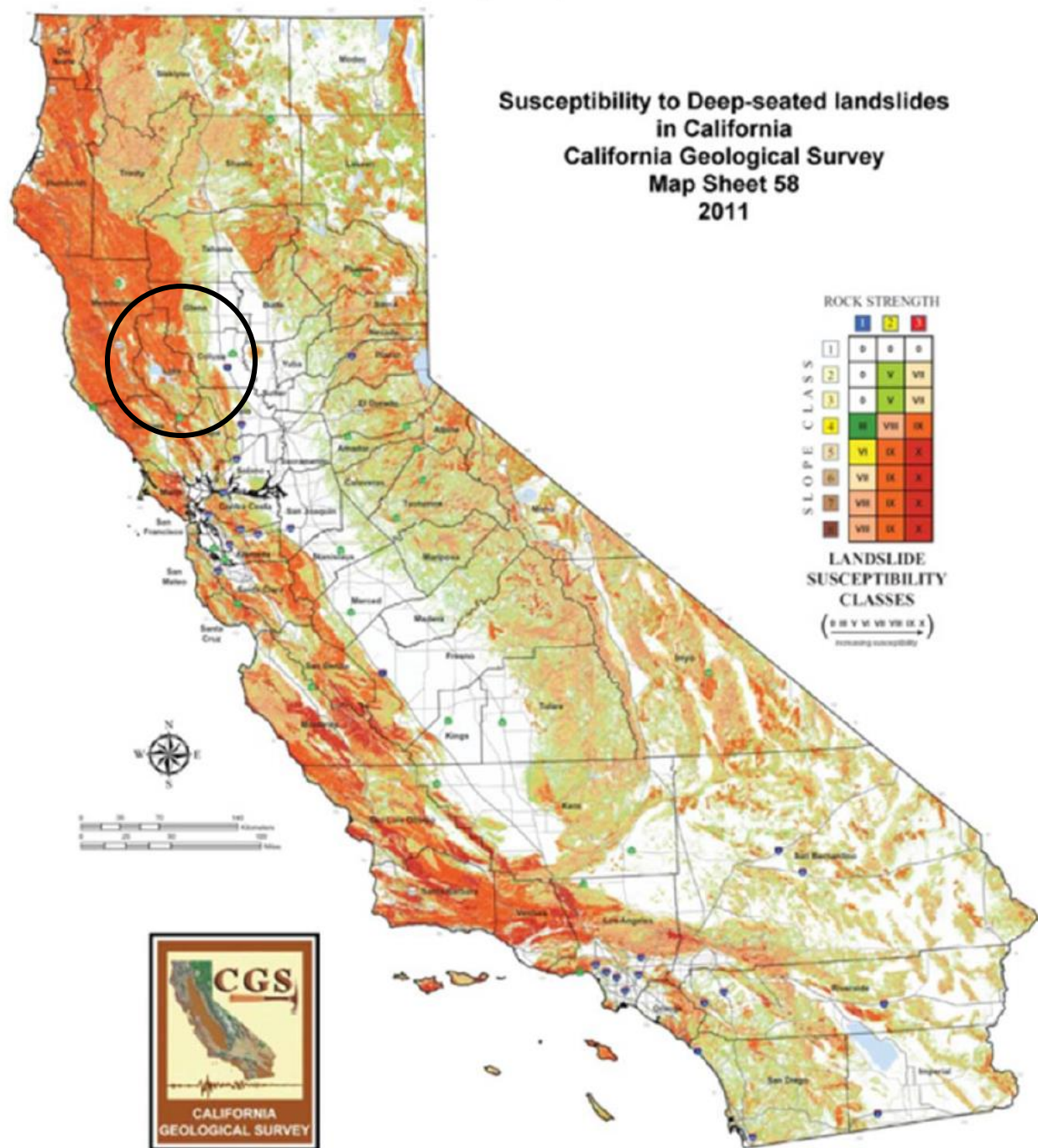
- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in Section 4.2.15)
- Road building, excavation and grading
- Earthquake

The 2018 State Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas bordering Lakeport to the west where the HMPC noted the topography is characterized by rolling hills and ridges.

Location

Destructive landslides, mudslides, and debris flows usually occur very suddenly with little or no warning time and are short in duration. The 2018 State Plan noted that although the area affected by a single landslide is less than that of earthquakes, landslides are pervasive in California's mountainous terrain and occur far more often. Figure 4-50 was included in the 2018 State Plan. It indicates that a majority of the City are at moderate to high susceptibility areas for landslides.

Figure 4-50 Landslide Susceptibility Areas



Source: 2018 State Plan

Landslides can be expected in areas with steep slopes and weak soils. Landslides are a geologic constraint to development in the Lakeport Planning Area. The City of Lakeport General Plan Safety Element noted that clay soils, which underlie many hillsides in Lakeport are particularly susceptible to sliding. Although landslides generally occur in areas with steep slopes, they may occur on slopes with a grade of 20% or less in geologically unstable areas. Since zones of high landslide potential exist in Lakeport, soils tests carried

out by a registered soils engineer or geologist are essential wherever landslide potential is indicated or suspected. Foundations for structures built in areas with steep slopes in excess of 20% must be carefully engineered to avoid increasing landslide risk

In addition to topography, post-wildfire burn areas are locations where heavy rains can cause erosion, landslides, and debris flows. The HMPC and LCFPD noted that this is true in the Highway 175 area going over to Hopland. The road is very steep and narrow, and particularly vulnerable to landslides, especially post River Fire (2018). This a heavily used corridor for commuters from Lakeport going to the Santa Rosa area. More information on post-fire landslides can be found in Section 4.2.15.

Extent

The legend on Figure 4-50 shows the measurement system that the California Geological Survey uses to show the possible magnitude of landslides. It is a combination of slope class and rock strength. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Landslide affects discrete areas of the City. GIS analysis was performed to determine what percentages of the City would be at risk from landslide using USGS data, which includes a scale of low, moderate, and high Landslide Incidence and Susceptibility areas. Methodologies for this analysis and maps showing extent can be found in Section 4.3.12. All of Lakeport falls in the high landslide incidence and susceptibility area. This can be seen in Table 4-31.

Table 4-31 City of Lakeport – Geographical Extents in Landslide Incidence and Susceptibility Areas

| Landslide Incidence and Susceptibility | Total Acres | % of Total Area |
|--|--------------|-----------------|
| High | 1,689 | 100.0% |
| Moderate | 0 | 0.0% |
| Low | 0 | 0.0% |
| Grand Total | 1,689 | 100.0% |

Source: USGS

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated with landslides in Lake County, as shown in Table 4-3.

NCDC Events

The NCDC contains no records for landslides in Lake County.

Hazard Mitigation Planning Team Events

The HMPC noted the following regarding landslides of concern to the City:

- At Central Park and 11th street there have been past landslides. Mitigation of these events was put in place. A gabion wall was placed in this location to keep the dirt embankment in place. Since this mitigation, no landslides have occurred here.
- At Hartley St. between 20th and Hillcrest, there had been past risk of landslide, though no landslide was known to have occurred. The City placed a soldier pile wall (vertical wall) to pre-emptively mitigate possible landslide. Since this mitigation, no landslides have occurred in this area.

Likelihood of Future Occurrences

Highly Likely—Landslides in the form of debris flow, or mudslides, have occurred in the past in and near Lakeport. Landslides occur more frequently in the winter and spring months, when high levels of precipitation and runoff combine with saturated soils, which leads to general slope instability. Landslides often can occur as a result of other hazard events, such as severe storms, floods, wildfires, or earthquakes. Due to the topography in and around Lakeport and the rainfall the City receives during the winter, it is highly likely future occurrences of landslide, mudslide, and debris flow will occur.

Climate Change and Landslides

According to the CAS and Cal-Adapt, increased precipitation may result from climate change. Increased precipitation makes areas more vulnerable to landslide potential. More information on precipitation increases can be found in Section 4.2.4.

4.2.16. Levee Failure

Hazard/Problem Description

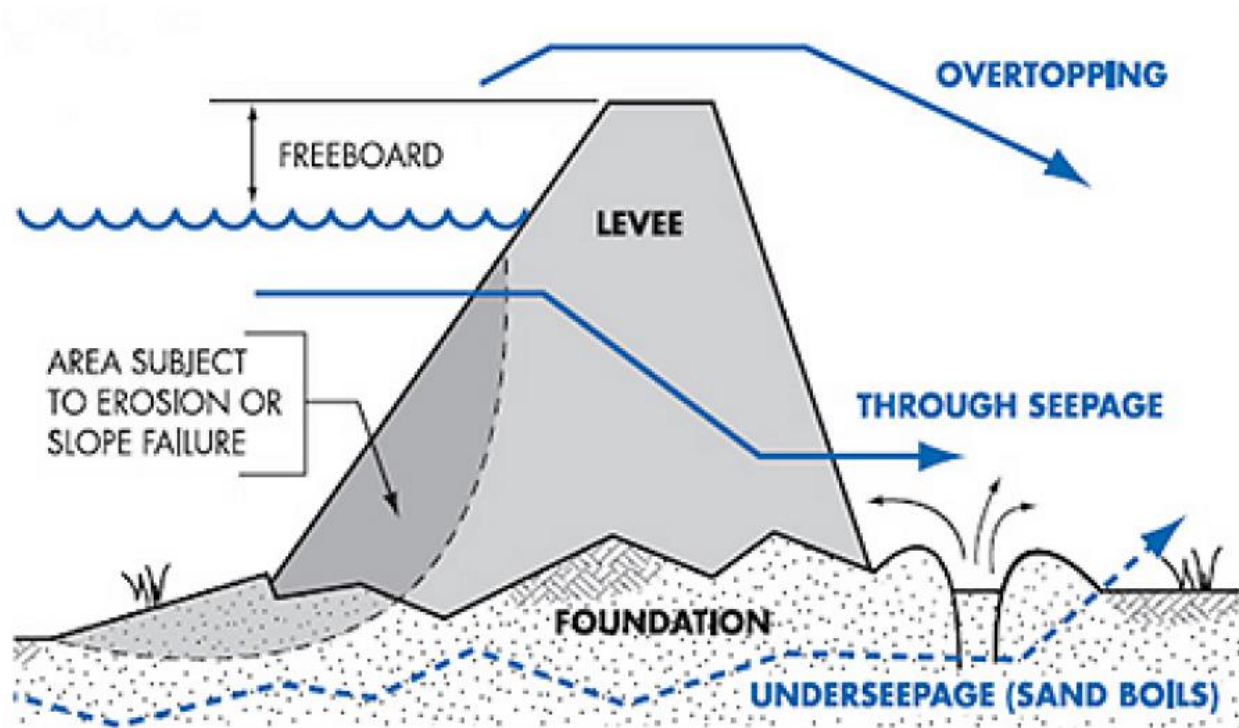
A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be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

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. Levees reduce, not eliminate, the risk to individuals and structures located behind them. A levee system failure or overtopping can create severe flooding and high-water velocities. It's important to remember that no levee provides protection from events for which it was not designed, and proper operation and maintenance are necessary to reduce the probability of failure.

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

Rodents burrowing into and compromising the levee system is a significant issue in the Planning Area. Erosion can also lead to levee failure. Figure 4-51 depicts the causes of levee failure.

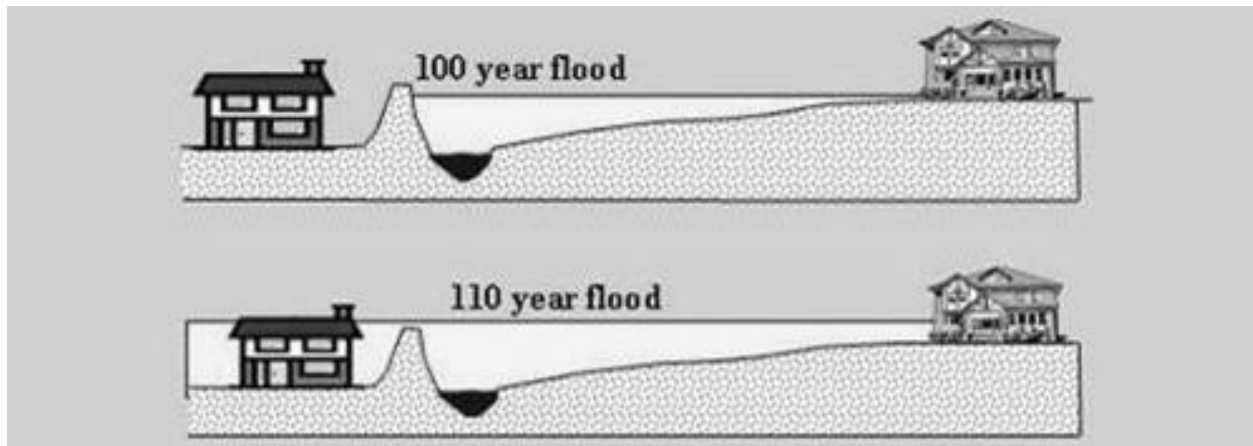
Figure 4-51 Potential Causes of Levee Failure



Source: USACE

Overtopping failure occurs when the flood water level rises above the crest of a levee. As shown in Figure 4-52, overtopping of levees can cause greater damage than a traditional flood due to the often lower topography behind the levee.

Figure 4-52 Flooding from Levee Overtopping

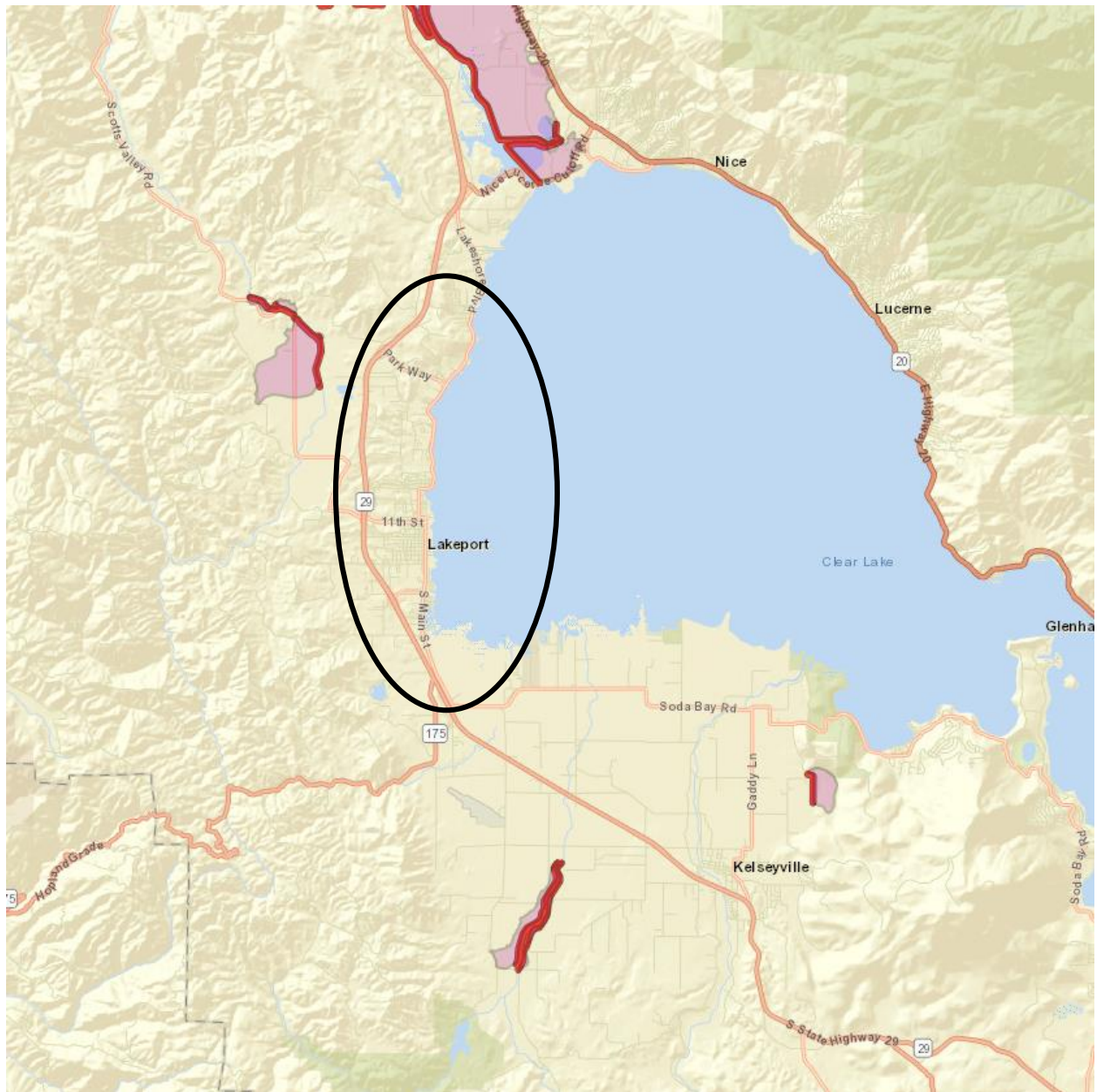


Source: *Levees in History: The Levee Challenge*. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.

Location

The National Levee Database and the Lake County Flood Insurance Study (FIS) were searched for levee locations in the City. According to both sources, no levees exist that affect the City of Lakeport. Levees exist to the west of the City (shown in red), but not in the City limits. These red areas are referred to in the National Levee Database as Lake County Levee 9, 14, and 15. No assumed protection areas (shown in pink/purple) from the levees enter the City limits. This can be seen in Figure 4-53. These levees would not affect the City of Lakeport.

Figure 4-53 City of Lakeport– Levees in the Planning Area



Source: National Levee Database. Map created 2/19/2018

Extent

Since no levees protect the City, extent of levee failure in the City would be negligible.

Past Occurrences

Given that there are no levees, the HMPC noted that there have been no levee failures in the City.

Likelihood of Future Occurrences

Unlikely – Due to the lack of levees in or near the City, the likelihood of levee failure is unlikely.

Climate Change and Levee Failure

In general, increased flood frequency in California is a predicted consequence of climate change. Mechanisms whereby climate change leads to an elevated flood risk include more extreme precipitation events and shifts in the seasonal timing of river flows. This threat may be particularly significant because recent estimates indicate the additional force exerted upon the levees is equivalent to the square of the water level rise. These extremes are most likely to occur during storm events, leading to more severe damage from waves and floods. Given the lack of levees in the City, climate change is unlikely to affect the future occurrences of levee failure.

4.2.17. Seiche

Hazard/Problem Description

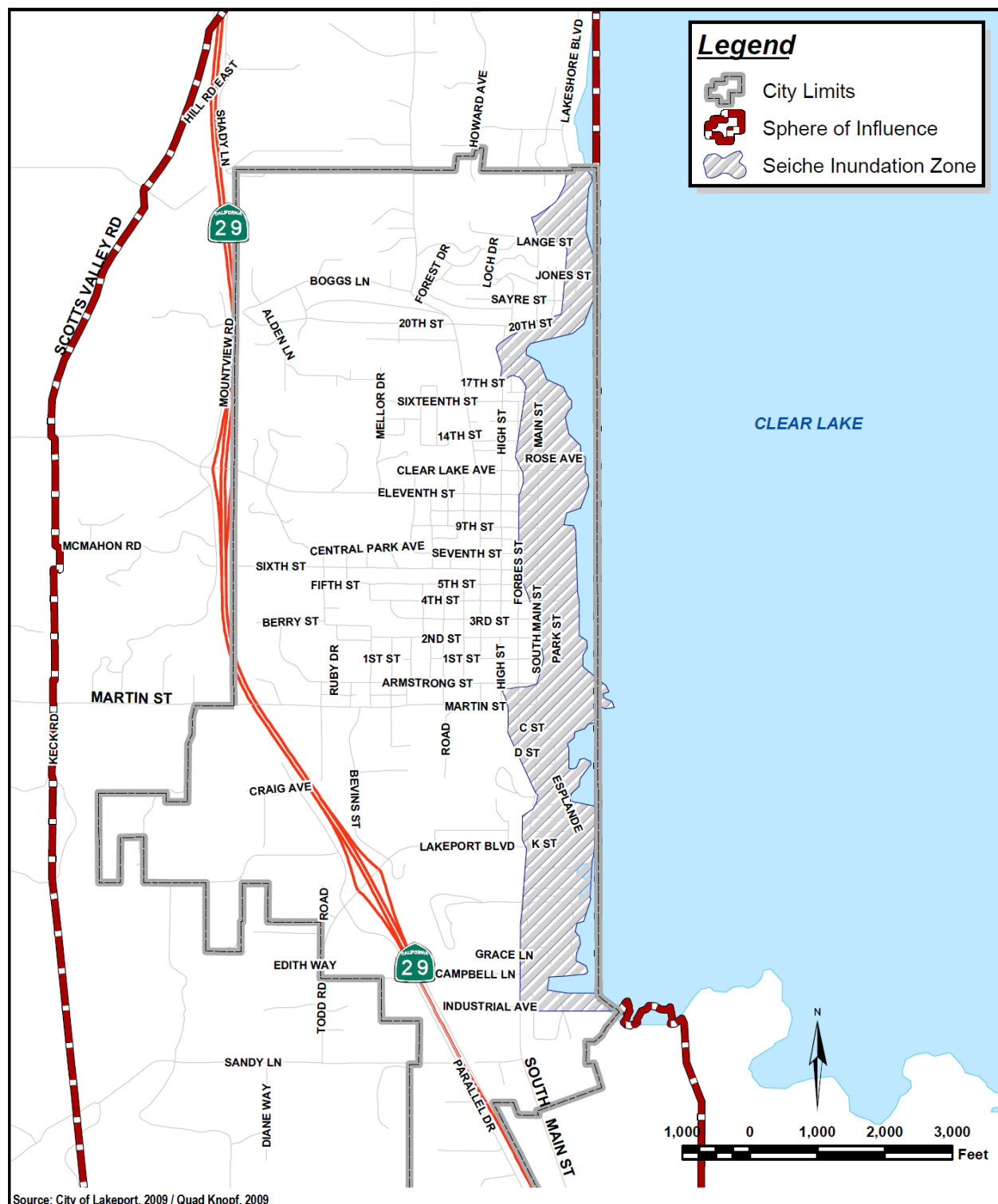
The 2018 California State Mitigation Plan notes that seiche is caused by resonances in a body of water that has been disturbed by wind, atmospheric pressure variations, landslide, or seismic activity. The most likely cause on Clear Lake would be from landslide or earthquake. The vertical harmonic motion caused by landslide or earthquake could produce an impulse that travels the length of the water basin, reflecting off the other end or sides, and then these reflected waves can interfere with each other and create amplified standing waves. Seiches can also be generated when the water is subject to changes in wind or atmospheric pressure gradients or, in the case of semi-enclosed basins, by the oscillation of adjacent connected water bodies having a periodicity close to that of the seiche or of one of its harmonics. Other, less frequent causes of seiches include heavy precipitation over a portion of the lake, flood discharge from rivers, seismic disturbances, submarine mudslides or slumps, and tides.

Seiches can occur in large bays or lakes as well as large, odd-shaped harbors. Natural basins like Clear Lake can be a location where seiches occur. Although seiche activity can be captured by numerical tsunami models, little work has been performed exclusively on seiches in the state. The most dramatic seiches have been observed after earthquakes (caused by fault rupture or volcanic activity). Another way a seiche can occur is a sudden land tilt or drop as a result of fault rupture or other seismic activity.

Location

Should a seiche occur on Clear Lake, inundation in low lying areas in the City of Lakeport that border Clear Lake may occur. Expected affected areas are shown on Figure 4-54.

Figure 4-54 City of Lakeport – Seiche Inundation Zone



Source: City of Lakeport General Plan Safety Element

Extent

There is no scientific scale to measure seiche. In Lakeport, it can be measured by aerial extent and depth of flooding from seiche. Low lying areas all around the lake, including areas in Lakeport, could potentially be inundated. Depths of inundation are not currently known. Aerial extent of expected flooding is shown on Figure 4-54. The speed of onset is fast, and the duration is usually short. Floodwaters persist only as long as the seiche continues, and then drain back towards Clear Lake.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations due to seiche, as shown in Table 4-3.

NCDC Events

The NCDC does not track seiche events.

HMPC Events

The HMPC noted no past occurrences of seiche on Clear Lake.

Likelihood of Future Occurrence

Unlikely – The major threat to seiche in Clear Lake is from earthquake. Lakeport seismic activity within the past two hundred years has shown absence of any major or damaging earthquake occurring on identified fault lines within Lake County. However, the possibility of an earthquake is an ever-present phenomenon in Lake County. The combination of plate tectonics and associated California coastal mountain range geology essentially guarantees earthquake as a result of the periodic release of tectonic stresses. Lake County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. A very large earthquake would be necessary for a seiche to occur on Clear Lake. However, Lake County and the City of Lakeport are located moderate distances from faults that could cause great shaking. Rarely are winds or landslides severe enough to cause seiche.

Climate Change and Seiche

Seiche on Clear Lake would be most likely caused by a large earthquake. As noted in Section 4.2.10 above, climate change is unlikely to increase earthquake frequency or strength.

4.2.18. Volcano and Geothermal Gas Release

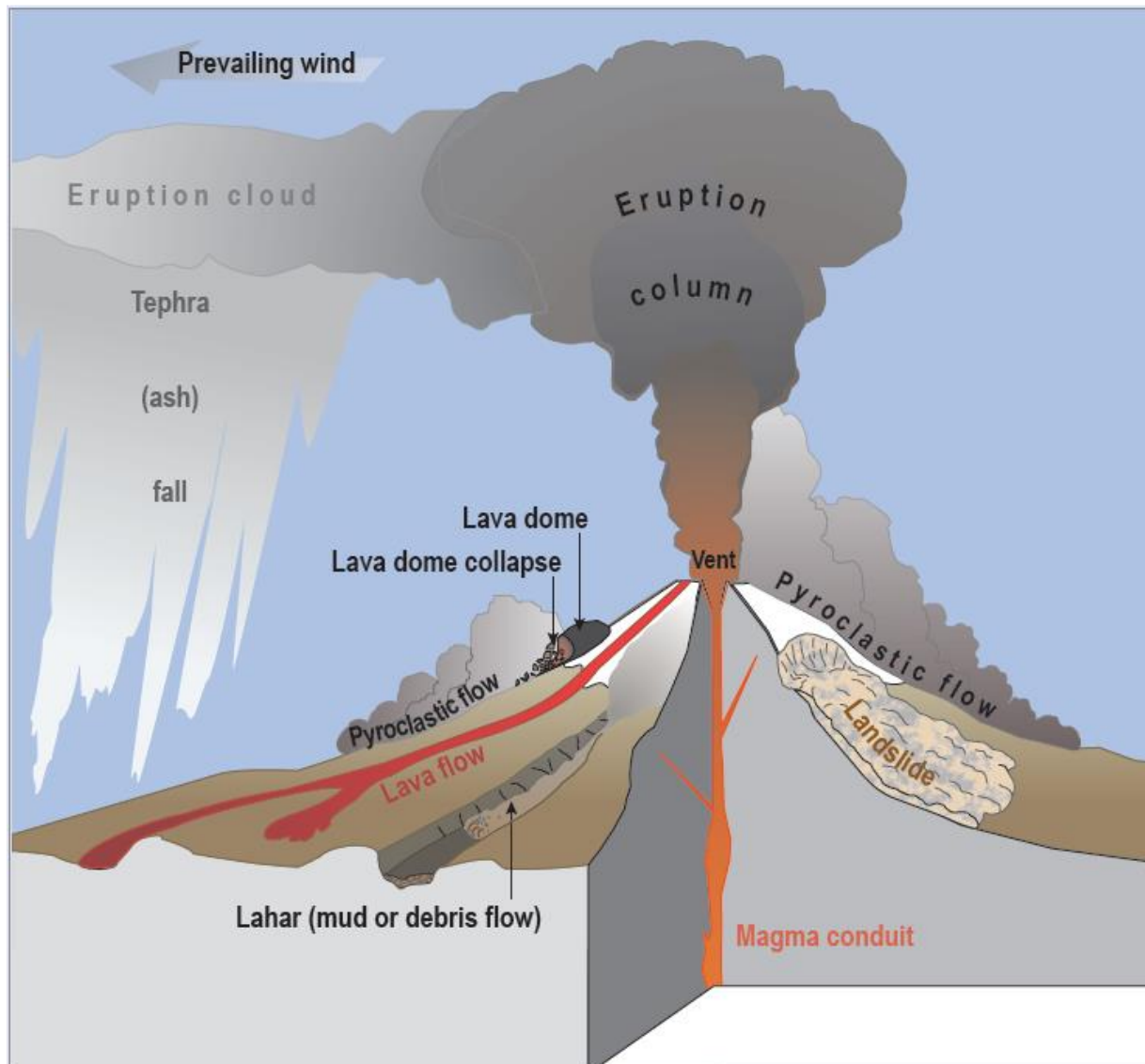
Hazard/Problem Description

The California State Hazard Mitigation Plan identifies volcanoes as one of the hazards that can adversely impact the State. However, there have been few losses in California from volcanic eruptions.

Volcano

As shown in Figure 4-55, active volcanoes pose a variety of natural hazards. Explosive eruptions blast lava fragments and gas into the air with tremendous force. The finest particles (ash) billow upward, forming an eruption column that can attain stratospheric heights in minutes. Simultaneously, searing volcanic gas laden with ash and coarse chunks of lava may sweep down the flanks of the volcano as a pyroclastic flow. Ash in the eruption cloud, carried by the prevailing winds, is an aviation hazard and may remain suspended for hundreds of miles before settling to the ground as ash fall. During less energetic effusive eruptions, hot, fluid lava may issue from the volcano as lava flows that can cover many miles in a single day. Alternatively, a sluggish plug of cooler, partially solidified lava may push up at the vent during an effusive eruption, creating a lava dome. A growing lava dome may become so steep that it collapses, violently releasing pyroclastic flows potentially as hazardous as those produced during explosive eruptions. A growing lava dome may become so steep that it collapses, violently releasing pyroclastic flows potentially as hazardous as those produced during explosive eruptions.

Figure 4-55 Volcanoes and Associated Hazards

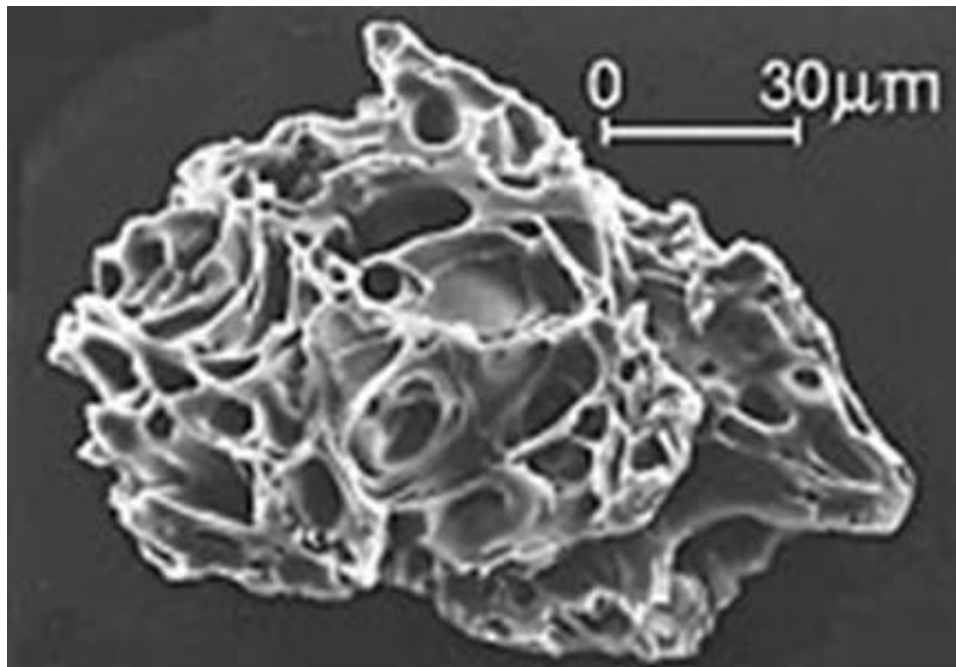


Source: USGS Publication 2014-3120

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

Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away and cause problems for aviation. The USGS notes specific characteristics of volcanic ash. Volcanic ash is composed of small jagged pieces of rocks, minerals, and volcanic glass the size of sand and silt, as shown in Figure 4-56. Very small ash particles can be less than 0.001 millimeters across. Volcanic ash is not the product of combustion, like the soft fluffy material created by burning wood, leaves, or paper. Volcanic ash is hard, does not dissolve in water, is extremely abrasive and mildly corrosive, and conducts electricity when wet.

Figure 4-56 Ash Particle from 1980 Mt. St Helens Eruption Magnified 200 Times



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

Volcanic ash is formed during explosive volcanic eruptions. Explosive eruptions occur when gases dissolved in molten rock (magma) expand and escape violently into the air, and also when water is heated by magma and abruptly flashes into steam. The force of the escaping gas violently shatters solid rocks. Expanding gas also shreds magma and blasts it into the air, where it solidifies into fragments of volcanic rock and glass. Once in the air, wind can blow the tiny ash particles tens to thousands of miles away from the volcano.

The average grain-size of rock fragments and volcanic ash erupted from an exploding volcanic vent varies greatly among different eruptions and during a single explosive eruption that lasts hours to days. Heavier, large-sized rock fragments typically fall back to the ground on or close to the volcano and progressively smaller and lighter fragments are blown farther from the volcano by wind. Volcanic ash, the smallest

particles (2 mm in diameter or smaller), can travel hundreds to thousands of kilometers downwind from a volcano depending on wind speed, volume of ash erupted, and height of the eruption column.

The size of ash particles that fall to the ground generally decreases exponentially with increasing distance from a volcano. Also, the range in grain size of volcanic ash typically diminishes downwind from a volcano (becoming progressively smaller). At specific locations, however, the distribution of ash particle sizes can vary widely.

The impact of coarse ash fall is limited to the immediate area of the volcanic vent. Structures may be damaged by accumulation of falling lava fragments or burnt by their high heat. Wildfires may be ignited by coarse ash. Although generally non-lethal, fine ash fall is the most widespread and disruptive volcanic hazard. People exposed to fine ash commonly experience various eye, nose, and throat symptoms. Short-term exposures are not known to pose a significant health hazard. Long-term health effects have not been demonstrated conclusively. Ash deposited downwind of the volcano covers everything like a snowfall, but also infiltrates cracks and openings in machinery, buildings, and electronics. Falling ash can obscure sunlight, reducing visibility to zero. When wet, it can make paved surfaces slippery and impassable. Fine ash is abrasive, damaging surfaces and moving parts of machinery, vehicles, and aircraft. Life-threatening and costly damage can occur to aircraft that fly through fine ash clouds. Newly fallen volcanic ash may result in short-term physical and chemical changes in water quality. Close to the volcano, heavy ash fall may cause roofs to collapse, wastewater systems to clog, and power systems to shut down. In agricultural areas, fine ash can damage crops, and sicken livestock. Resuspension of ash by human activity and wind cause continuing disruption to daily life.

Geothermal Gases

Volcanic gases produce the driving force that causes most volcanic eruptions. Deep in the earth, they are dissolved in magma, but as pressure decreases when magma rises to the surface, gases separate from the liquid. Because gas is less dense than magma, it may rise more quickly and be detected at the surface of the earth. Increased gas output or appearance of new gas vents at a volcano can be some of the first signs that magma is moving nearer to the surface.

The most commonly analyzed volcanic gases in the plume of a volcano are carbon dioxide (CO₂) and sulfur dioxide (SO₂). By monitoring the relative abundances of these gas types, scientists may be able to infer magma movement through the volcanic system. Gas monitoring can either be conducted close to the source in ground-based campaigns or from a distance using remote sensing.

Hydrogen sulfide may also occur. Hydrogen sulfide is a flammable, colorless gas that has a characteristic smell of rotten eggs at low concentrations. Once released, H₂S can remain in the atmosphere for an estimated 18 hours. The World Health Organization recommends that exposure to H₂S be avoided. Children are readily affected by H₂S because it is heavier than air; the gas accumulates in poorly ventilated, low-lying areas and travels along the ground. At concentration between 0.00011–0.00033 ppm no health effects have been found in humans. Exposure to higher concentrations may trigger eye and nose irritation as well as breathing difficulties in asthmatics. Most people can tolerate exposure levels up to 20 ppm for some hours without any harm. At 500 ppm victims will look intoxicated and at 700 ppm, H₂S will cause loss of consciousness and death if the victim is not resuscitated within three minutes. Survivors suffer from

long term, or permanent health effects, such as headaches, poor motor function, poor memory and poor attention span. The scope and magnitude of the problem are not well understood, nor are the health risks to residents who may experience low level and/or intermittent exposures. Engineering efforts to mitigate the worst areas of gas release through filtration and venting have been only partially successful. A thorough geologic study of the area is needed in order to better understand the nature and scope of the risk and the mitigation measures that could be appropriately applied.

The USGS periodically analyzes volcanic gases and hot springs at Clear Lake volcanic field during ground-based campaigns.

Location

Volcano

Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, the Clear Lake Volcano poses a threat to Lakeport. According to the USGS, the Clear Lake volcanic field lies in the northern Coast Ranges, California. The volcanic field consists of lava dome complexes, cinder cones, and maars of basaltic-to-rhyolitic composition. Mount Konocti, a dacitic lava dome on the south shore of Clear Lake, is the largest volcanic feature. The area has intense geothermal activity, caused by a large, still hot silicic magma chamber about 14 km wide and 7 km beneath the surface. It provides the heat source for the Geysers, the world's largest producing geothermal field on the SW side of the volcanic field. Its geothermal power plants can generate approximately 2,000 megawatts, enough to power two cities the size of San Francisco. The latest volcanic activity happened about 10,000 years ago and formed maars and cinder cones along the shores of Clear Lake, the largest natural freshwater lake in California. Volcanism around Clear Lake is related to the complex San Andreas transform fault system. Figure 4-57 shows volcanoes in or near California and the location of the Lakeport area relative to the City.

Figure 4-57 Active Volcanoes in California and in the Clear Lake Area



Source: 2018 State Plan

The HMPC noted an article in the Lake County News from October 28, 2018.

An update to the U.S. Volcanic Threat Assessment puts the Clear Lake Volcanic Field among a group of volcanoes in the “high” risk category, with other volcanoes around California and the Pacific Rim rating even higher for danger. The new U.S. Geological Survey report, which updates the first assessment released in 2005, ranks the 161 young, active volcanoes within the United States’ borders.

Sitting on the western shore of Clear Lake, the Clear Lake Volcanic Field's most notable feature is Mount Konocti. It was ranked at No. 33, in the "high" threat category. Elsewhere in California, the assessment lists Mt. Shasta and Lassen Volcanic Center in the "very high" ranking, placing them No. 5 and No. 11, respectively. The Long Valley Caldera in the Inyo National Forest near Yosemite National Park is in the very high threat category, at No. 18. The Mono-Inyo Craters, also near Yosemite, was listed in the "high" category at No. 24.

This 2018 update considers field and laboratory research that adds or removes volcanoes from the list of potentially active volcanoes, and updates the hazard and exposure factors used to produce a relative threat ranking of volcanoes. Officials said the new document also adds or raises the threat level for 12 volcanoes and reduces or removes threat level status from 20 volcanoes. The USGS said that, since 1980, there have been 120 eruptions and 52 episodes of notable volcanic unrest at 44 U.S. volcanoes.

Geothermal Gases

In addition, the area of Lake County where Lakeport is located has geothermal sources and mineral springs that release gases through surface vents. Hydrogen sulfide, carbon dioxide and methane gases leach out from underground magma through hot springs and during volcanic activity. The HMPC noted that none of these surface vents affect the City directly.

Extent

Volcano

Volcano extent is traditionally measured in magma production and ashfall. Maps showing ashfall or magma affected areas have not been created for the Clear Lake Volcanics Area. However, the USGS noted that if the magma chamber beneath the Clear Lake field were tapped again, eruptions might occur in the lake. These eruptions would be phreatomagmatic and would pose ash-fall and wave hazards to the lakeshore and ash-fall hazards to areas within a few kilometers of the vent. Eruptions away from the lake would produce silicic domes, cinder cones and flows and would be hazardous within a few kilometers of the vents. Speed of onset is generally short; however, future eruptions would be signaled by heightened earthquake activity.

Geothermal Gases

Geothermal gases can occur during eruptions, or during releases from geothermal fields. When they are released, they have varying degrees of extent. This is shown below.

- Carbon dioxide constitutes approximately 0.04% of the air in the Earth's atmosphere. In an average year, volcanoes release between about 180 and 440 million tons of carbon dioxide. When this colorless, odorless gas is emitted from volcanoes, it typically becomes diluted to low concentrations very quickly and is not life threatening. However, because cold carbon dioxide gas is heavier than air it can flow into in low-lying areas where it can reach much higher concentrations in certain, very stable atmospheric conditions. This can pose serious risks to people and animals. Breathing air with more than 3% CO₂ can quickly lead to headaches, dizziness, increased heart rate and difficulty breathing. At mixing ratios exceeding about 15%, carbon dioxide quickly causes unconsciousness and death.

- Sulfur dioxide is a colorless gas with a pungent odor that irritates skin and the tissues and mucous membranes of the eyes, nose, and throat. SO₂ emissions can cause acid rain and air pollution downwind of a volcano—at Kilauea volcano in Hawaii, high concentrations of sulfur dioxide produce volcanic smog (VOG) causing persistent health problems for downwind populations. During very large eruptions, SO₂ can be injected to altitudes of greater than 10km into the stratosphere. Here, SO₂ is converted to sulfate aerosols which reflect sunlight and therefore have a cooling effect on the Earth's climate.
- Geothermal gas extent is limited to the areas where the releases occur. Hydrogen sulfide is a colorless, flammable gas with a strong, offensive odor. It is sometimes referred to as sewer gas. Interestingly, the human nose is more sensitive to H₂S than any gas monitoring instrument we have today: air mixtures with as little as 0.000001% H₂S are associated with a rotten egg smell. Unfortunately, however, our sense of smell is not a reliable alarm - at mixing ratios above about 0.01%, H₂S becomes odorless and very toxic, causing irritation of the upper respiratory tract and, during long exposure, pulmonary edema. Exposure to 500 ppm can cause a human to fall unconscious in 5 minutes and die in an hour or less.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations related to volcano or geothermal gases, as shown on Table 4-3.

NCDC Events

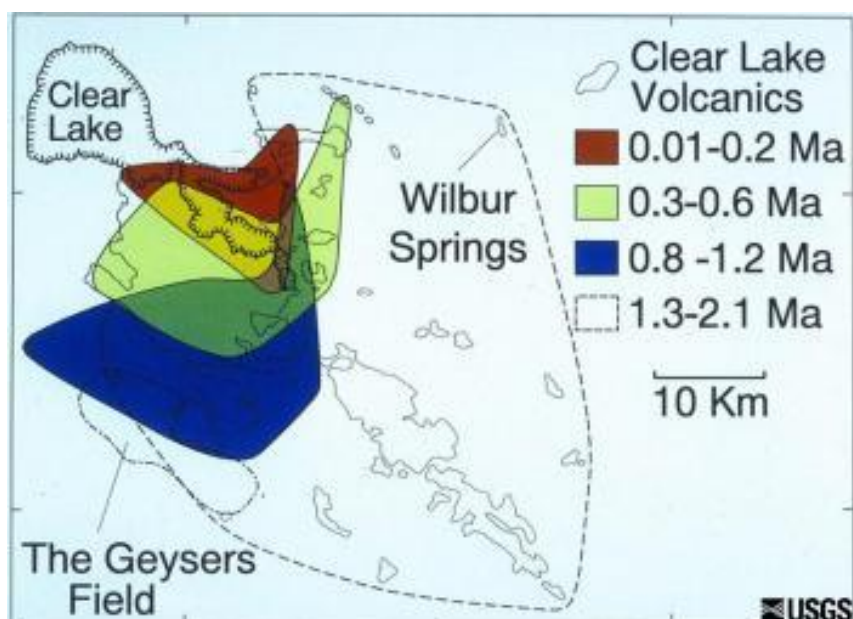
The NCDC does not track volcanic or geothermal gas activity.

USGS Events

The Clear Lake volcanics erupted during four periods of time beginning at about 2 million years ago. There is a general decrease in age northward from 2 million years ago in the south to about 10,000 years in the north. Geophysical data suggests there is currently a spherical to cylindrical magma chamber about 8.7 miles in diameter and about 4.3 mi from the surface. Seismic studies indicate that the vertical extent is approximately 18.6 miles deep.

Four eruptive episodes have been recognized: 2.1-1.3 million years ago, 1.1-0.8 million years ago, 0.65-0.30 million years ago., and 100,000-10,000 years ago. These can be seen on Figure 4-58. The total volume of about 100 individual eruptions exceeds 70 cubic kilometers. Eruptive products from the first activity episode are found in the east of the field. The second activity episode constructed Cobb Mountain (1 million years ago) and Mount Hannah (0.9 million years ago). The third episode of activity was at the Mount Konocti–Thurston Lake area, the most voluminous dacite and rhyolite feature of the Clear Lake volcanics. The most recent activity, up to about 10,000 years ago were small mostly basaltic and andesitic eruptions in the north of the field.

Figure 4-58 Clear Lake – Past Eruptions



Source: USGS

*Ma = million years ago

The USGS does not track geothermal gas activity.

Hazard Mitigation Planning Committee Events

There have been no volcanic eruptions of the Clear Lake Volcanic Field for thousands of years. No recorded incidents of geothermal gasses affecting Lakeport could be recalled by the HMPC.

Likelihood of Future Occurrences

Volcano

Unlikely—According to the USGS, the complex eruptive history over the past 2 million years and the 10,000-year age of the youngest eruption indicate that the Clear Lake magmatic system is not extinct and that future eruptions are likely. Such a long period of multiple volcanic events and the large volume magma chamber suggest that the Clear Lake system could be in pre-caldera early evolutionary stage. Although future eruptions are likely in the Clear Lake field, prediction of the timing is difficult because activity has been episodic in the past. From dates and numbers of ash beds beneath Clear Lake, and the apparent lack of eruptions in the past 10,000 years is a geologically brief lull in activity after frequent eruptions (about 34, or averaging one every 1,800 years) in the previous 60,000 years. Episodes of volcanic activity have typically continued for at least 300,000 years, so that the youngest episode, which began about 100,000 years ago could be in an early stage and may continue for another 200,000 years. Eruptions are likely to be located close to, beneath, or northeast of Clear Lake, especially around the east arm of the lake.

Geothermal Gas Release

Highly Likely – The gas issue continues to be an ongoing natural emission and is likely to occur. The most severe conditions seem to occur when the lake level is high and there is a low-pressure system over the area, this creates saturated soils preventing widespread seepage of gases resulting in fewer point source vents of higher flow.

Climate Change and Volcano

Climate change is unlikely to have an effect on volcano eruptions or geothermal gas releases.

4.2.19. Wildfire

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for Lake County and the City of Lakeport. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. However, in recent years, wildfire season is more of a year around event. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Economic losses could also result. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides and mudflows, and erosion during the rainy season. The City noted that additional losses could occur if PG&E initiates a power shutdown. This is discussed in greater detail in Section 4.3.17.

Location

Wildfire is part of California's natural ecology. However, its danger and cost have increased as fire-prone areas across the state have been developed. Over the years, fire suppression and invasive plants have contributed to fuel build-up and increased the risk of more catastrophic fire events.

Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be

considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. In and near the City, an abundance of dead vegetation on properties paired with construction using non-fire-resistant building materials can also increase the potential for structural losses in fires.

- **Topography** – An area’s terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes. The periphery of Lakeport is a wildland urban interface (WUI) area where structures are at significant risk of fire exposure. Poor road conditions and inadequate water suppression infrastructure can limit the ability of fire crews from successfully fighting fires. These areas are also in steeper topography. Steep slopes, drainages and timber fuels can significantly hinder firefighting efforts in and around Lakeport.
- **Weather** – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most treacherous weather factor. The greater a wind, the faster a fire will spread and the more intense it will be. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, often in difficult to reach terrain for firefighters. The 2016 Strategic Fire Plan noted that in Lake County and Lakeport, the weather is generally warm and dry during the day with good relative humidity recovery at night. Mid slope elevations may see poor humidity recovery due to inversions. Critical weather patterns are generally those that have higher temperatures and dryer conditions with poor nighttime humidity recovery such as north and east winds. When these conditions combine with the topography, expect extreme rates of spread, especially along exposed ridges and through constricted areas. Peak summer day temperatures generally range from 90-110°F, with relative humidity ranging between 10 – 25%. Temperatures and humidity moderate and winds tend to increase immediately adjacent to Lakeport. Gradient winds are generally out of the west or northwest at 5-10 mph,
- **Human Actions** – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

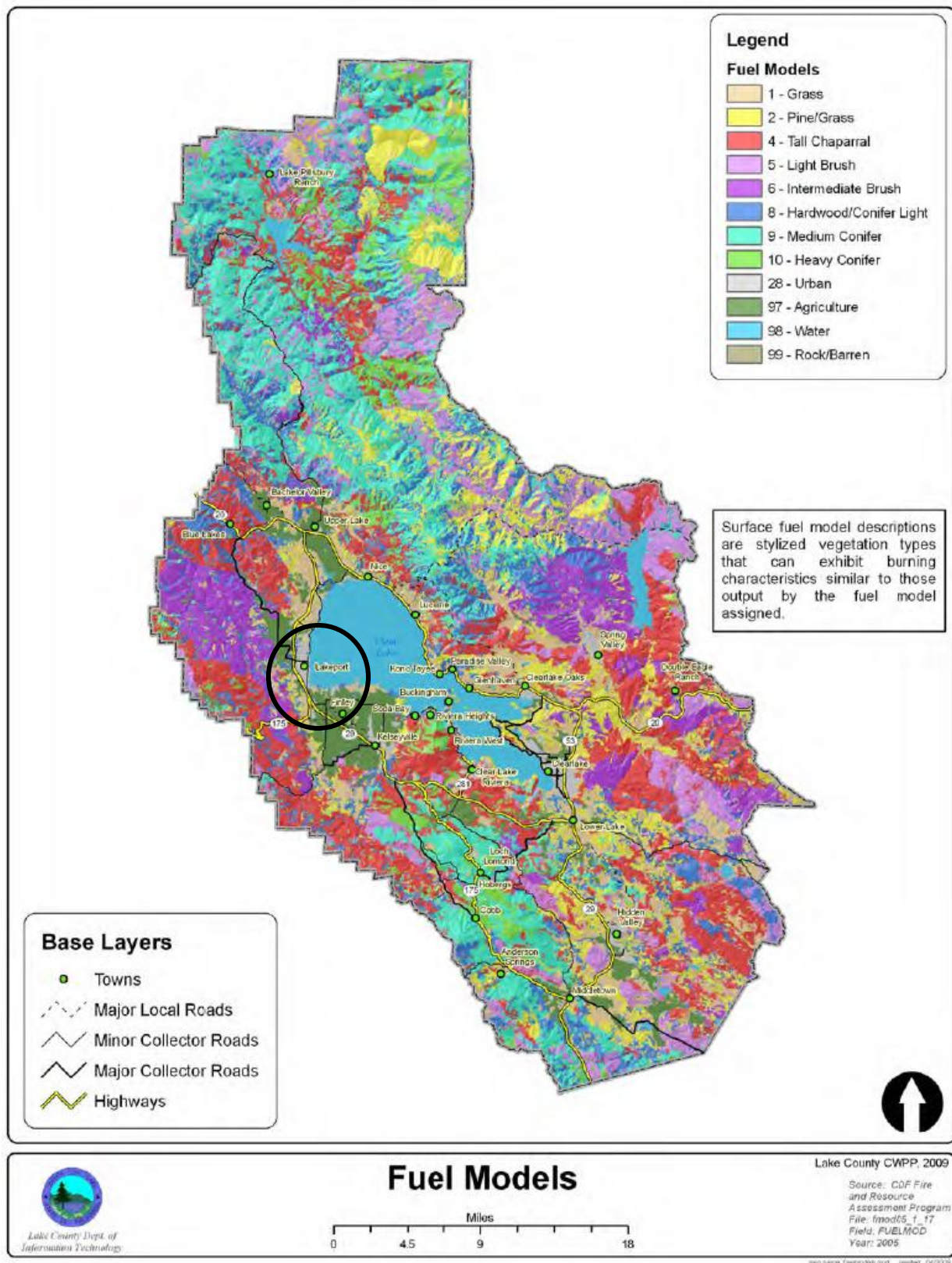
Wildfire Environment of Lake County, California

The 2008 Lake County Community Wildfire Protection Plan (CWPP) noted much about the wildfire environment in the County. From the grasslands and chaparral to the pine/oak woodlands and conifer forests, it is generally believed today that fires in the rural landscape of Lake County are less frequent and more severe compared to the patterns present before Europeans settled the area. This region evolved with fire, and fire will continue to shape it. Much of the vegetation in the county is adapted to, meaning it has evolved with, fire. For example, ponderosa pine (*Pinus ponderosa*) and incense cedar (*Calocedrus decurrens*) both produce very thick bark with age, helping them to withstand the heat of low and moderate intensity fire.

Lake County is no exception to the increasingly common problem of property loss and habitat destruction from wildfire. Fuel loads have been accumulating to unnaturally high levels throughout the region due to decades of fire suppression and prevalent land-management practices. This has led to an increase in large, catastrophic wildfires. In 2008, fire protection agencies responded to 687 fires in Lake County. One of the largest fires that year was the Walker Fire, burning a total of 14,500 acres in the Walker Ridge area near Colusa County. It started at the same time as the extensive lightning strike fires burned throughout northern California, stressing local fire protection resources. Further, in 2012 the Wye Fire burned in Lake and Colusa County, consuming 7,394 acres. In 2015, due to drought conditions that occurred throughout California, other major fires occurred: the Valley Fire and Rocky Fire. These fires caused major damage. In 2016, the Clayton Fire caused large damages in the County as well (more information on these can be found in the past occurrences section of this hazard profile)

One of the tools used to predict fire behavior based on vegetation type is called “fuel models.” Fuel models give fire managers a general idea of the type of vegetation that can be found in a given area, and how it is expected to burn. Of the standard 13 fuel models identified in California by CAL FIRE, eight can be found in Lake County. They are: Grass, Pine/Grass, Tall Chaparral, Light Brush, Intermediate Brush, Hardwood/Conifer Light, Medium Conifer, and Heavy Conifer. This is shown on Figure 4-59 for the County, with the Lakeport area circled in black.

Figure 4-59 Lake County – Fuel Models

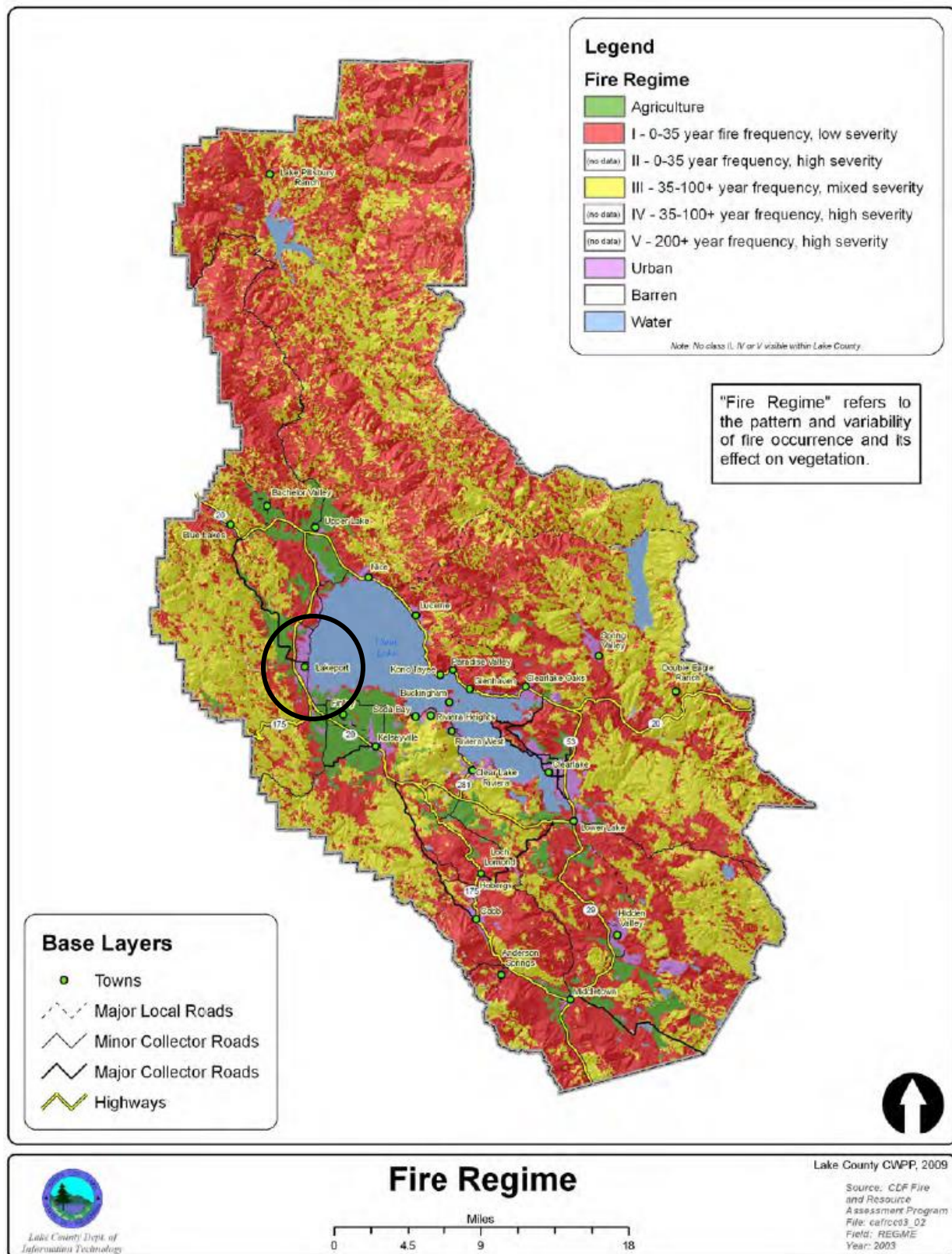


Fuel models are combined with topographic slope and fuel density information to provide a fuel hazard assessment of fire behavior under extreme conditions. CAL FIRE's recent Fire Hazard Severity Zones (FHSZ) analysis is based on fuels, terrain, and weather. Most of Lake County's wildland areas are mapped within Very High Fire Hazard Severity Zones, as are the communities of Nice, Lucerne, the Rivas, Cobb, Lake Pillsbury, and a few others. However, most of the County's residents live in High or Moderate FHSZs around Clear Lake and the valleys. Parts of Lakeport fall into the Moderate and High FHSZs.

Another tool used to understand fire is "fire regime." Fire regime is a measurement of fire's historic natural occurrence in the landscape. It includes the season, frequency, intensity, and spatial distribution of fire. In other words, it models how often fire historically would burn through a certain place and at what intensity. A standardized set of five fire regimes is used nationwide. There are two pre-settlement fire regimes found in Lake County: Fire Regime I—a natural fire-return interval between 0–35 years of low-severity fire, and Fire Regime III—a frequency of between 35–100 years of mixed-severity fire.

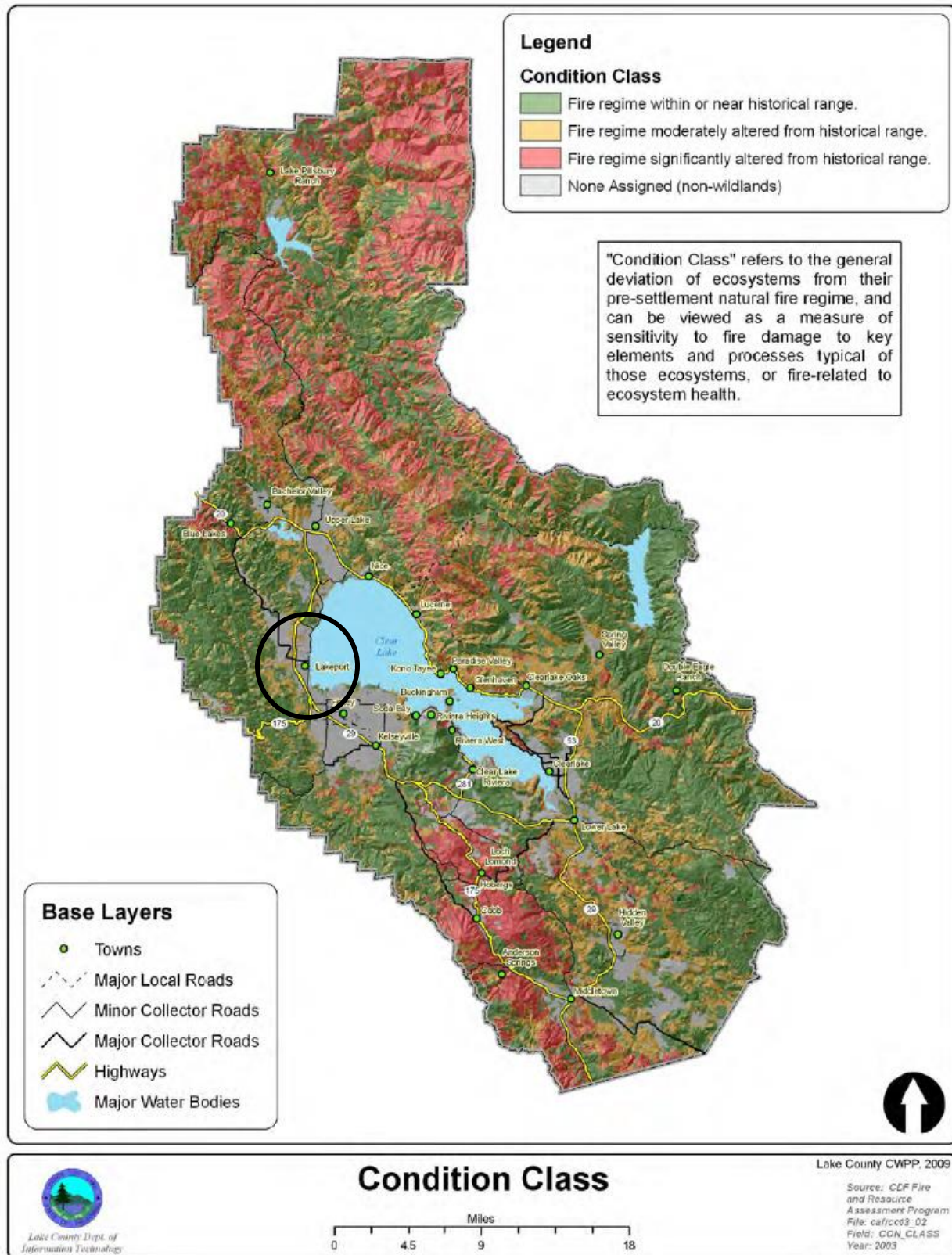
The difference in fire regime between pre- and post-European settlement is described by the "condition class," or degree of departure from the historical natural fire regime. The greater the departure from the natural fire regime, the greater the variations to ecological components and the higher the risk of losing key ecosystem components. All three condition class levels (of low, moderate, and high departure from historical conditions) are present in Lake County. The largest area in Lake County (at 45%) contains those ecosystems with a low departure from their natural fire regime, and hence low risk of key ecosystem loss. Another 22% are at a moderate departure. Those areas with a significant departure and high risk of ecosystem loss, are 20% of the county lands, and located primarily in the mountainous regions of the north and south. Finally, 13% are not classified because they are not wildlands. For more information on fire regime and condition class, see Figure 4-60 and Figure 4-61. These both show the County, with the City of Lakeport area circled in black.

Figure 4-60 Lake County – Fire Regime Class



Source: 2008 Lake County CWPP

Figure 4-61 Lake County – Fire Condition Class



Source: 2008 Lake County CWPP

Post-Wildfire Landslides and Debris Flows

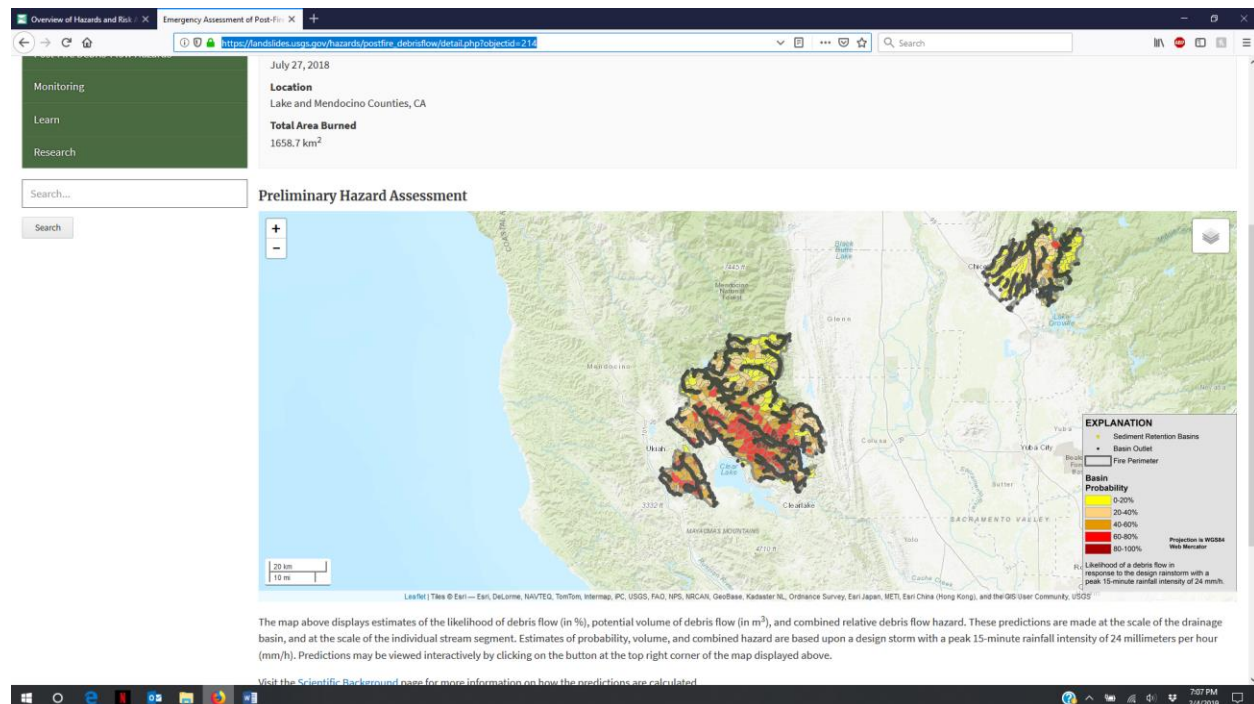
Post-wildfire landslides and debris flows are a concern in the City. Fires that burn in hilly areas, which comprise the portions of the area surrounding of the City, remove vegetation that holds hillsides together during rainstorms. Once that vegetation is removed, the hillside may be compromised, resulting in landslides and debris flows. Mapping of these areas has begun.

2018 Mendocino Complex Fire Landslide Mapping

Post-fire debris flow hazard assessments for the Mendocino Fire were performed by the USGS. These assessments are prepared at the request of land and emergency management agencies responsible for managing wildfires impacts. The assessments are presented as a series of maps and geospatial data showing the probability of debris flows and their expected volume for burned drainage basins. Other landslide hazard assessments produced by the USGS are performed at the request of government agencies or sometimes as demonstration products from research to improve methods of hazard and risk assessment.

Figure 4-62 estimates of the likelihood of debris flow (in %), potential volume of debris flow (in m³), and combined relative debris flow hazard from the Pawnee Fire. These predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h)

Figure 4-62 2018 Mendocino Complex Fire Landslide Debris Flow Probabilities



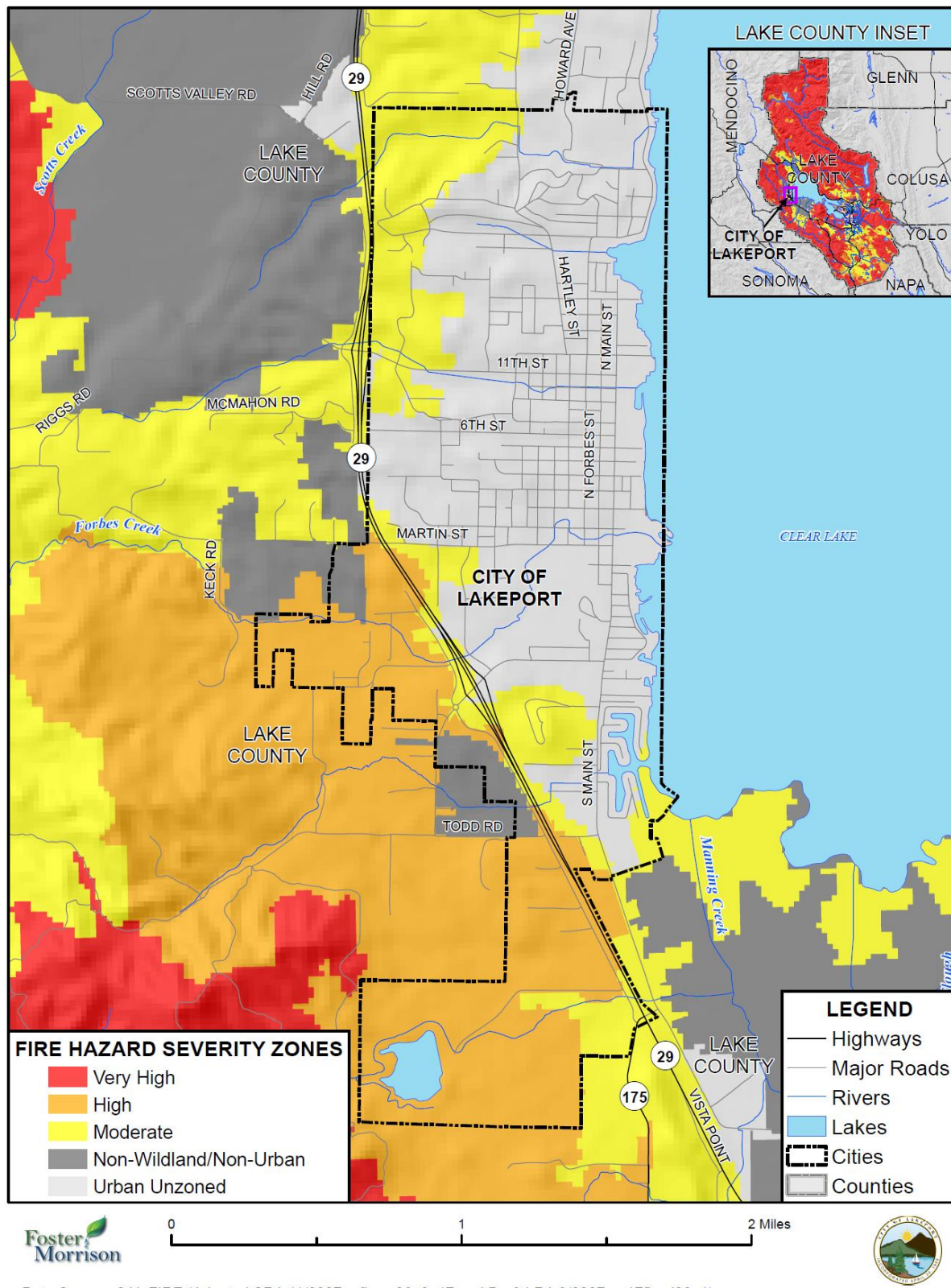
Other Post-Wildfire Issues

In addition to the landslide and debris flow risk, hazardous minerals within the burn areas are often associated with asbestos and mercury. Based on a limited review of regional geologic maps, a small outcrop of partially serpentized ultramafic rocks is present within the burn area that may contain asbestiform minerals. Asbestos is classified as a known human carcinogen by state, federal, and international agencies. State and federal health officials consider all types of asbestos to be hazardous. Additionally, the Sulphur Bank Mercury Mine is within the northern portion of the burn area, just south of the Elem Tribal Colony residential area. The mine site contains soils, sediments, and surface water impacted by mercury and arsenic, as well as other heavy metals. Areas of localized hydrothermal alteration and enrichment containing heavy metals, mercury and arsenic, that are not identified on published maps may be present, particularly along faults that propagate through the burn area. Where identified, additional precautions may be necessary to minimize contact and disturbance of these areas.

Extent

Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time, or may have durations lasting for a week or more. Wildfire can affect any areas of the City; however, CAL FIRE has mapped areas in California that are at risk to wildfire. Methodologies for this analysis and maps showing extent can be found in Section 4.3.17. GIS analysis was performed to determine what percentages of the City would be at risk to wildfire (using CAL FIRE Fire Hazard Severity Zone data) that separates risk into four risk categories as described in Table 4-32 below. 27.6% and 17.9% of all parcels in the Lakeport Planning Area fall in the CAL FIRE High or Moderate Fire Hazard Severity Zones (FHSZ), respectively. This can be seen on Figure 4-63 and in Table 4-32.

Figure 4-63 City of Lakeport - CAL FIRE FHSZs



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhszs06_3_17 and Draft LRA 9/2007 - c17fhszl06_1), City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

Table 4-32 City of Lakeport –Geographical Extents in FHSZs

| Fire Hazard Severity Zones | Total Acres | % of Total Area |
|----------------------------|--------------|-----------------|
| High | 466 | 27.6% |
| Moderate | 302 | 17.9% |
| Non-Wildland/Non-Urban | 52 | 3.1% |
| Urban Unzoned | 869 | 51.4% |
| Grand Total | 1,689 | 100.0% |

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There have been 10 federal and 1 state disaster declarations due to wildfire. This can be seen in Table 4-36.

Table 4-33 Lake County Disaster Declarations 1950-2019 from Wildfire

| Disaster Type | Federal Declarations | | State Declarations | |
|---------------|----------------------|---|--------------------|-------|
| | Count | Years | Count | Years |
| Fire | 10 | 1985, 1996, 2012, 2015 (three times), 2016, 2017(twice), 2018 | 1 | 1987 |

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. The 10 events in Lake County are shown in Table 4-34.

*Table 4-34 NCDC Wildfire Events in Lake County 1993 to 6/31/2018**

| Date | Event | Injuries (direct) | Deaths (direct) | Property Damage | Crop Damage | Injuries (direct) | Deaths (direct) |
|-----------|----------|-------------------|-----------------|-----------------|-------------|-------------------|-----------------|
| 6/12/2008 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 6/21/2008 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 7/1/2008 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 9/7/2009 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 4 | 0 |
| 7/11/2014 | Wildfire | 1 | 21 | \$0.00 | \$0.00 | 0 | 0 |
| 7/29/2015 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 8/1/2015 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 8/9/2015 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 9/12/2015 | Wildfire | 4 | 4 | \$0.00 | \$0.00 | 0 | 0 |
| 8/13/2016 | Wildfire | 0 | 0 | \$1,500,000.00 | \$0.00 | 0 | 0 |
| 10/8/2017 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |
| 6/23/2018 | Wildfire | 0 | 0 | \$0.00 | \$0.00 | 0 | 0 |

| Date | Event | Injuries (direct) | Deaths (direct) | Property Damage | Crop Damage | Injuries (direct) | Deaths (direct) |
|---------------|-------|-------------------|-----------------|----------------------|-------------|-------------------|-----------------|
| Totals | | 0 | 27 | \$500,000,000 | \$0 | 12 | 0 |

Source: NCDC

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

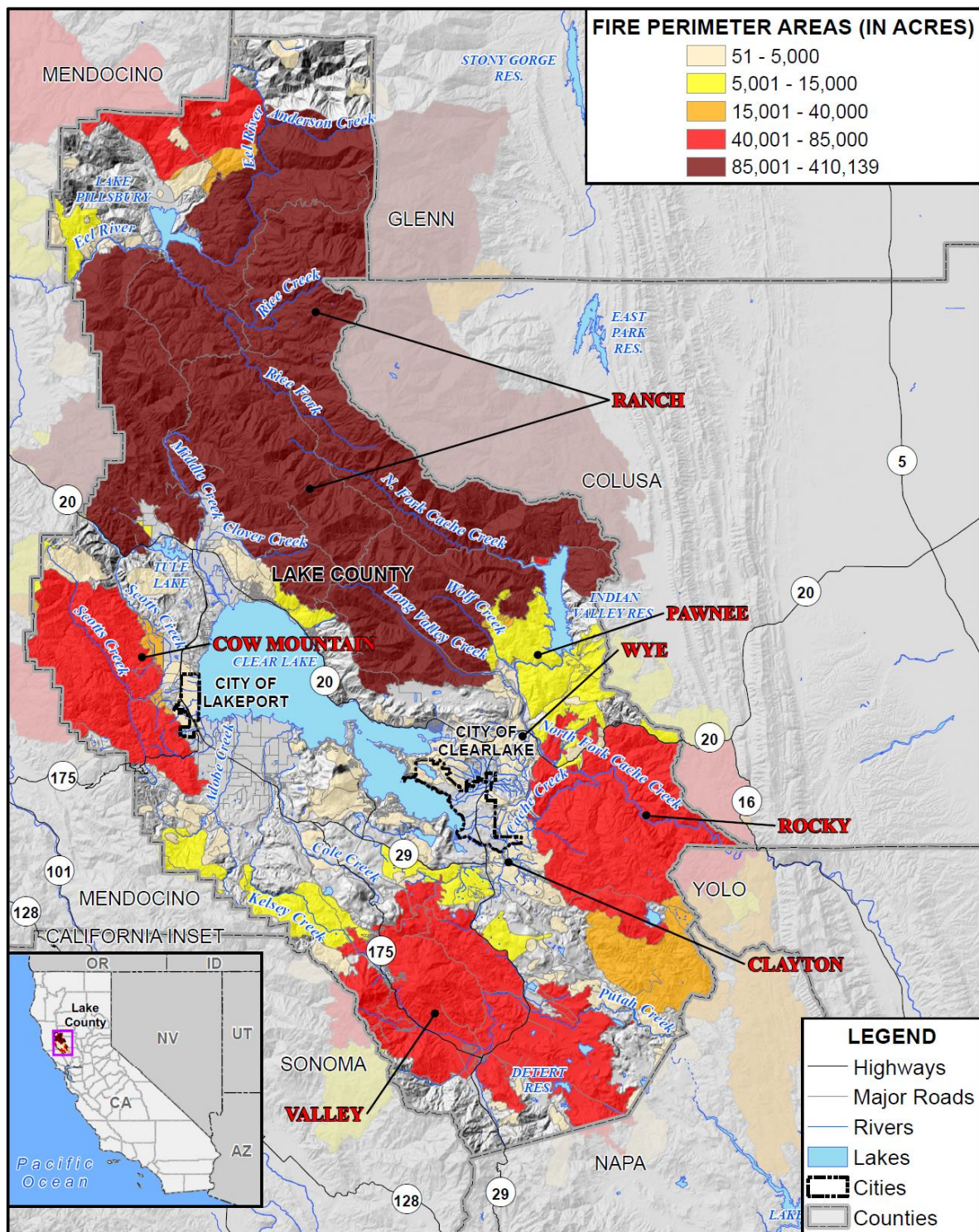
CAL FIRE Events

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Lakeport were extracted and are listed in Table 4-35. This table shows the acreage burned inside of the City. Each of them was tracked by CAL FIRE. Many more small fires have occurred, but were not included in the analysis. Figure 4-64 shows fire history for the County, colored by the size of the acreage burned. This map contains fires from 1950 to 2017.

Figure 4-64 City of Lakeport – Wildfire History 1950 to 2017



Data Source: CAL FIRE and Lake County Fire History (firep17_1) 4/13/2018,
City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 10/20/2018.



Table 4-35 City of Lakeport – Wildfire History

| Year | Start Date | Wildfire Name | Cause | Acres Burned | Comments |
|------|------------|---------------|------------|--------------|-------------------------------|
| 2007 | 7/15/2007 | Spruce | Power Line | 129 | – |
| 2007 | 7/28/2007 | Robinson | Arson | 122 | Started on Robinson Rancheria |

Source: CAL FIRE

2008 CWPP Events

The fire history of an area is a description of the time, space, and cause of fires in the area. In fire jargon, “fire risk” is often associated with fire history, as this term describes the events that cause a fire to start (i.e. ignitions). Fire history is important because it illustrates the potential for future fires. Large fires often repeat themselves; thus, it is useful to understand burning patterns over time. An area’s fire history also portrays ignition patterns that can target effective prevention programs. For example, if there is a history of frequent fires along a well-traveled route, roadside vegetation management may be in order. Additionally, fire history discerned through fire scars on tree rings may indicate the way fires have changed over time, both in frequency and intensity. This may point to appropriate goals for future fuel conditions.

Fire Caused by Natural Lightning

Lightning fires in northern California, including around Lakeport and in Lake County, are common in the summer and fall months, particularly in the higher elevations where strikes are more likely to occur. Fires ignite when lightning strikes coincide with rainless, windy weather; however, lightning fires rarely occur in the spring. Lightning fires pose a significant threat to Lakeport and Lake County especially during dry lightning events where burning conditions are met.

In the summer of 2008, over 2,000 fires burned throughout Northern California as a result of thunderstorms and dry conditions that occurred from the coast to the Sierra Nevada. Approximately 4,046 acres burned within Lake County at that time. These fires, fueled by extremely dry vegetation, quickly overwhelmed fire-fighting resources as they burned through thousands of acres. Lakeport and Lake County, as well as much of the rest of Northern California, experienced unhealthy, smoky days for a long period of time (over a month in some Northern California communities). When lightning starts multiple fires, suppression resources may not be adequate or available for new fires. This occurred in June of 2008 when the Walker Fire (see below) started in the middle of the lightning fire siege of Northern California. The Walker Fire was understaffed for many days while resources were committed elsewhere.

Native American Period Fire History

It is widely understood that during the pre-settlement period, Native Americans used fire as a resource management tool throughout California and the West. In fact, “When Spanish explorer Juan Rodriguez Cabrillo anchored in San Pedro Bay in October of 1542, it was the chaparral fires that gave him the signal that the coast was occupied by humans. A succession of explorers, missionaries, and settlers thereafter would continually note the ‘smoky air’ from these fires in their journals in every corner of the state – in the coastal redwood forests, the tule marshes of the Delta, the southern oak woodlands, the mixed conifer forests, and the northern hazelnut flats”.

The use of fire as a tool ranged from plant cultivation and land clearing to mast production and hunting. For example, in Lake County near Lakeport the native Pomo burned bracken fern patches to enhance them; the new fronds were eaten, and the rhizomes used to create basket designs. The acreage burned by California's earliest humans was significant; fire scientists Robert Martin and David Sapsis estimate that 5.6 to 13 million acres of California burned annually under both lightning and indigenous people's fire regimes. However, fire scientist Scott Stephens, Sapsis, and others have now estimated lower numbers. They estimate that 4,447,896 acres burned annually in California prior to 1800, excluding the southwestern deserts. This estimate of prehistoric annual area burned in California is 88% of the total annual "extreme" wildfire area burned in the entire United States within a single decade (1994–2004). From 1950 to 1999, the average annual area burned by wildfire in all vegetation types in California was approximately 25,2047 acres/year, only approximately 5.6% of what traditionally burned in a similar timeframe. Regardless of errors in either estimation, prior to modern fire suppression very large amounts of land burned in California. Skies were likely smoky much of the summer and fall in California during this period.

European Settlement Fire History

During European settlement, logging—primarily of the largest, oldest trees—became common, with subsequent changes in forest structure and fuel volumes. Many forms of land management during this era (such as logging, grazing, development, and most notably fire suppression) have influenced the fire history of Lake County and Lakeport.

As a result of large destructive fires in the West and Midwest in the early part of the 1900's, the perception of fire as a beneficial tool, such as seen by Native Americans, was overlooked and instead viewed as a major threat to lives, property, and natural resources. The outcome of this viewpoint was the "10 a.m. policy" adopted by the US Forest Service in 1935. This policy sought to aggressively suppress fires and have them extinguished by 10 a.m. the morning following a fire being discovered. This type of land management activity (intensive fire suppression), combined with increased development, a resulting lack of homeowner defensible space, logging of the largest trees, etc., has led to an increase in the amount of flammable materials now accumulated within Lake County as well as around Lakeport. Today it is widely accepted that fires now burn longer and hotter than those prior to European settlement.

Post European Settlement Fire History to 2008

During the last century, fire history has changed dramatically. Forest fuels have changed through more modern cultural practices of timber harvesting, mining, and grazing. Fire control in the west, including Lake County, has been extremely effective, particularly since the 1930's. Wildfire now escapes less than two percent of the time—but those escaped fires cause the vast majority of damage.

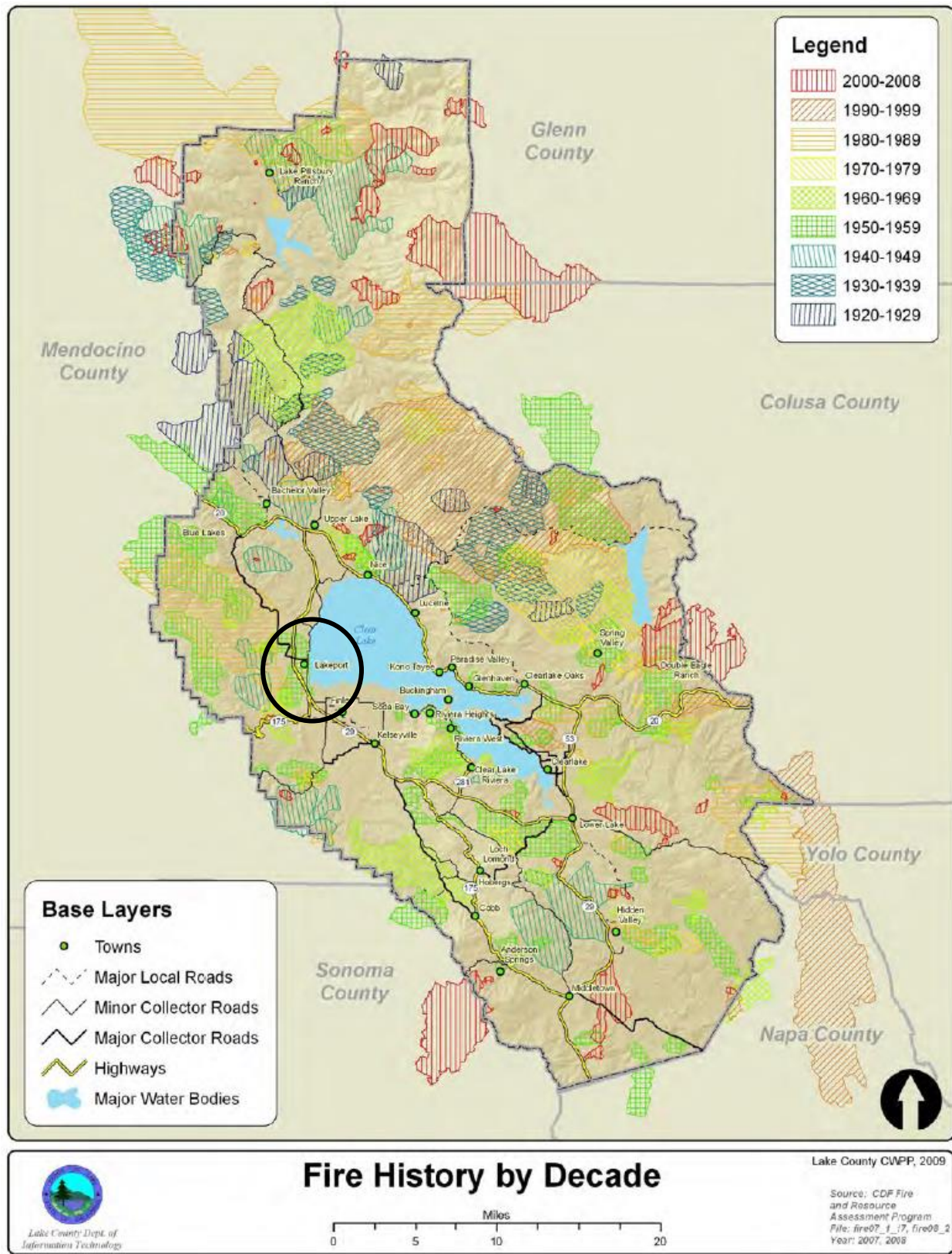
Lake County fire history shows that there have been several major wildland-urban interface (WUI) fires. While not all of these fires directly affected Lakeport, this history does show how high the wildfire risk is in and around the City. In the autumn of 1961, a 9,000+-acre fire burned through the Cobb Mountain area, destroying several structures. In the fall of 1964, the South County region again was subject to a 52,000-acre fire known as the Hanley Fire that started near the Lake/Napa County border northwest of Calistoga. This wildland fire ultimately burned all the way to the city limits of Santa Rosa, approximately forty miles southwest. That same year, a 15,000-acre wildland fire started at the Lake County dump (possibly the result

of the past practice of burning garbage at the dump) and threatened the community of Middletown. In the fall of 1968, the Lower Lake area was subject to a 10,000-acre wildland fire. In 1981, the Lang Peak Fire consumed 11,000 acres. In 1981, the Cow Mountain Fire traveled eastward from the Bureau of Land Management (BLM) lands near Ukiah in Mendocino County and burned to the foothills near Lakeport. In 1985 an interface fire burned through the Hidden Valley residential community, leaving significant property damage. The Mendenhall Fire burned approximately 70,000 acres in Lake and Mendocino Counties in 1987, while the Fouts Fire burned 19,000 acres in Lake and Colusa Counties.

The most recent large fires in Lake County have been the 1996 Fork Fire, the 2001 Trough Fire, and the 2008 Walker Fire. The Fork Fire started on the southern end of the Mendocino National Forest and burned 83,000 acres and eleven structures. The fire threatened the northern shore of Clear Lake, including the communities of Nice and Lucerne, and burned east almost to the Colusa County line. The Trough Fire started in eastern Colusa County at an intersection of U.S Forest Service roads in heavy brush and moved into Lake County. This fire burned through 24,970 acres, including portions of the Snow Mountain Wilderness. The most recent large fire—the Walker Fire—started on June 22, 2008. The likely source of this fire was a vehicle being driven near Indian Valley Reservoir hitting a rock with its metal undercarriage. This fire burned 14,500 remote acres in the eastern portion of Lake County.

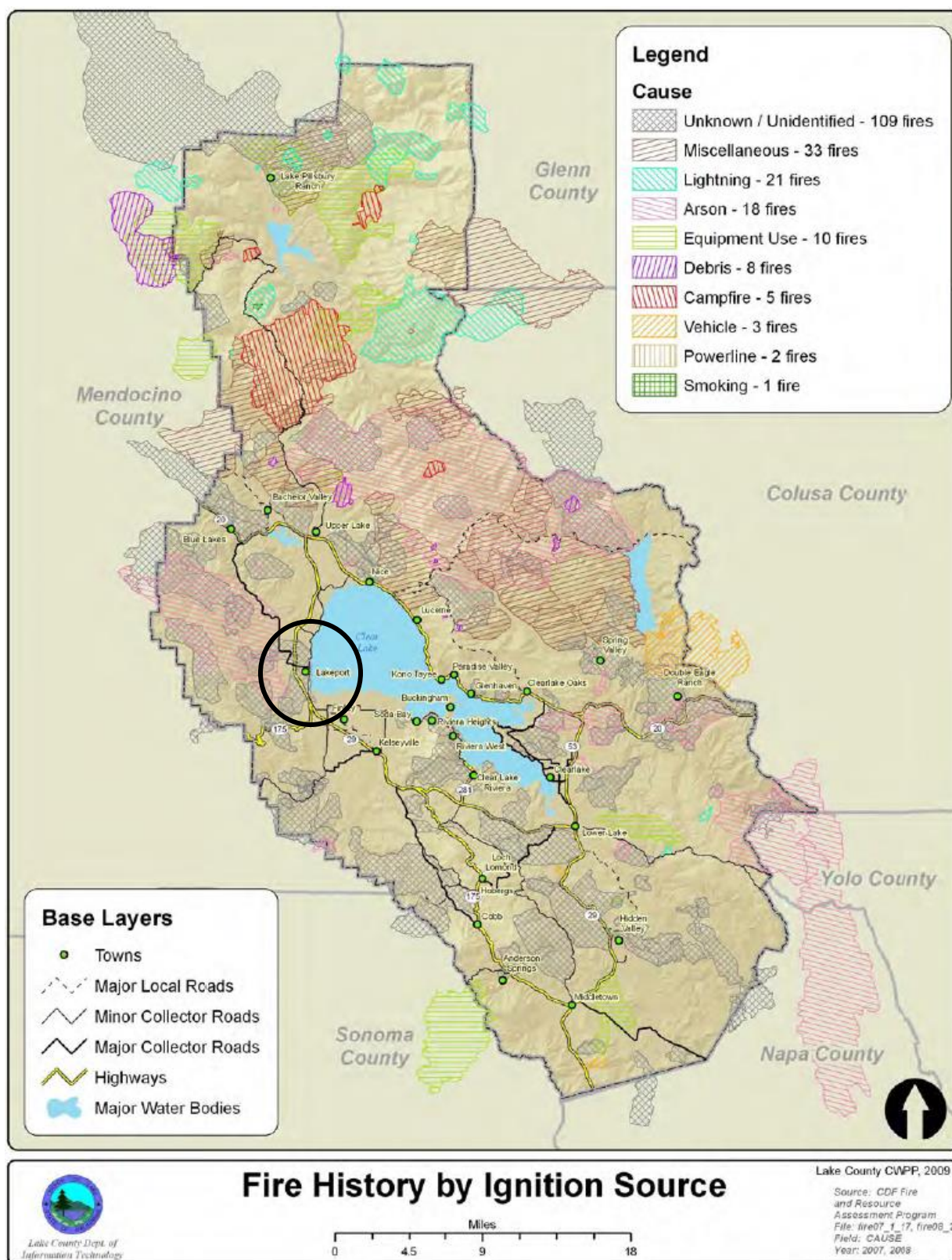
Figure 4-66 and Figure 4-65 show Lake County fire history, both by the decade in which the fire occurred, and by the ignition source (where known). This is useful to compare fire history both temporally and by cause.

Figure 4-65 Lake County – Fire History by Decade 1920 to 2008



Source: 2008 Lake County CWPP

Figure 4-66 Lake County – Fire History by Ignition Source 1920 to 2008



Source: 2008 Lake County CWPP

Hazard Mitigation Planning Team Events

The HMPC noted that fire has played a significant historical role in defining the current vegetative strata in Lake County and Lakeport. Past occurrences the HMPC noted are as follows:

- **1981** – Lakeport Fire Protection District noted a fire near 6th St. that burned. In all, 4 structures were totally destroyed.
- **1981** – Lakeport Fire Protection District noted a fire near Cow Mountain. In all, 11 structure were totally destroyed.
- **1985 Hidden Valley Lake Fire** – The HMPC noted fire impacts included use of fairgrounds, mutual aid, with large impacts to road systems. No reimbursements were given to the City from the State or FEMA. The City functioned as staging area for firefighters.
- **1987 Fires** – The HMPC noted fire impacts included use of fairgrounds, mutual aid, with large impacts to road systems. No reimbursements were given to the City from the State or FEMA. The City functioned as staging area for firefighters. A federal disaster declaration was announced on September 3, 1987.
- **1996 Lake County Fire** – The HMPC noted fire impacts included use of fairgrounds, mutual aid, with large impacts to road systems. No reimbursements were given to the City from the State or FEMA. The City functioned as staging area for firefighters. A federal disaster declaration was announced on August 1, 1996.
- **2012 Wye Fire** – The Wye Fire burned 7,934 acres in Lake and Colusa counties. Challenging fire behavior, low reality humidity, very high temperatures, and erratic winds contributed to the spread of the fire. The fire burned an area around Highway 20 east of Highway 53 and in the Clearlake Oaks area. The smoke from the fires could be seen for miles. It could be seen from Napa County from the south and Butte County from the north. The fire destroyed two structures and one outbuilding. In addition, two other structures were damaged. 3 injuries were attribute to this fire. At its peak, more than 1,250 fire personnel from multiple agencies were involved in the fire fight. Multiple evacuation orders were put out. The Wye Fire resulted in a federal disaster declaration (FM-5004). While the City wasn't burned, mutual aid was granted to surrounding communities.
- **2015 Rocky Fire** – The Rocky Fire was a wildfire that burned in Lake County, California during the 2015 California wildfire season. The fire, which ignited July 29, burned 69,438 acres, destroying 43 residences and 53 outbuildings before it was contained on August 14. On August 12 CAL FIRE officials confirmed that the fire had merged with the Jerusalem Fire which was burning to the south. On August 19 investigators from CAL FIRE determined that the fire had been caused by a faulty gas-powered water heater inside an outbuilding. Multiple evacuation orders were put forth for areas near Morgan Valley Road and Rocky Creek Road. Fortunately, no injuries or deaths were reported. While the City wasn't burned, mutual aid was granted to surrounding communities. City staff assisted Lake County personnel with inspections for approximately two weeks.
- **2015 Valley Fire** – The Valley Fire was a wildfire during the 2015 California wildfire season that started on September 12 in Lake County, California. The fire started shortly after 1:00 pm near Cobb and by 6:30 PM had burned more than 10,000 acres. The fire quickly spread into Middletown and Hidden Valley, threatening northern Sonoma County around The Geysers, and northern Napa County, approaching Pope Valley and Angwin. On September 12, mandatory evacuation orders were issued for Cobb, Middletown, Loch Lomond, Harbin Hot Springs, Hidden Valley Lake, the Clearlake Riviera, Riviera West, and Soda Bay communities of unincorporated parts of Kelseyville, Pope Valley and Angwin. By midnight of the first day, scores of homes and businesses had been destroyed in

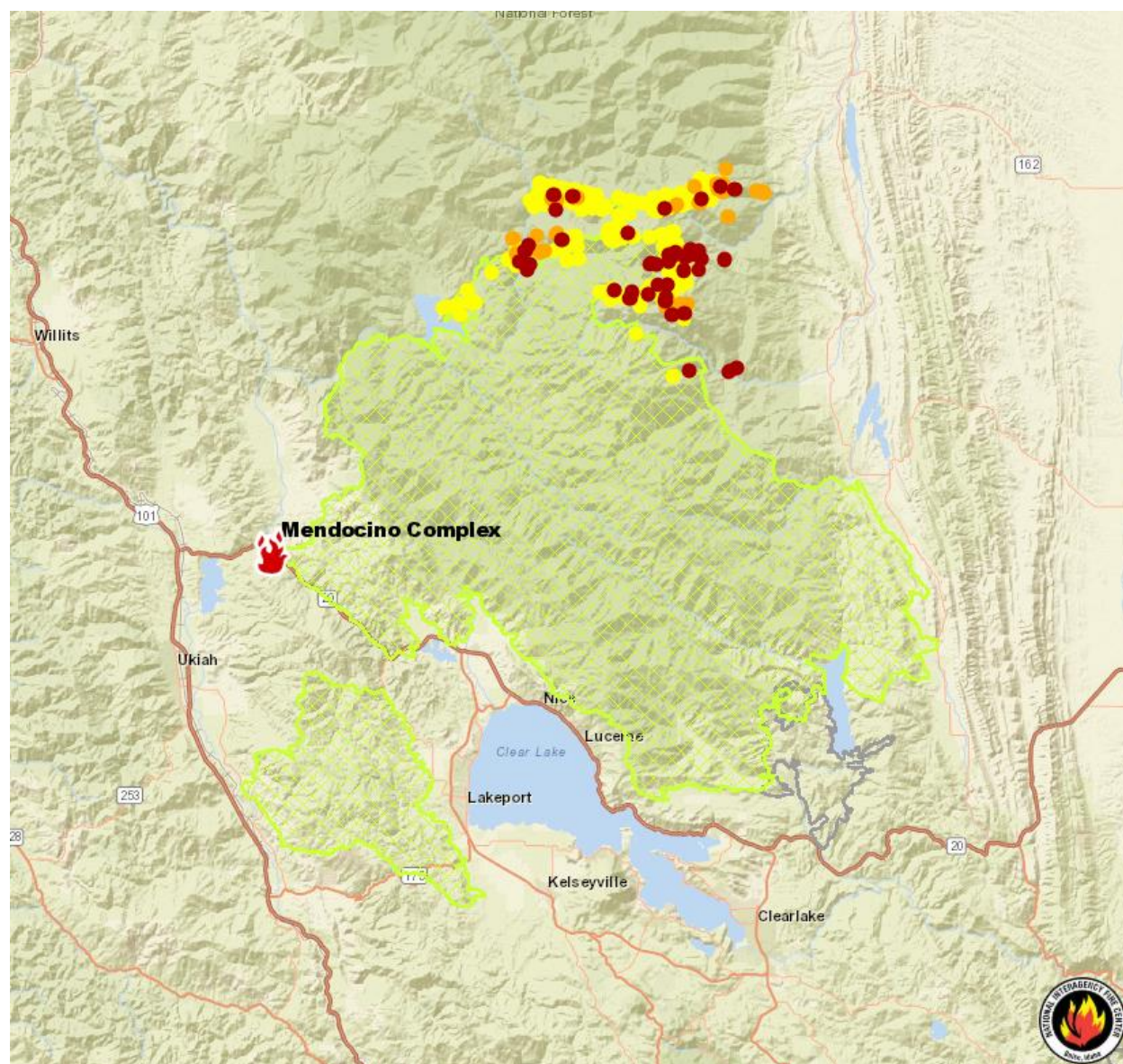
Middletown, along with at least 50 homes in Cobb as well as the entire Hoberg's Resort, an historic retreat built in the 1880s. The resort community of Harbin Hot Springs was also destroyed. Evacuation centers were established in the town of Kelseyville to the northwest and Calistoga to the southeast. By September 13, the fire had reached 50,000 acres and had destroyed much of Cobb, Middletown, Whispering Pines, and parts in the south end of Hidden Valley Lake. High winds spread the fire very quickly. The fire ultimately spread to 76,067 acres, killed four people and destroyed nearly 2,000 buildings. At the time, the fire was the third-worst fire in California history, based on the total structures burned. A CAL FIRE investigation pointed to faulty wiring of a hot tub installation as the cause of the fire. While the City wasn't burned, mutual aid was granted to surrounding communities. City staff assisted Lake County personnel with inspections for approximately two weeks.

- **2016 Clayton Fire** – The Clayton Fire began as a new start just a mile south of Lower Lake and the Highway 53/29 intersection on the evening of August 13. The area was under the apex of an upper level ridge with temperatures in the upper 90s and relative humidity in the low teens. The typically late afternoon WSW onshore winds pushed the fire eastward on the evening of August 13. Then that night and into August 14, a weak upper trough moved onshore. The south to southwest winds during the day on August 14 pushed the fire north and northeast into the city of Lower Lake and beyond. Konocti RAWs wind gusts increased from 17 mph to 24 mph from August 13 to 14 (figure 1), and relative humidity dropped to 9% on August 14. By August 14, the second day, 10 homes had been destroyed and up to 6,000 people had been evacuated from Lower Lake and Clearlake, including St. Helena Hospital Clearlake. An evacuation center was opened at Highlands Senior Center and was evacuated the following day. By August 15, the third day, 5 percent of the fire had been contained, burning a total of 3,000 acres, 175 buildings, including the offices of a Habitat for Humanity affiliate, had been destroyed and 1,044 fire personnel were on the ground. Road closures were announced throughout the area, including Clayton Creek Road at Highway 29, Morgan Valley Road, North Spruce Grove Road at Spruce Grove Road, and Jerusalem Grade South Spruce Grove Road. State Route 53 at Highway 29 is closed. New evacuation centers were opened at Twin Pine Casino, Kelseyville High School, and the Seventh-day Adventist Church in Lakeport. By August 16, the fourth day, 1,664 fire personnel were on the ground and 20 percent of the fire had been contained. It was reported, at the time, as burning a total of 4,000 acres. Additionally, the Clearlake area of the Avenues and neighborhoods from Polk Avenue to Cache Creek, east of Highway 53, had been evacuated. A state of emergency was declared for Lake County by California Governor Jerry Brown. On the fifth day, August 17, road closures remained, and evacuation centers also remained open, with 40 percent of the fire being contained, burning a total of 3,929 acres, and 2,327 fire personnel were on the ground. By August 24, the fire was 98 percent contained and has burned a total of 3,929 acres and has destroyed 300 buildings. A construction worker from Clearlake was arrested and faced 17 counts of arson related to the Clayton Fire and other fires. While Lakeport was not directly affected, mutual aid agreements with the County and City of Clearlake were honored. The City had costs in excess of \$6,000 for labor for evacuation and traffic support.
- The **2017 Sulphur Fire**, which was part of the Mendocino Lake Fire Complex, started on October 8, 2017, burned 2,207 acres, and was contained on October 27, 2017. Approximately 169 buildings (residences, outbuildings and commercial buildings) were destroyed or damaged. The fire burned in watersheds that drain directly to Clear Lake or too much smaller Borax Lake. Clear Lake supplies municipal water for several communities, including the City of Clearlake. The Sulphur Fire was located about 4 miles east of Mount Konocti and is immediately northwest of Clearlake Park, in Lake County, California. The fire perimeter partially straddles Sulphur Bank Ridge, a prominent, roughly east-west trending ridge that creates a peninsula projecting into Clear Lake. Along the northern flank of Sulphur

Bank Ridge, and within the burn perimeter, is the Sulphur Bank Mercury Mine Superfund Site managed by the U.S. EPA. Just north of the northern burn perimeter is the Elem Indian Colony. While the City wasn't burned, mutual aid was granted to surrounding communities.

- The **2018 Mendocino Complex Fire**, consisting of the Ranch and River fires, began on July 27 of 2018, and was not 100% contained until September 18 of 2018. The Mendocino Complex Fire was the largest recorded fire complex in California history. While the Camp Fire in 2018 in Butte County burned more structures, the Mendocino Complex Fire burned the most acreage. In all 459,129 acres were burned, much of it in Lake County. The communities of Witter Springs, Kelseyville, Finley, Saratoga Springs, Nice, Bachelor Valley, Scotts Valley, and Big Valley Rancheria were evacuated. While the City of Lakeport was not affected, the burn perimeter did come close to the City limits. The wastewater treatment plant sustained damage to fields and fences surround the facility. Air quality during and after the fires was very poor. Mutual aid was necessary for fires and for sheltering. All Lakeport residents were evacuated as a precaution.

Figure 4-67 Mendocino Complex Fire Burn Perimeter



Source: National Interagency Fire Center

Likelihood of Future Occurrences

Highly Likely — Conventional thought states that from May to October of each year, Lakeport faces a serious wildland fire threat. Recently, it appears as though the fire threat is almost year around. Fires will continue to occur on an annual basis in the Lake County and in and near the City of Lakeport. The threat of wildfire and potential losses are constantly increasing as human development and population increase and the wildland urban interface areas expand. Due to its high fuel load and long, dry summers, the City of Lakeport continues to be at risk from wildfire.

Climate Change and Wildfire

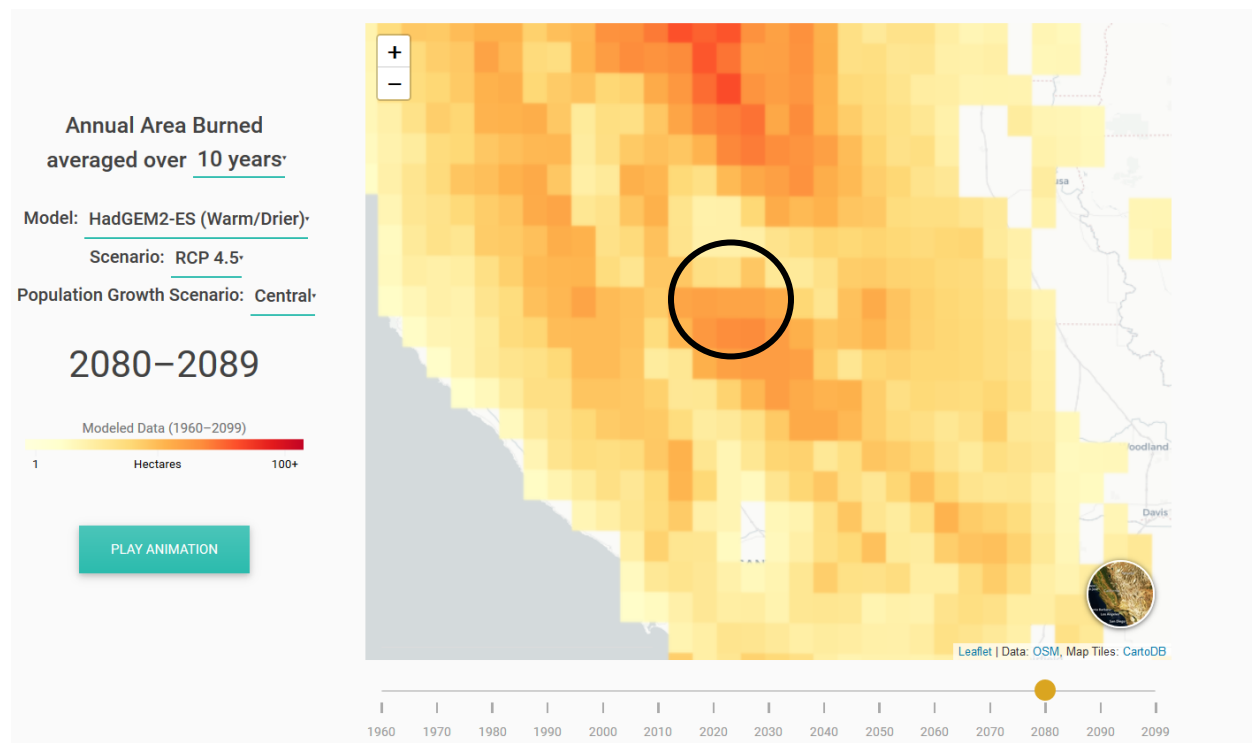
Climate change and its effect on wildfire near the City has been discussed by three sources:

- Cal-Adapt
- Climate Change and Health Report for Lake County

Cal-Adapt Predictions

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2080-2089, as compared to recent (2010) conditions. This is shown in Figure 4-68. Based on this model, Cal-Adapt predicts that wildfire risk in Lake County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in Lakeport, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Figure 4-68 City of Lakeport – Projected Increase in Wildfire Burn Areas

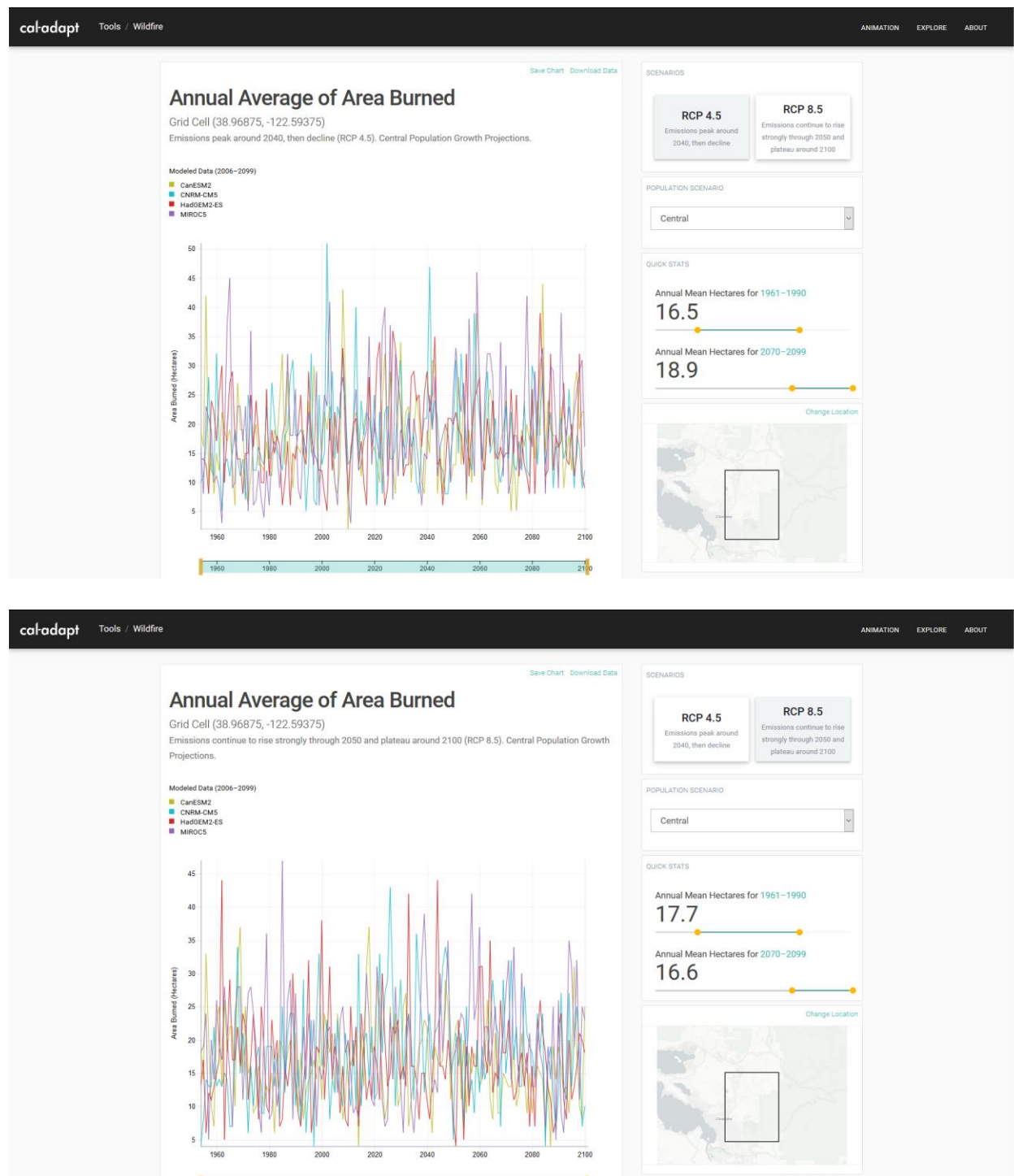


Source: Cal-Adapt

Wildfire scenario projections were done by Cal-Adapt, based on statistical modeling from historical data of climate, vegetation, population density, and fire history. The fire modeling ran simulations on five variables on a monthly time step - Large fire presence/absence, Number of fires given presence, Area burned in a grid cell given a fire, High severity burned area given a fire and emissions. These are shown

on Figure 4-69. The upper chart shows modeled annual averages of area burned for Lakeport under the RCP 4.5 scenario, while the lower chart shows modeled annual averages of area burned for Lakeport under the RCP 8.5 scenario.

Figure 4-69 City of Lakeport – Future Annual Averages of Acres Burned under RCP 4.5 and 8.5 Scenarios

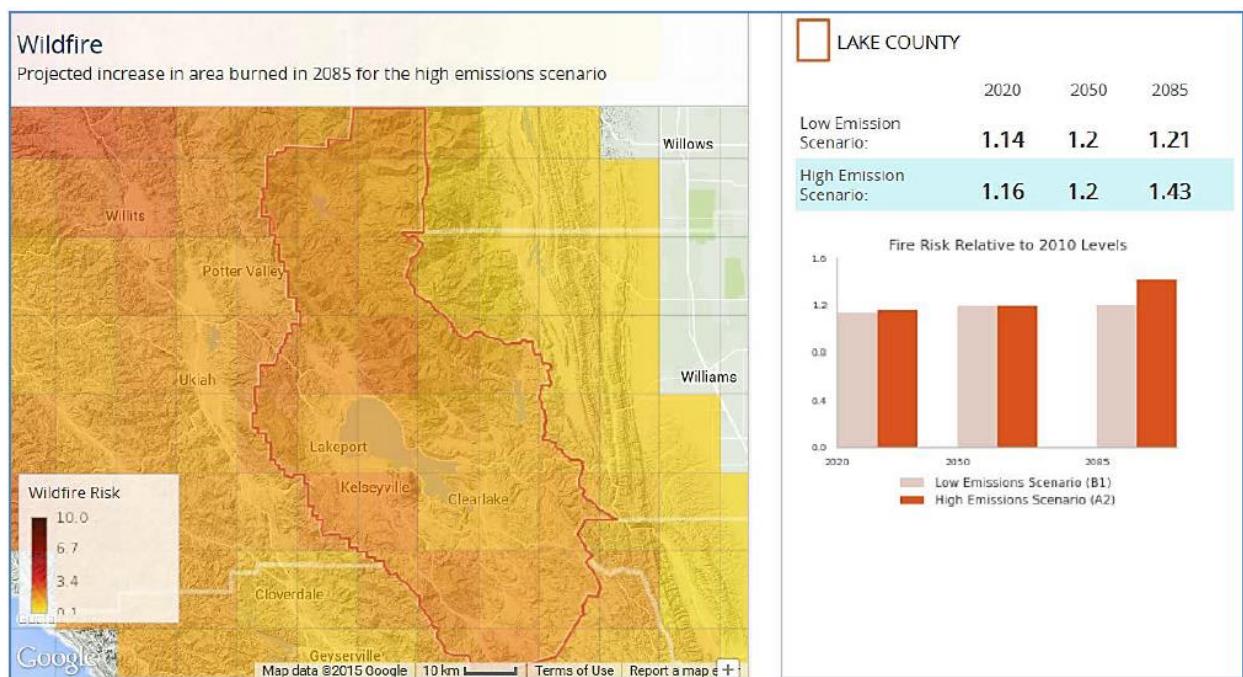


Source: Cal-Adapt

Climate Change and Health Report for Lake County Predictions

The map below (Figure 4-70) displays the projected increase or decrease in potential area burned based on projections of the Coupled Global Climate Model (version 3) for the high carbon emissions scenario in 2085. The bar graphs to the right of the map in Figure 4-70 illustrate the projected time trend over the 21st century for both the high and low emissions scenarios. Please note that these data are modeled solely on climate projections and do not take landscape and fuel sources into account. The projections of acreage burned are expressed in terms of the relative increase or decrease (greater or less than 1) from a 2010 baseline for fires that consume at least 490 acres. The 2010 baseline reflects historic data from 1980 to 1989 and trends through 2010.

Figure 4-70 Lake County – Increase in Wildfire Acreage in Future Carbon Emissions Scenarios 2020 to 2085



Source: Climate Change and Health Report for Lake County

4.2.20. Natural Hazards Summary

Table 4-36 summarizes the results of the hazard identification and hazard profile for the City based on the hazard identification data and input from the HMPC. For each hazard profiled in Section 4.2, this table includes the likelihood of future occurrence and whether the hazard is initially considered a priority hazard for the City based on the hazard profiles.

Table 4-36 Hazard Identification and Initial Determination of Priority Hazards

| Hazard | Likelihood of Future Occurrence | Priority Hazard |
|--|---------------------------------|-----------------|
| Aquatic Biological Hazards: cyanobacterial bloom | Highly Likely | Y |
| Aquatic Biological Hazards: quagga mussel | Highly Likely | Y |
| Climate Change | Likely | Y |
| Dam Failure | Unlikely | Y |
| Drought and Water Shortage | Likely | Y |
| Earthquake (major/minor) | Unlikely/Highly Likely | Y |
| Flood: 1%/0.2% Annual Chance | Likely | Y |
| Flood: Localized/Stormwater | Highly Likely | Y |
| Hazardous Materials Transport | Likely | Y |
| Landslide and Debris Flows | Highly Likely | Y |
| Levee Failure | Unlikely | N |
| Seiche | Unlikely | N |
| Severe Weather: Extreme Cold and Freeze | Likely | N |
| Severe Weather: Extreme Heat | Highly Likely | Y |
| Severe Weather: Heavy Rains, Snow, and Storms | Highly Likely | Y |
| Severe Weather: High Winds | Highly Likely | Y |
| Volcano and Geothermal Gas Release | Unlikely/ Highly Likely | N |
| Wildfire | Highly Likely | Y |

4.3 Vulnerability Assessment

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction’s vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

With Lakeport’s hazards identified and profiled, the HMPC conducted a vulnerability assessment to describe the impact that each priority hazard would have on the City. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to natural hazards and estimates potential losses. This section focuses on the risks to the City as a whole. Data, as available, from the additional participating jurisdiction – the Lakeport Fire Protection District (LFPD) – was also evaluated and is integrated here and in the jurisdictional annex and noted where the risk differs across the Planning Area and from jurisdiction to jurisdiction.

This vulnerability assessment followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses*. The vulnerability assessment first describes the total vulnerability of the City and assets at risk and then discusses vulnerability by hazard.

Data Sources

Data used to support this vulnerability assessment included the following:

- 2013 Lake County Drought Management Plan
- 2018 Lake County Local Hazard Mitigation Plan
- 2018 State of California Multi-Hazard Mitigation Plan
- CAL FIRE GIS Datasets
- Cal OES Dam Inundation Data
- Cal-Atlas
- Cal-DWR Disadvantage Community Mapping Tool
- California Adaptation Planning Guide
- California Department of Finance
- California Department of Fish and Wildlife
- California Department of Parks and Recreation Office of Historic Preservation
- California Geological Survey

- California Natural Diversity Database
- California’s Sustainable Groundwater Management Act
- CalTrans Truck Network
- City of Lakeport 2025 General Plan Background Report
- City of Lakeport 2025 General Plan Land Use Element
- City of Lakeport 2025 General Plan Safety Element
- FEMA - Understanding Your Risks—Identifying Hazards and Estimating Losses.
- FEMA Disaster Declaration Database
- FEMA Hazus 4.0
- FEMA Lake County Digital Flood Insurance Rate Map 9/30/2005
- FEMA Lake County Flood Insurance Study 9/30/2005
- FEMA Lake County Preliminary Flood Insurance Study 6/18/2014
- FEMA NFIP Data for Lakeport
- HMPC input
- Lake County Assessor’s Data
- Lake County Climate and Health Profile Report
- Lake County GIS
- National Drought Mitigation Center Drought Impact Reporter
- National Oceanic and Atmospheric Administration
- National Weather Service
- Proceedings of the National Academy of Sciences
- Public Health Alliance of Southern California
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- U.S. Geological Survey Landslide Data
- UNFCCC Conference of Parties Paris Agreement of 2015
- University of California
- US Census Bureau

4.3.1. Lakeport’s Vulnerability and Assets at Risk

As a starting point for analyzing the City’s vulnerability to identified hazards, the HMPC used a variety of data to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur in the City, this section describes significant assets at risk. Data and analysis used in this baseline assessment include:

- Total values at risk;
- City critical facilities;
- Natural, cultural, and historical resources; and
- Growth and development trends.

Total Values at Risk

Parcel Inventory and Assessed Values

This analysis captures the values associated with assessed assets located within the City of Lakeport. The 2018 GIS parcel layer and the Lake County Assessor data, dated 10/30/2018, obtained from Lake County, was used for the basis of this analysis. In addition to the Lake County parcel data, the Lakeport General Plan data was obtained containing detailed supplemental parcel information. This data provided by the City of Lakeport and Lake County represents best available data.

Understanding the total assessed value of the City of Lakeport is a starting point to understanding the overall value of identified assets at risk in the City. When the total assessed values are combined with potential values associated with other community assets such as area populations, public and private critical infrastructure, historic and cultural resources, and natural resources, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the City.

Methodology

Lake County's 10/30/2018 Assessor Data and the County's GIS parcel data were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the City. This data provides the land and improved values assessed for each parcel. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Lakeport and Lake County to support citywide mapping and analysis of assets at risk. The Countywide Lake County GIS parcel data contained 64,046 parcels, including the areas of the City of Clearlake, City of Lakeport, and the unincorporated areas of Lake County. This analysis focuses on the City of Lakeport area as the Planning Area for this effort, and therefore the GIS parcel data specific to the Lakeport Planning Area contained 2,431 parcels.

Data Limitations & Notations

Although based on best available data, the resulting information should only be used as an initial guide to overall values in the City. In the event of a disaster, structures and other infrastructure improvements are at the greatest risk of damage. Depending on the type of hazard and resulting damages, the land itself may not suffer a significant loss. For that reason, the values of structures and other infrastructure improvements are of greatest concern. Also, it is critical to note a specific limitation to the assessed values data within the City, created by Proposition 13. Instead of adjusting property values annually, no adjustments are made until a property transfer occurs. As a result, overall property value information is most likely low and may not reflect current market or true potential loss values for properties within the City.

The 2018 GIS parcel and Assessor data (Table M) was obtained to perform the spatial analysis. The initial Table M contained 64,151 records. The initial GIS parcel data contained 64,047 records. When the assessor table was linked to the GIS parcel attribute table, there were 64,046 successful record matches. Of those records, the GIS data was further refined to the Lakeport jurisdictional boundaries, and the total parcel count was 2,431. GIS was used to compare parcel polygons and parcel centroids, or points, representing the center of each parcel polygon. For the purposes of this analysis, the centroids which were not coincident in locations were re-positioned to overlay on the corresponding polygons so that each assessor record (with a unique assessor parcel number) was spatially positioned on the corresponding parcel. Thus, in some

instances, the position of the centroids may result in less accurate hazard analysis overlay results. The data did not contain duplicate records. In total, 14,463 records were utilized for the analysis.

Property Use Categories

Lakeport provided a Land Use dataset from the City of Lakeport General Plan containing base land use designations which provided detailed descriptive information about how each property is generally used such as commercial, industrial, mixed use, open space, residential, or special plan. The general plan's mixed use and special plan designations were further refined by using additional primary land use detailed information and then categorized into the following property use categories and linked back to the Lake County Assessor data. The final property use categories for Lakeport are shown on Table 4-37.

Table 4-37 City of Lakeport – Property Use Categories

| Property Use Categories | General Plan Land Use Descriptions |
|--------------------------|---|
| Commercial | Commercial, Retail, Office Space |
| Government | City Property / Civic |
| Open Space / Rural Lands | Open Space / Rural Lands, Park Space |
| Residential | Residential (Resort, Low, Medium, High Density Residential) |

Source: City of Lakeport

Once the General Plan Land Use data were grouped into property use categories, the number of total and improved parcels and land and improved values were inventoried for the City by property use.

Estimated Content Replacement Values

Lakeport's assigned property use categories were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards. FEMA's standard CRV factors were utilized to develop more accurate loss estimates for all mapped hazard analyses. FEMA's CRV factors estimate value as a percent of improved structure value by property use. Table 4-38 shows the breakdown of the different property uses in Lakeport and their estimated CRV factors.

Table 4-38 Lakeport – Content Replacement Factors by Property Use

| Lakeport Property Use Categories | Hazus Property Use Categories | Hazus Content Replacement Values |
|----------------------------------|-------------------------------|----------------------------------|
| Commercial | Commercial | 100% |
| Government | Government | 100% |
| Open Space/Rural Lands | Open Space | 100% |
| Residential | Residential | 50% |

Source: Hazus

Lakeport Values at Risk Results

Values at Risk without Contents

Values associated with land and improved structure values were identified and summed to determine total assessed values at risk in the Lakeport Planning Area. Together, the land value and improved structure value make up the majority of assessed values associated with each identified parcel or asset. Improved parcel counts were based on the assumption that a parcel was improved if a structure value was present. Information on other values such as personal property values were not readily available for inclusion in this effort.

Table 4-39 shows the total values or exposure for the entire Lakeport geographic area. Table 4-40 breaks down Table 4-39, and gives detail about how the property use category is broken down. The values for the Lakeport Planning Area are broken out by property use type and are provided in Table 4-38.

Table 4-39 City of Lakeport – Total Values at Risk by Summary Property Use

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Total Value |
|--------------------------|--------------------|-----------------------|----------------------|--------------------------|----------------------|
| Commercial | 415 | 333 | \$44,492,040 | \$92,952,265 | \$137,444,305 |
| Government | 27 | 0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 26 | 2 | \$295,682 | \$371,865 | \$667,547 |
| Residential | 1,963 | 1,684 | \$118,260,050 | \$220,308,051 | \$338,568,101 |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$476,679,953 |

Source: Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Table 4-40 City of Lakeport – Total Values at Risk by Detailed Property Use

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Total Value |
|---------------------------|--------------------|-----------------------|---------------------|--------------------------|----------------------|
| Commercial | | | | | |
| Central Business District | 101 | 95 | \$7,182,299 | \$17,846,560 | \$25,028,859 |
| Light Retail | 21 | 17 | \$1,141,851 | \$1,704,405 | \$2,846,256 |
| Major Retail | 201 | 153 | \$29,947,936 | \$60,615,719 | \$90,563,655 |
| Office Space | 88 | 66 | \$5,172,968 | \$12,168,090 | \$17,341,058 |
| (blank) | 4 | 2 | \$1,046,986 | \$617,491 | \$1,664,477 |
| Commercial Total | 415 | 333 | \$44,492,040 | \$92,952,265 | \$137,444,305 |
| Government | | | | | |
| City Property | 3 | 0 | \$0 | \$0 | \$0 |
| Civic | 24 | 0 | \$0 | \$0 | \$0 |

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Total Value |
|---------------------------------------|--------------------|-----------------------|----------------------|--------------------------|----------------------|
| Government Total | 27 | 0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | | | | | |
| Open Space | 4 | 1 | \$0 | \$0 | \$0 |
| Park Land | 17 | 1 | \$131,866 | \$237,303 | \$369,169 |
| (blank) | 5 | 1 | \$163,816 | \$134,562 | \$298,378 |
| Open Space / Rural Lands Total | 26 | 2 | \$295,682 | \$371,865 | \$667,547 |
| Residential | | | | | |
| High Density Residential | 1 | 1 | \$101,219 | \$172,421 | \$273,640 |
| High Density Residential | 180 | 161 | \$12,748,658 | \$27,305,145 | \$40,053,803 |
| Low Density Residential | 1,270 | 1,103 | \$66,468,656 | \$134,235,239 | \$200,703,895 |
| Medium Density Residential | 445 | 381 | \$26,069,821 | \$44,405,853 | \$70,475,674 |
| Resort Residential | 46 | 23 | \$10,761,852 | \$11,757,495 | \$22,519,347 |
| (blank) | 21 | 15 | \$2,109,844 | \$2,431,898 | \$4,541,742 |
| Residential Total | 1,963 | 1,684 | \$118,260,050 | \$220,308,051 | \$338,568,101 |
| | | | | | |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$476,679,953 |

Source: Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Values at Risk with Contents

Table 4-41 shows the total values of the City Lakeport as shown in Table 4-39, but with estimated content replacement values (CRVs) included (using CRV multipliers from Table 4-37). This table is important as potential losses to the City include structure contents. In addition, loss estimates contained in the hazard vulnerability sections of this Chapter will use calculations based on the total values, including content replacement values. Table 4-42 breaks down Table 4-41, and gives detail about how the property use category is broken down.

Table 4-41 City of Lakeport – Total Values at Risk by Summary Property Use with Content Replacement Values

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--------------|--------------------|-----------------------|------------------|--------------------------|--------------------------|---------------|
| Commercial | 415 | 333 | \$44,492,040 | \$92,952,265 | \$92,952,265 | \$230,396,570 |

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--------------------------|--------------------|-----------------------|----------------------|--------------------------|--------------------------|----------------------|
| Government | 27 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 26 | 2 | \$295,682 | \$371,865 | \$371,865 | \$1,039,412 |
| Residential | 1,963 | 1,684 | \$118,260,050 | \$220,308,051 | \$110,154,026 | \$448,722,127 |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 | \$680,158,109 |

Source: Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Table 4-42 City of Lakeport – Total Values at Risk by Detailed Property Use with Content Replacement Values

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|---------------------------------------|--------------------|-----------------------|---------------------|--------------------------|--------------------------|----------------------|
| Commercial | | | | | | |
| Central Business District | 101 | 95 | \$7,182,299 | \$17,846,560 | \$17,846,560 | \$42,875,419 |
| Light Retail | 21 | 17 | \$1,141,851 | \$1,704,405 | \$1,704,405 | \$4,550,661 |
| Major Retail | 201 | 153 | \$29,947,936 | \$60,615,719 | \$60,615,719 | \$151,179,374 |
| Office Space | 88 | 66 | \$5,172,968 | \$12,168,090 | \$12,168,090 | \$29,509,148 |
| (blank) | 4 | 2 | \$1,046,986 | \$617,491 | \$617,491 | \$2,281,968 |
| Commercial Total | 415 | 333 | \$44,492,040 | \$92,952,265 | \$92,952,265 | \$230,396,570 |
| Government | | | | | | |
| City Property | 3 | 0 | \$0 | \$0 | \$0 | \$0 |
| Civic | 24 | 0 | \$0 | \$0 | \$0 | \$0 |
| Government Total | 27 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | | | | | | |
| Open Space | 4 | 1 | \$0 | \$0 | \$0 | \$0 |
| Park Land | 17 | 1 | \$131,866 | \$237,303 | \$237,303 | \$606,472 |
| (blank) | 5 | 1 | \$163,816 | \$134,562 | \$134,562 | \$432,940 |
| Open Space / Rural Lands Total | 26 | 2 | \$295,682 | \$371,865 | \$371,865 | \$1,039,412 |
| Residential | | | | | | |
| High Density Residential | 1 | 1 | \$101,219 | \$172,421 | \$86,211 | \$359,851 |
| High Density Residential | 180 | 161 | \$12,748,658 | \$27,305,145 | \$13,652,573 | \$53,706,376 |

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|----------------------------|--------------------|-----------------------|----------------------|--------------------------|--------------------------|----------------------|
| Low Density Residential | 1,270 | 1,103 | \$66,468,656 | \$134,235,239 | \$67,117,620 | \$267,821,515 |
| Medium Density Residential | 445 | 381 | \$26,069,821 | \$44,405,853 | \$22,202,927 | \$92,678,601 |
| Resort Residential | 46 | 23 | \$10,761,852 | \$11,757,495 | \$5,878,748 | \$28,398,095 |
| (blank) | 21 | 15 | \$2,109,844 | \$2,431,898 | \$1,215,949 | \$5,757,691 |
| Residential Total | 1,963 | 1,684 | \$118,260,050 | \$220,308,051 | \$110,154,026 | \$448,722,127 |
| | | | | | | |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 | \$680,158,109 |

Source: Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Critical Facilities

For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

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

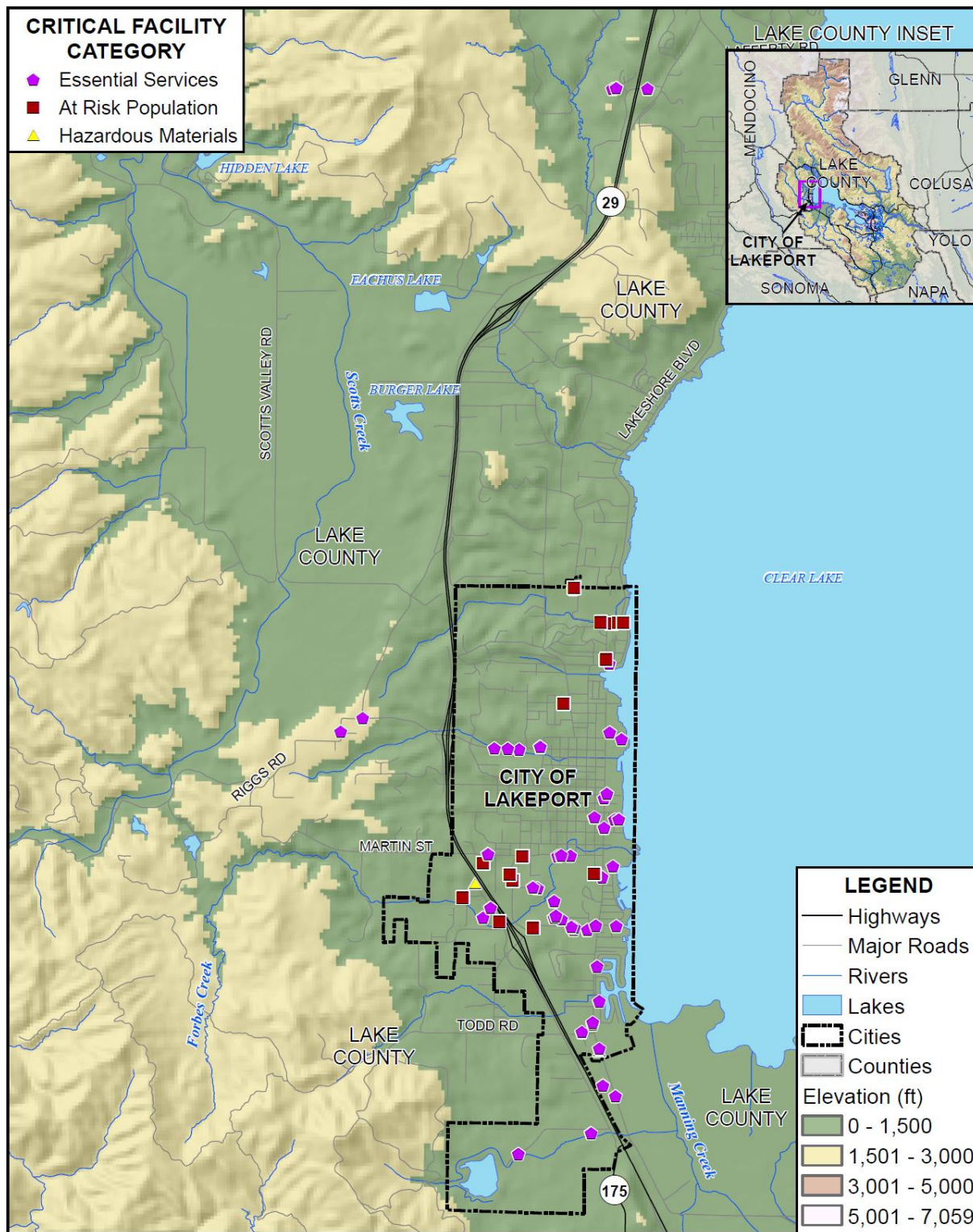
- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
 - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers
 - ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
 - ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.
 - ✓ Designated Emergency Shelters.
 - ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio and other emergency warning systems.
 - ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power and gas).
 - ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.

- ✓ Transportation Lifeline Systems - Airports, helipads, and critical highways, roads, bridges and other transportation infrastructure (Note: Critical highways, roads, etc. will be determined during any hazard-specific evacuation planning and are not identified in this plan).
- **At Risk Population Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release of hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property

A fully detailed list of all critical facilities in the planning area can be found in Appendix E. A summary of critical facilities in the County can be seen on Figure 4-71. A summary of these facilities can be found in Table 4-43.

The HMPC noted that the Bank of America building has been acquired and will be a Senior Center, which will make it a critical facility. It is not currently on the mapped critical facilities below, but it will be considered one in the future. The HMPC also noted that due to the Public Safety Power Shutoffs (described in more detail in Section 4.3.17), all grocery stores and businesses selling perishables would be considered critical facilities in the future during shut off times.

Figure 4-71 City of Lakeport – Critical Facility Inventory



0 1.5 3 Miles



Data Source: City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 5/1/2019.

Table 4-43 City of Lakeport – Critical Facility Inventory by Category

| Critical Facility Category / Jurisdiction | Facility Type | Facility Count |
|---|------------------------------------|----------------|
| City of Lakeport | | |
| Essential Services Facilities | Commerce | 7 |
| | Communications | 2 |
| | Construction - Engineering | 1 |
| | Fire - Rescue | 1 |
| | Government | 6 |
| | Law | 3 |
| | Medical - Clinic | 8 |
| | Pump Stations | 10 |
| | Transportation | 1 |
| | Water Intake | 1 |
| | Water Treatment Plant | 1 |
| | Sewer Treatment Plant | 1 |
| | Senior Activity Center | 1 |
| | Water Storage | 1 |
| | Community Center | 1 |
| | Total | 45 |
| At Risk Population Facilities | Assisted Living | 2 |
| | Child Care | 2 |
| | School | 6 |
| | Senior Apt Complex | 5 |
| | Assisted Living Senior Apt Complex | 1 |
| | Total | 16 |
| Hazardous Materials Facilities | Hazardous Material | 2 |
| | Total | 2 |
| City of Lakeport Total | | 63 |
| Unincorporated Lake County | | |
| Essential Services Facilities | Animal | 1 |
| | Communications | 1 |
| | Law | 1 |
| | Medical - Hospital | 1 |
| | Water Storage | 1 |
| | Water Wells | 1 |
| | Total | 6 |
| Unincorporated Lake County Total | | 6 |

| Critical Facility Category / Jurisdiction | Facility Type | Facility Count |
|---|---------------|----------------|
| | | |
| Grand Total | | 69 |

Source: City of Lakeport GIS

Natural, Historical, and Cultural Resources

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

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The General Plan Conservation Element noted that the City of Lakeport is uniquely situated in an area that is rich in biological resources. There is an abundance of fish in Clear Lake, many species of plant and animals in nearby wetlands and hundreds of acres of oak savannah woodlands. Protecting these valuable resources is essential for maintaining a healthy environment, sustaining the region's tourist industry, and the quality of life of the community. The policies and implementation programs in this element are intended to protect biological resources from development and careless management practices.

The Lakeport region is composed of a variety of plant communities that support a diversity of wildlife species. Each plant community is dependent on special ecological factors within that particular plant community. Micro-habitats occur within each plant community and are generally the result of a unique physical and/or biological factor. Most of the rare, threatened and endangered plants in Lake County occur in micro-habitats such as vernal pools and/or serpentine soils. The habitat types in the vicinity of the City of Lakeport are presented and described below.

- **Shoreline** - The remaining undeveloped portions of the Clear Lake shoreline are composed of marsh and riparian habitat that supports a diverse and abundant variety of fish and wildlife. Wildlife that is common to shoreline areas includes a variety of ducks, herons, grebes, egrets, ospreys and furbearing mammals. Large populations of catfish, crappie, largemouth bass, carp and hitch are found in Clear Lake along the shores. A majority of the wetland habitat located along the Clear Lake shoreline has been lost to urban and agricultural development.
- **Riparian Area** – Riparian areas occur along the banks or edges of rivers or creeks, and typically include tree species such as willows, maple, cottonwood, and alder, with an understory of shrubs and vines. Riparian areas provide cover and nesting habitat for a variety of birds. Riparian areas generally act as a movement corridor where many wildlife species migrate or disperse into other habitats to forage for

food or to carry out a distinct part of its life cycle. Much of the sediments being deposited in Clear Lake are filtered out by vegetation, marshes and creek-bank structures. Changing the course of streams and altering vegetation along their banks can result in changes to the natural hydrologic processes.

- **Oak Woodlands** – Oak woodlands occur in inland valleys and foothills usually with a hard pan or rocky soil between 4 and 20 feet deep. Some of the dominant plants in an oak woodland include blue oak, coast live oak, interior live oak, and foothill pine, with manzanita, coffeeberry, redberry, currant, gooseberry, and toyon to a lesser extent. Annual goldfields, poppies, lupines, and other forbs are commonly found in the spring in this plant community. Oak woodlands support many large mammals including blacktail deer, mountain lion, black bear, coyote, bobcat and grey fox. Small mammals include the grey squirrel, California ground squirrel, and a variety of mice. Birds include turkey vultures, eagles, hawks, owls, quail, mourning dove, mockingbird, scrub jay, western meadow lark, finches, and sparrows.
- **Chaparral** – Chaparral communities occur in the inland foothills on dry slopes and ridges with shallow soils and are often found on serpentine soils. Common plants found in chaparral communities include ceanothus, manzanita, hollyleaf cherry, chamise, scrub oak, birchleaf mountain-mahogany, and red shank. Chaparral communities provide habitat for various kinds of snakes and lizards, as well as many birds and mammals along the chaparral/oak woodland ecotone.
- **Agricultural Land** – Agricultural land that is actively tilled and intensively managed for long durations is generally low in plant and animal diversity due to the marginal habitat qualities that they provide. Small mammals that can commonly be found in agricultural land include pocket gophers, deer mouse, and California ground squirrel, among others. Small mammals are the main food source for raptors such as red-tailed hawk, red-shouldered hawk, American kestrel, and barn owl, and for large mammals such as coyote, raccoon, striped skunk, and opossum. Common birds found in agricultural land include western scrub jay, American crow, house finch, killdeer, and European starling among others. The disturbed field margins of agricultural lands are located along the perimeter of fields. Plant diversity in this habitat type is higher compared to agricultural land, as this area is generally not regularly managed. Plants that can commonly be found in disturbed field margins include mustards, filarees, clovers, wild oats, bromes, foxtail barley, Italian ryegrass, and fiddle-neck among others. Wildlife in disturbed field margins is generally similar to that of active agricultural areas.
- **Urban** – Urban areas consist of structures, roads, and parking areas. The plant diversity in this type of habitat is generally low and is composed of primarily of ornamental landscaping plants as well as plants commonly found along disturbed field margins. Wildlife in the area is very limited as food sources are scarce. Wildlife that is commonly found in these areas is similar to those found in agricultural and disturbed areas although they are less abundant and are generally passing through rather than occupying the area.

Wetlands: Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital, and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Natural site features such as wetlands with native plants and hydric soils have long disappeared and they no longer can function as they should. Landowners are encouraged to plant native plants on their property. These plants will assist with absorption and filtration of water. They will help to hold soils to keep erosion and siltation from occurring in the waterway. Landowners are also encouraged to remove any obstructions which might restrict water conveyance during high water events.

The National Wetlands inventory indicates that small wetland areas are located within the City. Wetlands in Lakeport are shown in Figure 4-72 and detailed in Table 4-44.

[illegible]

Table 4-44 City of Lakeport – Wetlands Area Types, Counts, and Acreages

| Wetlands Area Type | Wetlands Count | Wetlands Area (in Acres) |
|-----------------------------------|----------------|--------------------------|
| Freshwater Emergent Wetland | 6 | 22 |
| Freshwater Forested/Shrub Wetland | 2 | 3 |
| Freshwater Pond | 5 | 13 |
| Lake | 2 | 55 |
| Riverine | 13 | 14 |
| City of Lakeport Total | 28 | 107 |

Source: US Fish and Wildlife Service, May 2017, Lake County GIS

Critical Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the City. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

There are many federal endangered, threatened, or candidate species in or near Lakeport. The California Natural Diversity Database was searched for listed species. The quad that contains the City of Lakeport contained 34 species. These species are listed in Table 4-45.

Table 4-45 City of Lakeport – Threatened and Endangered Species

| Scientific Name | Common Name | Federal Status | State Status | CDFW Status | CA Rare Plant Rank |
|---------------------------------|---------------------------|----------------|----------------------|-------------|--------------------|
| Animals - Birds | | | | | |
| <i>Elanus leucurus</i> | white-tailed kite | None | None | FP | – |
| <i>Haliaeetus leucocephalus</i> | bald eagle | Delisted | Endangered | FP | – |
| <i>Ardea alba</i> | great egret | None | None | – | – |
| <i>Ardea herodias</i> | great blue heron | None | None | – | – |
| <i>Egretta thula</i> | snowy egret | None | None | – | – |
| <i>Nycticorax nycticorax</i> | black-crowned night heron | None | None | – | – |
| <i>Agelaius tricolor</i> | tricolored blackbird | None | Candidate Endangered | SSC | – |
| <i>Pandion haliaetus</i> | osprey | None | None | WL | – |
| <i>Phalacrocorax auritus</i> | double-crested cormorant | None | None | WL | – |

| Scientific Name | Common Name | Federal Status | State Status | CDFW Status | CA Rare Plant Rank |
|--|---------------------------------------|----------------|--------------|-------------|--------------------|
| Animals - Fish | | | | | |
| <i>Archoplites interruptus</i> | Sacramento perch | None | None | SSC | – |
| <i>Lavinia exilicauda chi</i> | Clear Lake hitch | None | Threatened | – | – |
| Animals - Insects | | | | | |
| <i>Andrena blennospermatis</i> | Blennosperma vernal pool andrenid bee | None | None | – | – |
| <i>Bombus occidentalis</i> | western bumble bee | None | None | – | – |
| <i>Dubiraphia brunnescens</i> | brownish dubiraphian riffle beetle | None | None | – | – |
| Animals - Mammals | | | | | |
| <i>Pekania pennanti</i> | fisher - West Coast DPS | None | Threatened | SSC | – |
| <i>Taxidea taxus</i> | American badger | None | None | SSC | – |
| Animals - Reptiles | | | | | |
| <i>Emys marmorata</i> | western pond turtle | None | None | SSC | – |
| Community - Terrestrial | | | | | |
| Coastal and Valley Freshwater Marsh | Coastal and Valley Freshwater Marsh | None | None | – | – |
| Plants - Vascular | | | | | |
| <i>Layia septentrionalis</i> | Colusa layia | None | None | – | 1B.2 |
| <i>Tracyina rostrata</i> | beaked tracyina | None | None | – | 1B.2 |
| <i>Amsinckia lunaris</i> | bent-flowered fiddleneck | None | None | – | 1B.2 |
| <i>Cryptantha dissita</i> | serpentine cryptantha | None | None | – | 1B.2 |
| <i>Plagiobothrys lithocaryus</i> | Mayacamas popcornflower | None | None | – | 1A |
| <i>Brasenia schreberi</i> | watershield | None | None | – | 2B.3 |
| <i>Arctostaphylos manzanita ssp. elegans</i> | Konocti manzanita | None | None | – | 1B.3 |
| <i>Astragalus breweri</i> | Brewer's milk-vetch | None | None | – | 4.2 |
| <i>Fritillaria purdyi</i> | Purdy's fritillary | None | None | – | 4.3 |
| <i>Hesperolinon adenophyllum</i> | glandular western flax | None | None | – | 1B.2 |
| <i>Clarkia gracilis ssp. tracyi</i> | Tracy's clarkia | None | None | – | 4.2 |
| <i>Erythranthe nudata</i> | bare monkeyflower | None | None | – | 4.3 |
| <i>Antirrhinum virga</i> | twig-like snapdragon | None | None | – | 4.3 |
| <i>Leptosiphon acicularis</i> | bristly leptosiphon | None | None | – | 4.2 |
| <i>Leptosiphon latisectus</i> | broad-lobed leptosiphon | None | None | – | 4.3 |
| <i>Ranunculus lobbii</i> | Lobb's aquatic buttercup | None | None | – | 4.2 |

Source: California Natural Diversity Database

Legend: CDFW: WL – Watch List; SSC – Species of Special Concern; FP – Fully Protected

Legend: CA Rare Plant Rank:

- 1A Plants presumed extinct in California and rare/extinct elsewhere
- 1B.1 Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California
- 1B.2 Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California
- 1B.3 Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California
- 2A Plants presumed extirpated in California, but more common elsewhere
- 2B.1 Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California
- 2B.2 Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California
- 2B.3 Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California
- 3.1 Plants about which we need more information; seriously threatened in California
- 3.2 Plants about which we need more information; fairly threatened in California
- 3.3 Plants about which we need more information; not very threatened in California
- 4.1 Plants of limited distribution; seriously threatened in California
- 4.2 Plants of limited distribution; fairly threatened in California
- 4.3 Plants of limited distribution; not very threatened in California

Historical and Cultural Resources

Lakeport has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements.

- The **National Register of Historic Places** is the nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.
- The **California Register of Historical Resources** program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance and identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act. The Register is the authoritative guide to the state's significant historical and archeological resources.
- **California Historical Landmarks** are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Landmarks #770 and above are automatically listed in the California Register of Historical Resources.
- **California Points of Historical Interest** are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register.

Historical resources included in the programs above are identified in Table 4-46.

Table 4-46 City of Lakeport – Historic Properties

| Resource Name (Plaque Number) | National Register | State Landmark | Point of Interest | Date Listed | City |
|---|-------------------|----------------|-------------------|-------------|------------|
| Lake County Courthouse (N59) | X | | | 10/28/1970 | Lakeport |
| Lakeport Carnegie Library (N2406) | X | | | 4/10/2008 | Lakeport |
| Old Lake County Courthouse (897) | | X | | 6/16/1976 | Lakeport |
| St. Helena Toll Road and Bull Trail (467) | | X | | 8/30/1950 | Middletown |
| St. John's Episcopal Church (P679) | | | X | 11/28/1986 | Lakeport |

Source: California Office of Historic Preservation

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability. Information from the 2014 City of Lakeport Housing Element, City of Lakeport General Plan Land Use Element, the US Census Bureau, and the California Department of Finance (DOF) form the basis of this discussion.

Past Growth and Current Population

As shown in Table 4-47, there has been slow and uneven growth. The California Department of Finance estimated the 2018 population to be 5,134, an increase of 381 over the 2010 population.

Table 4-47 City of Lakeport – Past and Current Populations

| Year | Population | Population Change |
|------|------------|-------------------|
| 1990 | 4,390 | – |
| 2000 | 4,820 | 430 |
| 2010 | 4,753 | -67 |
| 2018 | 5,134 | 381 |

Source: City of Lakeport 2014 Housing Element, California Department of Finance

Future Populations

The City of Lakeport General Plan 2025 Urban Boundary Element note that the number of residential, commercial and industrial acres needed in the City of Lakeport through 2025 is based on population projections through 2025 and an analysis of vacant and under-utilized lands currently within the City limits. By 2025, the population of Lakeport is estimated to be approximately 6,859 (*as shown in Table 4-48),

with a total of 156 acres of residential land needed, 22 acres of commercial land needed and 45 acres of industrial land needed. Most of the projected land needed can be found in existing vacant infill areas within the City.

Table 4-48 City of Lakeport – Future Population Estimates

| Date | 2020 | 2025 |
|------------|-------|-------|
| Population | 6,380 | 6,859 |

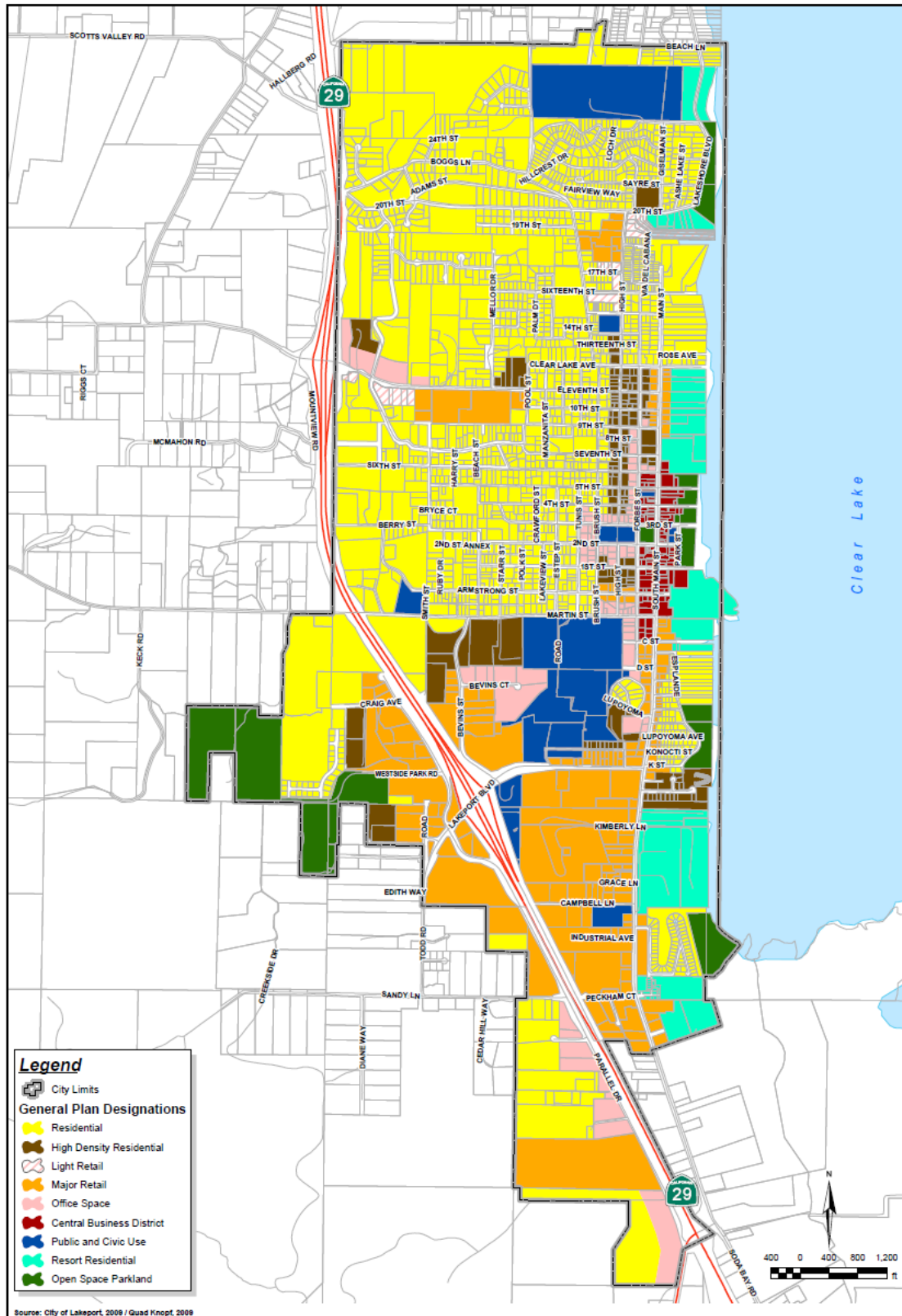
Source: 2025 City of Lakeport General Plan Urban Boundary Element

Future Land Use

Future land use is detailed in the General Plan Land Use Element. The Future Land Use and Growth Plan is an important planning tool for the City to manage the type, pattern, and scale of future development. The plan is to be used to guide decisions relating to zone change requests. The plan will also be used to determine the requisite transportation improvements and capacity requirements for the water and wastewater systems and other public facility and service provisions.

Existing land use information is essential to an understanding of current development patterns and acreages devoted to particular land uses. Existing land use information and a vacant and underutilized land use inventory for the Lakeport Planning Area was developed by the Lakeport Community Development Department. The information was then entered into a geographic information system at the parcel level, then used for statistical analysis and mapping. The General Plan Land Use Map as shown in Figure 4-73.

Figure 4-73 City of Lakeport – Land Use Diagram



Source: City of Lakeport 2025 General Plan Land Use Element

Vulnerable Populations

The vulnerable populations discussion is based on the following three sources:

- Lake County Climate and Health Profile Report (Lake County CCHPR)
- Cal-DWR Disadvantage Community Mapping Tool
- HMPC Input

Lake County Climate and Health Profile Report

While not specific to the City of Lakeport, the CHPR paints a picture of vulnerable populations in the greater County. Health inequities based on race/ethnicity, income, geography (urban/rural) are widespread today in California. Even without climate change, demographic changes already underway will increase the size of vulnerable populations in California in the coming decades. The population is aging, and the share of individuals aged 65 or more years will increase from 13 percent in 2010 to 19 percent in 2050.28 In many California communities, racial and ethnic minorities constitute the majority of residents.

In 2010, the age-adjusted death rate in Lake County was higher than as the state average. Disparities in death rates among race/ethnicity groups highlight how certain populations disproportionately experience health impacts. Within the county, the highest death rate occurred among African Americans and the lowest death rate occurred among Hispanics/Latinos.

In 2012, nearly 46% of adults (59,511; pooled for Mendocino and Lake Counties) reported one or more chronic health conditions including heart disease, diabetes, asthma, severe mental stress or high blood pressure. In 2012, 17% of adults reported having been diagnosed with asthma. In 2012, approximately 26% of adults were obese (statewide average was 25%). In 2012, nearly 20% of residents aged 5 years and older had a mental or physical disability (statewide average was 10%).

In 2005-2010, there was an annual average of 13 heat-related emergency room visits and an age-adjusted rate of 20 emergency room visits per 100,000 persons (the statewide age-adjusted rate was 10 emergency room visits per 100,000 persons).

Among climate-vulnerable groups in 2010 were 3,633 children under the age of 5 years and 11,440 adults aged 65 years and older. In 2010, there were approximately 1,085 people living in nursing homes, dormitories, and other group quarters where institutional authorities would need to provide transportation in the event of emergencies.

Social and demographic factors and inequities affect individual and community vulnerability to the health impacts of climate change. In 2010, 3% of households (813) did not have a household member 14 years or older who spoke English proficiently (called linguistically isolated; statewide average was 10%). In 2010, approximately 14% of adults aged 25 years and older had less than a high school education (statewide average was 19%). In 2010, 19% of the population had incomes below the poverty level (the statewide average was 14%).

Twenty-two percent of households paid 50% or more of their annual income on rent or a home mortgage (statewide average was 22%). In 2012, approximately 9,000 (42%) low-income residents reported they did

not have reliable access to a sufficient amount of affordable, nutritious food (called food insecurity; statewide average was 42%). In 2010, Lake County had approximately 2,473 outdoor workers whose occupation increased their risk of heat illness. In 2010, roughly six percent of households did not own a vehicle that could be used for evacuation (statewide average was 8%).

In 2009, approximately 37% of households were estimated to lack air conditioning, a strategy to counter adverse effects of heat (statewide average was 36%). In 2011, tree canopy, which provides shade and other environmental benefits, was present on 18% of the county's land area (statewide average was 8%).

Social capital is embedded in social relationships and networks and refers to the existence of trust and mutual aid among the members of society. These relationships are important in building resilience when confronted with extreme climates. There is evidence that populations with higher levels of political participation also have greater social capital. Sixty-six percent of registered voters voted in the 2010 general election (statewide average was 58%).

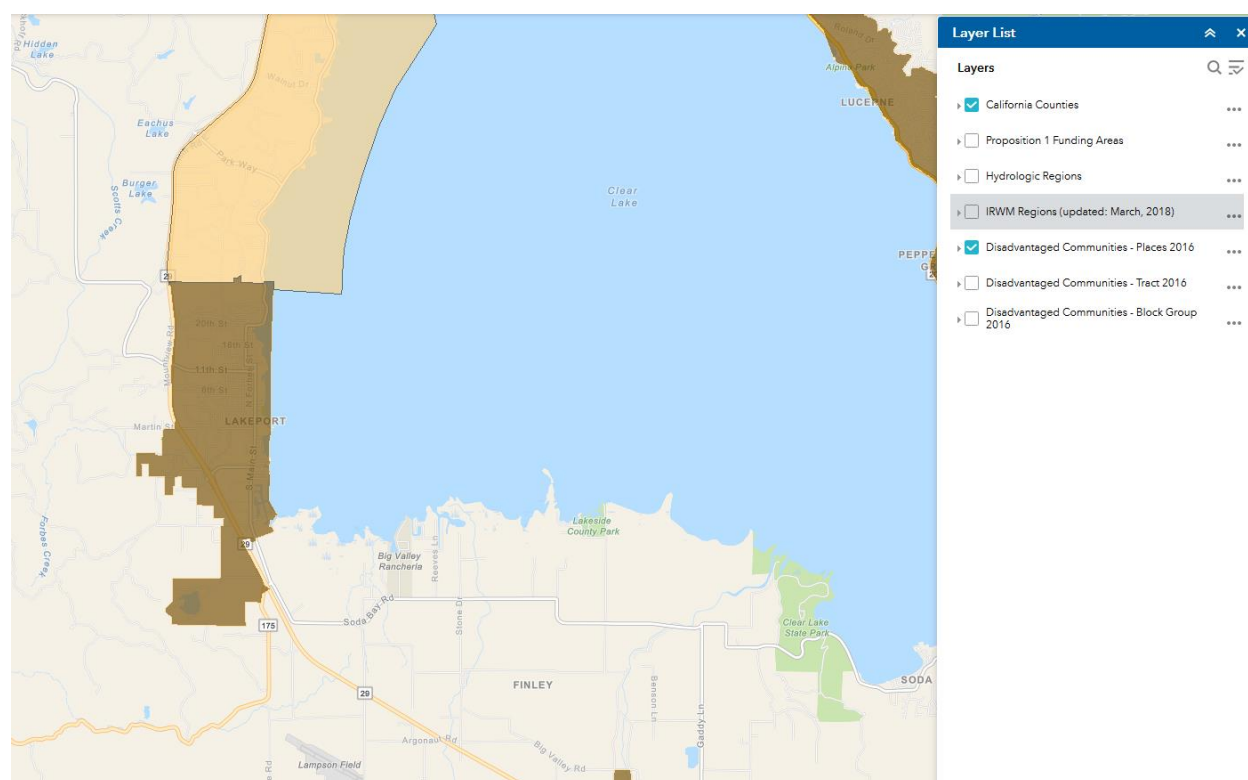
Natural disasters worsened by climate change increase the displacement of victims, which in turn increases population densities and tensions over resources. Violent crime also increases during heat events. Safe neighborhoods that are free of crime and violence are an integral component of healthy neighborhoods and community resilience. In 2010, Lake County experienced approximately 5 violent crimes per 1,000 residents (statewide rate was 4 per 1,000 residents).

These findings highlight specific populations that are most susceptible to health risks, as well as the social determinants of health and adaptive capacity that contributes to resilience or conversely intensifies the impacts from climate change.

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in and around Lakeport considered disadvantaged are shown in Figure 4-74.

Figure 4-74 City of Lakeport Disadvantaged Areas



Source: Cal DWR DAC Mapping Tool – Map Date 1/7/2019

HMPC Input

The HMPC noted issues with vulnerable populations, particularly after the Valley Fire. It was noted that there was a shortage of available housing stock. Rents increased greatly, though this was also tied to the improvements to the economy. The HMPC noted that the Forbes Creek area is extremely disadvantaged. The HMPC noted that homeless always an issue.

Some of these issues are exacerbated by the flooding. Old Lakefront hotels/resorts were turned into low income/mobile home parks which flood. During the floods of 2017 – large vulnerable populations were affected. For example, the Will-O-Point area is low income area that is predominantly Spanish speaking. During the floods, it took multiple boat trips to evacuate the community. The City found housing for them. Once relocated, the City provided busing to get them to their schools. Flood mitigation design for this area was looked at in this Plan for overall neighborhood improvements.

Future Development

In addition to the population increases, the City has planned areas for future growth. These areas have been mapped and are discussed below.

Future Development GIS Analysis

Using GIS, the following methodology was used in determining parcel counts and values associated with future development in the City of Lakeport Planning Area.

Lake County's 10/30/2018 Assessor Data and the County's GIS parcel data were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the City. This data provides the land and improved values assessed for each parcel. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Lakeport and Lake County to support citywide mapping and analysis of assets at risk. In this analysis, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point containing the assessor's data. In addition, Lake County provided a table containing the assessor parcel numbers (APNs) for the 97 parcels. Using the GIS parcel spatial file and the APNs, the 97 parcels associated with future development projects for which the analysis was to be performed was identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area.

These areas can be seen on Figure 4-75, and detailed information can be found on Table 4-49.

[illegible]

Table 4-49 City of Lakeport – Future Development Projects Overview by Parcels and Acres

| Future Development Project/Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| Future Commercial Infill - Central | 5 | 1 | 20 |
| Future Commercial Infill - Citywide | 7 | 2 | 32 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 3 | 1 | 9 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 7 | 0 | 59 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| Tribal Health Future Development | 8 | 2 | 18 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 50 | 43 | 124 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: City of Lakeport, Lake County GIS

4.3.2. Lakeport's Vulnerability to Specific Hazards

The Disaster Mitigation Act regulations require that the HMPC evaluate the risk and vulnerability associated with priority hazards identified in the planning process. This section summarizes the possible impacts and quantifies, where data permits, the City's vulnerability to each of the hazards identified as a priority hazard in Section 4.2.20 Natural Hazards Summary. Where specific hazards vary across the City Planning Area, additional information can be found in the jurisdictional annexes. The priority hazards evaluated further as part of this vulnerability assessment include:

- Aquatic Biological Hazards: cyanobacterial bloom
- Aquatic Biological Hazards: quagga mussel
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Earthquake (major/minor)
- Flood: 1%/0.2% Annual Chance
- Flood: Localized/Stormwater
- Hazardous Materials Transport

- Landslide and Debris Flows
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains, Snow, and Storms
- Severe Weather: High Winds
- Wildfire
- Wildfire

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of likelihood of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of City critical facilities, historic structures, and valued natural resources (e.g., an identified wetland or endangered species habitat). Together, this information conveys the impact, or vulnerability, of an area to that hazard.

The HMPC identified six hazards in the City for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These six hazards are dam failure, earthquake, flood, hazardous materials transport, landslide, and wildfire. Because these hazards have discrete hazard risk areas, their risk varies throughout the City. For dam failure, flood, hazardous materials transport, landslide, and wildfire, the HMPC inventoried the following, to the extent possible, to quantify vulnerability in identified hazard areas:

- General hazard-related impacts, including impacts to life, safety, health, and property
- Values at risk (i.e., types, numbers, and value of land and improvements)
- Population at risk
- Critical facilities at risk
- Overall community impact
- Future development/redevelopment trends within the identified hazard area

HMPC used FEMA's loss estimation software, HAZUS-MH, to analyze the City's vulnerability to earthquakes.

The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analysis are discussed here in more general terms. A separate vulnerability assessment was completed for the LFPD, and is included in their annex to this Plan.

4.3.3. Aquatic Biological Hazards: Cyanobacterial Bloom Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

The protection and enhancement of City water resources are important for recreation, agriculture and domestic supply purposes. Pollution to surface and groundwater resources creates a major hazard to public and environmental health. Lakeport and the greater Lake County face a wide array of potential water quality problems. Septic tanks used in areas with high groundwater may contaminate wells and Clear Lake water. Failure of these onsite waste disposal systems has resulted in leakage to Clear Lake in the past. In addition, heavy winter rains or lake level above 7.56' Rumsey result can result in overflows from wastewater treatment facilities or from manholes along the lake below that level. Loss of electric power would further result in failure of lift stations to transport raw sewage to the treatment plants. While some stations have backup generators, not all lift stations are equipped for power failures.

Fertilizer and pesticide runoff from agricultural areas can contaminate waters by entering surface water bodies and percolating to the groundwater. Extraction of gravel and sand from creek beds may decrease the size of natural water recharge areas. Naturally occurring soil erosion produces sedimentation into the lake. Besides being a pollutant in its own right, sediment acts as a transport medium to other pollutants, especially nutrients, pesticides and heavy metals, which absorb to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality. Clear Lake water quality suffers from high naturally occurring sedimentation. Another source of contamination comes from mercury infiltration from an abandoned quicksilver mine in the Clearlake Oaks area.

Many of these sources of pollutants contribute to cyanobacterial bloom. Many of these pollutants have contributed to the cyanobacterial bloom problems within Clear Lake. The growth of blue-green algae can cause considerable degradation of the lake shore and surface environment during summer and fall. Algal problems are typically most serious at the eastern end of Clear Lake where prevailing winds can push floating algae into huge rotting mats that produce strong odors. Erosion of sediments from the upper watershed carries nutrients that contribute to algal growth.

Cyanobacteria can produce toxins that can be harmful for animals and people when consumed at high levels. There are several ways that cyanobacteria can be harmful to humans or pets. Coming into contact with water through skin, by ingestion or swallowing, or even breathing in aerosolized water, such as from a sprinkler or spray from a boat motor, are all potential pathways to exposure. People whose skin comes in contact with toxins from swimming or other water-related activities may experience itching, rash, blisters, irritated eyes, sore throat, or hay fever-like symptoms. These effects may be caused by a person's sensitivity

(allergy) to the components of the cyanobacteria rather than the toxin. Some preexisting health conditions can exasperate and enhance responses to toxins, so be extra vigilant before going in the water. Ingestion of cyanobacteria/ cyanotoxin can cause nausea, vomiting, headache, fever, loss of appetite, and diarrhea, but these symptoms are typical of many common diseases, and it may not be possible to determine whether a given illness is caused by a cyanotoxin exposure. It is important to exercise caution by avoiding contact with any visible blooms, algal mats or scum. Local residents along the impacted City of Lakeport shoreline have reported severe odors as well as nonspecific ocular irritation and hayfever-like symptoms.

Utilities can be affected in the future with more taste and odor issues. The HMPC noted that to date, the City has never had a level that can't be treated to a "no detect" level for delivered water. Treatment costs are increased during times of cyanobacterial bloom. The HMPC also noted that there is no mutual aid agreement with the groundwater suppliers in Lake County to provide water to the 20,000 people that rely on the water from Clear Lake. Cyanobacterial bloom could leave a large portion of the County with limited water supplies. There is a mutual aid agreement in process to provide the drinking water and water for fire suppression efforts.

The HMPC noted that reduced tourism and associate economic impacts are the biggest impact. Generally speaking, test sites in Lakeport are among the lowest in toxicity levels of other test locations. The last test within the Lakeport test site that was above actionable levels was back in 2014.

Future Development

Continued widespread and persistent cyanobacterial blooms may adversely affect lakeside property values and the desirability to visit and recreate at Clear Lake. Non-native aquatic vegetation has been demonstrated to adversely affect real estate values of shoreline property in the County, and in Lakeport. Future development could be impacted by cyanobacteria bloom by damaging Clear Lake, thereby negatively impacting tourism including boating and fishing.

4.3.4. Aquatic Biological Hazards: Quagga Mussels

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

Quagga and zebra mussels are an invasive, non-native species that breed very fast, have no known predators, and can quickly colonize new areas within California waters. Once established, these mussels can clog water intake and delivery pipes; dam intake gates and pipes; adhere to boats, pilings, and most hard and some soft substrates, and litter beaches and shores with jagged, foul smelling shells.

The most serious measurable economic impacts are suffered by water districts and other users of lake water who may have increased maintenance costs due to plugged water pipes, intake screens, and possible damage to pumps and other equipment. It even impacts citizens who don't use the lakes through increased costs for drinking water and food prices passed along to consumers by the water and agriculture industries brought on by their increased costs in maintenance and equipment repair. It impacts the local fisheries, and in some lakes, has caused a collapse in the populations of sport fish.

These mussels have the ability to tolerate a wide range of conditions and are extremely adaptable. Once they have infected a water body, they cannot be eradicated. They have no predators native to the US. They cannot be prevented from spreading into downstream waters. Should quagga mussels reach Lake County and Clear Lake, the economic impacts would be substantial to all Clear Lake communities.

The HMPC noted that live mussels have been found on vessels in the County but not necessarily in Clear Lake. The County has an active program to screen all trailered water vessels. In addition, all watercraft launched in Lake County must display a current Lake County mussel sticker as proof of screening. This is in addition to the State DMV sticker that is proof of the State's mussel fee payment.

Future Development

With regards to the quagga and zebra mussels, public education and monitoring programs must continue into the future (and possibly expand) so this hazard can continue to be prevented in Clear Lake. Since tourism is a large part of the local economy, should Clear Lake become infested, future development in the City may be adversely affected.

4.3.5. Climate Change Vulnerability Assessment

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

City of Lakeport Climate Change Impacts

The discussion on impacts to Lakeport and Lake County come from four sources:

- Lake County Climate Change and Health Profile Report
- California Adaptation Planning Guide
- Proceedings of the National Academy of Sciences

Lake County Climate Change and Health Profile Report Impacts

According to the Lake County CCHPR, all Californians are vulnerable to the health impacts of climate change. Even if one is fortunate to live, work, study, or play in a place without direct contact with wildfires, flooding, or sea level rise, no one can entirely avoid excessive heat or the indirect effects of extreme weather events. Based on medical reviews of individuals who died during heat waves and other extreme weather events, those who are particularly vulnerable to the direct effects of climate change include the very old and very young, individuals who have chronic medical conditions and psychiatric illness, people taking multiple medications, people without means for evacuation (no access to public transit or private cars), people who are socially isolated, medically fragile people, and people living in institutions. Acclimatization to heat may help reduce risks from heat waves in the healthy general population, but may not be sufficient to protect those with underlying medical conditions.

Researchers have examined the pathways in which increased temperatures and hydrologic extremes can impact health and generally recognize three main pathways: direct exposures, indirect exposures, and socioeconomic disruption. Based on the review of weather-related natural disasters and historical patterns

and scientific judgment, public health researchers have suggested the nature and direction of health harms or benefits.

- **Extreme Weather-Related Injury, Mental Health, and Displacement** **Extreme weather events (storms, flooding)** – These events can cause fatal and nonfatal injuries from drowning, being struck by objects, fire, explosions, electrocution, or exposure to toxic materials. A widespread weather-related natural disaster may destroy or ruin housing, schools and businesses and cause temporary or permanent displacement. Individuals and families may experience post-traumatic stress, depression, and increased risk of suicide.
- **Vector-borne Illnesses** – Climatic changes alter the range, biogeography, and growth of microbes and the vectors of food, water, and vector-borne illnesses. This includes the changes in aquatic environments that could increase harmful algal blooms and lead to increases in foodborne and waterborne illnesses.
- **Food Insecurity** – Climate change is expected to have global impacts on food production and distribution systems. This can cause food prices to increase, which makes food less affordable and increases food insecurity, obesity, and malnutrition in economically constrained households.
- **Sea Level Rise, Mold, and Indoor Air Quality** – Through sea level rise, saltwater may intrude into coastal aquifers thus reducing quality and quantity of water supply. Coastal erosion can contribute to the loss of recreational venues and pose a variety of hazards to infrastructure and public safety. Water intrusion into buildings can result in mold contamination leading to indoor air quality problems.
- **Socioeconomic Disruption** – Widespread social and economic disruption includes damage to the infrastructure for the delivery of health services and for general economic well-being. Health care facilities, water treatment plants, and roads for emergency responders and transportation for health care personnel can be damaged in climate-related extreme weather events. Increased burden of disease and injury will test the surge capacity of health care facilities. Economic disruption can lead to income loss, income insecurity, food insecurity, housing insecurity, and mental health problems, which in turn may increase substance abuse, suicide and other health problems. Energy production and distribution is also threatened by heat and wildfires through loss of efficiency, generating capacity, and fires disrupting transmission lines. California's ports that provide the gateway to goods for California, national, and international markets are at risk from sea level rise and coastal storms.

In addition to the bulleted points above, drought, extreme heat, and wildfire are also exacerbated by climate change. This will be discussed further in Section 4.3.7 (Drought), Section 4.3.13 (Extreme Heat), and Section 4.3.17 (Wildfire). All Californians are vulnerable to the health impacts of climate change. Even if one is fortunate to live, work, study, or play in a place without direct contact with wildfires, flooding, or sea level rise, no one can entirely avoid excessive heat or the indirect effects of extreme weather events.

California Adaptation Planning Guide Impacts

The California Adaptation Planning Guide (APG) prepared by California OES and CNRA was developed to provide guidance and support for local governments and regional collaboratives to address the unavoidable consequences of climate change.

The APG: Defining Local and Regional Impacts focuses on understanding the ways in which climate change can affect a community. According to this APG, climate change impacts (temperature, precipitation, sea level rise, ocean acidification, and wind) affect a wide range of community structures,

functions and populations in the City of Lakeport. These impacts further defined by regional and local characteristics are discussed by secondary impacts and seven sectors found in local communities: Public Health, Socioeconomic, and equity impacts; Ocean and Coastal Resources; Water Management; Forest and Rangeland; Biodiversity and Habitat; Agriculture; and Infrastructure.

The APG: Understanding Regional Characteristics identified the following impacts specific to the North Coast region in which the City of Lakeport is part of:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increase wildfire

California's Adaptation Guide: Understanding Regional Characteristics provides input on adaptation considerations for the North Coast Region. As detailed in this guide, climate change has the potential to disrupt many features that characterize the region, including ecosystems health, snowpack, and the tourist economy. Specific regional impacts include the following:

Agriculture. Each of the products will be affected by climate change differently. Forests will experience changed seasonal patterns that may alter moisture and temperature regimes, both of which may affect growth rates. Further threatening timber production is that temperature and precipitation along with management and invasive species (fuel load) will result in increased fire risk in this region. For wine grapes climate can affect productivity, as well as the quality of the grape for wine production. Lakeport should collaborate closely with local agricultural organizations to best support and prepare for changes in this economic sector.

Ecosystems and Biodiversity. Exacerbated by new development in the region, climate change can cause habitats to shift, creating conditions that stress ecosystems and endemic species. Timber practices, also compounded by climate change, has resulted in forests with trees of similar age, lacking snags and underbrush, further reducing the diversity of the habitat. Continued changes in hydrologic flow regimes and increased temperatures will further stress these systems regional habitats supporting many special-status species.

Snowpack and Flooding. Climate-related decrease in snowpack can have significant consequences on the areas that depend on this water. In addition, a decrease in snowpack can increase impacts from flooding, landslide, and loss of economic base related to a drop in tourism. Recreation and tourism are likely to suffer due to lower water levels in waterways, lakes, and reservoirs and declining snowpack. This can result impacts to hotels, restaurants, and second home development. Increases in flood events can further stress the region and increase flood related impacts and damages.

Water Management. Depending on location, parts of this region are projected to experience between 6 inches and 15 inches less rainfall by 2100. Specifics for Lakeport were not given in this report. Reduced rainfall, combined with reductions in snowpack and existing diversions, could result in an altered flow

regime in the region. This change would be particularly challenging due to its impact on fish, as well as the Clear Lake water level. Reduced flow, altered timing of flows, and periodic extreme events can result in reduced water quality, habitat destruction, and/or isolation of habitats. Lakeport will need to carefully assess local aquatic ecosystems for vulnerability to these changes.

Wildfire. The North Sierra Region is already challenged through past fire suppression combined with the large number of structures that have been built throughout the WUI areas. Climate change is projected to result in large increases in wildfire frequency and size which will further compound the wildfire problem. In addition, potential impacts following fires, such as heavy rains causing landslide and erosion in post-burn areas can have significant consequences on waterways and entire watersheds.

Public Health, Socioeconomic, and Equity Impact. The foothills of the North Sierra Region show higher ozone levels and increased temperatures causing vulnerable populations to be at greater risk to these issues. In addition to the elderly population found in this region, people who work and play outdoors are also vulnerable.

Proceedings of National Academy of Sciences Impacts

In addition to the APG, the HMPC provided a report from the Proceedings of the National Academy of Sciences (PNAS) stating that some of the recent fire impacts may have been attributed to climate change. The PNAS report posits that climate influences wildfire potential primarily by modulating fuel abundance in fuel-limited environments, and by modulating fuel aridity in flammability-limited environments. Increased forest fire activity across the western United States in recent decades has contributed to widespread forest mortality, carbon emissions, periods of degraded air quality, and substantial fire suppression expenditures. Those most vulnerable to high levels of ozone and particulate matter include people who work or spend a lot of time outdoors, such as residents of this region who are employees of the tourist industry. Households eligible for energy utility financial assistance programs are an indicator of potential impacts. These households may be more at risk of not using cooling appliances, such as air conditioning, due to associated energy costs.

Future Development

Lakeport could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. For example, extended drought can have an effect on Clear Lake as well as the agricultural industry in the area surrounding the City. Other interior western states may experience an exodus of population due to challenges in adapting to heat even more extreme than that which is projected to occur here. While there are currently no formal studies of specific migration patterns expected to impact the City and Lake County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Climate change, coupled with shifting demographics and market conditions, could impact both the location of desired developments and the nature of development. Demand may increase for smaller dwellings that are less resource intensive, more energy efficient, easier to maintain and can be more readily adapted or even moved in response to changing conditions. The value of open space and pressure to

preserve it will likely increase, due in part to its restorative, recreational, environmental and habitat benefits but also for its ability to sequester carbon, help mitigate the accumulation of greenhouse gas in the atmosphere and slow down the global warming trend. Higher flood risks, especially if coupled with increased federal flood insurance rates, may decrease market demand for housing and other types of development in floodplains, while increased risk of wildfires may do the same for new developments in the urban-wildland interface. Flood risks may also inspire new development and building codes that elevate structures while maintaining streetscapes and neighborhood characteristics.

Climate change will stress water resources. Water is an issue in every region, but the nature of the potential impacts varies. Drought, related to reduced precipitation, increased evaporation, and increased water loss from plants, is an important issue in many U.S. regions, especially in the West. Floods, water quality problems, and impacts on aquatic ecosystems and species are likely to be amplified by climate change. Declines in mountain snowpack are important in Lake County, the Sierra Nevada Mountains, and across the state, where snowpack provides vital natural water storage and supply. The ability to secure and provide water for new development requires on-going monitoring and assurances. It is recommended that the ability to provide a reliable water supply from the appropriate water purveyor, continue to be in the conditions for project approval, and such assurances shall be verified and in place prior to issuing building permits.

Similarly, protecting and enhancing water supply will also need to be addressed. California's Sustainable Groundwater Management Act (SGMA) will contribute to addressing groundwater and aquifer recharge needs. Good groundwater management will provide a buffer against drought and climate change and contribute to reliable water supplies regardless of weather patterns. California depends on groundwater for a major portion of its annual water supply, and sustainable groundwater management is essential to a reliable and resilient water system. Protection of critical recharge areas should be addressed across the County in the respective Groundwater Management Plans. Further, these plans should include provisions that guide development or curtail development in areas that would harm or compromise recharge areas.

Climate change will affect transportation. The transportation network is vital to the City and the region's economy, safety, and quality of life. While it is widely recognized that emissions from transportation have impacts on climate change, climate will also likely have significant impacts on transportation infrastructure and operations. Examples of specific types of impacts include softening of asphalt roads and warping of railroad rails; damage to roads; flooding of roadways, rail routes, and airports from extreme events; and interruptions to flight plans due to severe weather. Climate change impacts considered in the plan include: extreme temperatures; increased precipitation, runoff and flooding; increased wildfires; and landslides. Although landslides are not a direct result of climate change, these events are expected to increase in frequency due to increased rainfall, runoff, and wildfire. These events have the potential to cause injuries or fatalities, environmental damage, property damage, infrastructure damage, and interruption of operations.

Climate change will affect land uses and planning. Climate change coupled with shifting demographics and market conditions, could impact both the location of desired developments and the nature of development. Demand may increase for smaller dwellings that are less resource intensive, more energy efficient, easier to maintain and can be more readily adapted or even moved in response to changing conditions. The value of open space, urban greening, green infrastructure, tree canopy expansion and

pressure to preserve it will likely increase, due in part to its restorative, recreational, environmental, and habitat, and physical and mental health benefits but also for its ability to sequester carbon and cool the surrounding environment.

Climate change will affect utilities. California is already experiencing impacts from climate change such as an increased number of wildfires, sea level rise and severe drought. Utility efforts to deal with these impacts range from emergency and risk management protocols to new standards for infrastructure design and new resource management techniques. Utilities are just beginning to build additional resilience and redundancy into their infrastructure investments from a climate adaptation perspective, but have been doing so from an overall safety and reliability perspective for decades. Significant efforts are also being made in those areas that overlap with climate change mitigation such as diversification of resources, specifically the addition of more renewables to the portfolio mix, as well as implementation of demand response efforts to curb peak demand. Efforts are also under way to upgrade the distribution grid infrastructure, which should add significant resilience to the grid as well. Next, they will issue a guidance document that expands upon the vulnerability assessments phase and includes plans for resilience solutions including cost/benefit analysis methodologies. The outcomes of this work will help to inform next steps on how infrastructure, the grid and other related operations will be modified to address climate change. New development will have to adapt and incorporate these new approaches as they evolve. Existing and new development will be affected from impacts that include not only diminished capacity from all of the utility assets from generation to transmission and distribution, but also the cost consequences resulting from prevention, replacement, outage, and energy loss. These have the potential for greatly impacting not just residential development but commercial and industrial and all utility users.

Addressing heat events. During heat waves in Lakeport, a heat alert is issued and news organizations are provided with tips on how vulnerable people can protect themselves. Programs used by health departments to engage with thousands of block captains to check on elderly and other vulnerable residents, along with public cooling places extending their hours, or local businesses welcoming residents into their businesses for purposes of staying cool are examples of programs and services that will be necessary. Other programs to consider that could further involve hospitals and clinics are operating a “heatline” with nurses or other healthcare professionals ready to assist callers with heat-related health problems. In addition, continued funding for weatherization, reduced utility rates and similar programs that offers assistance to elderly, low-income residents to install roof insulation, solar, trees and cool surfaces to save energy and lower indoor temperatures.

4.3.6. Dam Failure Vulnerability Assessment

Likelihood of Future Occurrence—Unlikely

Vulnerability—Medium

Dam failure flooding can occur as the result of partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions.

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. Based on the risk assessment, it is apparent that a major dam failure could have a devastating impact on the Planning Area. Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies. Impacts from dam failure flooding include property damage, critical facility damage, infrastructure damage, erosion on creek and river banks, and life safety.

One dam was identified as a dam of concern in the Lakeport area, and its inundation area datasets were obtained from Cal OES. As such, inundation analysis was performed on the following dam:

➤ **Lakeport Wastewater Treatment Plant Dam**

The City of Lakeport Municipal Sewer District (CLMSD) maintains an earthen dam in the south west part of the Planning Area, near the intersection of Highways 29 and 175, for the retention of treated wastewater. The dam stores a total of 650 acre feet of water and has been approved by the State. The possibility of catastrophic collapse of this dam is remote. Should this occur, however, the spill-out would result in a relatively minor inundation that would probably be contained by existing drainage courses, with a low probability of loss of life or property damage.

Values at Risk

Dam inundation layers were available for the dam of concern in the City. Dam inundation areas, as obtained from the City of Lakeport, were used as the basis of this dam inundation analysis. Figure 4-76 shows the dam inundation areas of the Lakeport Wastewater Treatment Plan dam. As shown in Figure 4-76, the Lakeport Wastewater Treatment Plant Dam has two types of mapped inundation area in the City, each with discrete inundation areas:

- North Breach Scenario (Table 4-50)
- East Breach Scenario (Table 4-51)

Figure 4-76 City of Lakeport – Dam Inundation Areas

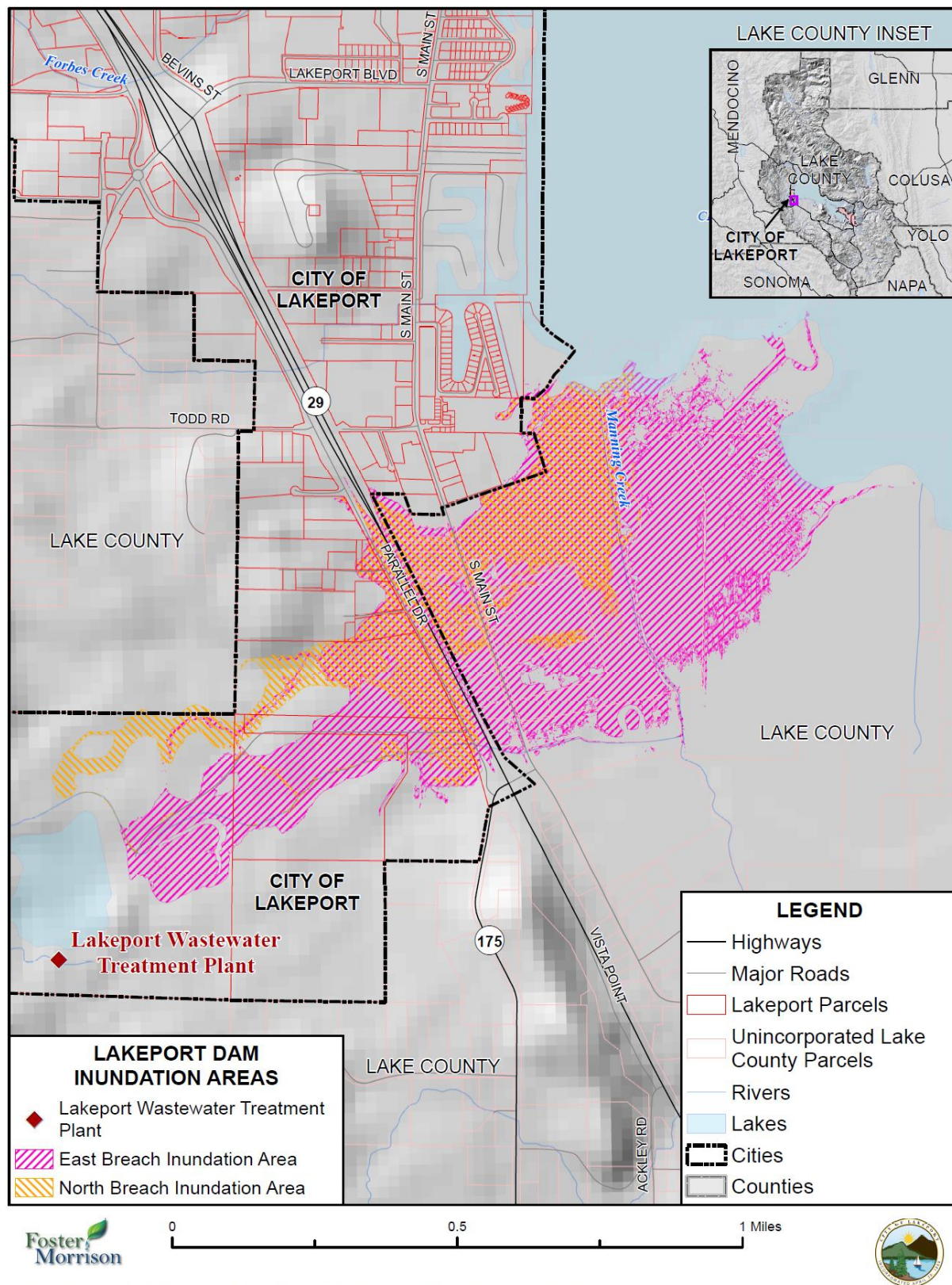


Table 4-50 City of Lakeport – Count and Value of Parcels in Lakeport Wastewater Treatment Plan Inundation Area (North Breach Scenario)

| Dam Inundation Area/ Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--------------------------------------|--------------------|-----------------------|--------------------|--------------------------|--------------------------|--------------------|
| Lakeport WWTP – North Breach | | | | | | |
| Commercial | 7 | 6 | \$2,216,999 | \$748,364 | \$748,364 | \$3,713,727 |
| Government | 2 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 1 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 8 | 7 | \$1,584,997 | \$927,027 | \$463,514 | \$2,975,538 |
| Total | 18 | 13 | \$3,801,996 | \$1,675,391 | \$1,211,878 | \$6,689,265 |

Source: City of Lakeport GIS, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Table 4-51 City of Lakeport – Count and Value of Parcels in Lakeport Wastewater Treatment Plan Inundation Area (East Breach Scenario)

| Dam Inundation Area/ Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--------------------------------------|--------------------|-----------------------|--------------------|--------------------------|--------------------------|--------------------|
| Lakeport WWTP – East Breach | | | | | | |
| Commercial | 8 | 6 | \$2,233,289 | \$748,364 | \$748,364 | \$3,730,017 |
| Government | 2 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 3 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 9 | 7 | \$1,948,096 | \$927,027 | \$463,514 | \$3,338,637 |
| Total | 22 | 13 | \$4,181,385 | \$1,675,391 | \$1,211,878 | \$7,068,654 |

Source: City of Lakeport GIS, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Population at Risk

Those residential parcel centroids that intersect the dam inundation areas for both the north and east breach scenarios were counted and multiplied by the 2010 Census Bureau average household factors for the City of Lakeport (2.31). According to this analysis, there is a total population of 16 residents that reside in Lakeport in the north and east breach scenarios. This is shown in Table 4-52.

Table 4-52 City of Lakeport – Count of Residential Parcels and Population by DFIRM Flood Zone

| Breach Scenario | Improved Residential Parcels | Population |
|-----------------------|------------------------------|------------|
| North Breach Scenario | 7 | 16 |
| East Breach Scenario | 7 | 16 |

Source: FEMA September 30, 2005 DFIRM, US Census Bureau, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the City of Lakeport to determine critical facilities in the dam inundation areas. Using GIS, the dam inundation areas were overlayed on the critical facility GIS layer. Figure 4-77 shows critical facilities, as well as the dam inundation areas. Table 4-53 and Table 4-54 provide information by category of critical facilities in the dam inundation (north and east, respectively) areas. As shown on the table, there is 1 and 3 critical facilities in the Lakeport Wastewater Treatment Plant Dam inundation area north breach and east breach area, respectively. Details of critical facility definition, type, name, and address by dam inundation area are listed in Appendix E.

CRITICAL FACILITY CATEGORY

- Essential Services
- At Risk Population
- Hazardous Materials

LAKEPORT DAM INUNDATION AREAS

- Lakeport Wastewater Treatment Plant
- East Breach Inundation Area
- North Breach Inundation Area

LEGEND

- Highways
- Major Roads
- Lakeport Parcels
- Unincorporated Lake County Parcels
- Rivers
- Lakes
- Cities
- Counties

LAKE COUNTY INSET

Map showing Lake County location relative to surrounding counties: MENDOCINO, GLENN, COLUSA, YOLO, SONOMA, and NAPA. The City of Lakeport is highlighted within Lake County.

Map labels include: HIDDEN LAKE, EACHUS LAKE, BURGER LAKE, Scotts Creek, LAKE COUNTY, CITY OF LAKEPORT, LAKESHORE BLVD, CLEAR LAKE, RIGGS RD, MARTIN ST, TODD RD, Lakeport Wastewater Treatment Plant, Mountain Creek, and Highway markers 29 and 175.

Table 4-53 City of Lakeport – Critical Facilities in Dam Inundation Areas (North Breach)
Detail by Category and Facility Type

| Dam Inundation Area | Critical Facility Category / Critical Facility Type | Facility Count |
|---|---|----------------|
| Lakeport WWTP - North Breach | | |
| Essential Services Facilities | Commerce | 1 |
| | Total | 1 |
| Lakeport WWTP - North Breach Total | | 1 |

Source: Cal OES, City of Lakeport GIS

Table 4-54 City of Lakeport – Critical Facilities in Dam Inundation Areas (East Breach) Detail by Category and Facility Type

| Dam Inundation Area | Critical Facility Category / Critical Facility Type | Facility Count |
|--|---|----------------|
| Lakeport WWTP - East Breach | | |
| Essential Services Facilities | Commerce | 1 |
| | Pump Stations | 1 |
| | Sewer Treatment Plant | 1 |
| | Total | 3 |
| Lakeport WWTP - East Breach Total | | 3 |

Source: Cal OES, City of Lakeport GIS

Overall Community Impact

Dam failure floods and their impacts vary by location and severity of any given dam breach event and will likely only affect certain areas of the City. Based on the risk assessment, it is evident that a dam failure flood could have potentially devastating economic impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in future dam failure events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental health of the community.

Future Development

Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur.

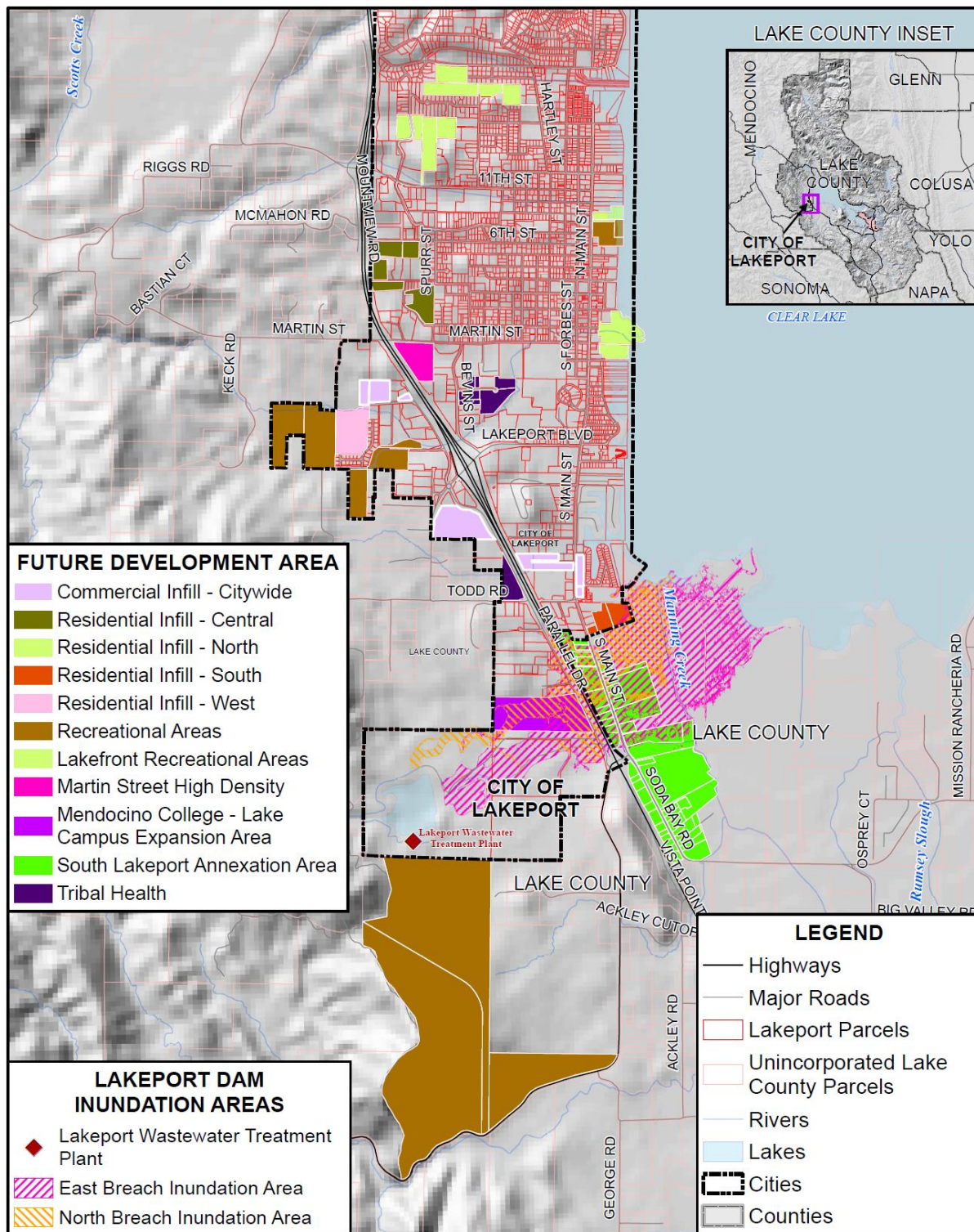
GIS Analysis

Lake County's 10/30/2018 Assessor Data and the County's GIS parcel data were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the City. This data provides the land and improved values assessed for each parcel. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Lakeport and Lake County to support citywide mapping and analysis of assets at risk. In this analysis, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point containing the assessor's data. In addition, Lake County provided a table containing the assessor parcel numbers (APNs) for the 97 parcels. Using the GIS parcel spatial file and the APNs, the 97 parcels associated with future development projects for which the analysis was to be performed was identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area.

Dam inundation areas, as obtained from the City of Lakeport, were used as the basis of this dam inundation analysis. The singular dam of concern to the City is the Wastewater Treatment Plan Dam. It has 2 possible breach scenarios (both of which are shown on Figure 4-78):

- North Breach Scenario (Table 4-55)
- East Breach Scenario (Table 4-56)

Figure 4-78 City of Lakeport – Future Development Areas in Dam Inundation Areas



Data Source: City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.



Table 4-55 City of Lakeport – Future Development in Wastewater Treatment Plant North Breach Dam Inundation Area

| Jurisdiction/Dam Inundation Area/Future Development Project | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| Lakeport WWTP - North Breach | | | |
| Future Commercial Infill - South | 1 | 1 | 5 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| Lakeport WWTP - North Breach Total | 2 | 1 | 36 |
| Outside of Dam Inundation Area | | | |
| Future Commercial Infill - Central | 5 | 1 | 20 |
| Future Commercial Infill - Citywide | 7 | 2 | 32 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 2 | 0 | 4 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 7 | 0 | 59 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Tribal Health Future Development | 8 | 2 | 18 |
| Outside of Dam Inundation Area Total | 42 | 10 | 211 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| Lakeport WWTP - North Breach | | | |
| South Lakeport Annexation Area | 18 | 15 | 41 |
| Lakeport WWTP - North Breach Total | 18 | 15 | 41 |
| Outside of Dam Inundation Area | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 32 | 28 | 82 |
| Outside of Dam Inundation Area Total | 35 | 28 | 399 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: City of Lakeport, Lake County GIS

Table 4-56 City of Lakeport – Future Development in Wastewater Treatment Plant East Breach Dam Inundation Area

| Jurisdiction/Dam Inundation Area/Future Development Project | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| Lakeport WWTP - North Breach | | | |
| Future Commercial Infill - South | 2 | 1 | 8 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| Lakeport WWTP - North Breach Total | 3 | 1 | 39 |
| Outside of Dam Inundation Area | | | |
| Future Commercial Infill - Central | 5 | 1 | 20 |
| Future Commercial Infill - Citywide | 7 | 2 | 32 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 1 | 0 | 1 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 7 | 0 | 59 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Tribal Health Future Development | 8 | 2 | 18 |
| Outside of Dam Inundation Area Total | 41 | 10 | 208 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| Lakeport WWTP - North Breach | | | |
| South Lakeport Annexation Area | 25 | 21 | 64 |
| Lakeport WWTP - North Breach Total | 25 | 21 | 64 |
| Outside of Dam Inundation Area | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 25 | 22 | 60 |
| Outside of Dam Inundation Area Total | 28 | 22 | 376 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: City of Lakeport, Lake County GIS

4.3.7. Drought and Water Shortage Vulnerability Assessment

Likelihood of Future Occurrence—Likely Vulnerability—High

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Based on historical information, the occurrence of drought in California, including the City of Lakeport, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of Lakeport to drought is citywide, but impacts may vary and include reduction in water supply, agricultural losses, and an increase in dry fuels. Impacts to the City would be mostly from secondary risks to drought and water shortage – mostly from wildfires and their related impacts to property damage and life security.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Table 4-57 show drought impacts for the Lake County from 1850 to December 2018. The data represented is skewed, with the majority of these impacts from records within the past ten years. It is anticipated that drought impacts to the City Planning Area would be similar to those experienced in the County.

Table 4-57 Lake County Drought Impacts 1850-12/1/2018

| Category | Number of Impacts |
|------------------------------------|-------------------|
| Agriculture | 31 |
| Business and Industry | 3 |
| Energy | 5 |
| Fire | 21 |
| Plants & Wildlife | 10 |
| Relief, Response, and Restrictions | 51 |
| Society and Public Health | 32 |
| Tourism and Recreation | 4 |
| Water Supply and Quality | 37 |
| Total | 194 |

Source: National Drought Mitigation Center

The most significant qualitative impacts associated with drought in the City are those related to water intensive activities such as wildfire protection, municipal usage, commerce, tourism, recreation, and

wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Water quality deterioration and increased cyanobacterial bloom are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. The HMPC noted that when Clear Lake's level is low, water intake pipes need to be moved. The City has undertaken several intertie projects to address this. There is one more intertie project left in the City to implement to mitigate this problem.

The HMPC also noted that the Scotts Creek area needs to pull on wells when the creek is dry. The HMPC noted that groundwater supply is generally good. However, the HMPC noted that the City can't use groundwater from the two wells located below the creek until late spring when the creek is no longer running. During periods of drought, the City seeks to use as much groundwater as feasible and only supplement with surface (Clear Lake) water if necessary. The expense of treating Clear Lake water to drinking water standards is far in excess of that required for groundwater sources.

It is difficult to quantitatively assess drought impacts to the City because not many city-specific studies have been conducted. Some factors to consider include: the impacts of fallowed agricultural land, habitat loss and associated effects on wildlife, and the drawdown of the groundwater table. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in the City. It can be assumed, however, that the loss of production in one sector of the economy would affect other sectors. This is especially true of agriculture in Lake County and the City, which is highly vulnerable to drought conditions.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs. These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection.

The HMPC also noted that land subsidence can also occur when the groundwater table is depleted. Effects of drought-driven land subsidence include damage to buildings and infrastructure such as roads and canals, increased flood risk in low-lying areas, and lasting damage to groundwater aquifers and aquatic ecosystems.

The 2013 Drought Management Plan discussed the difficulty in accessing extra water supply during times of drought. Historically, during drought or other water emergency conditions, system operators were able to supplement their supply with purchased water from another source. Unfortunately, during a prolonged drought, most other sources may not have an excess supply and cannot be relied upon to supply emergency water. Water districts are examining and evaluating existing well sources for rehabilitation or reworking to recover or increase productions capabilities. Water districts are also working toward increasing the efficiency of water delivery. Inspections, looking for water waste, reducing system pressures, and increasing the frequency of system checks are all being looked at, as well as researching the potential for private construction projects to utilize recycled water rather than potable water from the public water systems.

The CCHPR for Lake County also discussed how climate change may increase the impact of drought. Lack of moisture, already at a severe level in California due to a current multi-year drought and decades of fuel accumulation from historical forestry and fire suppression practices, increases the risk of wildfires. Devastating wildfires like the Valley Fire of 2015, Mendocino Complex Fire of 2018, and others impacted watersheds and increase the risk of landslides or mudslides, and sediment in run-off that reduce water quality. In addition to fire related injuries, local and regional transport of smoke, ash, and fine particles increases respiratory and cardiovascular risks. Increasing temperatures and changes in precipitation may lead to intensified drought conditions. Drought decreases the availability and quality of water for humans. This includes reduced water levels to fight wildfires. Drought may increase exposure to health hazards including wildfires, dust storms, extreme heat events, flash flooding, degraded water quality, and reduced water quantity. Dust storms associated with drought conditions have been associated with increased incidents of Valley Fever, a fungal pathogen.

Tree Mortality (Drought and Bark Beetles)

One of the specific vulnerabilities of drought in the City and surrounding Lake County is the increased risk to trees from beetle kill and other tree mortality issues. Drought weakens trees and makes them more susceptible to insect infestation. Bark beetles mine the inner bark (the phloem-cambial region) on twigs, branches, or trunks of trees and shrubs. This activity often starts a flow of tree sap in conifers, but sometimes even in hardwoods like elm and walnut. The sap flow (pitch tube) is accompanied by the sawdustlike frass created by the beetles. Frass accumulates in bark crevices or may drop and be visible on the ground or in spider webs. Small emergence holes in the bark are a good indication that bark beetles were present. Removal of the bark with the emergence holes often reveals dead and degraded inner bark and sometimes new adult beetles that have not yet emerged. Bark beetles frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. Bark beetles can contribute to the decline and eventual death of trees; however only a few aggressive beetle species are known to be the sole cause of tree mortality (see Figure 4-79).

Figure 4-79 Monterey Pine Killed by Engraver Beetles



Source: University of California

In addition to attacking larger limbs, some species such as cedar and cypress bark beetles feed by mining twigs up to 6 inches back from the end of the branch, resulting in dead tips. These discolored shoots hanging on the tree are often referred to as “flagging” or “flags.” (see Figure 4-80) Adult elm bark beetles feed on the inner bark of twigs before laying eggs. If an adult has emerged from cut logs or a portion of a tree that is infected by Dutch elm disease, the beetle’s body will be contaminated with fungal spores. When the adult beetle feeds on twigs, the beetle infects healthy elms with the fungi that cause Dutch elm disease. Elms showing yellowing or wilting branches in spring may be infected with Dutch elm disease.

Figure 4-80 Flag Tips from Cypress Bark Beetle Feeding



Source: University of California

Future Development

According to the HMPC, the City of Lakeport has access to large quantities of water through its groundwater as well as surface water. However, population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth.

4.3.8. Earthquake Vulnerability Assessment

Likelihood of Future Occurrence—Unlikely (major)/Likely (minor)

Vulnerability—High

Earthquakes occur when a slip in the fault releases built up energy. Energy travels in waves through the earth's crust and causes ground shaking. Secondary hazards resulting from seismic activity include ground rupture along the fault, liquefaction of soils, settlement from sinking soils, and seismically induced landslides. The geologic conditions along streambeds and the lake suggest these areas are most likely to be affected by liquefaction and settlement.

Lakeport is located in a highly active earthquake area and the potential exists for a significant seismic event in the future. Immediately east of the City, between the City limits and Clear Lake, there is a potentially active rupture zone. Potentially active rupture zones are faults which have been active in the past 2,000 years. Little is known about this shoreline fault rupture zone; however, it represents a potentially significant hazard and must be taken into consideration when development occurs in the vicinity. Within the past 200 years, no major earthquakes have occurred along faults in Lake County.

The Lakeport General Plan Safety Element noted that communities containing structures built with unreinforced masonry walls are particularly susceptible to damage from earthquakes. The Unreinforced Masonry Law passed by the State Legislature in 1986 [SB 547], requires all cities and counties in Seismic Zone 4 to identify potentially hazardous unreinforced masonry buildings. The City has complied with this legislation and identified several unreinforced masonry buildings. Implementation of an inspection and reinforcement program was carried out to help mitigate hazards associated with seismic effects on structures. A comprehensive structural rehabilitation program was not carried out city-wide.

In addition to unreinforced masonry buildings, other key community structures are also considered at-risk in the occurrence of a seismic event.

- All critical emergency buildings (city hall, county courthouse, police and fire stations);
- High priority buildings (theaters, schools, limited care facilities)
- The majority of high-use buildings (commercial and office buildings, large apartment buildings, and churches);

A major earthquake would be expected to cause considerable damage to transportation systems. Roads, bridges and highway overpasses all cross various earthquake faults as well as areas susceptible to ground failure.

2019 Earthquake Scenarios

HAZUS-MH 4.2 was utilized to model earthquake losses for the City. Specifically, the probable magnitude used for Lakeport utilized two scenarios based on data from the City of Lakeport General Plan.

- 8.5 San Andreas Earthquake
- 6.75 Healdsburg Fault Earthquake

Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis.

The methodology for running the deterministic earthquake scenario used seismic hazard contour maps developed by the U.S. Geological Survey (USGS) for the 2002 update of the National Seismic Hazard Maps that are included with HAZUS-MH. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively. The 2,500-year return period analyzes ground shaking estimates with a 2 percent probability of being exceeded in 50 years, from the various seismic sources in the area. The International Building Code uses this level of ground shaking for building design in seismic areas and is more of a worst-case scenario.

8.5 San Andreas Earthquake Results

The HMPC noted that such a scenario would produce moderate shaking in most of the City. Structural damage could occur, including failure of stucco and masonry walls, collapse of chimneys and tanks, unbolted houses moving off of their foundations, and cracks in wet ground and on steep slopes.

The results of the probabilistic scenario are captured in Table 4-58. Maps showing total losses by census tract for this scenario are shown in Figure 4-81. Key losses included the following:

- Total economic loss estimated for the earthquake was \$66.02 million, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled \$59.66 million.
- Over 13 percent of the buildings in the City were at least moderately damaged. 35 buildings were completely destroyed.
- Over 43 percent of the building- and income-related losses were residential structures.
- 20 percent of the estimated losses were related to business interruptions.
- The mid-day earthquake caused the most casualties: 1
- No households experienced a loss of potable water or electricity from the earthquake.

Table 4-58 City of Lakeport – HAZUS-MH 2,500-year Earthquake Scenario Results

| Earthquake Impacts | 8.5 Magnitude Earthquake |
|---|---|
| Residential Buildings Damaged (Based upon 4,000 buildings) | Slight: 933 Moderate: 457 Extensive: 135 Complete: 35 |
| Building Related Loss | \$59,660,000 |
| Total Economic Loss | \$66,020,000 |
| Injuries (Based upon 2am time of occurrence) | Without requiring hospitalization: 7 Requiring hospitalization: 1 Life Threatening: 0 Fatalities: 0 |
| Injuries (Based upon 2pm time of occurrence) | Without requiring hospitalization: 11 Requiring hospitalization: 2 Life Threatening: 0 Fatalities: 1 |
| Injuries (Based upon 5pm time of occurrence) | Without requiring hospitalization: 7 Requiring hospitalization: 2 Life Threatening: 0 Fatalities: 0 |
| Essential Facility Damage (Based upon 12 buildings) | None with at least moderate damage. |
| Transportation and Utility Lifeline Damage | None with at least moderate damage. 86 potable water leaks, and 22 breaks 43 wastewater leaks and 11 breaks 15 natural gas leaks and 4 breaks. |

| Earthquake Impacts | 8.5 Magnitude Earthquake | |
|--|---|---|
| Households w/out Power & Water Service (Based upon 3,894 households) | Water loss @ Day 1: 0 Water loss @ Day 3: 0 Water loss @ Day 7: 0 Water loss @ Day 30: 0 Water loss @ Day 90: 0 | Power loss @ Day 1: 0 Power loss @ Day 3: 0 Power loss @ Day 7: 0 Power loss @ Day 30: 0 Power loss @ Day 90: 0 |
| Displaced Households | 9 displaced households | |
| Shelter Requirements | 6 persons | |
| Debris Generation | 13,000 tons | |

Source: HAZUS-MH 4.2

LAKE COUNTY INSET

MENDOCINO GLENN COLUSA YOLO SONOMA NAPA
LAKE COUNTY
CITY OF LAKEPORT

SCOTTS VALLEY RD HILL RD 29 HOWARD AVE
LAKE COUNTY
RIGGS RD MCMAHON RD 29
FORBES CREEK KECK RD
MARTIN ST 11TH ST HARLEY ST N MAIN ST
6TH ST N FORBES ST
CITY OF LAKEPORT
TODD RD S MAIN ST
CLEAR LAKE
Manning Creek
VISTA POINT 29 175
LAKE COUNTY

LEGEND

- Highways
- Major Roads
- Rivers
- Lakes
- Cities
- Counties

LEGEND

Total Loss
By Census Tract

- \$0 - \$22,827,723
- \$22,827,724 - \$36,836,500

0 1 2 Miles

Foster Morrison

CITY OF LAKEPORT

6.75 Healdsburg Scenario

The HMPC noted that such a scenario would produce moderate shaking in most of the City. Structural damage could occur, including failure of stucco and masonry walls, collapse of chimneys and tanks, unbolted houses moving off of their foundations, and cracks in wet ground and on steep slopes.

The results of the probabilistic scenario are captured in Table 4-68. Maps showing total losses by census tract for this scenario are shown in Figure 4-82. Key losses included the following:

- Total economic loss estimated for the earthquake was \$7.59 million, which includes building losses and lifeline losses based on the HAZUS-MH inventory.
- Building-related losses, including direct building losses and business interruption losses, totaled \$6.61 million.
- Over 2 percent of the buildings in the City were at least moderately damaged, however, no buildings were completely destroyed.
- Over 52 percent of the building- and income-related losses were residential structures.
- 15 percent of the estimated losses were related to business interruptions.
- No households experienced a loss of potable water or electricity from the earthquake.

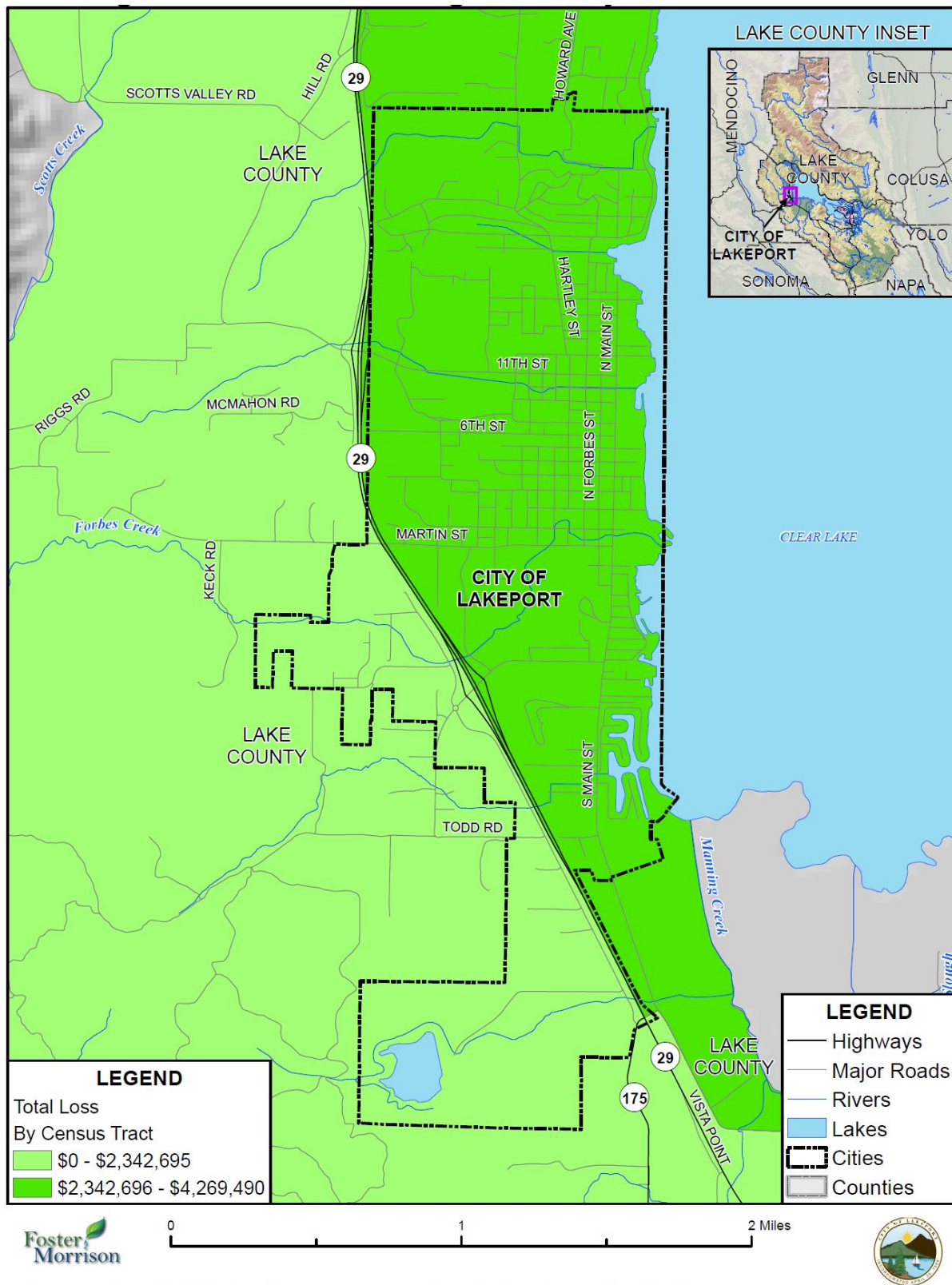
Table 4-59 City of Lakeport – HAZUS-MH 2,500-year Earthquake Scenario Results

| Impacts/Earthquake | 6.75 Magnitude Earthquake |
|---|--|
| Residential Buildings Damaged (Based upon 4,000 buildings) | Slight: 287 Moderate: 81 Extensive: 6 Complete: 0 |
| Building Related Loss | \$6,610,000 |
| Total Economic Loss | \$7,590,000 |
| Injuries (Based upon 2am time of occurrence) | Without requiring hospitalization: 1 Requiring hospitalization: 0 Life Threatening: 0 Fatalities: 0 |
| Injuries (Based upon 2pm time of occurrence) | Without requiring hospitalization: 1 Requiring hospitalization: 0 Life Threatening: 0 Fatalities: 0 |
| Injuries (Based upon 5pm time of occurrence) | Without requiring hospitalization: 0 Requiring hospitalization: 0 Life Threatening: 0 Fatalities: 0 |
| Essential Facility Damage (Based upon 12 buildings) | None with at least moderate damage. |
| Transportation and Utility Lifeline Damage | None with at least moderate damage. 6 potable water leaks, and 2 breaks 3 wastewater leaks and 1 break 1 natural gas leak and 0 breaks. |

| Impacts/Earthquake | 6.75 Magnitude Earthquake | |
|--|---|---|
| Households w/out Power & Water Service (Based upon 3,894 households) | Water loss @ Day 1: 0 Water loss @ Day 3: 0 Water loss @ Day 7: 0 Water loss @ Day 30: 0 Water loss @ Day 90: 0 | Power loss @ Day 1: 0 Power loss @ Day 3: 0 Power loss @ Day 7: 0 Power loss @ Day 30: 0 Power loss @ Day 90: 0 |
| Displaced Households | 0 displaced households | |
| Shelter Requirements | 0 persons | |
| Debris Generation | 1,000 tons | |

Source: Hazus MH 4.2

Figure 4-82 City of Lakeport– Hazus Total Loss Areas from Healdsburg 6.75 Quake Scenario



Scenario Results Comparison

After the analysis of each earthquake scenario was completed, the results of the analysis were compared. The comparison is shown on Table 4-60. As shown, the City of Lakeport is at much greater risk from an 8.5 San Andreas earthquake than a 6.75 Healdsburg earthquake.

Table 4-60 City of Lakeport – Comparison of San Andreas and Healdsburg Scenarios

| Impacts | Count Type | 6.75 Healdsburg | 8.5 San Andreas |
|--|--|--|---|
| Residential Buildings Damaged (Based upon 4,000 buildings) | Slight: Moderate: Extensive: Complete: | 287 81 6 0 | 933 457 135 35 |
| Building Related Loss | \$ | \$6,610,000 | \$59,660,000 |
| Total Economic Loss | \$ | \$7,590,000 | \$66,020,000 |
| Injuries (Based upon 2am time of occurrence) | Without requiring hospitalization: Requiring hospitalization: Life Threatening: Fatalities: | 1 0 0 0 | 7 1 0 0 |
| Injuries (Based upon 2pm time of occurrence) | Without requiring hospitalization: Requiring hospitalization: Life Threatening: Fatalities: | 1 0 0 0 | 11 2 0 1 |
| Injuries (Based upon 5pm time of occurrence) | Without requiring hospitalization: Requiring hospitalization: Life Threatening: Fatalities: | 0 0 0 0 | 7 2 0 0 |
| Essential Facility Damage (Based upon 10 buildings) | – | None with at least moderate damage. | None with at least moderate damage. |
| Transportation and Utility Lifeline Damage | – | None with at least moderate damage. 6 potable water leaks, and 2 breaks 3 wastewater leaks and 1 break 1 natural gas leak and 0 breaks. | None with at least moderate damage. 86 potable water leaks, and 22 breaks 43 wastewater leaks and 11 breaks 15 natural gas leaks and 4 breaks. |
| Households w/out Power & Water Service (Based upon 3,801 households) | – | No power or water losses | No power or water losses |
| Displaced Households | – | 0 displaced households | 9 displaced households |
| Shelter Requirements | – | 0 persons | 6 persons |
| Debris Generation | – | 1,000 tons | 13,000 tons |

Source: Hazus-MH 4.2

Overall Community Impact

The overall impact to the community from earthquake includes:

- Commercial and residential structural and property damage;
- Damage to natural resource habitats and other natural resources;
- Disruption of and damage to public infrastructure and services;
- Loss of water, power, roads, phones, and transportation, which could impact, strand, and/or impair mobility for emergency responders and/or area residents;
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures;
- Loss of churches, which could severely impact the social fabric of the community;
- Loss of schools, which could severely impact the entire school system and disrupt families and teachers, as temporary facilities and relocations would likely be needed;
- Impact on the overall mental health of the community;
- Injury and loss of life; and
- Negative impact on commercial and residential property values.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

4.3.9. Flood: (1% and 0.2% Annual Chance) Vulnerability Assessment

Likelihood of Future Occurrence—Likely

Vulnerability—High

Floods have been a part of Lakeport's historical past and will continue to be so in the City's future. During winter months, long periods 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 structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the waterways and Clear Lake. The HMPC noted that the Lake level determines locations and duration of flooding. When the Lake is full, local streams and drainage basins can't drain. These drainages back up and overflow their banks. Flood related erosion could cause damages to homes, businesses, and government structures, including damage to ancillary structures, and utilities. 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-saturated soils. Electrical power outages happen, and the interruption of power causes major problems. Loss of power is usually a precursor to closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule.

Health Hazards from Flooding

According to FEMA, certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water

itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm, and industrial chemicals. Pastures and areas where cattle and hogs are kept or their wastes are stored can contribute polluted waters to the receiving streams.

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

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

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

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

Values at Risk

The City of Lakeport has mapped FEMA flood hazard areas. GIS was used to determine the possible impacts of flooding within the City and how the risk varies across the City Planning Area. The following methodology was followed in determining improved parcel counts and assets at risk to the 1% annual chance flood event and 0.2% annual chance flood events.

Methodology

Lake County's 10/30/2018 Assessor Data and the County's and the City of Lakeport's GIS parcel data were used as the basis for the City inventory of parcels, values, and acres. Lake County, including Lakeport, has a FEMA effective DFIRM dated September 30, 2005, which was obtained from the National Flood Hazard Layer to perform the flood analysis.

In some cases, there are parcels in multiple flood zones, such as Zone A, Zone X, or Shaded X. GIS was used to create a centroid, or point representing the center of the parcel polygon. DFIRM flood data was then overlaid on the parcel layer. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned the flood zone for the entire parcel. The parcels were segregated and analyzed in this fashion for the Lakeport Planning Area. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and

the GIS parcel layer. Analysis on values at risk to floods in the City is provided for Lakeport Planning Area as previously described in Section 4.2.12 in Table 4-38.

Each of the DFIRM flood zones that begins with the letter ‘A’ depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-61 explains the difference between DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the City. The effective DFIRM maps for the Lakeport Planning Area are shown on Figure 4-83.

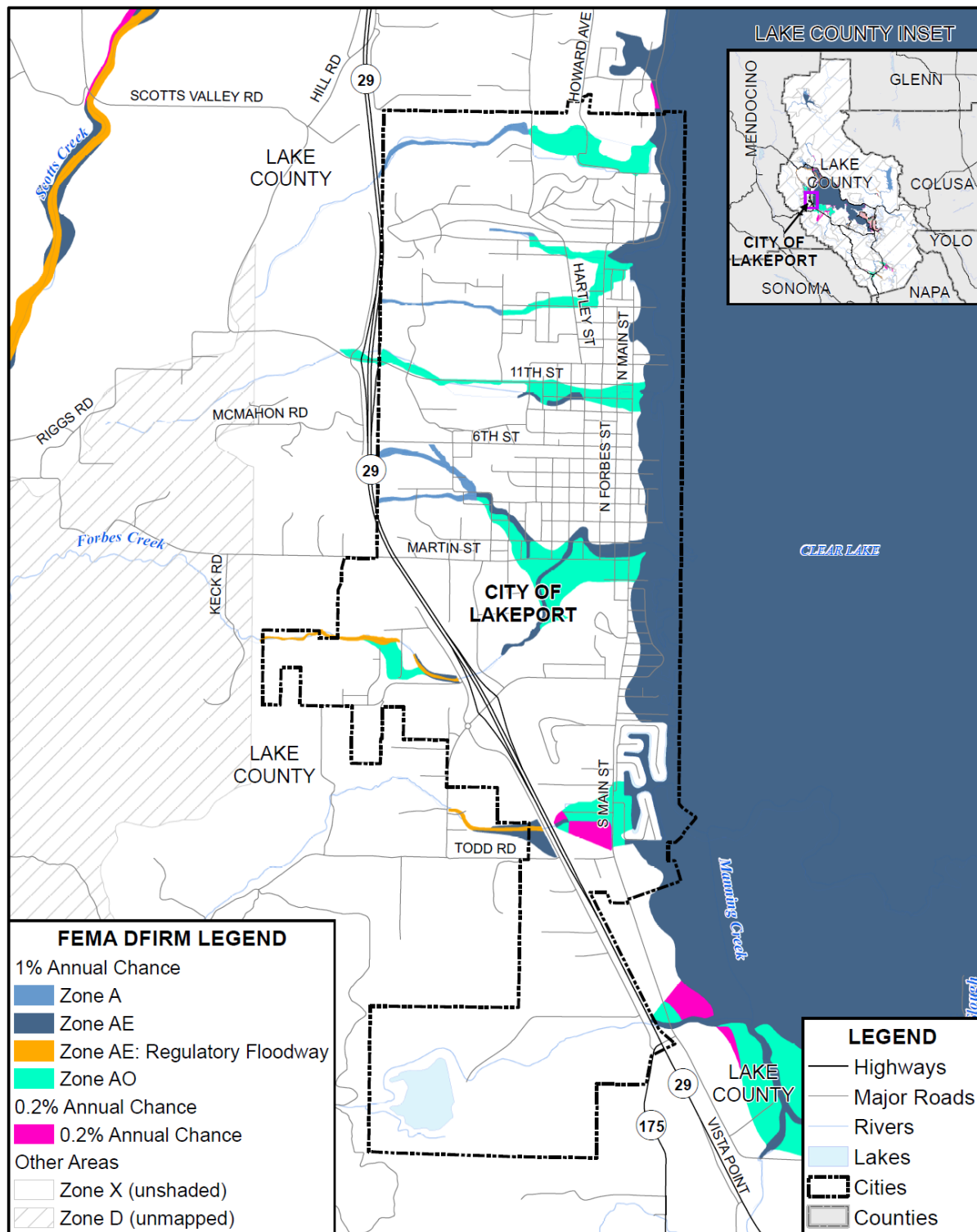
Table 4-61 Lakeport – DFIRM Flood Hazard Zones

| Flood Zone | Description |
|--------------|---|
| AE | 1% annual chance flood: Base flood elevations provided |
| AE Floodway* | 1% annual chance flood: Regulatory floodway; Base flood elevations provided |
| AO | 1% annual chance flood: River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. |
| Shaded X | 0.2% annual chance flood: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood |
| X (unshaded) | No flood hazard |
| D | Unmapped Areas |

Source: FEMA

*In Lakeport, the floodway is defined as the channel of any water course and adjacent lands that must be reserved in order to discharge the base flood without increasing the water surface elevation more than one foot.

Figure 4-83 City of Lakeport – DFIRM Flood Zones



Data Source: FEMA DFIRM 9/30/2005, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.



Limitations

It should be noted that the resulting flood loss estimates may actually be more or less than that presented in the below tables as the City may include structures located within the 1% or 0.2% annual chance floodplain that are elevated at or above the level of the base flood elevation, according to local floodplain development requirements. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the floodplain due primarily to Proposition 13.

Flood Loss Estimate

The loss estimate for flood is based on the total of improved and contents value. Improved parcels include those with improved structure values identified in the Assessor's database. Only improved parcels and the value of their structure improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of improvements and structure contents. The land value is represented in the detailed flood tables, but are primarily present to show the value of the land associated with each flood zone.

The property use categories for the City (derived from general plan land use descriptions) were used to develop estimated content replacement values (CRV) that are potentially at loss from hazards, using FEMA Hazus methodologies as previously described in Section □. The CRVs were added to the improved parcel values.

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total loss of an area or building. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percent of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an assumed average flood depth of 2 feet. The end result of the flood hazard analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard.

Flooded Acres

In addition to the centroid analysis used to obtain numbers of parcels and assets at risk to flood hazards, parcel boundary analysis was performed to obtain total acres and flooded acres by flood zone for each parcel. The parcel layer was intersected with the FEMA DFIRM data to obtain the acres flooded. The flooded acres analysis methodology and results are presented at the end of this section.

Lakeport Flood Analysis Results

Table 4-62 and Table 4-63 contain flood analysis results for the Lakeport Planning Area. These tables show the number of parcels and values at risk to the 1% and 0.2% annual chance event for the City of Lakeport. Table 4-62 shows a summary of the value of improved parcels by 1% and 0.2% annual chance flood zone. Table 4-63 shows the improved parcels by property use category in each flood zone for the City.

Table 4-62 City of Lakeport – Count and Value of Parcels by FEMA DFIRM 1% and 0.2% Annual Chance Flood Zones*

| Flood Zone | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|---------------------------------|--------------------|-----------------------|----------------------|--------------------------|--------------------------|----------------------|
| 1% Annual Chance Flood Hazard | 497 | 424 | \$38,395,470 | \$62,270,498 | \$36,656,670 | \$137,322,638 |
| 0.2% Annual Chance Flood Hazard | 3 | 3 | \$2,944,239 | \$6,431,551 | \$6,431,551 | \$15,807,341 |
| Other Areas | 1,931 | 1,592 | \$121,708,063 | \$244,930,132 | \$160,389,935 | \$527,028,130 |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 | \$680,158,109 |

Source: FEMA September 30, 2005 DFIRM, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*With respect to improved parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table 4-63 City of Lakeport – Count and Value of Parcels by Detailed DFIRM Flood Zones and Property Use*

| Flood Zone/Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--------------------------------------|--------------------|-----------------------|---------------------|--------------------------|--------------------------|---------------------|
| 1% Annual Chance Flood Hazard | | | | | | |
| Zone AE | | | | | | |
| Commercial | 44 | 40 | \$3,868,394 | \$6,888,829 | \$6,888,829 | \$17,646,052 |
| Government | 1 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 13 | 2 | \$229,382 | \$371,865 | \$371,865 | \$973,112 |
| Residential | 220 | 194 | \$21,024,417 | \$30,916,436 | \$15,458,218 | \$67,399,071 |
| Zone AE Total | 278 | 236 | \$25,122,193 | \$38,177,130 | \$22,718,912 | \$86,018,235 |
| Zone AE Floodway | | | | | | |
| Commercial | 1 | 0 | \$0 | \$0 | \$0 | \$0 |
| Government | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 1 | 0 | \$28,000 | \$0 | \$0 | \$28,000 |
| Zone AE Floodway Total | 2 | 0 | \$28,000 | \$0 | \$0 | \$28,000 |
| Zone AO | | | | | | |
| Commercial | 37 | 33 | \$3,438,868 | \$3,782,147 | \$3,782,147 | \$11,003,162 |
| Government | 4 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 156 | 139 | \$9,069,353 | \$18,508,468 | \$9,254,234 | \$36,832,055 |
| Zone AO Total | 197 | 172 | \$12,508,221 | \$22,290,615 | \$13,036,381 | \$47,835,217 |
| Zone A | | | | | | |
| Commercial | 0 | 0 | \$0 | \$0 | \$0 | \$0 |

| Flood Zone/Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--|--------------------|-----------------------|----------------------|--------------------------|--------------------------|----------------------|
| Government | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 20 | 16 | \$737,056 | \$1,802,753 | \$901,377 | \$3,441,186 |
| Zone A Total | 20 | 16 | \$737,056 | \$1,802,753 | \$901,377 | \$3,441,186 |
| 1% Annual Chance Total | 497 | 424 | \$38,395,470 | \$62,270,498 | \$36,656,670 | \$137,322,638 |
| 0.2% Annual Chance Flood Hazard | | | | | | |
| Commercial | 3 | 3 | \$2,944,239 | \$6,431,551 | \$6,431,551 | \$15,807,341 |
| Government | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 0 | 0 | \$0 | \$0 | \$0 | \$0 |
| 0.2% Annual Chance Total | 3 | 3 | \$2,944,239 | \$6,431,551 | \$6,431,551 | \$15,807,341 |
| Other Areas | | | | | | |
| Zone X (unshaded) | | | | | | |
| Commercial | 330 | 257 | \$34,240,539 | \$75,849,738 | \$75,849,738 | \$185,940,015 |
| Government | 22 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 13 | 0 | \$66,300 | \$0 | \$0 | \$66,300 |
| Residential | 1,566 | 1,335 | \$87,401,224 | \$169,080,394 | \$84,540,197 | \$341,021,815 |
| Zone X (unshaded) Total | 1,931 | 1,592 | \$121,708,063 | \$244,930,132 | \$160,389,935 | \$527,028,130 |
| Other Areas Total | 1,931 | 1,592 | \$121,708,063 | \$244,930,132 | \$160,389,935 | \$527,028,130 |
| | | | | | | |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 | \$680,158,109 |

Source: FEMA September 30, 2005 DFIRM, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*With respect to improved parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

Table 4-64 shows a summary table of loss estimates by flood zone for the Lakeport Planning Area, and gives potential losses summarized by the 1% and 0.2% annual chance flood event with loss estimate and loss ratios for the Lakeport Planning Area. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located in the Planning Area) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator that a community may have more difficulties recovering from a flood. The City should keep in mind that the loss ratio could increase with additional development in the 1% and 0.2% annual chance floodplain unless development is elevated in accordance with the local floodplain management ordinance.

*Table 4-64 Lakeport – Flood Loss Estimate Summary**

| Flood Zone | Total Parcel Count | Improved Parcel Count | Improved Structure Value | Estimated Contents Value | Total Value | Loss Estimate | Loss Ratio |
|--------------------------|--------------------|-----------------------|--------------------------|--------------------------|----------------------|---------------------|-------------|
| 1% Annual Chance Total | 497 | 424 | \$62,270,498 | \$36,656,670 | \$98,927,168 | \$19,785,434 | 4.2% |
| 0.2% Annual Chance Total | 3 | 3 | \$6,431,551 | \$6,431,551 | \$12,863,102 | \$2,572,620 | 0.5% |
| | | | | | | | |
| Grand Total | 500 | 427 | \$68,702,049 | \$43,088,221 | \$111,790,270 | \$22,358,054 | 4.7% |

Source: FEMA September 30, 2005 DFIRM, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*With respect to improved parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance floodplain.

According to the information in Table 4-62 through Table 4-64, the Lakeport Planning Area has 424 improved parcels and roughly \$19.8 million of structure and contents value in the 1% annual chance floodplain. There are an additional 3 improved parcels and roughly \$2.6 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 4.7% indicates that while the City does have assets at risk, those asset values do not indicate a disproportionate number of assets in the FEMA regulated floodplains.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City.

Methodology

GIS was used to calculate acres flooded by FEMA flood zones and property use categories. The Lakeport parcel layer and FEMA DFIRM were intersected, and each segment divided by the intersection of flood zone and parcels were calculated for acres. This process was conducted for 1% and 0.2% annual chance flood areas, with each segment being defined by zone type (AE, AE Floodway, AO, 0.2% Annual Chance, D, and X) and acres. The resulting data tables with flooded acreages were then imported into a database and linked back to the original parcels, including total acres by parcel number. Once this was completed, each parcel contained acreage values for flooded acres by zone type within the parcel. In the tables below, the 1% and 0.2% annual chance flood zones are summarized and then split out by property use, their total flooded acres, total improved acres, and percent of improved acres that are flooded.

Limitations

One limitation created by this type of analysis is that improvements are uniformly found throughout the parcel, while in reality, only portions of the parcel are improved, and improvements may or may not fall within the flood zone portion of a parcel; thus, areas of improvements flooded, calculated through this method may be higher or lower than those actually seen in a similar real-world event.

The following tables represent a detailed and summary analysis of total acres for each FEMA DFIRM flood zone. Table 4-65 gives detailed information for the Planning Area by summary flood zone and property use. Table 4-66 gives a summary for the entire Planning Area by summary property use and flood zone. Table 4-67 gives a summary of acres in the 1% and 0.2% annual chance floodplains.

Table 4-65 Lakeport – Flooded Acres by Detailed DFIRM Flood Zone and Property Use

| Flood Zone/Property Use | Total Flooded Acres | Improved Flooded Acres |
|--|---------------------|------------------------|
| 1% Annual Chance Flood Hazard | | |
| Zone A | | |
| Commercial | 0 | 0 |
| Government | 0 | 0 |
| Open Space / Rural Lands | 0 | 0 |
| Residential | 13 | 12 |
| Zone A Total | 13 | 12 |
| Zone AE | | |
| Commercial | 20 | 19 |
| Government | 8 | 0 |
| Open Space / Rural Lands | 32 | 1 |
| Residential | 113 | 88 |
| Zone AE Total | 173 | 108 |
| Zone AE Floodway | | |
| Commercial | 0 | 0 |
| Government | 0 | 0 |
| Open Space / Rural Lands | 0 | 0 |
| Residential | 1 | 0 |
| Zone AE Floodway Total | 1 | 0 |
| Zone AO | | |
| Commercial | 22 | 18 |
| Government | 51 | 0 |
| Open Space / Rural Lands | 0 | 0 |
| Residential | 29 | 25 |
| Zone AO Total | 102 | 43 |
| 1% Annual Chance Flood Hazard Total | 289 | 163 |
| 0.2% Annual Chance Flood Hazard | | |
| Commercial | 10 | 10 |
| Government | 0 | 0 |
| Open Space / Rural Lands | 0 | 0 |
| Residential | 0 | 0 |

| Flood Zone/Property Use | Total Flooded Acres | Improved Flooded Acres |
|--|---------------------|------------------------|
| 0.2% Annual Chance Flood Hazard Total | 10 | 10 |
| Other Areas | | |
| Zone X (unshaded) | | |
| Commercial | 293 | 171 |
| Government | 281 | 0 |
| Open Space / Rural Lands | 56 | 0 |
| Residential | 760 | 557 |
| Zone X (unshaded) Total | 1,390 | 728 |
| Other Areas Total | 1,390 | 728 |
| | | |
| Grand Total | 1,689 | 901 |

Source: FEMA September 30, 2005 DFIRM, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*This count only includes those acres in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all acres in the 1% annual chance floodplain.

Table 4-66 Lakeport – Flooded Acres by DFIRM Flood Zone and Property Use

| Property Use / Flood Zone | Total Flooded Acres | Improved Flooded Acres |
|---------------------------------------|---------------------|------------------------|
| Commercial | | |
| 1% Annual Chance Flood Hazard | 42 | 37 |
| 0.2% Annual Chance Flood Hazard | 10 | 10 |
| Other Areas | 293 | 171 |
| Commercial Total | 344 | 217 |
| Government | | |
| 1% Annual Chance Flood Hazard | 59 | 0 |
| 0.2% Annual Chance Flood Hazard | 0 | 0 |
| Other Areas | 281 | 0 |
| Government Total | 340 | 0 |
| Open Space / Rural Lands | | |
| 1% Annual Chance Flood Hazard | 32 | 1 |
| 0.2% Annual Chance Flood Hazard | 0 | 0 |
| Other Areas | 56 | 0 |
| Open Space / Rural Lands Total | 88 | 1 |
| Residential | | |
| 1% Annual Chance Flood Hazard | 156 | 125 |
| 0.2% Annual Chance Flood Hazard | 0 | 0 |
| Other Areas | 760 | 557 |
| Residential Total | 917 | 682 |

| Property Use / Flood Zone | Total Flooded Acres | Improved Flooded Acres |
|---------------------------|---------------------|------------------------|
| | | |
| Grand Total | 1,689 | 901 |

Source: FEMA September 30, 2005 DFIRM, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*This count only includes those acres in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all acres in the 1% annual chance floodplain.

Table 4-67 City of Lakeport – Flooded Acres Summary by FEMA DFIRM Flood Zone

| Flood Zone/Property Use | Total Flooded Acres | Improved Flooded Acres |
|---------------------------------|---------------------|------------------------|
| 1% Annual Chance Flood Hazard | 289 | 163 |
| 0.2% Annual Chance Flood Hazard | 10 | 10 |

Source: FEMA September 30, 2005 DFIRM, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*This count only includes those acres in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all acres in the 1% annual chance floodplain.

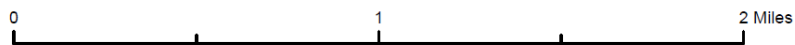
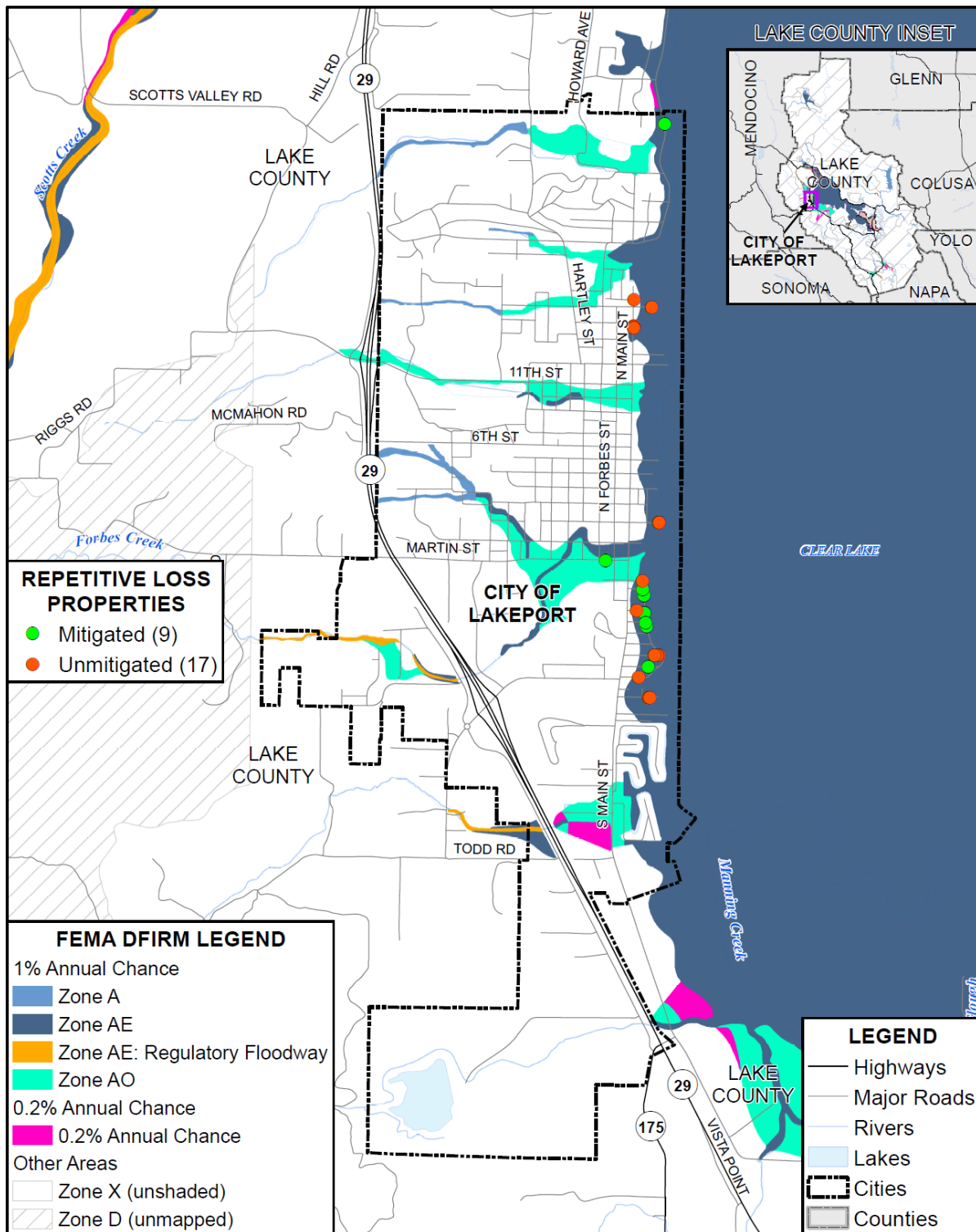
Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Lakeport joined the NFIP on October 17, 1978. The City does not participate in the CRS program. NFIP insurance data indicates that as of July 19, 2018, there were 212 policies in force in the City, resulting in \$48,450,900 of insurance in force. Of these, 195 are for residential properties and 17 are nonresidential. 214 of these are in A zones and 26 policies are for parcels in the B, C, & X zones.

There have been 238 closed paid losses totaling \$2,756,495.05. 206 of these were for residential properties and 32 were for nonresidential. Of these 60 paid losses, 199 were parcels in the A zone and 38 parcels were in B, C, & X zones, and 1 was for an unknown zone. Of the 238 claims, 212 claims were associated with pre-FIRM structures and 25 with post-FIRM structures, while 1 was unknown. Based on this analysis of insurance coverage, the City has assets at risk to the 1% annual chance and greater floods. Of the 424 improved parcels within the 1% annual chance floodplain, 214 (or 50.5 percent) of those parcels maintain flood insurance.

There have been 18 substantial damage claims since 1978. There are 24 repetitive loss (RL) properties and 3 severe repetitive loss (SRL) properties in the City. Most of the RL properties are an issue due to slab on grade foundations. The City has mapped their repetitive loss properties. Using GIS, these were overlaid on the DFIRM. RL properties by DFIRM are shown on Figure 4-84.

Figure 4-84 City of Lakeport – DFIRM Flood Zones and Repetitive Loss Properties



Data Source: FEMA DFIRM 9/30/2005, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 5/17/2019.

Population at Risk

Those residential parcel centroids that intersect the DFIRM flood zones were counted and multiplied by the 2010 Census Bureau average household factors for the City of Lakeport (2.31). According to this analysis, there is a total population of 349 and 0 residents that reside in Lakeport in 1% annual chance and 0.2% annual chance floodplains, respectively. This is shown in Table 4-68. It should be noted that all of the residents in the 1% annual chance floodplain would also fall in the 0.2% annual chance floodplain.

Table 4-68 City of Lakeport – Count of Residential Parcels and Population by DFIRM Flood Zone

| Flood Zone | Improved Residential Parcels | Population |
|-------------------------------|------------------------------|------------|
| 1% Annual Chance Flood Zone | 349 | 806 |
| 0.2% Annual Chance Flood Zone | 0 | 0 |
| Total | 349 | 806 |

Source: FEMA September 30, 2005 DFIRM, US Census Bureau, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the City of Lakeport to determine critical facilities in the DFIRM flood zones. Using GIS, the DFIRM flood zones were overlayed on the critical facility GIS layer. Figure 4-85 shows critical facilities, as well as the DFIRM flood zones. Table 4-69 provides summary information of critical facilities in the DFIRM zones by 1% and 0.2% annual chance floodplain. Table 4-70 provides greater detail on which DFIRM floodplain these critical facilities fall in by facility type and count. According to these tables, there are 19 critical facilities in the 1% annual chance floodplain and 0 critical facilities in the 0.2% annual chance floodplain. Details of critical facility definition, type, name, and address by FEMA DFIRM flood zone are listed in Appendix E.

CRITICAL FACILITY CATEGORY

- Essential Services
- At Risk Population
- Hazardous Materials

FEMA DFIRM LEGEND

1% Annual Chance

- Zone A
- Zone AE
- Zone AE: Regulatory Floodway
- Zone AO

0.2% Annual Chance

- 0.2% Annual Chance

Other Areas

- Zone X (unshaded)
- Zone D (unmapped)

LEGEND

- Highways
- Major Roads
- Rivers
- Lakes
- Cities
- Counties

LAKE COUNTY INSET

LAKE COUNTY

CITY OF LAKEPORT

SONOMA

NAPA

YOLUB

COLUSA

GLENN

MENDOCINO

Table 4-69 City of Lakeport – Critical Facilities in DFIRM Flood Zones Summary

| Flood Zone/Critical Facility Category | Facility Count |
|--|----------------|
| City of Lakeport | |
| 1% Annual Chance Flood Hazard | |
| Essential Services Facilities | 15 |
| At Risk Population Facilities | 4 |
| Hazardous Materials Facilities | 0 |
| 1% Annual Chance Flood Hazard Total | 19 |
| 0.2% Annual Chance Flood Hazard* | |
| Essential Services Facilities | 0 |
| At Risk Population Facilities | 0 |
| Hazardous Materials Facilities | 0 |
| 0.2% Annual Chance Flood Hazard Total | 0 |
| Other Areas | |
| Essential Services Facilities | 30 |
| At Risk Population Facilities | 12 |
| Hazardous Materials Facilities | 2 |
| Other Areas Total | 44 |
| Unincorporated Lake County | |
| Other Areas | |
| Essential Services Facilities | 6 |
| At Risk Population Facilities | 0 |
| Hazardous Materials Facilities | 0 |
| Other Areas Total | 6 |
| Grand Total | |
| | 69 |

Source: City of Lakeport GIS, FEMA DFIRM 9/30/2005

*This count only includes those critical facilities in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain. The 0.2% annual chance flood, in actuality, also includes all critical facilities in the 1% annual chance floodplain.

Table 4-70 City of Lakeport – Critical Facilities in Detailed DFIRM Flood Zones by Category and Facility Type

| Jurisdiction / Flood Zone | Critical Facility Category / Critical Facility Type | Facility Count |
|--------------------------------------|---|----------------|
| City of Lakeport | | |
| 1% Annual Chance Flood Hazard | | |
| Zone AE | Essential Services Facilities | |
| | Government | 2 |
| | Pump Stations | 3 |

| | | |
|--------------------|--|-----------|
| | Water Intake | 1 |
| | Essential Services Facilities Total | 6 |
| | At Risk Population Facilities | |
| | School | 1 |
| | At Risk Population Facilities Total | 1 |
| | Total | 7 |
| Zone AO | Essential Services Facilities | |
| | Commerce | 4 |
| | Construction - Engineering | 1 |
| | Government | 1 |
| | Law | 1 |
| | Pump Stations | 2 |
| | Essential Services Facilities Total | 9 |
| | At Risk Population Facilities | |
| | Assisted Living | 1 |
| | School | 2 |
| | At Risk Population Facilities Total | 3 |
| | Total | 12 |
| | 1% Annual Chance Flood Hazard Total | 19 |
| Other Areas | | |
| Zone X (unshaded) | Essential Services Facilities | |
| | Commerce | 3 |
| | Communications | 2 |
| | Fire - Rescue | 1 |
| | Government | 3 |
| | Law | 2 |
| | Medical - Clinic | 8 |
| | Pump Stations | 5 |
| | Transportation | 1 |
| | Water Treatment Plant | 1 |
| | Sewer Treatment Plant | 1 |
| | Senior Activity Center | 1 |
| | Water Storage | 1 |
| | Community Center | 1 |
| | Essential Services Facilities Total | 30 |
| | At Risk Population Facilities | |
| | Assisted Living | 1 |
| | Child Care | 2 |

| | | |
|---|---|-----------|
| | School | 3 |
| | Senior Apt Complex | 5 |
| | Assisted Living Senior Apt Complex | 1 |
| | At Risk Population Facilities Total | 12 |
| | Hazardous Materials Facilities | |
| | Hazardous Material | 2 |
| | Hazardous Materials Facilities Total | 2 |
| | Total | 44 |
| Other Areas Total | | 44 |
| City of Lakeport Total | | 63 |
| Unincorporated Lake County | | |
| Other Areas | | |
| Zone D (unmapped) | Essential Services Facilities | |
| | Communications | 1 |
| | Law | 1 |
| | Essential Services Facilities Total | 2 |
| | Total | 2 |
| Zone X (unshaded) | Essential Services Facilities | |
| | Animal | 1 |
| | Medical - Hospital | 1 |
| | Water Storage | 1 |
| | Water Wells | 1 |
| | Essential Services Facilities Total | 4 |
| | Total | 4 |
| Other Areas Total | | 6 |
| Unincorporated Lake County Total | | 6 |
| | | |
| Grand Total | | 69 |

Source: Lake County GIS, FEMA DFIRM 9/30/2005

*This count only includes those critical facilities in the 0.2% annual chance floodplain, exclusive of the 1% annual chance floodplain.

The 0.2% annual chance flood, in actuality, also includes all critical facilities in the 1% annual chance floodplain.

Overall Community Impact

Floods and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially devastating economic impacts to certain areas of the City. However, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;

- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure and services;
- Health hazards associated with mold and mildew, contamination of drinking water, etc.;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community;
- Negative impact on commercial and residential property values; and
- Significant disruption to students and teachers as temporary facilities and relocations would likely be needed.
- Impact on the overall mental health of the community.

Future Development

Future development in the City of Lakeport may be built in the floodplain, as long as it conforms to the standards of the floodplain ordinance. The City enforces the floodplain ordinance on new development and substantial improvements in Lakeport.

Future Development: GIS Analysis

Lake County's 10/30/2018 Assessor Data and the County's GIS parcel data were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the City. This data provides the land and improved values assessed for each parcel. In this analysis, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point containing the assessor's data. In addition, Lake County provided a table containing the assessor parcel numbers (APNs) for the 97 parcels. Using the GIS parcel spatial file and the APNs, the 97 parcels associated with future development projects for which the analysis was to be performed was identified. Utilizing the future development project spatial layer, the parcel centroid data was intersected to determine the parcel counts within each area.

The FEMA DFIRM was used to perform the analysis. This can be seen in Figure 4-86. Three tables follow:

- Table 4-71 shows the breakdown of the future development parcel counts in the City of Lakeport and their acreages summarized by 1%, 0.2%, and outside DFIRM flood zone.
- Table 4-72 breaks down Table 4-71, and shows the breakdown of the future development parcel counts in the City of Lakeport and their acreages by 1%, 0.2%, and outside DFIRM flood zone.
- Table 4-73 breaks down both previous tables to show the breakdown of the future development parcel counts in the City of Lakeport and their acreages by detailed DFIRM flood zone.

This map displays the City of Lakeport and surrounding areas in Lake County, California, highlighting future development potential and flood risk. The map includes a detailed legend for both future development areas and FEMA DFIRM flood zones.

FUTURE DEVELOPMENT AREA

- Commercial Infill - Citywide
- Residential Infill - Central
- Residential Infill - North
- Residential Infill - South
- Residential Infill - West
- Recreational Areas
- Lakefront Recreational Areas
- Martin Street High Density
- Mendocino College - Lake Campus Expansion Area
- South Lakeport Annexation Area
- Tribal Health

FEMA DFIRM LEGEND

1% Annual Chance

- Zone A
- Zone AE
- Zone AE: Regulatory Floodway
- Zone AO

0.2% Annual Chance

- 0.2% Annual Chance

Other Areas

- Zone X (unshaded)
- Zone D (unmapped)

LEGEND

- Highways
- Major Roads
- Rivers
- Lakes
- Cities
- Counties

The map also features a scale bar from 0 to 2 miles and a north arrow. An inset map shows the location of Lake County relative to neighboring counties: Glenn, Colusa, Yolo, Napa, Sonoma, and Mendocino.

Table 4-71 City of Lakeport – Future Development Areas in Summary DFIRM Flood Zones by Parcel Count and Acres

| Future Development Project / Flood Zone / Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|--|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| 1% Annual Chance Flood Hazard | 11 | 6 | 49 |
| Other Areas | 33 | 5 | 198 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| 1% Annual Chance Flood Hazard | 6 | 4 | 38 |
| 0.2% Annual Chance Flood Hazard | 2 | 2 | 10 |
| Other Areas | 45 | 37 | 392 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: FEMA DFIRM 9/30/2005, Lake County GIS, City of Lakeport

Table 4-72 City of Lakeport – Future Development Areas in Summary DFIRM Flood Zones by Detailed Parcel Count and Acres

| Future Development Project / Flood Zone / Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|--|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| 1% Annual Chance Flood Hazard | | | |
| Future Commercial Infill - Central | 1 | 1 | 4 |
| Future Commercial Infill - Citywide | 2 | 1 | 9 |
| Future Commercial Infill - South | 1 | 1 | 5 |
| Future Recreational Development Areas | 2 | 0 | 7 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Tribal Health Future Development | 1 | 1 | 6 |
| 1% Annual Chance Flood Hazard Total | 11 | 6 | 49 |
| Other Areas | | | |
| Future Commercial Infill - Central | 4 | 0 | 15 |
| Future Commercial Infill - Citywide | 5 | 1 | 23 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 2 | 0 | 4 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 5 | 0 | 53 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |

| Future Development Project / Flood Zone / Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|--|--------------------|-----------------------|-------------|
| Tribal Health Future Development | 7 | 1 | 12 |
| Other Areas Total | 33 | 5 | 198 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| 1% Annual Chance Flood Hazard | | | |
| South Lakeport Annexation Area | 6 | 4 | 38 |
| 1% Annual Chance Flood Hazard Total | 6 | 4 | 38 |
| 0.2% Annual Chance Flood Hazard | | | |
| South Lakeport Annexation Area | 2 | 2 | 10 |
| 0.2% Annual Chance Flood Hazard Total | 2 | 2 | 10 |
| Other Areas | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 42 | 37 | 76 |
| Other Areas Total | 45 | 37 | 392 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| Grand Total | | | |
| | 97 | 54 | 687 |

Source: FEMA DFIRM 9/30/2005, Lake County GIS, City of Lakeport

Table 4-73 City of Lakeport – Future Development Areas in Detailed DFIRM Flood Zones by Parcel Count and Acres

| Future Development Project / Flood Zone / Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|--|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| 1% Annual Chance Flood Hazard | | | |
| Zone A | | | |
| Future Commercial Infill - Central | 1 | 1 | 4 |
| Zone A Total | 1 | 1 | 4 |
| Zone AE | | | |
| Future Commercial Infill - South | 1 | 1 | 5 |
| Future Recreational Development Areas | 2 | 0 | 7 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Tribal Health Future Development | 1 | 1 | 6 |
| Zone AE Total | 8 | 4 | 35 |
| Zone AO | | | |
| Future Commercial Infill - Citywide | 2 | 1 | 9 |
| Zone AO Total | 2 | 1 | 9 |

| Future Development Project / Flood Zone / Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|--|--------------------|-----------------------|-------------|
| 1% Annual Chance Flood Hazard Total | 11 | 6 | 49 |
| Other Areas | | | |
| Zone X (unshaded) | | | |
| Future Commercial Infill - Central | 4 | 0 | 15 |
| Future Commercial Infill - Citywide | 5 | 1 | 23 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 2 | 0 | 4 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 5 | 0 | 53 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| Tribal Health Future Development | 7 | 1 | 12 |
| Zone X (unshaded) Total | 33 | 5 | 198 |
| Other Areas Total | 33 | 5 | 198 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| 1% Annual Chance Flood Hazard | | | |
| Zone AE | | | |
| South Lakeport Annexation Area | 3 | 2 | 29 |
| Zone AE Total | 3 | 2 | 29 |
| Zone AO | | | |
| South Lakeport Annexation Area | 3 | 2 | 9 |
| Zone AO Total | 3 | 2 | 9 |
| 1% Annual Chance Flood Hazard Total | 6 | 4 | 38 |
| 0.2% Annual Chance Flood Hazard | | | |
| Zone X (shaded) | | | |
| South Lakeport Annexation Area | 2 | 2 | 10 |
| Zone X (shaded) Total | 2 | 2 | 10 |
| 0.2% Annual Chance Flood Hazard Total | 2 | 2 | 10 |
| Other Areas | | | |
| Zone X (unshaded) | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 42 | 37 | 76 |
| Zone X (unshaded) Total | 45 | 37 | 392 |
| Other Areas Total | 45 | 37 | 392 |
| Unincorporated Lake County Total | 53 | 43 | 440 |

| Future Development Project / Flood Zone / Jurisdiction | Total Parcel Count | Improved Parcel Count | Total Acres |
|--|--------------------|-----------------------|-------------|
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: FEMA DFIRM 9/30/2005, Lake County GIS, City of Lakeport

4.3.10. Flood: Localized/Stormwater Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Historically, the City of Lakeport has been at risk to flooding primarily during the winter and spring months when stream systems in the County and City swell with heavy rainfall. Localized flooding also occurs throughout the City at various times throughout the year with several areas of primary concern. In addition to flooding, damage to these areas during heavy storms includes road closures, pavement deterioration, washouts, landslides/mudslides, debris areas, and downed trees. The amount and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff. These areas and the types of damage are presented in Table 4-29 in Section 4.2.13. The HMPC noted that heavy rains may produce ponding around storm drains but these events are short in duration and do not typically cause property damage. Impacts primarily include damages to infrastructure. Impacts to property and life safety from localized flooding would be more limited.

Future Development

The City of Lakeport Stormwater Management Plan noted that post-construction runoff impact occurs by changing the natural hydrology of a land area through the creation of new impervious surfaces during development. Increased impervious surfaces interrupts the natural cycle of gradual percolation of water through vegetation and soil by altering the timing and quantity of peak flows. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include stream bank scouring, bank erosion and downstream flooding, which often lead to a loss of aquatic life and damage to property. The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding.

4.3.11. Hazardous Materials Transport Vulnerability Assessment

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Impacts

include loss of life, damages to infrastructure, damages to property, and damages to critical facilities. Should hazardous materials be spilled in Clear Lake, damages to the marine environment may occur, and if significant, the local economy could be affected.

Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key City assets relative to the hazardous materials transportation corridors identified above in Section 4.2.14. Figure 4-87 shows the hazardous materials transportation corridors (for roadways) in the City of Lakeport as well as the one-mile buffer zone (on each side of the corridor for a two-mile total buffer) used this analysis as detailed further in the methodology below. Location of improved parcels in the hazardous materials transportation corridor buffer zones are also shown.

Methodology: Buffer Zone

An analysis of the potential vulnerability of the City Planning Area to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. Transportation corridors focus on key roadways. To evaluate the areas most vulnerable, a one-mile buffer was applied to both sides of Highways 29 and 175. The result is a two-mile buffer zone around each transportation corridor that is used for this analysis. The buffer distance was based on guidelines in the U.S. Department of Transportation's Emergency Response Guidebook that suggest distances useful to protect people from vapors resulting from spills involving dangerous goods considered toxic if inhaled. The recommended buffer distance referred to in the guide as the "protective action distance" is the area surrounding the incident in which people are at risk of harmful exposure. For purposes of this Plan, a buffer distance of one mile was used on either side of the transportation corridor. Actual buffer distances will vary depending on the nature and quantity of the release, whether the release occurred during the night or daytime, and prevailing weather conditions.

Values at Risk

During a hazardous materials transportation spill, it is generally the people that are at risk to the effects of the spill. During a spill, buildings, property, and their values are at a lesser risk; however, given the location of hazardous materials routes in the City, an analysis is performed here. Analysis results for the Lakeport Planning Area are summarized in Table 4-74, which summarizes, by route, the total parcel counts, improved parcel counts, and their improved and land values and the estimated contents replacement values based on the CRV factors detailed in Table 4-38.

Table 4-74 City of Lakeport – Count and Value of Parcels in Buffer Zones by Route and Property Use

| Hazardous Materials Transportation Routes/Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--|--------------------|-----------------------|----------------------|--------------------------|--------------------------|----------------------|
| HWY 29 | | | | | | |
| Commercial | 357 | 286 | \$34,239,826 | \$79,198,554 | \$79,198,554 | \$192,636,934 |
| Government | 23 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 23 | 2 | \$295,682 | \$371,865 | \$371,865 | \$1,039,412 |
| Residential | 1,861 | 1,602 | \$106,199,926 | \$207,955,690 | \$103,977,845 | \$418,133,461 |
| HWY 29 Total | 2,264 | 1,890 | \$140,735,434 | \$287,526,109 | \$183,548,264 | \$611,809,807 |
| HWY 29 and HWY 175 | | | | | | |
| Commercial | 58 | 47 | \$10,252,214 | \$13,753,711 | \$13,753,711 | \$37,759,636 |
| Government | 4 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 3 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 99 | 79 | \$11,589,196 | \$11,849,972 | \$5,924,986 | \$29,364,154 |
| HWY 29 and HWY 175 Total | 164 | 126 | \$21,841,410 | \$25,603,683 | \$19,678,697 | \$67,123,790 |
| | | | | | | |
| Grand Total | 2,428 | 2,016 | \$162,576,844 | \$313,129,792 | \$203,226,961 | \$678,933,597 |

Source: CalTrans, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Population at Risk

To determine the populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential population that resides within the two-mile buffer zone of the highway corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel data and results tabulated for the Planning Area, as found in Table 4-75, and broken out by route in Table 4-76. Those residential parcel centroids that intersect the buffered corridor were counted and multiplied by the 2010 Census Bureau average household

factors for Lakeport (2.31). According to this analysis, there is a total population of 3,883 in the buffered corridor that reside in the Planning Area.

Table 4-75 City of Lakeport – Count of Residential Parcels and Population at Risk in Hazardous Materials Buffer Zones

| Jurisdiction | Residential Parcels | Population |
|--------------|---------------------|------------|
| Lakeport | 1,681 | 3,883 |

Source: Cal Trans, Lakeport/Lake County GIS, US Census Bureau

Table 4-76 City of Lakeport – Count of Residential Parcels and Population at Risk in Hazardous Materials Buffer Zones by Transportation Route

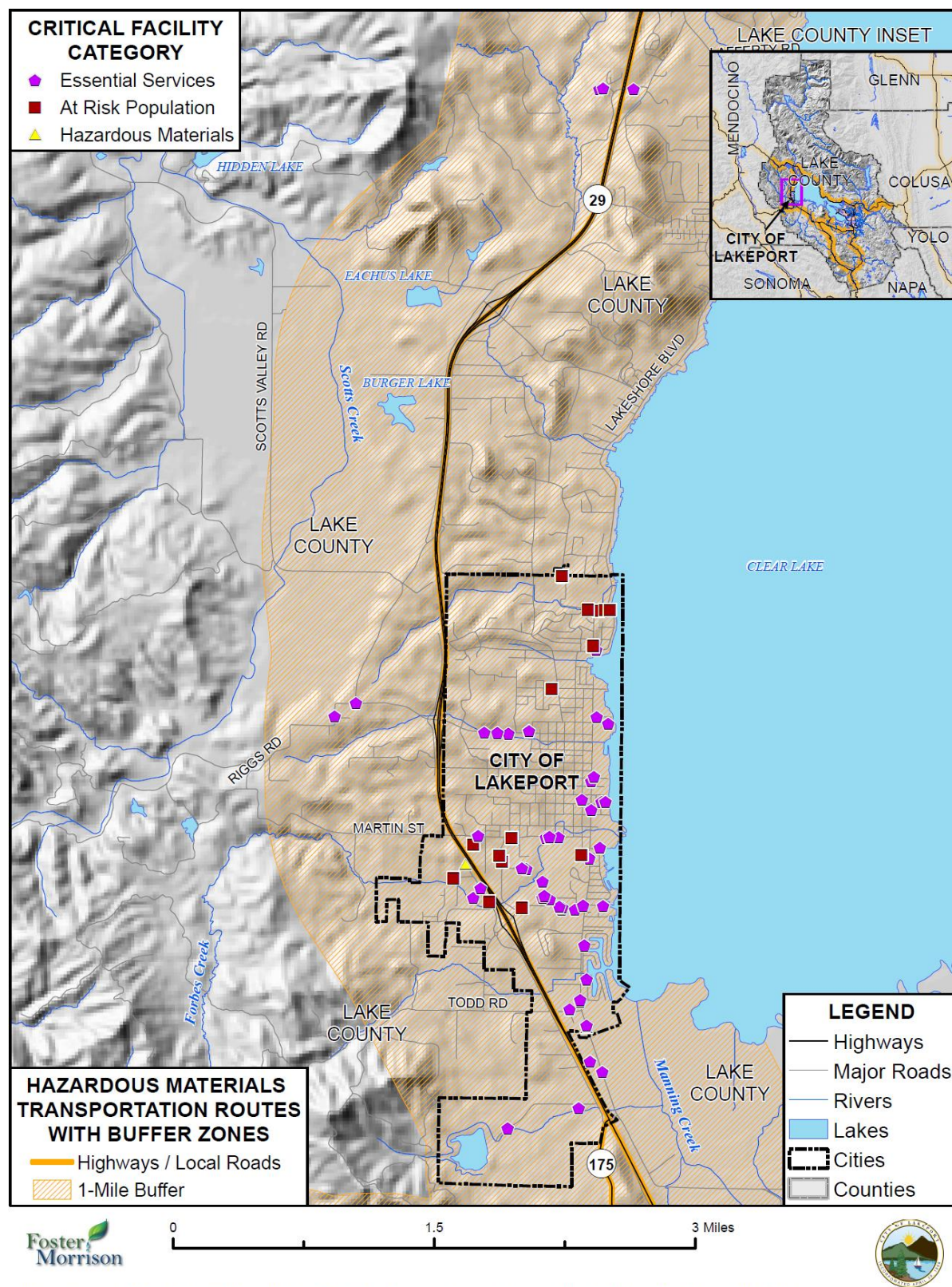
| Hazardous Material Route | Improved Residential Parcels | Population |
|--------------------------|------------------------------|--------------|
| Highway 29 | 1,602 | 3,701 |
| Highway 29 and 175 | 79 | 182 |
| Total | 1,681 | 3,883 |

Source: CalTrans, Lakeport/Lake County GIS, US Census Bureau

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the City of Lakeport to determine critical facilities in the hazardous material buffer zones. Using GIS, the hazardous material route buffer zones were overlayed on the critical facility GIS layer. Figure 4-88 shows critical facilities as well as the buffer zones. Table 4-77 provides summary information of critical facilities in the buffer zones by category. Table 4-78 provides greater detail of critical facilities in hazardous material route buffer zones by facility type and count. As shown on the tables, there are 63 critical facilities in the City and 6 facilities outside the City that fall within the hazardous material transportation route buffered corridors. Details of critical facility definition, type, name, and address by hazardous material buffer zone route are listed in Appendix E.

Figure 4-88 City of Lakeport – Critical Facilities in Hazardous Materials Buffer Zones



Data Source: CalTrans Truck Network 12/2016, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 5/1/2019.

Table 4-77 City of Lakeport – Critical Facilities in Hazardous Materials Buffer Zones Summary

| Critical Facility Category / Hazardous Materials Route / Jurisdiction | Facility Count |
|---|----------------|
| City of Lakeport | |
| HWY 29 | |
| Essential Services Facilities | 45 |
| At Risk Population Facilities | 16 |
| Hazardous Materials Facilities | 2 |
| HWY 29 Total | 63 |
| City of Lakeport Total | 63 |
| Unincorporated Lake County | |
| HWY 29 | |
| Essential Services Facilities | 6 |
| At Risk Population Facilities | 0 |
| Hazardous Materials Facilities | 0 |
| HWY 29 Total | 6 |
| Unincorporated Lake County Total | 6 |
| Grand Total | |
| | 69 |

Source: City of Lakeport GIS, CalTrans

Table 4-78 City of Lakeport – Critical Facilities in Hazardous Materials Buffer Zones Detail by Category and Facility Type

| Jurisdiction/Hazardous Materials Route | Critical Facility Category/Critical Facility Type | Facility Count |
|--|---|----------------|
| City of Lakeport | | |
| HWY 29 | Essential Services Facilities | |
| | Commerce | 7 |
| | Communications | 2 |
| | Construction – Engineering | 1 |
| | Fire – Rescue | 1 |
| | Government | 6 |
| | Law | 3 |
| | Medical – Clinic | 8 |
| | Pump Stations | 10 |
| | Transportation | 1 |
| | Water Intake | 1 |
| | Water Treatment Plant | 1 |
| | Sewer Treatment Plant | 1 |

| Jurisdiction/Hazardous Materials Route | Critical Facility Category/Critical Facility Type | Facility Count |
|---|---|----------------|
| | Senior Activity Center | 1 |
| | Water Storage | 1 |
| | Community Center | 1 |
| | Essential Services Facilities Total | 45 |
| | At Risk Population Facilities | |
| | Assisted Living | 2 |
| | Child Care | 2 |
| | School | 6 |
| | Senior Apt Complex | 5 |
| | Assisted Living Senior Apt Complex | 1 |
| | At Risk Population Facilities Total | 16 |
| | Hazardous Materials Facilities | |
| | Hazardous Material | 2 |
| | Hazardous Materials Facilities Total | 2 |
| | Total | 63 |
| City of Lakeport Total | | 63 |
| Unincorporated Lake County | | |
| HWY 29 | Essential Services Facilities | |
| | Animal | 1 |
| | Communications | 1 |
| | Law | 1 |
| | Medical – Hospital | 1 |
| | Water Storage | 1 |
| | Water Wells | 1 |
| | Essential Services Facilities Total | 6 |
| | Total | 6 |
| Unincorporated Lake County Total | | 6 |
| | | |
| Grand Total | | 69 |

Source: City of Lakeport GIS, CalTrans

Overall Community Impact

Hazardous materials transportation impacts vary by location and severity of any given event and will likely only affect certain areas of the Planning Area during specific times. Based on the risk assessment, it is evident that landslides will continue to have potentially large economic impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;

- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values.

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

GIS Analysis

Lake County's GIS parcel layer was used as the basis for the countywide inventory of parcels and their associated values. In this analysis, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point containing the assessor's data. In addition, the City of Lakeport provided a GIS spatial file identifying the future development areas for which the analysis was to be performed. Utilizing the future development spatial layer, the parcel centroid data was intersected to determine the parcel counts within each development. The Caltrans hazardous materials route buffer zones were used to perform the analysis. This can be seen in Figure 4-89. Table 4-79 shows the breakdown of the future development parcel counts in the City of Lakeport and their acreages in the hazardous materials buffer zones.

Figure 4-89 City of Lakeport – Future Development in Hazardous Materials Buffer Zones

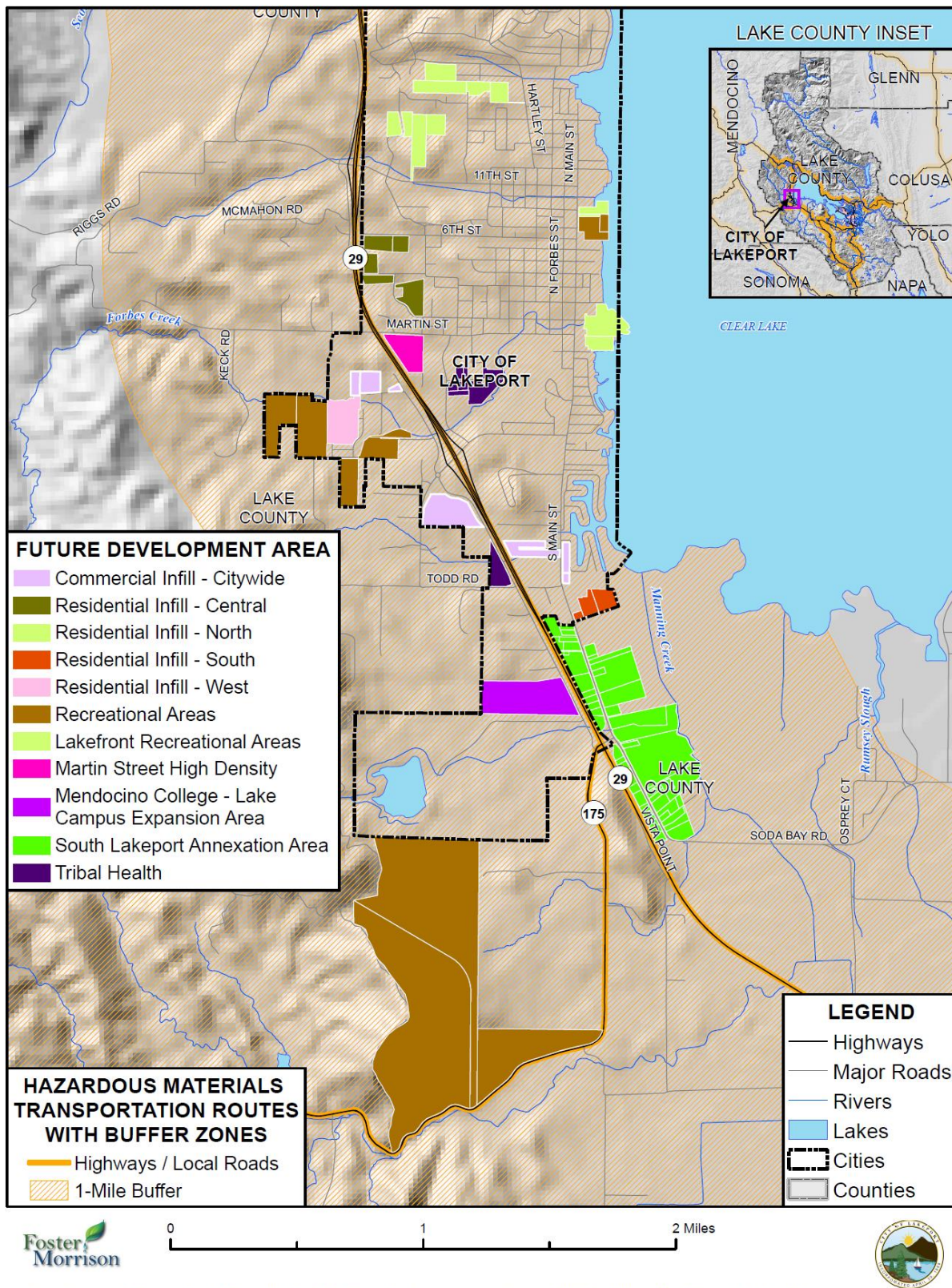


Table 4-79 City of Lakeport – Future Development Areas in Hazardous Materials Buffer Zones by Parcel Count and Acres

| Jurisdiction/Future Development Project | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| Future Commercial Infill - Central | 5 | 1 | 20 |
| Future Commercial Infill - Citywide | 7 | 2 | 32 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 3 | 1 | 9 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 7 | 0 | 59 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| Tribal Health Future Development | 8 | 2 | 18 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 50 | 43 | 124 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: Caltrans, Lake County GIS, City of Lakeport

4.3.12. Landslide and Debris Flows Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Landslides in the City of Lakeport include a wide variety of processes resulting in downward and outward movement of soil, rock, and vegetation. Common names for landslide types include slumps, rockslides, debris slides, lateral spreading, debris avalanches, earth flows, and soil creep. Although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides may be triggered by both natural- and human-caused activity. Impacts from landslide include loss of life, property damage, and critical facility damages. In addition, the City of Lakeport could be isolated if State Highway 29 and 175 were impacted by landslides or large debris flow.

Although this hazard also includes related issues such as mudslides and debris flows, available mapped hazard data was limited to landslides; thus, the remainder of this section is focused on the landslide

vulnerability. Additional data and information on post-fire related mudslides and debris flows are included in the wildfire (Section 4.2.15) profile of this plan.

Note: After completing the hazard profile and the vulnerability assessment, the City noted that all areas of concern for the City have been effectively mitigated. For the mitigation strategy section of this LHMP in Chapter 5, landslide and debris flows will be considered a non-priority hazard.

Values at Risk

Rainfall induced landslide areas are areas which have been historically documented by the USGS to have experienced landslides, mudslides, or debris/earth flows and therefore have been considered to be potentially hazardous and at risk to property. The landslide vulnerability assessment focuses on understanding the potential impacts to Lakeport properties.

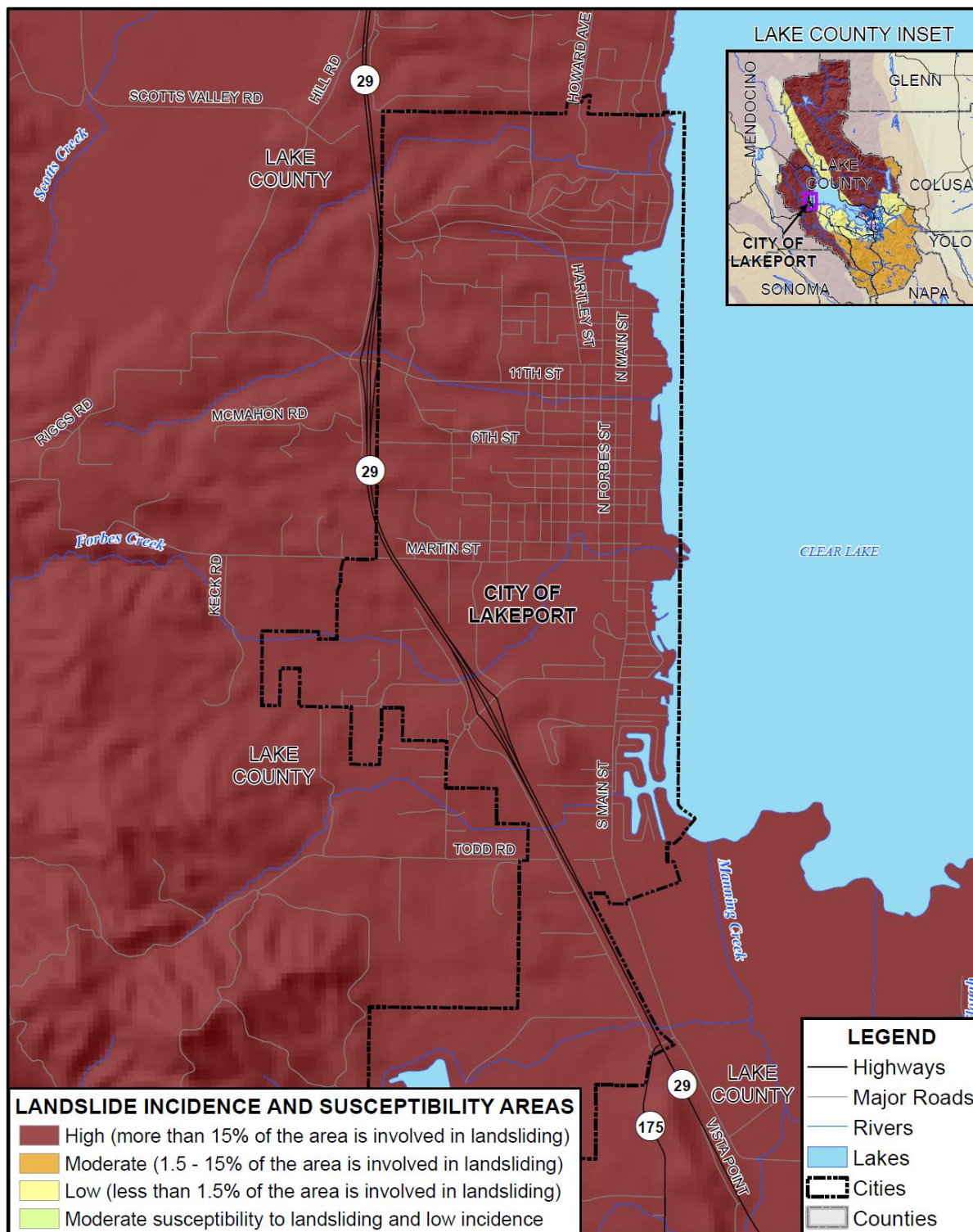
Methodology

The 2001 Landslide Incidence and Susceptibility data was obtained for the entire Lake County geographic area which includes the Lakeport Planning Area. According to the landslide layer obtained by the USGS, their landslide incidence falls entirely within the high incidence and susceptibility areas. The County's parcel layer was used as the basis for the inventory of all parcels within Lakeport. GIS was used to overlay the landslide incidence and susceptibility hazard layer onto the parcel layer centroids, and where the landslide zones intersected a parcel centroid, it was assigned with that hazard zone for the entire parcel. Note that the value of the improved land is also included in the total of values at risk as the land itself is at risk to landslide.

Landslide Analysis Results

The USGS landslide layer was overlaid with the Lakeport parcel layer in GIS to obtain results. Areas of landslide incidence and susceptibility in the Lakeport Planning Area is shown in Figure 4-90. Table 4-80 illustrates the potential estimated damages to Lakeport from landslides, including FEMA contents replacement values from Table 4-38.

Figure 4-90 City of Lakeport – Landslide Incidence and Susceptibility Areas



0 1 2 Miles



Data Source: USGS Landslide Data 2001, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

Table 4-80 City of Lakeport – Count and Value of Parcels in Landslide Incidence and Susceptibility Areas by Property Use

| Property Use | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Total Value |
|--------------------------|--------------------|-----------------------|----------------------|--------------------------|----------------------|
| High | | | | | |
| Commercial | 415 | 333 | \$44,492,040 | \$92,952,265 | \$92,952,265 |
| Government | 27 | 0 | \$ | \$0 | \$0 |
| Open Space / Rural Lands | 26 | 2 | \$295,682 | \$371,865 | \$371,865 |
| Residential | 1,963 | 1,684 | \$118,260,050 | \$220,308,051 | \$110,154,026 |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 |

Source: USGS, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

It should be noted that maps and analysis represent best available data. There have been past occurrences of landslides in areas not shown to be at risk to landslide. Generally, landslide risk maps detail areas prone to slope failure; the maps rarely include the runout areas where the failed slope will go. By way of example, a landslide on March 22, 2014, killed 43 people when it wiped out a rural neighborhood in Oso, northeast of Seattle. While the failed slope area was mapped as prone to landslides, the runout area was not. It was the runout area that resulted in devastating loss. Thus, mapping of landslide susceptible areas should be considered as one part of the equation. Damages to the area that could be inundated by such slope failure should also be considered by local jurisdictions.

Population at Risk

Those residential parcel centroids that intersect the landslide risk areas were counted and multiplied by the 2010 Census Bureau average household factors for the City of Lakeport (2.31). According to this analysis, there is a total population of 3,890 residents that reside in Lakeport in the High Landslide Incidence and Susceptibility Area. This is shown in Table 4-81.

Table 4-81 City of Lakeport – Count of Residential Parcels and Population by Landslide Incidence and Susceptibility Area

| Landslide Incidence and Susceptibility Area | Improved Residential Parcels | Population |
|---|------------------------------|--------------|
| High | 1,684 | 3,890 |
| Total | 1,684 | 3,890 |

Source: USGS, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the City of Lakeport to determine critical facilities in the Landslide Incidence and Susceptibility Areas. Using GIS, Landslide Incidence and Susceptibility Areas were overlaid on the critical facility GIS layer. Figure 4-88 shows critical facilities as well as the Landslide Incidence and Susceptibility Areas. Table 4-77 provides summary information of critical facilities in the Landslide Incidence and Susceptibility Areas by category. All 69 facilities fall in

the High Landslide Incidence and Susceptibility Area. Table 4-78 provides greater detail of critical facilities in Landslide Incidence and Susceptibility Areas by facility type and count. Details of critical facility definition, type, name, and address by Landslide Incidence and Susceptibility Areas are listed in Appendix E.

Figure 4-91 City of Lakeport – Critical Facilities in Landslide Incidence and Susceptibility Areas

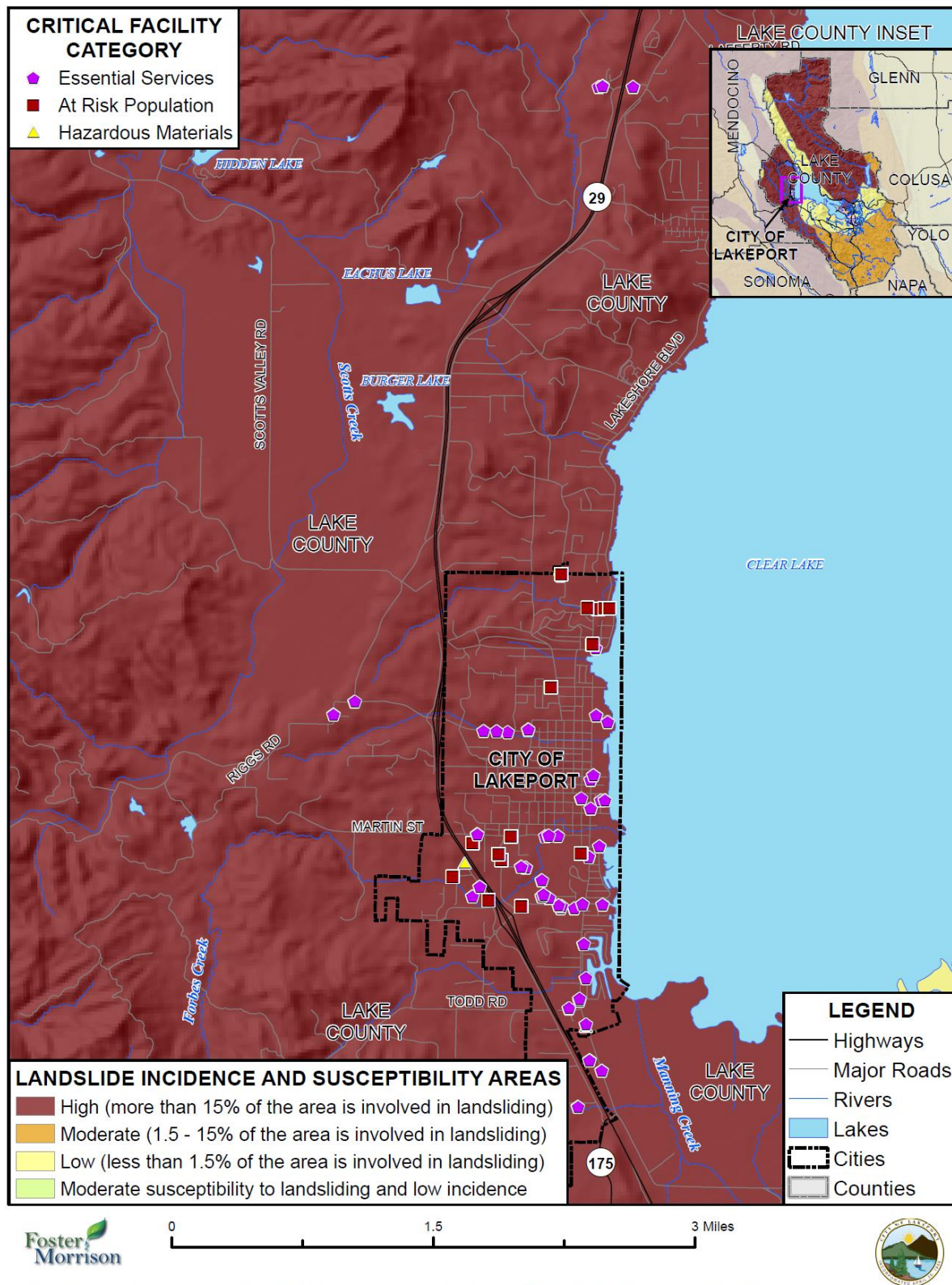


Table 4-82 City of Lakeport – Critical Facilities in Landslide Incidence and Susceptibility Areas Summary

| Critical Facility Category / Landslide Incidence and Susceptibility / Jurisdiction | Facility Count |
|--|----------------|
| City of Lakeport | |
| High | |
| Essential Services Facilities | 45 |
| At Risk Population Facilities | 16 |
| Hazardous Materials Facilities | 2 |
| High Total | 63 |
| City of Lakeport Total | 63 |
| Unincorporated Lake County | |
| High | |
| Essential Services Facilities | 6 |
| At Risk Population Facilities | 0 |
| Hazardous Materials Facilities | 0 |
| High Total | 6 |
| Unincorporated Lake County Total | 6 |
| Grand Total | 69 |

Source: City of Lakeport GIS, USGS Landslide Data 2001

Table 4-83 City of Lakeport – Critical Facilities in Landslide Incidence and Susceptibility Areas Detail by Category and Facility Type

| Jurisdiction / Landslide Incidence and Susceptibility | Critical Facility Category / Critical Facility Type | Facility Count |
|---|---|----------------|
| City of Lakeport | | |
| High | Essential Services Facilities | |
| | Commerce | 7 |
| | Communications | 2 |
| | Construction - Engineering | 1 |
| | Fire - Rescue | 1 |
| | Government | 6 |
| | Law | 3 |
| | Medical - Clinic | 8 |
| | Pump Stations | 10 |
| | Transportation | 1 |
| | Water Intake | 1 |
| | Water Treatment Plant | 1 |
| | Sewer Treatment Plant | 1 |

| Jurisdiction / Landslide Incidence and Susceptibility | Critical Facility Category / Critical Facility Type | Facility Count |
|---|---|----------------|
| | Senior Activity Center | 1 |
| | Water Storage | 1 |
| | Community Center | 1 |
| | Essential Services Facilities Total | 45 |
| | At Risk Population Facilities | |
| | Assisted Living | 2 |
| | Child Care | 2 |
| | School | 6 |
| | Senior Apt Complex | 5 |
| | Assisted Living Senior Apt Complex | 1 |
| | At Risk Population Facilities Total | 16 |
| | Hazardous Materials Facilities | |
| | Hazardous Material | 2 |
| | Hazardous Materials Facilities Total | 2 |
| | Total | 63 |
| City of Lakeport Total | | 63 |
| Unincorporated Lake County | | |
| High | Essential Services Facilities | |
| | Animal | 1 |
| | Communications | 1 |
| | Law | 1 |
| | Medical - Hospital | 1 |
| | Water Storage | 1 |
| | Water Wells | 1 |
| | Essential Services Facilities Total | 6 |
| | Total | 6 |
| Unincorporated Lake County Total | | 6 |
| | | |
| Grand Total | | 69 |

Source: City of Lakeport GIS, USGS Landslide Data 2001

Overall Community Impact

Landslides, debris flows, and mud flow impacts vary by location and severity of any given event and will likely only affect certain areas of the Planning Area during specific times. Based on the risk assessment, it is evident that landslides will continue to have potentially large economic impacts to certain areas of the City. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Future Development

Although new growth and development corridors would fall in the area affected by high risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide area will continue to occur. The City requires engineered foundations and grading plans where appropriate, thereby mitigating risk for development in landslide areas.

Future Development GIS Analysis

Lake County's GIS parcel layer was used as the basis for the countywide inventory of parcels and their associated values. In this analysis, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point containing the assessor's data. In addition, the City of Lakeport provided a GIS spatial file identifying the future development areas for which the analysis was to be performed. Utilizing the future development spatial layer, the parcel centroid data was intersected to determine the parcel counts within each development. The USGS landslide incidence and susceptibility areas were used to perform the analysis. This can be seen in Figure 4-92. Table 4-86 shows the breakdown of the future development parcel counts in the City of Lakeport and their acreages in the moderate or higher landslide incidence and susceptibility areas.

Data Source: USGS Landslide Data 2001, City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

Table 4-84 City of Lakeport – Future Development Areas in Landslide Incidence and Susceptibility Areas by Parcel Count and Acres

| Jurisdiction/Landslide Incidence Areas/Future Development Project | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| High | | | |
| Future Commercial Infill - Central | 5 | 1 | 20 |
| Future Commercial Infill - Citywide | 7 | 2 | 32 |
| Future Commercial Infill - North | 7 | 3 | 36 |
| Future Commercial Infill - South | 3 | 1 | 9 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 7 | 0 | 59 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| Tribal Health Future Development | 8 | 2 | 18 |
| High Total | 44 | 11 | 247 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| High | | | |
| Future Recreational Development Areas | 3 | 0 | 316 |
| South Lakeport Annexation Area | 50 | 43 | 124 |
| High Total | 53 | 43 | 440 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: USGS, Lake County GIS, City of Lakeport

4.3.13. Severe Weather: Extreme Heat Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Extreme heat happens in Lakeport each year. Extreme heat normally does not impact structures as there may be a limited number of days where the temperatures stay high which gives the structure periodic relief between hot and cool temperature cycles.

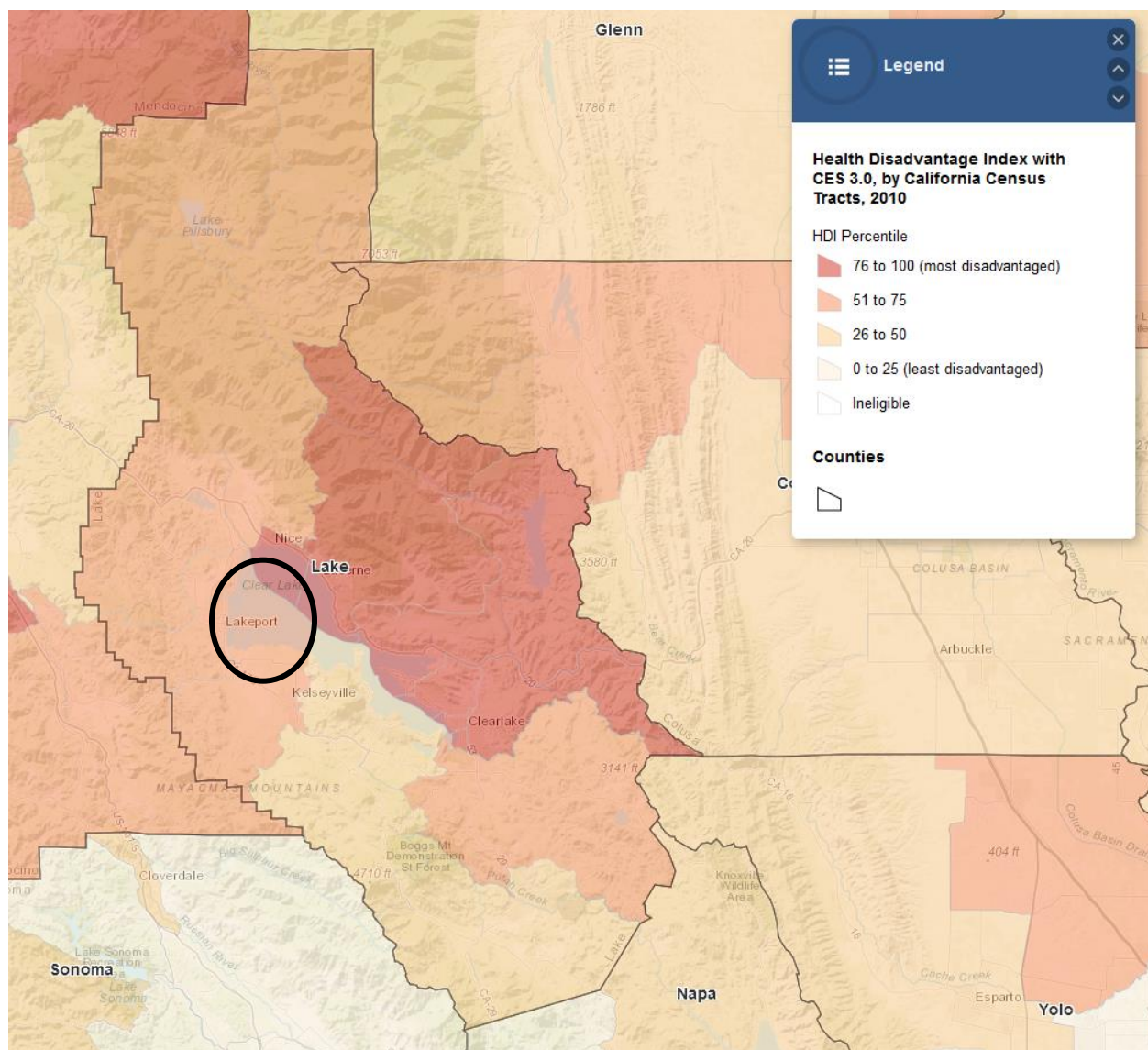
Recent research indicates that the impact of extreme temperatures, particularly on populations, has been historically under-represented. However, as temperature variances may occur outside of larger hazards or outside of the expected seasons but still incur large costs, it is important to examine them as stand-alone hazards. Extreme heat may overload demands for electricity to run air conditioners in homes and businesses

during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. Extreme heat may also be a secondary effect of droughts, or may cause drought-like conditions in a temporary setting. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist.

The HMPC noted that extreme heat has caused brownout conditions in the past. A brownout is a reduction in or restriction on the availability of electrical power in a particular area. When brownouts happen during extreme heat, the risk of heat related illnesses and deaths increases.

The Public Health Alliance has developed a composite index to identify cumulative health disadvantage in California. Factors such as those bulleted above were combined to show what areas are at greater risk to hazards like extreme heat. This is shown on Figure 4-93.

Figure 4-93 Health Disadvantage Index by California Census Tract



Vulnerable populations to extreme heat include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The HMPC noted that the biggest concern with people with durable medical equipment – especially with the potential for PG&E shutdowns, both during red flag events and those associated with proactive shutdowns in times of high usage. In addition to vulnerable populations, pets are at risk to extreme heat.

Future Development/Redevelopment

As the City shifts in demographics, more residents will become senior citizens. The residents of nursing homes and elder care facilities, as well as elderly individuals who live alone, are especially vulnerable to extreme temperature events. It is encouraged that such facilities generally have emergency plans or backup power to address power failure during times of extreme heat. Low income residents and homeless populations are also vulnerable. Community gathering places with air conditioning for these populations are utilized when necessary.

4.3.14. Severe Weather: Heavy Rains, Snow, and Storms Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

According to historical hazard data, heavy rain and storms are an annual occurrence in Lake County and the City of Lakeport. Damage and disaster declarations related to severe storm events have occurred and will continue to occur in the future. Heavy rains are the most frequent type of severe weather occurrences in the City, with thunderstorms occurring more occasionally. Wind often accompanies these storms and have caused damage in the past. Hail and lightning are rare in the City. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods and high winds, that have had the greatest impact (road damage, utility damage, power outages, etc.) on the City. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this Plan (Section 4.3.9 Flood: 1%/0.2% Annual Chance and Section 4.2.13 Flood: Localized Stormwater).

Future Development

Residential housing that is built in the City must be built to residential code. That code ensures that homes are built to withstand heavy rains and storms. New critical facilities should be built to withstand severe storms and thunderstorm winds. While minimal damages have occurred to critical facilities in the past due

to severe storm events, there still remains future risk. With development occurring in the region, future losses to new development may occur.

4.3.15. Other Mitigation Efforts

The City has many other mitigation efforts that are being worked towards that have not been previously captured in this capability assessment. They are discussed in detail below by hazard.

Multi-Hazard

Lakeport has hosted a Community Disaster Preparedness Expo in the City. An example is shown in Figure 4-94.

Figure 4-94 City of Lakeport – Invite to Expo



NEWS RELEASE

City of Lakeport
225 Park St.
Lakeport, CA 95453
(707) 263-5615

LAKEPORT DISASTER PREPAREDNESS EXPO

Date: September 28, 2011

From: City of Lakeport

For Further information contact City of Lakeport Emergency Service Volunteer Greg Scott by email at gscott@lakeportpolice.org or by telephone at (707) 263-5350

A free Community Disaster Preparedness Expo will be held Saturday, October 15, 2011, between 10:00 a.m. and 3:00 p.m. at Mendo Mill Home Center and Lumber Company at 2465 South Main Street in Lakeport. The focus of the Expo is to provide local residents with information on ways to prepare for a disaster should such an event ever occur.

The Expo is co-hosted by Mendo Mill Home Center and Lumber Company and the City of Lakeport and is supported by the Lake County Chamber of Commerce and Bruno's Shop Smart. Representatives from a number of City, County, and State public service agencies, along with representatives from private business, will staff booths to motivate residents on how to prepare for potential disasters by providing information and educational materials and sharing resources. The objective is to inform and motivate the public on how to become and stay prepared, develop a plan, and build an emergency resource kit for any local disaster that might affect them. Recent disasters around the country, including floods, wild land fires, tornados, hazardous materials spills, earthquakes, and acts of terrorism have underscored the need for citizens to be prepared at all times. Studies show that most Californians, including people in our local area, are not adequately prepared for a significant disaster that could occur close to their home or work.

Free hot dogs and bottled water will be available for the first 200 Expo attendees.

The City of Lakeport and Mendo Mill Home Center and Lumber Company along with many other allied agencies, organizations, and businesses are excited about the opportunity to work together in helping our community be more prepared for disasters.

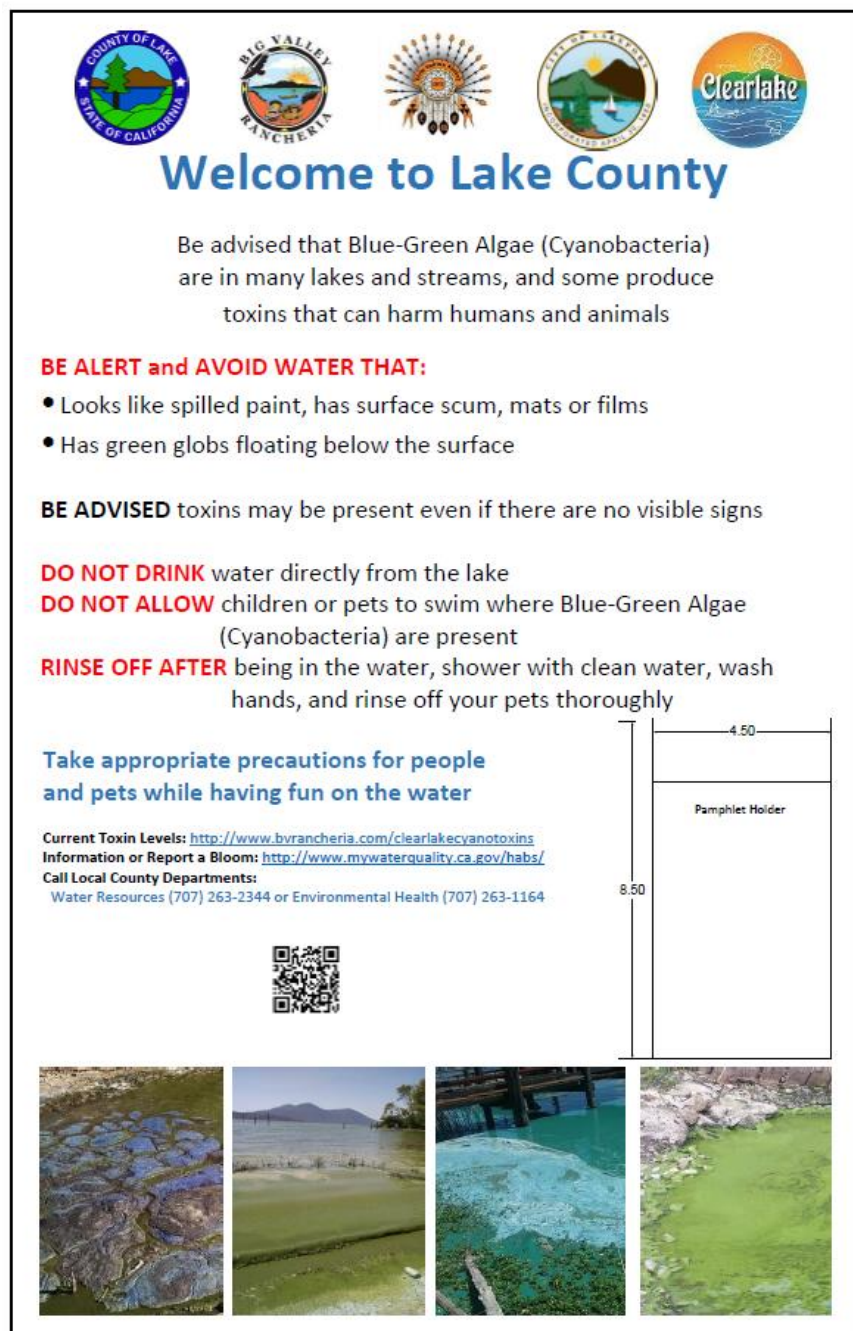
Agencies, organizations, and businesses confirmed for the event include Cal-Fire, California Highway Patrol, Lake County Public & Environmental Health, Lake County Vector Control District, Vietnam Veterans of American Chapter 951, Lincoln-Leavitt Insurance, LEAF, Pacific Gas & Electric, Lake County Fire Safe Council, American Red Cross, Timberline Land Management, Ukiah Oxygen Company, DFM Car Stereo &

Source: City of Lakeport

Aquatic Biological Hazards: Cyanobacteria

DWR has caution and warning signage for cyanobacteria. 8x11 laminated signs have been posted at Library Park when cyanotoxin levels are high. Danger signs warn swimmers and boaters of the presence of cyanotoxins. This can be seen in Figure 4-95.

Figure 4-95 Cyanobacteria Warning Sign



The City has produced a brochure warning about cyanobacteria. This can be seen in Figure 4-96.

Figure 4-96 Cyanobacteria Brochure

Safety First!

Follow these simple Do's and Don'ts to stay safe when on or around a freshwater lake, pond, or stream.

DO

- Do avoid water that looks discolored, like spilled paint, or has a green/blue surface scum, mats or film, or is emitting a foul odor.
- Do wash hands and rinse with clean water (yourself, children, and pets) after touching or swimming in any lake, pond, or stream, regardless of its visual conditions or presence of a cyanobacteria bloom.
- Do be alert, look for and obey ALL posted signage.
- Do report any large algal blooms by calling the state Harmful Algal Bloom (HAB) hotline at (844)729-6466 (toll free).

DON'T

- Don't ever drink lake water even if blooms are not visible, as toxins can still be present. **IMPORTANT: Boiling the water will not remove algal toxins.**
- Don't wakeboard, water-ski, or jet-ski over algal mats as toxins can become aerosolized.
- Don't allow children or pets to wade in, swim in, or drink water where a bloom is suspected or visible. Do not allow pets to lick fur after swimming in water with a potential bloom.
- Don't use fertilizers or detergents containing phosphates near the lake, as they increase cyanobacteria growth.

Source: City of Lakeport

Current Toxin Levels

During the warm seasons, water quality testing is conducted about every two weeks at over 20 locations throughout Clear Lake. This testing is provided by the Big Valley Band of Pomo Indians and the Elem Indian Colony. To find out if a bloom is occurring, visit The Clear Lake Cyano Reporting Page using this QR code or the link below:




www.bvrancheria.com/clearlakecyanotoxins

To report a bloom

If you see, or think you see, a cyanobacteria bloom, you can report it at the California Harmful Algal Bloom (HAB) Portal 1(844)729-6466
<https://mywaterquality.ca.gov/habs>

Or contact your local county departments:

Water Resources (707) 263-2344
water.resources@lakecountycalifornia.gov

Environmental Health (707)263-1164

Public Health (707) 263-1090
PublicHealth@lakecountycalifornia.gov

For more information:
www.lakecountycalifornia.gov

Cyanobacteria

Blue-Green Algae

Green Slime

Harmful Algal Blooms

They have many names, but cyanobacteria can produce toxins that cause serious harm to humans and animals. Use this brochure to learn about the risks and how to avoid them when swimming, boating, fishing, and wading in freshwater.



This information is provided to you by a collaborative effort from the County of Lake Departments of Public Health, Environmental Health, & Water Resources, and partners Big Valley Band of Pomo Indians & Elem Indian Colony

The City has employed aeration units to move the water in the summer near swimming areas.

The City also participates in a multi-jurisdictional Task Force/Work Group to address cyanobacterial issues lake-wide.

Aquatic Biological Hazards: Quagga Mussels

The City implements a comprehensive signage, inspection and sticker program. Boat ramp areas are highly monitored with boat inspections prior to launching. These inspections have caught quagga mussels and prevented them from entering Clear Lake. In addition to the Fish and Wildlife staff who implement this inspection program, there is an effort to cross train City of Lakeport Park staff to be able to educate the public and further conduct inspections.

Climate Change

The HMPC noted at solar energy upgrade project that is currently underway. This project entails implementing citywide energy efficient improvements such as the use of LEDs, upgrades to HVAC systems, installation of solar panels, and other similar activities to reduce greenhouse emissions.

Dam Failure

The City noted that dam maintenance is an ongoing issue. The dam sees regular maintenance regarding rodents and vegetation management. Recent inspections by the State have shown no issues. An Emergency Action Plan (EAP) and new inundation maps are being completed for the WWTP Dam.

Regular inspections are conducted, and regular maintenance of the dam is performed.

Drought and Water Shortage

- The City Utility Department is working on a groundwater sustainability plan. Lakeport is also working on securing continuous redundancy of water sources.
- During periods of drought, the City cuts back on irrigation. Library Park is always irrigated by Lake water if needed.

Flooding, Seiche, and Severe Weather: High Winds

- The City has received a FEMA grant for past damages to their seawall caused by high lake levels, flooding, and wave action.
- The City implements an annual drainage maintenance and street sweeping program to reduce flooding throughout the City.
- The City implements an Inflow and Infiltration (I&I) Program to reduce sanitary sewer overflows and sewer back-ups by eliminating storm water inflow and groundwater infiltration into the City's sanitary sewer collector system.
- After 2017 Floods, City implemented a slip fit project in Will-O-Point area that included more than 50 mobile homes which were evacuated during the floods. After the lake water receded, did smoke tests and discovered numerous sewer leaks, so evacuations continued until sewer systems repairs were complete.

Hazardous Materials Transport

The City noted the following:

- 40-hour hazwopper training of key staff
- Mobile haz mat trailer and equipment has been acquired under an oil spill response grant and training completed.
- No Hazmat transport is allowed on Highway 20.

Wildfire

- City implements a tree trimming and brush clearing program on City property

- The City also implements a weed abatement program to reduce grasses in public ROWs and oversee program on private property.
- Recently completed project to provide access for emergency vehicles along Highway 29 from Berry to 6th.
- In response to last year's fires, very aggressive ROW expansion of "paper streets" providing 40 – 50 foot passages.

4.3.16. Severe Weather: High Winds Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Medium

Lake County and the City of Lakeport are subject to potentially destructive straight-line winds. High winds are common throughout the area and can happen during most times of the entire year. Straight line winds are primarily a public safety and economic concern. Windstorms can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered.

Future impacts and losses from straight line winds include:

- Increased wildfire risk
- Erosion (soil loss)
- Downed trees
- Power line impacts and economic losses from power outages
- Occasional building damage, primarily to roofs

Outbuildings, mobile homes, campers, and their occupants are particularly vulnerable as windstorm events in the region can be sufficient in magnitude to overturn these lighter structures. Overhead power lines are vulnerable and account for some historical damages. High winds have caused power lines to arc or spark, which have led to wildfires in the region. State highways can be vulnerable to high winds and dust storms, where high profile vehicles may be overturned by winds and lowered visibility can lead to multi-car accidents. The greatest threat to the City from wind is not from damage from the winds themselves, but from the spread of wildfires during windy days. Wind can cause both power lines to arc, as well as quickly spreading the fire that is started by sparks. The HMPC also noted that wind can cause waves to form on Clear Lake. In the past, 5' waves have been recorded. These waves have caused significant issues in the City with erosion where the waves come in contact with the shore.

Future Development

Future development projects should consider windstorm hazards at the planning, engineering, and architectural design stage with the goal of reducing vulnerability. When high winds will occur, where, and of what intensity are all factors that evolve in the days and hours before they form. Improved weather forecasts coupled with information technologies, including weather radios and social media, has resulted in an increasingly large volume of risk information that is available to people when high winds threaten. Development trends in the City are not expected to increase vulnerability to the hazard.

4.3.17. Wildfire Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely

Vulnerability—Extremely High

Risk and vulnerability to the City of Lakeport from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. CAL FIRE has mapped areas at risk of fires in the eastern hills surrounding the City. CAL FIRE has also designated portions of land within City limits east as Moderate to High Fire Hazard Severity Zones. There are many vacant and undeveloped areas within or adjacent to the City, particularly on the west side of Highway 29 and the northern portions of the City, including mobile home parks. Rugged topography and highly flammable vegetation make residential development potentially unsafe unless adequate fire safety measures are taken. The periphery of Lakeport is a wild land urban interface (WUI) area where structures are at significant risk of fire exposure. Poor road conditions and inadequate water suppression infrastructure can limit the ability of fire crews from successfully fighting fires. An abundance of dead vegetation on properties paired with construction using non-fire-resistant building materials can also increase the potential for structural losses in fires. A number of environmental variables influence home and business exposure to wildfires. Extended periods of hot and dry weather combined with wind are often key variables determining the duration and severity of fires.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities. Fires have caused evacuations and school closures, which have put economic strain on nearby communities who receive the residents who have had to evacuate. Previous droughts have exacerbated the risk of major wildland/urban interface fires in or near the City of Lakeport. Future droughts will create greater risks to the City of Lakeport to wildfire.

Public Safety Power Shutoff (PSPS)

Recent wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in nearby Butte County in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are coordinating to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a Public Safety Power Shutoff (PSPS).

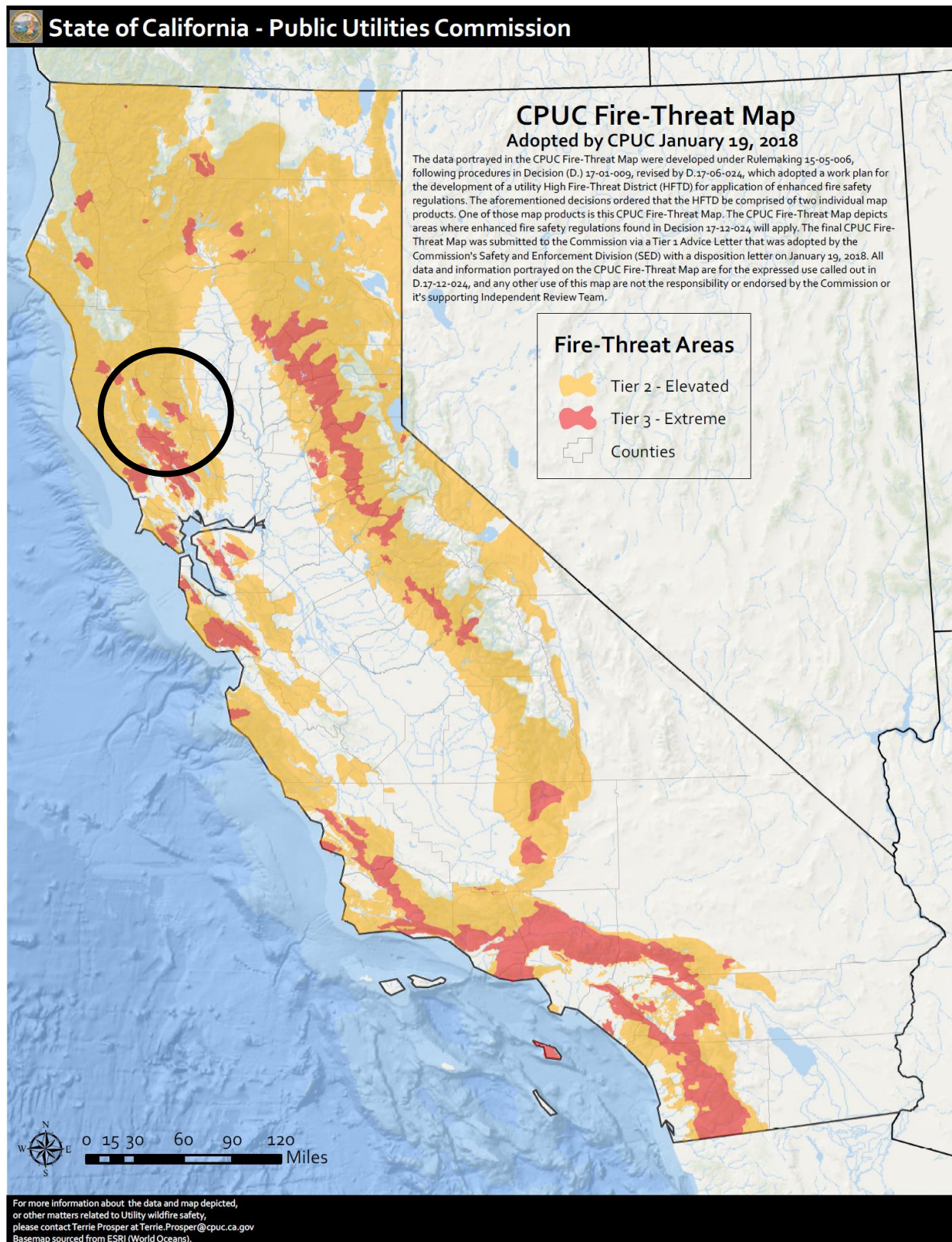
Public Safety Power Shutoff Criteria

The Wildfire Safety Operations Center (WSOC) monitors fire danger conditions across PG&E service area and evaluates whether to turn off electric power lines in the interest of safety. While no single factor will drive a Public Safety Power Shutoff, some factors include:

- A Red Flag Warning declared by the National Weather Service
- Low humidity levels generally 20% and below
- Forecasted sustained winds generally above 25 mph and wind gusts in excess of approximately 45 mph, depending on location and site-specific conditions such as temperature, terrain and local climate
- Condition of dry fuel on the ground and live vegetation (moisture content)
- On-the-ground, real time observations from PG&E's WSOC and field observations from PG&E crews

The most likely electric lines to be considered for shutting off for safety will be those that pass through areas that have been designated by the California Public Utilities Commission (CPUC) as at elevated (Tier 2) or extreme (Tier 3) risk for wildfire (seen on Figure 4-97). This includes both distribution and transmission lines. The specific area and number of affected customers will depend on forecasted weather conditions and which circuits PG&E needs to turn off for public safety. Although a customer may not live or work in a high fire-threat area, their power may also be shut off if their community relies upon a line that passes through an area experiencing extreme fire danger conditions. This means that any customer who receives electric service from PG&E should be prepared for a possible public safety power outage.

Figure 4-97 State of California Tier 2 and 3 Areas



PG&E noted that extreme weather threats can change quickly. When possible, PG&E will provide customers with advance notice prior to turning off the power, as well as updates until power is restored. Timing of notifications (when possible) are:

- Approximately 48 hours before power is turned off
- Approximately 24 hours before power is turned off
- Just before power is turned off
- During the public safety outage
- Once power has been restored

The HMPC noted that residents in the City are without power for up to 7 days at a time due to these events. The HMPC also noted that Sutter Hospital is preparing for long term (5-day) power outages. They are conducting generator drills to see how long fuel lasts, and looking to see what is actually on or not on generator power. They will use this information to add additional uninterrupted power supply to other emergency equipment. It was noted that there will not be generator power to clinics, but that the Hospital would create and repurpose space to absorb clientele from clinics. In addition, the City, County, and private industry are assessing personal readiness of group homes, looking to add additional generator capacity, and additional fridge space. The City, County, and PG&E are telling citizens to plan for 5 days for generator backup.

Communities at Risk to Wildfire

The National Fire Plan is a cooperative, long-term effort between various government agency partners with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. For purposes of the National Fire Plan, CAL FIRE generated a list of California communities at risk for wildfire. The intent of this assessment was to evaluate the risk to a given area from fire escaping off federal lands. Three main factors were used to determine the wildfire threat in the wildland-urban interface areas of California: fuel hazards, probability of fire, and areas of suitable housing density that could create wildland urban interface fire protection strategy situations. The preliminary criteria and methodology for evaluating wildfire risk to communities is published in the Federal Register, January 4, 2001.

The City of Lakeport is considered a Community at Risk.

Values at Risk

The City of Lakeport has mapped CAL FIRE data which provides a variety of fire hazard information for California communities. Utilizing this data from CAL FIRE, GIS was used to determine the possible impacts of wildfire within Lakeport and how the wildfire risk varies across the City Planning Area. Two primary CAL FIRE datasets and associated analysis was used for this plan:

- Fire Responsibility Areas
- Fire Hazard Severity Zones

Fire Responsibility Areas

There are numerous wildland fire protection agencies that have responsibility within Lake County and the City of Lakeport, including the USDA Forest Service (FS), the Bureau of Land Management (BLM), and CAL FIRE. There are also numerous local fire departments and fire protection districts that serve local areas, many of whom have mutual aid agreements with each other as well as state and federal agencies for fire suppression and protection. Fire Responsibility Areas are generally categorized by Federal Responsibility Areas (FRA), State Responsibility Areas (SRA) and Local Responsibility Areas (LRA).

Methodology

CAL FIRE has a legal responsibility to provide fire protection on all SRA lands, which are defined based on land ownership, population density and land use. CAL FIRE's State Responsibility Area layer was used in this analysis to show Lakeport's parcel counts and values by FRA, SRA, and LRA. GIS was used to create a centroid, or point representing the center of the City's parcel polygons. The FRA, SRA, and LRA areas were then overlaid on the parcel centroids. For the purposes of this analysis, the wildfire responsibility area that intersected a parcel centroid was assigned for the entire parcel. Locations of each responsibility area are shown in Figure 4-98.

[illegible]

Fire Responsibility Areas and Values at Risk

The entire geographical area of Lakeport falls within the LRA. The LRA contains 2,431 parcels, of which 2,019 are improved. The LRA has over \$680 million in total value. It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total City assets at risk. However, it is highly unlikely the whole City will ever be on fire at once. The City parcel inventory and associated values by fire responsibility area are provided in Table 4-85.

Table 4-85 Lakeport– Count and Value of Parcels in Local, State, and Federal Responsibility Areas by Property Use

| Property Use / Fire Responsibility Area | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|---|--------------------|-----------------------|----------------------|--------------------------|--------------------------|----------------------|
| LRA | | | | | | |
| Commercial | 415 | 333 | \$44,492,040 | \$92,952,265 | \$92,952,265 | \$230,396,570 |
| Government | 27 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 26 | 2 | \$295,682 | \$371,865 | \$371,865 | \$1,039,412 |
| Residential | 1,963 | 1,684 | \$118,260,050 | \$220,308,051 | \$110,154,026 | \$448,722,127 |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 | \$680,158,109 |

Source: CAL FIRE, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

Fire Hazard Severity Zone Analysis

As part of the Fire and Resource Assessment Program (FRAP), CAL FIRE was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), then define the application of various mitigation strategies to reduce risk associated with wildland fires.

Fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The fire hazard model developed by CAL FIRE considers the wildland fuels. Fuel is that part of the natural vegetation that burns during the wildfire. The model also considers topography, especially the steepness of the slopes. Fires burn faster as they burn up-slope. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. Finally, the model considers the production of burning fire brands (embers) how far they move, and how receptive the landing site is to new fires.

In 2007, CAL FIRE updated its Fire Hazard Severity Zone (FHSZ) maps for the State of California to provide updated map zones, based on new data, science, and technology that will create more accurate zone

designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources. The program is still ongoing with fire hazard severity zone maps being updated based on designated responsibility areas: FRA, SRA, and LRA.

The CAL FIRE data, detailing FHSZs within the Lakeport Planning Area, was utilized to determine the locations, numbers, types, and values of land and structures falling within each FHSZ. The following sections provide details on the methodology and results for this analysis.

Methodology

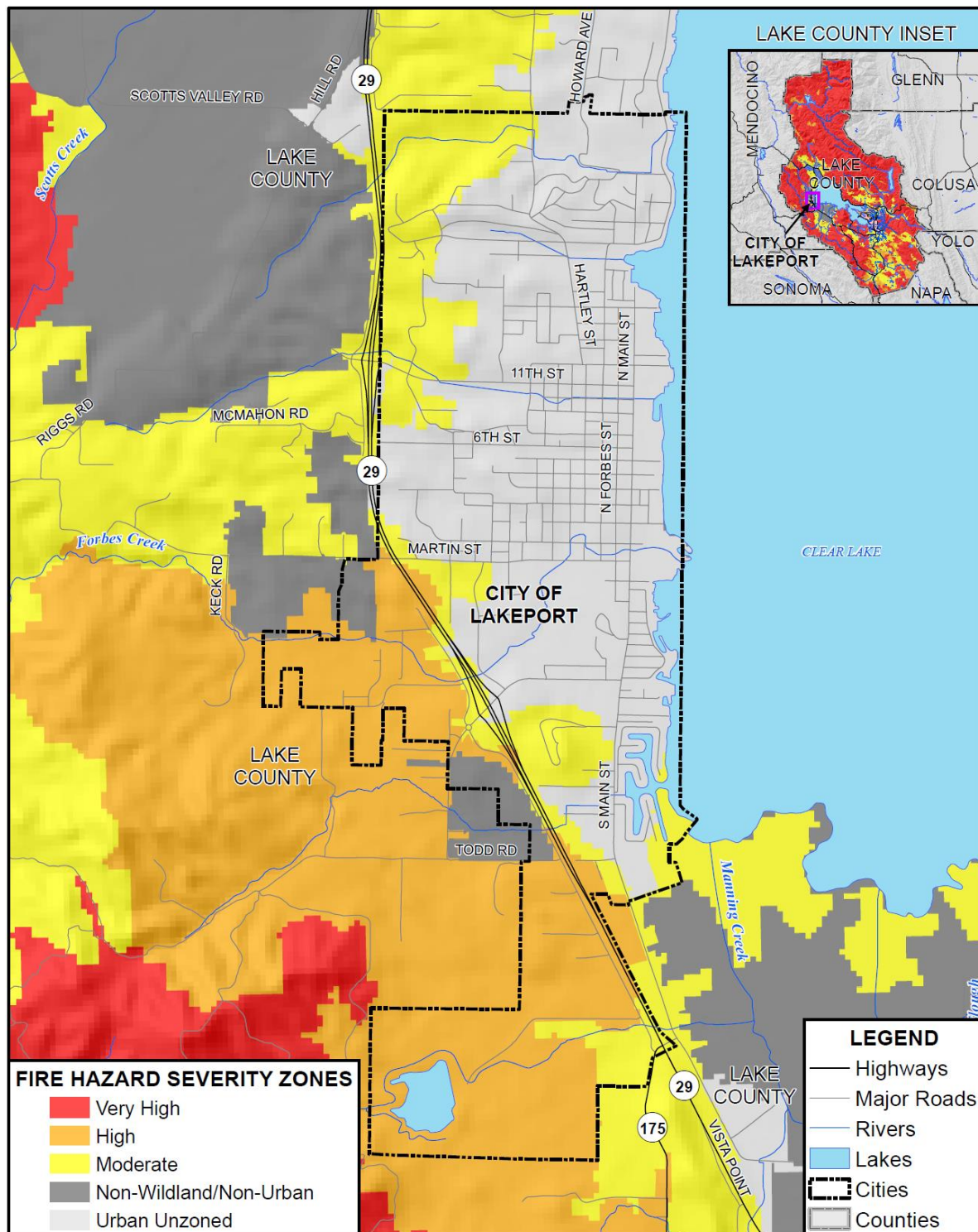
As previously described, CAL FIRE mapped the SRA Fire Hazard Severity Zones (FHSZs), or areas of significant fire hazard, based on fuels, terrain, weather, and other relevant factors. Within the City of Lakeport, the Recommended LRA (c17fhszl06_3) dataset dated 7/2009 was utilized for the analysis and contained Very High and Non-Very High hazard classes. In all areas surrounding Lakeport, the Adopted SRA (fhszs06_3_17) dataset dated 11/2007 was used to get a complete coverage of Fire Hazards.

Analysis was performed using only the Recommended FHSZ datasets, and using GIS, the parcel layer was overlaid on the Recommended FHSZ layers. Since it is possible for any given parcel to intersect with multiple FHSZs, for purposes of this analysis, the parcel centroid was used to determine which FHSZ to assign to each parcel. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessor's database and the parcel layer. Based on this approach, the FHSZs for the Lakeport Planning Area were determined and further broken out by property use and included information on both land and improved values.

Fire Hazard Severity Zones and Values at Risk

The FHSZs are shown in Figure 4-99. Analysis results for the Lakeport Planning Area is summarized in Table 4-86, which summarizes total parcel counts, improved parcel counts, and their improved and land values and the estimated contents replacement values based on the CRV factors detailed in Table 4-38, as well as the percentage of parcels affected by each FHZZ. As shown on Table 4-38, there are 1,887 improved parcels in the Very High FHSZ, with a total value in excess of \$247 million.

Figure 4-99 City of Lakeport – Fire Hazard Severity Zones



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhszs06_3_17 and Draft LRA 9/2007 - c17fhszl06_1), City of Lakeport, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.



Table 4-86 City of Lakeport – Count and Value of Parcels in Fire Hazard Severity Zones by Property Use

| Property Use / Fire Hazard Severity Zone | Total Parcel Count | Improved Parcel Count | Total Land Value | Improved Structure Value | Estimated Contents Value | Total Value |
|--|-----------------------|--------------------------|----------------------|--------------------------------|--------------------------------|----------------------|
| High | | | | | | |
| Commercial | 34 | 24 | \$7,534,740 | \$9,458,624 | \$9,458,624 | \$26,451,988 |
| Government | 3 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 11 | 0 | \$66,300 | \$0 | \$0 | \$66,300 |
| Residential | 59 | 39 | \$6,410,447 | \$11,584,424 | \$5,792,212 | \$23,787,083 |
| High Total | 107 | 63 | \$14,011,487 | \$21,043,048 | \$15,250,836 | \$50,305,371 |
| Moderate | | | | | | |
| Commercial | 37 | 28 | \$4,367,491 | \$6,933,141 | \$6,933,141 | \$18,233,773 |
| Government | 5 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 2 | 0 | \$0 | \$0 | \$0 | \$0 |
| Residential | 147 | 111 | \$12,481,222 | \$21,887,870 | \$10,943,935 | \$45,313,027 |
| Moderate Total | 191 | 139 | \$16,848,713 | \$28,821,011 | \$17,877,076 | \$63,546,800 |
| Non-Wildland/Non-Urban | | | | | | |
| Commercial | 3 | 2 | \$219,478 | \$680,707 | \$680,707 | \$1,580,892 |
| Residential | 4 | 3 | \$376,537 | \$182,308 | \$91,154 | \$649,999 |
| Non-Wildland/Non-Urban Total | 7 | 5 | \$596,015 | \$863,015 | \$771,861 | \$2,230,891 |
| Urban Unzoned | | | | | | |
| Commercial | 341 | 279 | \$32,370,331 | \$75,879,793 | \$75,879,793 | \$184,129,917 |
| Government | 19 | 0 | \$0 | \$0 | \$0 | \$0 |
| Open Space / Rural Lands | 13 | 2 | \$229,382 | \$371,865 | \$371,865 | \$973,112 |
| Residential | 1,753 | 1,531 | \$98,991,844 | \$186,653,449 | \$93,326,725 | \$378,972,018 |
| Urban Unzoned Total | 2,126 | 1,812 | \$131,591,557 | \$262,905,107 | \$169,578,383 | \$564,075,047 |
| Grand Total | | | | | | |
| Grand Total | 2,431 | 2,019 | \$163,047,772 | \$313,632,181 | \$203,478,156 | \$680,158,109 |

Source: CAL FIRE, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

*Land, structure, and contents values

Population at Risk

A separate analysis was performed to determine population in fire hazard severity zones. Using GIS, the CAL FIRE fire hazard severity zones datasets were overlaid on the improved residential parcel data.

Those parcel centroids that intersect each fire severity zone were counted and multiplied by the Census Bureau average household size (2.31) for the City; results were tabulated by jurisdiction and fire hazard severity zone. According to this analysis shown in Table 4-87, there is a population of 90 and 256 that reside in the High and Moderate FHSZ categories in the City, respectively.

Table 4-87 City of Lakeport – Count of Residential Parcels and Population at Risk in Moderate or Higher Fire Hazard Severity Zones

| Fire Hazard Severity Zones | Improved Residential Parcels | Population |
|----------------------------|------------------------------|--------------|
| High | 39 | 90 |
| Moderate | 111 | 256 |
| Non-Wildland/Non-Urban | 3 | 7 |
| Urban/Unzoned | 1,531 | 3,537 |
| Total | 1,684 | 3,890 |

Source: USGS, US Census Bureau 2010 Estimates, Lakeport/Lake County 10/30/2018 Parcel/Assessor's Data

** Census Bureau 2010 average household sizes were used

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in the City of Lakeport to determine critical facilities in the Fire Hazard Severity Zones. Using GIS, the hazardous material route buffer zones were overlaid on the critical facility GIS layer. Figure 4-100 shows critical facilities as well as the FHSZs. Table 4-82 provides summary information of critical facilities in the FHSZ by category. Table 4-83 provides greater detail of critical facilities in FHSZ by facility type and count. As shown in the table, in Lakeport there are 6 critical facilities in the High FHSZ, and 7 critical facilities in the Moderate FHSZ. In addition, outside of the City of Lakeport, there are 4 critical facilities in the Moderate FHSZ. Details of critical facility definition, type, name, and address FHSZ are listed in Appendix E.

Figure 4-100 City of Lakeport – Critical Facilities in Fire Hazard Severity Zones

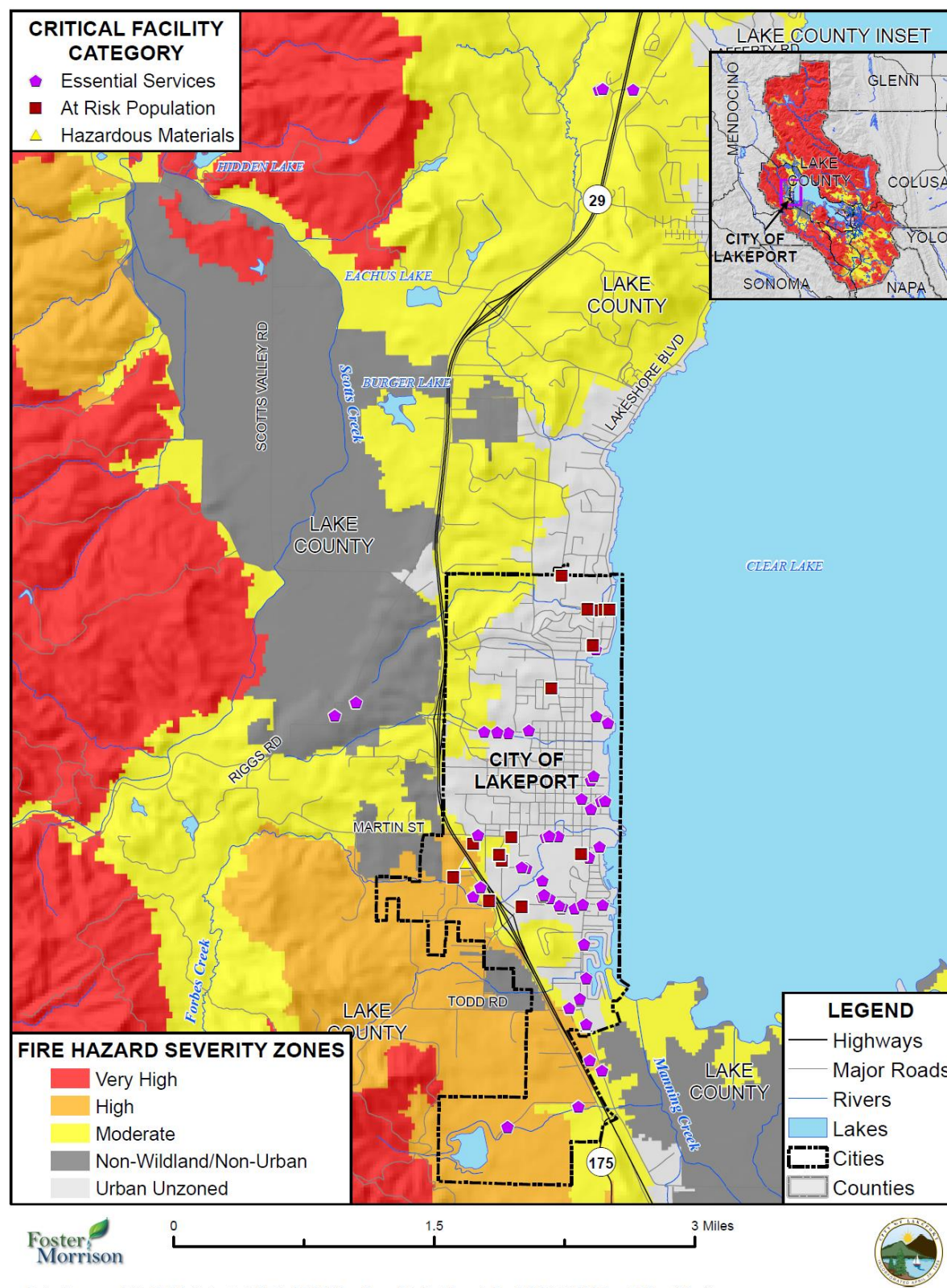


Table 4-88 City of Lakeport – Critical Facilities in Fire Hazard Severity Zones Summary

| Critical Facility Category / Fire Hazard Severity Zones / Jurisdiction | Facility Count |
|--|----------------|
| City of Lakeport | |
| High | |
| Essential Services Facilities | 4 |
| At Risk Population Facilities | 1 |
| Hazardous Materials Facilities | 1 |
| High Total | 6 |
| Moderate | |
| Essential Services Facilities | 3 |
| At Risk Population Facilities | 3 |
| Hazardous Materials Facilities | 1 |
| Moderate Total | 7 |
| Urban Unzoned | |
| Essential Services Facilities | 38 |
| At Risk Population Facilities | 12 |
| Hazardous Materials Facilities | 0 |
| Urban Unzoned Total | 50 |
| City of Lakeport Total | 63 |
| Unincorporated Lake County | |
| Moderate | |
| Essential Services Facilities | 4 |
| At Risk Population Facilities | 0 |
| Hazardous Materials Facilities | 0 |
| Moderate Total | 4 |
| Non-Wildland/Non-Urban | |
| Essential Services Facilities | 2 |
| At Risk Population Facilities | 0 |
| Hazardous Materials Facilities | 0 |
| Non-Wildland/Non-Urban Total | 2 |
| Unincorporated Lake County Total | 6 |
| | |
| Grand Total | 69 |

Source: City of Lakeport GIS, CAL FIRE

Table 4-89 City of Lakeport – Critical Facilities in Fire Hazard Severity Zones Detail by Category and Facility Type

| Jurisdiction / Fire Hazard Severity Zones | Critical Facility Category / Critical Facility Type | Facility Count |
|---|---|----------------|
| City of Lakeport | | |
| High | Essential Services Facilities | |
| | Commerce | 1 |
| | Medical - Clinic | 1 |
| | Pump Stations | 1 |
| | Sewer Treatment Plant | 1 |
| | Essential Services Facilities Total | 4 |
| | At Risk Population Facilities | |
| | Assisted Living | 1 |
| | At Risk Population Facilities Total | 1 |
| | Hazardous Materials Facilities | |
| | Hazardous Material | 1 |
| | Hazardous Materials Facilities Total | 1 |
| | High Total | 6 |
| Moderate | Essential Services Facilities | |
| | Communications | 1 |
| | Government | 1 |
| | Medical - Clinic | 1 |
| | Essential Services Facilities Total | 3 |
| | At Risk Population Facilities | |
| | School | 1 |
| | Senior Apt Complex | 2 |
| | At Risk Population Facilities Total | 3 |
| | Hazardous Materials Facilities | |
| | Hazardous Material | 1 |
| | Hazardous Materials Facilities Total | 1 |
| | Moderate Total | 7 |
| Urban Unzoned | Essential Services Facilities | |
| | Commerce | 6 |
| | Communications | 1 |
| | Construction - Engineering | 1 |
| | Fire - Rescue | 1 |
| | Government | 5 |
| | Law | 3 |

| Jurisdiction / Fire Hazard Severity Zones | Critical Facility Category / Critical Facility Type | Facility Count |
|---|---|----------------|
| | Medical - Clinic | 6 |
| | Pump Stations | 9 |
| | Transportation | 1 |
| | Water Intake | 1 |
| | Water Treatment Plant | 1 |
| | Senior Activity Center | 1 |
| | Water Storage | 1 |
| | Community Center | 1 |
| | Essential Services Facilities Total | 38 |
| | At Risk Population Facilities | |
| | Assisted Living | 1 |
| | Child Care | 2 |
| | School | 5 |
| | Senior Apt Complex | 3 |
| | Assisted Living Senior Apt Complex | 1 |
| | At Risk Population Facilities Total | 12 |
| | Urban Unzoned Total | 50 |
| City of Lakeport Total | | 63 |
| Unincorporated Lake County | | |
| Moderate | Essential Services Facilities | |
| | Animal | 1 |
| | Communications | 1 |
| | Law | 1 |
| | Medical - Hospital | 1 |
| | Essential Services Facilities Total | 4 |
| | Moderate Total | 4 |
| | | |
| Non-Wildland/Non-Urban | Essential Services Facilities | |
| | Water Storage | 1 |
| | Water Wells | 1 |
| | Essential Services Facilities Total | 2 |
| | Non-Wildland/Non-Urban Total | 2 |
| Unincorporated Lake County Total | | 6 |
| | | |
| Grand Total | | 69 |

Source: City of Lakeport GIS, CAL FIRE

Overall Community Impact

The overall impact to the community from a severe wildfire includes:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Decreased water quality in area watersheds;
- Increase in post-fire hazards such as flooding, sedimentation, and mudslides;
- Damage to natural resource habitats and other resources, such as timber and rangeland;
- Loss of water, power, roads, phones, and transportation, which could impact, strand, and/or impair mobility for emergency responders and/or area residents;
- Economic losses (jobs, sales, tax revenue) associated with loss of commercial structures;
- Negative impact on commercial and residential property values;
- Loss of churches, which could severely impact the social fabric of the community;
- Loss of schools, which could severely impact the entire school system and disrupt families and teachers, as temporary facilities and relocations would likely be needed; and
- Impact on the overall mental health of the community.

Future Development

As previously stated, population growth in the City is expected to be minimal. However, the addition of second homes on properties would add values at risk to wildfire. If homes are expanded and remodeled, additional values will be at risk to wildfires. The City enforces the California Building Code, which includes fire resistance standards during the building process.

To help manage wildfire risk at the state level, the California Building Code (CBC) contains standards for building materials, systems, and or assemblies used in the exterior design and construction of new buildings. For example, the 2016 CBC establishes minimum standards for the protection of life and property by increasing the ability of a building located in any FHSZ within SRA or any Wildland-Urban Interface Fire Area to resist the intrusion of flames or burning embers projected by a vegetation fire. (A Wildland-Urban Interface Fire Area is a geographical area identified by the state as a FHSZ, or other areas designated by the local agency to be at a significant risk from wildfires.)

However, the 2016 CBC standards have limitations. The standards only apply if: 1) the building site is located on land designated as a FHSZ or as a Wildland Interface Fire Area; and 2) the application for the building permit was submitted on or after July 1, 2008. Therefore, these standards do not apply to structures located outside of these designated areas. Additionally, these standards do not apply to structures for which building permit applications were submitted prior to July 1, 2008, regardless of their designation.

LOCAL-LEVEL RESPONSIBILITIES

Local agencies are responsible for identifying and managing wildfire risk within their jurisdictions. Cities and counties have multiple tools at their disposal to reduce wildfire risk, such as the General Plan, zoning ordinance, California Government Code, local fire departments, and Hazard Mitigation Plans. With new levels of concern regarding wildfires, local jurisdictions can evaluate their General Plans and zoning ordinances to locate weaknesses and bolster mitigation strategies related to wildfire hazards. Local jurisdictions can also create

overlay zoning or overlay districts for areas prone to wildfires that mandate heightened development regulations and landscape wildfire mitigation compliance measures.

The City also enforces a weed and rubbish ordinance to reduce flammable materials in and around homes in the City.

Future Development GIS Analysis

Lake County's GIS parcel layer was used as the basis for the countywide inventory of parcels and their associated values. In this analysis, the parcel data was converted to a point layer using a centroid conversion process, in which each parcel was identified by a central point containing the assessor's data. In addition, the City of Lakeport provided a GIS spatial file identifying the future development areas for which the analysis was to be performed. Utilizing the future development spatial layer, the parcel centroid data was intersected to determine the parcel counts within each development. The CAL FIRE Fire Hazard Severity Zones were used to perform the analysis. This can be seen on Figure 4-101 and in Table 4-90.

This map displays the City of Lakeport and surrounding areas in Lake County, California. It highlights future development potential and fire hazard severity.

FUTURE DEVELOPMENT AREA

- Commercial Infill - Citywide
- Residential Infill - Central
- Residential Infill - North
- Residential Infill - South
- Residential Infill - West
- Recreational Areas
- Lakefront Recreational Areas
- Martin Street High Density
- Mendocino College - Lake Campus Expansion Area
- South Lakeport Annexation Area
- Tribal Health

FIRE HAZARD SEVERITY ZONES

- Very High
- High
- Moderate
- Non-Wildland/Non-Urban
- Urban Unzoned

LEGEND

- Highways
- Major Roads
- Rivers
- Lakes
- Cities
- Counties

LAKE COUNTY INSET:

The inset map shows Lake County's location relative to neighboring counties: Glenn, Colusa, Yolo, Napa, Sonoma, and Mendocino. The City of Lakeport is indicated by a red dot within Lake County.

Geographic Labels:

- Forbes Creek
- Monning Creek
- SODA BAY RD
- OSPREY CT
- RUNNERS ST
- VISTA POINT
- TODD RD
- MARTIN ST
- 6TH ST
- 11TH ST
- HARTLEY ST
- N MAIN ST
- N FORBES ST
- KECK RD
- MCMAHON RD
- RIGGS RD

Scale: 0 to 2 Miles

Foster Morrison

Table 4-90 City of Lakeport – Future Development in Fire Hazard Severity Zones

| Jurisdiction/Fire Hazard Severity Zone / Future Development Project | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| City of Lakeport | | | |
| High | | | |
| Future Commercial Infill - Citywide | 2 | 1 | 5 |
| Future Commercial Infill - West | 1 | 0 | 14 |
| Future Recreational Development Areas | 5 | 0 | 53 |
| Mendocino College - Lake Campus Expansion Area | 1 | 0 | 31 |
| High Total | 9 | 1 | 103 |
| Moderate | | | |
| Future Commercial Infill - North | 3 | 1 | 17 |
| Future Commercial Infill - South | 1 | 1 | 5 |
| Martin Street High Density Development | 1 | 0 | 10 |
| Moderate Total | 5 | 2 | 33 |
| Non-Wildland/Non-Urban | | | |
| Future Commercial Infill - Citywide | 2 | 0 | 17 |
| Tribal Health Future Development | 1 | 1 | 6 |
| Non-Wildland/Non-Urban Total | 3 | 1 | 23 |
| Urban Unzoned | | | |
| Future Commercial Infill - Central | 5 | 1 | 20 |
| Future Commercial Infill - Citywide | 3 | 1 | 10 |
| Future Commercial Infill - North | 4 | 2 | 19 |
| Future Commercial Infill - South | 2 | 0 | 4 |
| Future Recreational Development Areas | 2 | 0 | 7 |
| Lakefront Recreational Future Development Areas | 4 | 2 | 18 |
| Tribal Health Future Development | 7 | 1 | 12 |
| Urban Unzoned Total | 27 | 7 | 89 |
| City of Lakeport Total | 44 | 11 | 247 |
| Unincorporated Lake County | | | |
| Very High | | | |
| Future Recreational Development Areas | 1 | 0 | 154 |
| Very High Total | 1 | 0 | 154 |
| High | | | |
| Future Recreational Development Areas | 2 | 0 | 162 |
| South Lakeport Annexation Area | 10 | 8 | 13 |
| High Total | 12 | 8 | 175 |
| Moderate | | | |

| Jurisdiction/Fire Hazard Severity Zone / Future Development Project | Total Parcel Count | Improved Parcel Count | Total Acres |
|---|--------------------|-----------------------|-------------|
| South Lakeport Annexation Area | 24 | 21 | 31 |
| Moderate Total | 24 | 21 | 31 |
| Non-Wildland/Non-Urban | | | |
| South Lakeport Annexation Area | 6 | 5 | 65 |
| Non-Wildland/Non-Urban Total | 6 | 5 | 65 |
| Urban Unzoned | | | |
| South Lakeport Annexation Area | 10 | 9 | 15 |
| Urban Unzoned Total | 10 | 9 | 15 |
| Unincorporated Lake County Total | 53 | 43 | 440 |
| | | | |
| Grand Total | 97 | 54 | 687 |

Source: Lake County GIS, City of Lakeport, CAL FIRE

4.4 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the City of Lakeport Planning Area and described, in general, the vulnerability of the City to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the City's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this plan.

The HMPC used a two-step approach to conduct this assessment for the City. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This section presents the City's mitigation capabilities and discusses select state and federal mitigation resources that are applicable to the City. These are in addition to, and supplement, the many plans, reports, and technical information reviewed and used for this LHMP as identified in Chapter 3 and in Chapter 4.

Similar to the HMPC's effort to describe hazards, risks, and vulnerability of the City, this mitigation capability assessment describes the City's existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This assessment is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; and mitigation education, outreach, and partnerships are discussed in Section 4.4.4. A discussion of other mitigation efforts follows in Section 4.3.15.

4.4.1. City of Lakeport Regulatory Mitigation Capabilities

Table 4-91 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 4-91 City of Lakeport Regulatory Mitigation Capabilities

| Plans | Y/N Year | Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions? |
|--|-------------|---|
| General Plan | Y | Safety Element addresses hazards; will be updated to incorporate LHMP |
| Capital Improvements Plan | Y | Annual update, includes hazard-related projects |
| Economic Development Plan | N | No plan, but has an economic development committee with goals and guidelines |
| Local Emergency Operations Plan | Y | |
| Continuity of Operations Plan | N | But Coop referenced in EOP |
| Transportation Plan | N | But Transportation Element of GP. Also participates in APC - Traffic Advisory Committee |
| Stormwater Management Plan/Program | N | 1980 – include mitigation projects |
| Engineering Studies for Streams | Y | FIS, Forbes Creek Flood Mitigation Design |
| Community Wildfire Protection Plan | Y | But not City specific – County-wide CWPP, 2009 |
| Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation) | Y | Floodplain Mitigation Plan |
| Building Code, Permitting, and Inspections | Y/N | Are codes adequately enforced? |
| Building Code | Y | Version/Year: 2016; as of Jan 1, 2020 will be 2019 |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | N | Score: Working on it |
| Fire department ISO rating: | N | Rating: |
| Site plan review requirements | Y | |
| Land Use Planning and Ordinances | Y/N | Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced? |
| Zoning ordinance | Y | |
| Subdivision ordinance | Y | |
| Floodplain ordinance | Y | |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | Y | Stormwater |

| | | |
|---|---|--|
| Flood insurance rate maps | Y | |
| Elevation Certificates | Y | Hard Copies |
| Acquisition of land for open space and public recreation uses | Y | Westside Community. Acquisition of School (Natural High) |
| Erosion or sediment control program | Y | |
| Other | Y | Active program for sediment control |
| How can these capabilities be expanded and improved to reduce risk? | | |
| Review and update of hazard related ordinances: emergency services ordinance; erosion control to establish construction season; flood ordinance. URM program to be reviewed and updated. Increase use of Solar (all large power consumption facilities are solar) | | |

As indicated in the tables above, Lakeport has several plans and programs that guide the City's mitigation of development of hazard-prone areas. Starting with the City of Lakeport General Plan, which is the most comprehensive of the City's plans when it comes to mitigation, some of these are described in more detail below.

2025 City of Lakeport General Plan (2009)

A general plan is a legal document, required by state law, that serves as a community's "constitution" for land use and development. The plan must be a comprehensive, long-term document, detailing proposals for the "physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning" (Government Code §65300 et seq.). Time horizons vary, but the typical general plan looks 10 to 20 years into the future. The law specifically requires that the general plan address seven topics or "elements." These are land use, circulation (transportation), housing, conservation, open space, noise, and safety. The plan must analyze issues of importance to the community, set forth policies in text and diagrams for conservation and development, and outline specific programs for implementing these policies

Goals and policies related to mitigation from the General Plan are the following:

Land Use Element

| | |
|---|--|
| OBJECTIVE LU 5: | TO DEVELOP A LONG-TERM SOLUTION TO ISSUES REGARDING THE SUPPLY, STORAGE, AND DISTRIBUTION OF POTABLE WATER TO PROTECT THE HEALTH, SAFETY, AND WELFARE OF LAKEPORT RESIDENTS AND IMPROVE THE ECONOMIC STABILITY OF THE COMMUNITY |
| Policy LU 5.1: Water System Master Plan. | Maintain and update a Water System Master Plan every five years and identify capital improvements required to meet anticipated demand. |
| Policy LU 5.4: Water Conservation. | Devise and implement appropriate water conservation ordinances. |
| Policy LU 5.5: New Development Water Connections. | Require new development and projects involving extensive renovations within City limits to connect to the City potable water system. |

| | |
|-------------------------------------|--|
| OBJECTIVE LU 7: | TO DEVELOP AND MAINTAIN A STORM DRAINAGE SYSTEM WHICH ENSURES THE SAFETY AND WELFARE OF RESIDENTS, VISITORS AND PROPERTY IN LAKEPORT. |
| Policy LU 7.1: Storm Drain Capacity | Ensure that capacity of the storm drain system is increased as a result of new development. |

Safety Element

| | |
|--|---|
| OBJECTIVE S 1: | TO PROTECT THE COMMUNITY FROM INJURY, LOSS OF LIFE AND PROPERTY DAMAGE RESULTING FROM NATURAL CATASTROPHES AND ANY HAZARDOUS CONDITIONS RELATING TO SEISMIC, GEOLOGIC, AND FLOODING HAZARDS. |
| Policy S 1.1: Seismic Hazards. | Reduce the risk of loss of life, personal injury and damage to property resulting from seismic hazards. |
| Policy S 1.2: Building Limitations in High Risk Zones. | Discourage construction of high density residential, other critical, high occupancy or essential services buildings in high risk zones such as Active Fault Displacement Study Areas, wildland fire areas, flood areas, and landslide areas. |
| Policy S 1.3: Slope Instability. | Minimize the risk of personal injury and property damage resulting from slope instability. |
| Policy S 1.4: Updated FIRM Maps. | Utilize the U.S. Army Corps of Engineers Flood Insurance Rate Maps (FIRM) to: reduce risk of flooding; identify 100 Year Flood Zones; implement the Flood Damage Prevention Ordinance; and calculate flow rates within identified stream channels. |
| Policy S 1.5: Cooperate with the County of Lake. | Continue to work with the County of Lake to ensure that additional storm drainage runoff resulting from development occurring in unincorporated areas upstream from drainage channels in the Lakeport Planning Area is adequately mitigated through improvements on site and/or downstream. |
| Policy S 1.6: Clear Lake Shoreline Flooding. | Work with the County to develop strategies for reducing flooding along the shoreline of Clear Lake. |
| Policy S 1.7: Funding Sources | Continue to pursue all available sources of funding such as, but not limited to, low interest loans, FEMA funds, FMHA funds, and Redevelopment Agency tax increment funds to finance improvements to storm drainage facilities. |
| Policy S 1.8: Flood Hazards. | Minimize the risk of personal injury and property damage due to flooding. |
| Policy S 1.9: Storm Drainage System. | Maintain unobstructed water flow in the storm drainage system. |
| Policy S 1.10: Asbestos. | New development of property found or expected to contain asbestos contaminated soil in the Lakeport Planning Area must mitigate the potential impact. This mitigation may include capping, excavation, disposal and backfill, landscaping, or a combination of all three. |

| | |
|--|--|
| OBJECTIVE S 2 | TO REDUCE THE IMPACT OF POLLUTION AS WELL AS HAZARDOUS MATERIALS AND HAZARDOUS WASTE ON THE WELL-BEING AND HEALTH OF THE COMMUNITY. |
| Policy S 2.1: Water Quality Protection | Protect the water quality of Clear Lake and the Scotts Valley aquifer from degradation. |

| OBJECTIVE S 2 | TO REDUCE THE IMPACT OF POLLUTION AS WELL AS HAZARDOUS MATERIALS AND HAZARDOUS WASTE ON THE WELL-BEING AND HEALTH OF THE COMMUNITY. |
|--|--|
| Policy S 2.2: Agricultural Contamination of Potable Water Supplies. | Reduce agricultural contamination of potable water supplies in the Clear Lake Basin and the Scotts Valley aquifer by working with the County Community Development Department, County Environmental Health Department and Agricultural Commissioner to identify the impacts of farming operations and the use of herbicides, pesticides and fertilizers on the City's domestic water supply. |
| Policy S 2.3: Hazards of Transportation, Storage and Disposal of Hazardous Wastes. | Provide measures to protect the public health from the hazards associated with the transportation, storage and disposal of hazardous wastes |
| Policy S 2.4: CEQA Review of Proposed TSD Facilities. | Facilitate thorough environmental review for Hazardous Waste Transportation, Storage and Disposal (TSD) Facilities proposed in the Lakeport Planning Area and throughout the County, since the potentially significant, widespread and long-term impacts on public health and safety of these facilities do not respect jurisdictional boundaries |
| Policy S 2.5: Secondary Containment Facilities. | Ensure that industries and businesses which store or process hazardous materials provide secondary containment facilities and a buffer zone between the installation and property boundaries sufficient to protect the public health and safety. |
| Policy S 2.6: Transportation and Storage of Hazardous Materials. | Minimize the risks to public health and safety due to the transportation and storage of hazardous materials. |
| Policy S 2.7: Truck Routes for Hazardous Material Transport. | Develop, in cooperation with the County, regulations prohibiting through-transport by truck of hazardous materials on the local street systems and requiring that this activity be limited to State highways. |
| Policy S 2.8: Lampson Field Airport. | Minimize the risk to lives and property due to hazards associated with the operation of Lampson Field Airport. |

| OBJECTIVE S 3: | TO MAINTAIN AN EFFECTIVE EMERGENCY RESPONSE SYSTEM. |
|---|--|
| Policy S 3.1: Emergency Preparedness Plan | Cooperate with Lake County in implementing the County's Emergency Preparedness Plan. |
| Policy S 3.2: Updated Emergency Operations Plan | Update the City's Emergency Operations Plan, as needed. |
| Policy S 3.3: Emergency Facilities | Identify essential emergency facilities and ensure that they will function in the event of a disaster. |
| Policy S 3.4: Public Information. | Inform the public of what actions to take in the event of an emergency or disaster. |
| Policy S 3.5: Emergency Evacuation Routes | Designate the following as emergency evacuation routes to provide a means to evacuate the community and to provide a route to or through the community from other areas: <ul style="list-style-type: none"> • Highway 29 • Lakeport Boulevard • Main St. • 11th Street • High Street • Hartley Street • Lakeshore Boulevard • Martin Street • Clear Lake Avenue |

| OBJECTIVE S 3: | TO MAINTAIN AN EFFECTIVE EMERGENCY RESPONSE SYSTEM. |
|--|---|
| Policy S 3.6: Fire Hazard Severity Scale. | Reduce the Risk of Damage and Destruction from Wildland Fires. |
| Policy S 3.7: Development Projects Fire Risks. | Review all development proposals for fire risk and require mitigation measures to reduce the probability of fire. |
| Policy S 3.8: Weed Abatement. | Promote the use of defensible space in order to reduce the risk of structure fires. |
| Policy S 3.9: California Building Code. | Continue to enforce the California Building Code (CBC) for all new construction and renovation and when occupancy or use changes occur. |
| Policy S 3.10: Use Redevelopment Funds. | Consider use of Redevelopment tax-increment funds to assist property owners in the Lakeport Redevelopment area to complete renovations that increase fire safety. |
| Policy S 3.11: Fire Hydrant Water Flows. | Ensure that there exists sufficient water flow in fire hydrants throughout Lakeport. The standard adopted by the City is a minimum of 1,000 gallons per minute of free flow from two adjacent hydrants flowing simultaneously with 20 pounds per square inch residual pressure. |
| Policy S 3.12: Funding for Fire Protection. | Recommend that Lakeport adequately fund and staff the Lakeport Fire Protection District. |

Other City Plans/Studies/Programs

Lake County Climate Change and Health Profile Report (2017)

The Climate Change and Health Profile Report seeks to provide a county-level summary of information on current and projected risks from climate change and potential health impacts. This report represents a synthesis of information on climate change and health for California communities based on recently published reports of state agencies and other public data.

The content of this report was guided by a cooperative agreement between CDPH and the CDC Climate-Ready States and Cities Initiative's program Building Resilience Against Climate Effects (BRACE). The goals of BRACE are to assist state health departments to build capacity for climate and health adaptation planning. This includes using the best available climate science to project likely climate impacts, identifying climate-related health risks and populations vulnerable to these impacts, assessing the added burden of disease and injury that climate change may cause, identifying appropriate interventions, planning more resilient communities, and evaluating to improve the planning effort. Communities with economic, environmental, and social disadvantages are likely to bear disproportionate health impacts of climate change.

This Climate Change and Health Profile Report is intended to inform, empower, and nurture collaboration that seeks to protect and enhance the health and well-being of all California residents. This report is part of a suite of tools that is being developed by the California Department of Public Health to support local, regional, and statewide efforts of the public health sector to build healthy, equitable, resilient, and adaptive communities ready to meet the challenges of climate change. Along with a county-level climate change and health vulnerability assessment and state guidance documents, such as *Preparing California for Extreme Heat: Guidance and Recommendations*, the profile provides a knowledge base for taking informed action to address climate change.

City of Lakeport Stormwater Management Plan (2003-2008)

The County of Lake, City of Lakeport, and the City of Clearlake have joined together as Co-permittees to form the Lake County Clean Water Program. The Storm Water Management Plan (SWMP) is a joint project of these agencies. As Co-permittees to the Program, each agency will pursue its own local storm water pollution prevention activities and also contribute support to a region-wide effort. Each Co-permittee is responsible for implementing the best management practices (BMP) put forward in the SWMP. Some of the BMPs will be implemented on a region-wide basis, being jointly sponsored by all Co-permittees. Examples of region-wide efforts include public education targeted to residents in both municipalities, and coordinating with other countywide, regional, and state agencies.

The overarching goal of the Program is to reduce pollutants from entering local water bodies through the effective implementation of BMPs. To accomplish these goals, the Program has developed the following strategic objectives:

- Develop a self-directed, proactive approach fostering trust and respect from regulators, businesses and environmental groups;
- Produce tangible water quality improvements through expanded collaborations with other organizations;
- Communicate a clear vision of the program's goals and objectives to the public, and to member agencies' staff, management, and elected officials; and,
- Improve communication links and working relationships among departments within member agencies and between the Program and RWQCB staff.

Lakeport Lakefront Revitalization Plan (2017)

Previous planning efforts developed a vision for the lakefront area by identifying potential areas for redevelopment and reinvestment. However, with current economic limitations and no redevelopment agencies that could provide incentives, the ability to attract reinvestment into communities such as Lakeport has been challenging. This document will take an implementable approach in developing the Lakeport Lakefront Revitalization Plan by understanding existing land uses, current market conditions and community needs. The plan will provide the community and elected officials with a road map for future improvements as well as encouraging reinvestment.

City of Lakeport Emergency Operations Plan (2011)

The City of Lakeport Emergency Plan (EOP) identifies the City's emergency planning, organization, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents and national security emergencies. The plan also addresses integration and coordination with other governmental levels when required. The plan addresses how the City will respond to extraordinary events or disasters: from preparation through recovery. A hazard analysis is also included in the plan. The responsibilities of each department are identified in matrices, which are based on each identified hazard or threat.

City of Lakeport Flood Management Plan (2003)

In 1978, the City of Lakeport (City) joined the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). Since that time, the City has made a concerted effort to manage the development of its floodplain by the adoption of various ordinances, regulations and practices, and by incorporating floodplain management goals into the City's General Plan. The Community Rating System (CRS) was created by the NFIP to encourage communities to become proactive in the reduction of potential losses due to flooding. Under this program, participating communities are credited with ratings reflective of their efforts to undertake various floodplain management plan activities. The CRS rating results in reduced flood insurance premiums to the floodplain residents. The City does not currently participate in the program and is thereby designated a class 10 rating, and does not receive a reduction in flood insurance premiums. However, the City of Lakeport has implemented several floodplain management plan activities that would likely qualify for a lower class rating and flood insurance premium reductions, but the City has yet to request an audit from the NFIP due to limitations in staffing. In 2003, there were approximately 270 flood insurance policies in effect, with an annual premium of over \$122,000. A drop in class rating from 10 to 9 would generate a 5% savings in flood insurance premiums, saving the residents an estimated \$6,100 per year.

The City made the decision to prepare a Floodplain Mitigation Plan after being awarded grant funds through the California Office of Emergency Services Floodplain Mitigation Assistance Grant Program.

City of Lakeport Storm Drainage Master Plan (1980)

The City of Lakeport was experiencing growth in 1980, which tended to accentuate existing drainage problems and increased the potential for damage from flooding. At that point, there was no storm drainage master plan and each new development was reviewed as it was proposed. As a result, the City found the need for uniform design standards and an overall storm make policy decisions.

City of Lakeport Ordinances

Ordinances related to mitigation in the City of Lakeport are as follows:

Emergency Services (Chapter 2.28)

The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within the city of Lakeport in the event of an emergency; the establishment, coordination and direction of the city emergency organization; the establishment, coordination and direction of the disaster council; the establishment, coordination and direction of the office of emergency services; and the coordination of the emergency functions of this city with all other public agencies, corporations, organizations and affected private persons.

It shall be the duty of the city disaster council, and it is hereby empowered, to develop and recommend for adoption by the city council, emergency and mutual aid plans and agreements and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements. The disaster council shall meet upon call of the chair or, if he/she is unavailable or unable to call such meeting, the first vice-chair and then the city manager or his/her designee may call a meeting. The disaster council shall

meet a minimum of twice a year at a time and place designated by the chair. The city disaster council shall call and conduct its meetings in accordance with rules, not inconsistent with this chapter, as the council shall adopt by majority vote.

The county operational area office of emergency services shall be responsible for the development of the operational area emergency plan, which plan shall provide for the utilization of the California Standardized Emergency Management System (SEMS); effective mobilization of all of the resources of the county, both public and private, to meet any condition constituting a local emergency, state of emergency or state of war emergency; and shall provide for the organization, powers and duties, services and staff of the emergency organization. The city emergency plan will reflect all requirements to coordinate activities in conjunction with the operational area emergency plan. Such plan shall take effect upon adoption by resolution of the city council

It shall be the responsibility of all city emergency operations center section chiefs and alternates to have a thorough knowledge of the city and operational area emergency plan. The city shall insure that the key personnel are properly trained and organized to meet all of their responsibilities in the event of an emergency.

Nonnative Invasive Aquatic Plants (Chapter 8.09)

The purpose of this chapter is to protect the aquatic resources of Lake County from the introduction of nonnative, invasive aquatic plants by prohibiting the possession, sale, propagation or release of specific species and declaring such plants as nuisances. As such, these nonnative, invasive aquatic plants are considered noxious weeds. The city council of the city of Lakeport finds that non-native, invasive aquatic plant species spread rapidly and eliminate the native flora and fauna biodiversity otherwise found in the lakes and streams of Lake County, most notably Clear Lake, with detrimental effects. Further, the city council declares that the most effective way to protect these aquatic areas from nonnative, invasive plant species is to prevent the introduction of these plants and also declares that such invasive plant species are public nuisances. For the purposes of this chapter, the following plants of concern are identified as nonnative, invasive aquatic plants:

- Hydrilla (*Hydrilla verticillata*);
- Spatter dock or yellow pondlily (*Nuphar polysepala*);
- Water hyacinth (*Eichornia crassipes*);
- Purple loosestrife (*Lythrum salicaria*);
- Giant salvinia (*Salvinia molesta*);
- Eurasian watermilfoil (*Myriophyllum spicatum*);
- South American spongeplant/frogbit (*Limnobium laevigatum*);
- Parrotfeather (*Myriophyllum aquaticum*);
- Brazilian waterweed (*Egeria densa*).

Except as provided in subsection D of this section, it shall be unlawful for any person to transport nonnative, invasive aquatic plants into the city of Lakeport. Except as provided in subsection D of this section, it shall be unlawful for any person to possess, release, sell or offer for sale, gift or plant nonnative, invasive aquatic plants in the city of Lakeport. It shall be unlawful for any shipment of nonnative, invasive aquatic plants to be off-loaded in the city of Lakeport.

Outside Burning (Chapter 8.11)

Outside burning of all kinds within the incorporated limits of the City of Lakeport is prohibited. The following exceptions shall apply:

- Cooking of food products using an appropriate barbecue on public or private property; and
- Fire department/district training exercises that include burning of a building or other structure when under the supervision of fire chief or his/her designee, and in compliance with applicable air pollution regulations.

Violation of this section shall constitute an infraction and shall be punishable in accordance with Section 1.08.010(C) of this code.

Weeds and Rubbish (Chapter 8.28)

All weeds growing upon the streets or sidewalks or upon private property within the city which bear seeds of a wingy or downy nature, or attain such a large growth as to become a fire menace when dry, or which are otherwise noxious or dangerous, and all rubbish, refuse and dirt upon streets, parkways, sidewalks or private property within the city, may be declared to be a public nuisance by the city council and may be abated as provided in this chapter.

Stormwater Management Ordinance (Chapter 8.40)

The purpose of this chapter is to insure the health, safety and general welfare of the city of Lakeport's citizens, and to protect and enhance the water quality of water courses and water bodies within the incorporated area of the city of Lakeport in a manner pursuant to and consistent with the Federal Clean Water Act (33 U.S.C. 1251 et seq.), by reducing pollutants in stormwater discharges to the maximum extent practicable and by prohibiting non-stormwater discharges.

New Development and Redevelopment. The city shall adopt by resolution requirements identifying appropriate BMPs to control the volume, rate, flow-duration and potential pollutant load of stormwater runoff from new development and redevelopment projects that disturb one acre or more, including projects less than one acre that are part of a larger common plan of development or sale, as may be appropriate to minimize the generation, transport and discharge of pollutants or that may be needed to comply with any successor permit or amendment to the municipal stormwater permit. The city shall incorporate such requirements in any land use entitlement and construction or building-related permit to be issued relative to such development or redevelopment. The owner and developer shall comply with the terms, provisions, and conditions of such land use entitlements and building permits as required by the city.

Water Rationing Procedure (Chapter 13.12)

This chapter is intended to establish a procedure whereby the city council can restrict or prohibit demands on the existing water supply; prohibit all non-essential uses of water as defined in this chapter; and to allocate the available water supply during any water shortage emergency to ensure that sufficient water will be available for human consumption, sanitation and fire protection.

The purpose of this chapter is to preserve the use of the city's water supply, to eliminate all non-essential water usage, and to provide for an allocation of existing water resources to ensure a sufficient water supply for human consumption, sanitation and fire protection. This chapter shall be liberally construed to effectuate its purpose.

Whenever the city council, by resolution, declares that a Stage I water emergency exists, the mayor shall issue a proclamation urging citizens to institute such water conservation measures on a voluntary basis as may be required to reduce water demand to coincide with the available supply. The city clerk shall publish such proclamation at least once a week for four weeks in a newspaper of general circulation within the county for the purpose of giving notice to the city's water customers.

It is unlawful for any person to use water for any non-essential use as defined in this chapter, whenever the city council determines by resolution, that a Stage II water emergency exists. The following uses of water shall be considered as non-essential:

- Use of water from public hydrants for any purpose other than fire protection and/or prevention;
- Use of water through any meter when the consumer had been given two days notice to repair one or more leaks and has failed to complete such repairs;
- Use of water to irrigate grass, lawns, ground cover, shrubbery, vegetable gardens, trees, or other outdoor vegetation by other than hand watering and/or drip irrigation;
- Use of water for the construction of any structure, including such use in dust control;
- Use of water to wash any sidewalk, walkways, driveway, street, parking lot, or other hard-surfaced area by hosing or by otherwise direct use of water from faucets or other outlets.
- Use of water to wash any motor vehicle, trailer, airplane, or boat by hosing or otherwise using water directly from a faucet or other outlet.
- Use of water to fill or refill any swimming pool.

In addition to the non-essential uses set forth in Stage 2, the following additional uses are determined to be non-essential when the council has, by resolution, declared that a Stage III water emergency exists.

- Use of water in excess of a daily usage allotment of fifty gallons per day per permanent resident (two hundred cubic feet per month per permanent resident);
- All other uses not expressly set forth in Stage II shall be limited to fifty percent of the prior water use for a similar period as determined by the department from its records. Where no such record exists, prior water use shall be deemed to be the average prior water use of similar existing services as shall be determined by the department from its records.
- The use of water to irrigate and for hand watering is prohibited.
- For the purposes of this section, the number of permanent residents shall be determined as follows: Each customer in whose name water is supplied to a residence shall, upon request of the coordinator, advise him/her under penalty of perjury of the number of permanent residents using water supplied to that residence. If such a residential customer shall fail to so advise the coordinator, such residence shall be permitted the water allocation provided for in this chapter for one permanent resident.

Water may be shut off by the department with appropriate notice whenever the coordinator determines there has been a willful failure to comply with the provisions of this chapter, any other provisions of this code to the contrary notwithstanding. Charges for reconnection or restoration of service which has been terminated

pursuant to this section shall be at the rates and on the conditions set by resolution or other appropriate action of the city council.

Construction Codes (Chapter 15.04)

The following codes are hereby adopted by reference and shall apply in the city of Lakeport: 2001 Building Standards Administrative Code; 2001 California Building Code, Volumes I and II; 2001 California Electrical Code; 2001 California Mechanical Code; 2001 California Plumbing Code; 2001 California Energy Code; 2001 California Elevator Safety Construction Code; 2001 California Historical Building Code; 2001 California Fire Code; 2001 California Code for Building Conservation; 2001 California Reference Standards Code all of which were copyrighted in 2002 by the California Building Standards Commission; and the 1997 Uniform Sign Code; 1997 Uniform Housing Code; 1997 Uniform Code for the Abatement of Dangerous Buildings; and the 1997 Uniform Swimming Pool, Spa, and Hot Tub Code.

Potentially Hazardous Masonry Buildings (Chapter 15.05)

The certain Appendix chapter 1 of the Uniform Code for Building Conservation, referred to in this chapter as the Conservation Code, is adopted and enacted as the standard for strengthening unreinforced or inadequately reinforced masonry buildings and is made a part of this chapter by reference with the same force and effect as if fully set forth in this chapter. The city shall be considered in its entirety to be located in Seismic Zone 4. The following mandatory measures are implemented:

- Every legal owner of a building identified as a potentially hazardous building shall be notified by certified mail that the building is considered to be one of a general type of structures that historically has exhibited little resistance to earthquake motion.
- Every legal owner of an identified potentially hazardous building, within thirty days of receipt of notification pursuant to subsection A may provide evidence to the building official that would exempt or eliminate the building from being classified as a potentially hazardous building. Upon receipt of satisfactory evidence, the building official shall make a determination that the building is not a potentially hazardous building.
- Every legal owner of an identified potentially hazardous building, within sixty days of receipt of notification pursuant to subsection A shall deliver to any tenants or occupants of the building a copy of the notification, attached as Exhibit A to this ordinance and on file in the office of the city clerk, and file with the building official the names, addresses and telephone numbers of the tenants or occupants. The owner shall identify the total square footage of floor area of the building and the existing uses of those areas. In those cases where a building or a portion of the building is not presently occupied, the owner shall identify the unoccupied area(s) and state the most recent use. Information regarding the use(s) and area(s) shall be provided on the form marked as Exhibit B, attached to the ordinance codified in this chapter and on file in the office of the city clerk, and returned to the city within sixty days of receipt of notification pursuant to subsection A.
- Every legal owner of an identified potentially hazardous building, within sixty days of receipt of notification pursuant to subsection A, shall post a copy of the potentially hazardous building notice, attached as Exhibit C to the ordinance codified in this chapter and on file in the office of the city clerk, in the building. The posted notice shall be highly visible to all tenants, occupants and users of the building and shall be located at each entrance/exit forty-eight inches above the floor. The notice shall remain posted until the identified building is no longer considered a potentially hazardous building.

The location of the notification posting shall be as approved by the city building official or his/her designee.

- At the expiration of the sixty day period following receipt of notification pursuant to subsection A, the building official shall record a copy of the notification at the county recorder's office, unless the building has been classified as exempt or unless satisfactory evidence has been provided which has enabled the building official to determine that the building is not a potentially dangerous building.
- Every legal owner of an identified potentially hazardous building shall do the following by January 1, 1995. If the building has unreinforced masonry parapets, cornices, and/or brick veneer adjacent to a public right-of-way as defined in the Uniform Building Code, the owner shall:
 - ✓ Remove or secure all parapets;
 - ✓ Remove or secure all cornices;
 - ✓ Remove or secure all masonry veneer extending higher than four feet above grade.
 - ✓ Plans and specifications for the removal and/or securing of unreinforced masonry parapets, cornices and veneers shall be prepared by a state licensed structural engineer or a civil engineer who is experienced in structural design. No removal of parapets shall occur unless permitted by the Uniform Building Code or Uniform Fire Code. Permits for the removal of parapets, cornices and veneer may be issued without the requirements for plans being signed by a registered engineer provided that all health and safety issues as set forth in the Uniform Building Code are addressed.
- Every legal owner of a building identified as a potentially hazardous building shall strengthen that building in compliance with the conservation code or the building code when any of the following events or actions take place:
 - ✓ At the time of major remodeling and/or major damage repair. Major remodeling and/or major damage repair shall be considered as construction for which the total cost is equal to or more than fifty percent of the valuation of the building as determined by the building official based on the current building valuation data and regional modifiers published periodically by the International Conference of Building Officials (ICBO). All new construction shall comply with the building code.
 - ✓ At the time of a major change in the occupancy classification as identified in the building code which increases the risk to human health, safety and welfare.

Floodplain Management (Chapter 15.16)

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purposes, this chapter includes methods and provisions to:

- Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction or subsequent construction;
- Control the alteration of natural Lakeport, stream channels and natural protective barriers, which help accommodate or channel floodwaters;
- Control filling, grading, dredging and other development which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

This chapter shall apply to all areas of special flood hazards within the jurisdiction of the city.

A development permit shall be obtained before any construction or other development begins within any area of special flood hazard established in Section 15.16.070. Application for a development permit shall be made on forms furnished by the city community development department and may include, but not be limited to plans in duplicate drawn to scale showing: the nature, location, dimensions and elevation of the area in question; existing or proposed structures, fill, storage of materials; drainage facilities; foundation details showing openings required in Section 15.16.170(C)(3)(b); and anchoring details. Specifically, the following information is required:

- Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all structures, in zone AO, elevation of highest adjacent grade and proposed elevation of lowest floor of all structures; or
- Proposed elevation in relation to mean sea level to which any structure will be floodproofed, if required in Section 15.16.170(C)(3);
- All appropriate certifications listed in Section 15.16.150(D); and
- Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

In all areas of special flood hazards the following standards are required:

Anchoring.

All new construction and substantial improvements shall be adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

All manufactured homes shall meet the anchoring standards of Section 15.16.200, however, the California Department of Housing and Community Development shall have authority and responsibility for mobile homes in mobile home parks in the city.

Construction Materials and Methods.

All new construction, substantial improvement and minor improvement shall be constructed:

- With materials and utility equipment resistant to flood damage;
- Using methods and practices that minimize flood damage;
- With electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding; and if within zones AH or AO where new construction or substantial improvement is to occur;
- So that there are adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.

Elevation and Floodproofing. (See Article II, Definitions, for “new construction,” “substantial damage” and “substantial improvement.”)

Residential construction, new or substantial improvement, shall have the lowest floor, including basement:

- In an AO zone, elevated above the highest adjacent grade to a height of at least one foot higher than the depth number specified in feet on the FIRM, or elevated at least three feet above the highest adjacent grade if no depth number is specified;
- In an A zone, elevated to at least one foot above the base flood elevation, as determined by the city;
- In all other zones, elevated to at least one foot above the base flood elevation.

Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor to be properly elevated. Such certification or verification in the form of a properly completed FEMA elevation certificate shall be provided to the floodplain administrator prior to occupancy of the structure.

Nonresidential construction shall either be elevated to conform with subsection (C)(1) of this section or together with attendant utility and sanitary facilities:

- Be floodproofed below the elevation recommended under subsection (C)(1) of this section so that the structure is watertight with walls substantially impermeable to the passage of water;
- Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
- Be certified by a registered professional engineer or architect that the standards of this subsection are satisfied. Such certification in the form of a properly completed FEMA elevation certificate or in the form of a properly completed FEMA floodproofing certificate shall be provided to the floodplain administrator prior to occupancy of the structure.

All new construction and substantial improvement with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access (crawl space) or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwater. Designs for meeting this requirement must exceed the following minimum criteria:

- Be certified by a registered professional engineer or architect; or
- Have a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding. The bottom of all openings shall be no higher than one

foot above grade. Openings may be equipped with screens, louvers, valves or other coverings or devices provided that they permit the automatic entry and exit of floodwater.

Manufactured homes shall also meet the standards in Section 15.16.200.

Standards for utilities.

All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate:

- Infiltration of floodwaters into the systems; and
- Discharge from the systems into floodwaters.

On-site waste disposal systems shall be located to avoid impairment to them, or contamination from them during flooding.

All new and replacement electrical panels and meters shall be installed a minimum one foot above the base flood elevation.

Standards for subdivisions.

All preliminary subdivision proposals shall identify the flood hazard area and the elevation of the base flood.

All subdivision plans will provide the elevation of proposed structure(s) and pad(s). If the site is filled above the base flood elevation, the lowest floor and pad elevations shall be certified by a registered professional engineer or surveyor and provided to the floodplain administrator.

All subdivision proposals shall be consistent with the need to minimize flood damage.

All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.

All subdivisions shall provide adequate drainage to reduce exposure to flood hazards.

Standards for manufactured homes.

Except for mobile homes in mobile home parks under the jurisdiction of the California Department of Housing and Community Development, all manufactured homes that are placed or substantially improved, within zones A1-30, AH, and AE on the community's Flood Insurance Rate Map, on sites located:

- Outside of a manufactured home park or subdivision;
- In a new manufactured home park or subdivision;
- In an expansion to an existing manufactured home park or subdivision; or
- In an existing manufactured home park or subdivision on a site upon which a manufactured home has incurred substantial damage as the result of a flood; shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated to at least one foot above the base flood

elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.

Except for mobile homes in mobile home parks under the jurisdiction of the California Department of Housing and Community Development, all manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within zones A1-30, AH and AE on the community's Flood Insurance Rate Map that are not subject to the provisions of subsection A of this section, will be elevated so that either the:

- Lowest floor of the manufactured home is at least one foot above the base flood elevation; or
- Manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than one foot in height above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse and lateral movement.

Standards for recreational vehicles.

Except for recreational vehicles in mobile home parks under the jurisdiction of the California Department of Housing and Community Development, all recreational vehicles placed on sites within zones A1-30, AH and AE on the community's Flood Insurance Rate Map will either:

- Be on the site for fewer than one hundred eighty consecutive days;
- Be fully licensed and ready for highway use--a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or
- Meet the permit requirements of Article IV of this chapter and the elevation and anchoring requirements for manufactured homes in Section 15.16.200(A).

Subdivisions (Chapter 16)

It is the purpose of this title to regulate and control the division of land within the city and to supplement the provisions of the Subdivision Map Act concerning the design, improvement, and survey data of subdivisions, the form and content of all required maps provided by the Subdivision Map Act, and the procedure to be followed in securing the official approval of the city regarding the maps. To accomplish this purpose, the regulations contained in this title are determined to be necessary to preserve the public health, safety, and general welfare; to promote orderly growth and development and to promote open space, conservation, protection, and proper use of land; and to ensure provision for adequate traffic circulation, utilities, and other services in the city.

No land shall be subdivided and developed for any purpose which is inconsistent with the Lakeport general plan or any applicable specific plan of the city or which is not permitted by Title 17 or other applicable provisions of this code.

The type and intensity of land use as shown on the general plan and any applicable specific plan shall determine, together with the requirements of the Subdivision Map Act and this title, the type of streets, roads, highways, utilities, and other public services that shall be provided by the subdivider.

Zoning (Chapter 17)

This title shall be known and cited as the “City of Lakeport Zoning Ordinance.” This title serves to implement the Lakeport general plan. The ordinance codified in this title is adopted to promote and protect the public health, safety, peace, morals, comfort, convenience, and general welfare.

This title establishes various zoning districts in the city; establishes setbacks, height limits, parking standards, and open spaces within said districts; specifies the uses of land and of buildings permitted in said districts; prescribes regulations for the erection, construction, alteration, and maintenance of buildings, structures, uses, signs, and other improvements in said districts, including the requirement that permits be secured for certain buildings, structures, uses, and improvements, and for the use of land; defines the terms used herein; specifies the procedure for any amendment hereof; and prescribes penalties for the violation of any of the provisions hereof.

The provisions of this title shall apply to all development proposed and undertaken in the incorporated city limits of Lakeport including, where applicable, development undertaken by the state, county, or other units of local government. No building or structure shall be erected, reconstructed, or structurally altered in any manner, nor shall any building or land be used for any purpose, other than as permitted by and in conformance with the provisions of this title and all other laws or maps referred to herein.

4.4.2. City of Lakeport Administrative/Technical Mitigation Capabilities

Table 4-92 identifies the City personnel responsible for activities related to mitigation and loss prevention in the City.

Table 4-92 *City of Lakeport Administrative/Technical Mitigation Capabilities*

| Administration | Y/N | Describe capability Is coordination effective? |
|--|--------------|--|
| Planning Commission | Y | |
| Mitigation Planning Committee | Y | With development of LHMP |
| Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems) | Y | Tree trimming, ditch digging, drainage maintenance |
| Mutual aid agreements | Y | Heavily relied on during historic fires and floods |
| Other | | |
| Staff | Y/N FT/PT | Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective? |
| Chief Building Official | Y | |
| Floodplain Administrator | Y | By ordinance |
| Emergency Manager | Y | By ordinance |
| Community Planner | Y | |
| Civil Engineer | Y | |

| | | |
|---|------------|---|
| GIS Coordinator | Y | |
| Other | Y | Contract engineer robust Public Works Dept., numerous staff with FEMA Training and Certifications |
| Technical | Y/N | Describe capability Has capability been used to assess/mitigate risk in the past? |
| Warning systems/services (Reverse 911, outdoor warning signals) | Y | Reverse 911, Nixle, Everbridge, Lake County alerts and messaging |
| Hazard data and information | Y | LHMP, EOP, Safety Element of GP, Hazard related plans |
| Grant writing | Y | Existing staff |
| Hazus analysis | N | |
| Other | | |
| How can these capabilities be expanded and improved to reduce risk? | | |
| Dedicated grant writers and management; warning system enhancements, sirens | | |

4.4.3. City of Lakeport Fiscal Mitigation Capabilities

Table 4-93 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table 4-93 City of Lakeport Fiscal Mitigation Capabilities

| Funding Resource | Access/ Eligibility (Y/N) | Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions? |
|--|--|--|
| Capital improvements project funding | Y | Will use to incorporate mitigation projects |
| Authority to levy taxes for specific purposes | Y | |
| Fees for water, sewer, gas, or electric services | Y | 2019 |
| Impact fees for new development | Y | |
| Storm water utility fee | Y | Impervious surface fee, storm drainage improvements |
| Incur debt through general obligation bonds and/or special tax bonds | Y | |
| Incur debt through private activities | Y | |
| Community Development Block Grant | Y | |
| Other federal funding programs | Y | Federal Highways, CDGB, Fish and Wildlife |
| State funding programs | Y | Caltrans |
| Other | Y | Prop 68, Oil Spill Response |
| How can these capabilities be expanded and improved to reduce risk? | | |
| Become eligible for FEMA grants, Possible rate studies for utilities, fee structures for building and stormwater permits; Cost recovery fee study, land use development fees | | |

4.4.4. City of Lakeport Mitigation Education, Outreach, and Partnerships

Table 4-94 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table 4-94 City of Lakeport Mitigation Education, Outreach, and Partnerships

| Program/Organization | Yes/No | Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities? |
|---|--------|--|
| Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. | Y | Lake County CERT, Watershed groups, Food Pantry |
| Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education) | Y | Limited Progress |
| Natural disaster or safety related school programs | Y | Safety related resource officers, some hazard training |
| StormReady certification | N | |
| Firewise Communities certification | N | Evaluating |
| Public-private partnership initiatives addressing disaster-related issues | Y | PG&E, Hospital |
| Other | Y | Vetting process for local disaster services workers |
| How can these capabilities be expanded and improved to reduce risk? | | |
| Implement robust, multi-hazard public awareness, outreach and education programs are continually sought by the City. The City will continue to work to expand partnerships with strategic partners to enhance mitigation efforts in the City. | | |

Health Advisory and Guidelines for Eating Fish and Shellfish from Clear Lake (Lake County) Report (August 2018)

Guidelines for eating fish from Clear Lake are given in this report. The Office of Environmental Health Hazard Assessment (OEHHA) first provided advice for eating fish from Clear Lake (Lake County) in 19871. The advice was based on findings of mercury in fish collected from the lake. Since the original advisory was issued, further studies of mercury in fish from Clear Lake were done. In the early 2000s, the Central Valley Regional Water Quality Control Board (RWB-5) compiled a large dataset comprised of historical and more recently collected fish tissue data from several studies. RWB-5 used the dataset and other information to develop a Total Daily Maximum Load (TMDL) for Clear Lake for mercury. The objective of the TMDL is to lower mercury levels in the watershed to protect human health and wildlife.

In recent years, OEHHA received requests to include traditional Tribal foods in its guidelines for Clear Lake. To do so, OEHHA needed data on chemical levels in the fish, shellfish, and other aquatic resources

identified as important to Tribal members. In 2013, OEHHA received data from the United States Geological Survey, from long-term mercury studies conducted at Clear Lake with University of California at Davis (UC Davis). These data allowed OEHHA to add advice for some of the traditional foods and species of interest identified by the Big Valley Rancheria Band of Pomo Indians. The newly added species include several species of small fish (threadfin shad, prickly sculpin, mosquitofish, and inland silversides), winged floater mussels, and Asian clams.

This advisory was updated in 2018 to remove Clear Lake Hitch. This species is currently listed as threatened under the California Endangered Species Act and take of Clear Lake Hitch is not permitted.



Chapter 5 Mitigation Strategy

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for this 2019 City of Lakeport Local Hazard Mitigation Plan (LHMP). It describes how the City and the LFPD met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the Hazard Mitigation Planning Committee (HMPC) led to the mitigation strategy and mitigation action plan for this LHMP.

Taking all of the above into consideration, the HMPC developed the following umbrella mitigation strategy for this LHMP:

- **Communicate** the hazard information collected and analyzed through this planning process as well as HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- **Implement** the action plan recommendations of this LHMP.
- **Use/enforce** existing rules, regulations, policies, and procedures already in existence.
- **Monitor** multi-objective management opportunities so that funding opportunities may be shared and packaged, and broader constituent support may be garnered.

5.1.1. Continued Compliance with NFIP

To participate in the National Flood Insurance Program (NFIP), a community must adopt and enforce floodplain management regulations that meet or exceed the minimum requirements of the Program. These requirements are intended to prevent loss of life and property and to reduce taxpayer's costs for disaster relief as well as minimize economic and social hardships that result from flooding. Participation in the NFIP provides a community with access to flood insurance.

Lakeport's Flood Management Program

The City of Lakeport has participated in the Regular Phase of the NFIP since September 1, 1978. Since then, the City has administered floodplain management regulations that meet the minimum requirements

of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The Community Rating System (CRS) was created in 1990. It is designed to recognize floodplain management activities that go above and beyond the NFIP's minimum requirements. If a community implements public information, mapping, regulatory, loss reduction and/or flood preparedness activities and submits the appropriate documentation to the FEMA, then its residents can qualify for a flood insurance premium rate reduction. The City does not currently participate in the CRS program, but will evaluate the overall value of joining CRS in the future during the implementation phase of this LHMP.

Presently, the City manages its floodplains in compliance with NFIP requirements and implements a floodplain management program designed to protect the people and property of the City. Floodplain regulations are a critical element in local floodplain management and are a primary component in the City's participation in the NFIP. As well, the City's floodplain management activities apply to existing and new development areas, implementing flood protection measures for structures and maintaining drainage systems to help reduce the potential of flooding within the City. Also to be considered are the numerous flood mitigation actions contained in this LHMP that support the ongoing efforts by the City to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program.

The City will continue to manage their floodplains in continued compliance with the NFIP. An overview of the City's NFIP status and floodplain management program are discussed on Table 5-1.

Table 5-1 City of Lakeport NFIP Status

| NFIP Topic | | Comments |
|---|--|----------|
| Insurance Summary | | |
| How many NFIP policies are in the community? What is the total premium and coverage? | 212 policies \$189,479 in premiums \$48,450,900 in coverage | |
| How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage? | 238 claims \$2,756,495.05 in paid losses 18 substantial damage claims since 1978 | |
| Repetitive Loss (RL) and Severe Repetitive Loss (SRL) properties | 24 RL properties 3 SRL properties | |
| How many structures are exposed to flood risk within the community? | 424 improved parcels in the 1% annual chance 3 improved parcels in the 0.2% annual chance | |
| Describe any areas of flood risk with limited NFIP policy coverage | No areas have limited NFIP policy coverage. | |
| Community Floodplain Administration | | |
| Is the Community Floodplain Administrator or NFIP Coordinator certified? | No | |

| NFIP Topic | Comments |
|---|---|
| Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability) | All permit applications are reviewed to determine any SGHA designation by checking the information on the data card assigned to the address and checking the parcel boundaries in the GIS flood map layer. If the property is within a SFHA, then the Floodplain Manager advises the applicant of all restrictions and requirements that pertain to the proposed work. A Floodplain Plan must show compliance with the City's Floodplain Management Ordinance. When necessary, the owner shall provide a benchmark set on site by a land surveyor or civil engineer. Site inspections shall confirm the work is performed in compliance. An Elevation Certificate (EC) shall be completed by the surveyor at the beginning and end of construction. The City Floodplain Manager maintains a collection of all ECs issued within the City. |
| What are the barriers to running an effective NFIP program in the community, if any? | Limited budgets and staff time. |
| Compliance History | |
| Is the community in good standing with the NFIP? | Y |
| Are there any outstanding compliance issues (i.e., current violations)? | N |
| When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)? | CAV – 3/16/2015 CAC – 8/4/2016 |
| Is a CAV or CAC scheduled or needed? | No |
| Regulation | |
| When did the community enter the NFIP? | 9/1/1978 |
| Are the FIRMs digital or paper? | Digital |
| Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways? | Exceed requirements. The City requires an additional one foot of freeboard, and for Substantial Improvement determinations, the City tracks cumulative improvement valuations for five years. |
| Provide an explanation of the permitting process. | All permit applications are reviewed to determine any SGHA designation by checking the information on the data card assigned to the address and checking the parcel boundaries in the GIS flood map layer. If the property is within a SFHA, then the Floodplain Manager advises the applicant of all restrictions and requirements that pertain to the proposed work. A Floodplain Plan must show compliance with the City's Floodplain Management Ordinance. When necessary, the owner shall provide a benchmark set on site by a land surveyor or civil engineer. Site inspections shall confirm the work is performed in compliance. An Elevation Certificate (EC) shall be completed by the surveyor at the beginning and end of construction. The City Floodplain Manager maintains a collection of all ECs issued within the City. |
| Community Rating System (CRS) | |
| Does the community participate in CRS? | No |

| NFIP Topic | | Comments |
|--|-----|----------|
| What is the community's CRS Class Ranking? | N/A | |
| What categories and activities provide CRS points and how can the class be improved? | N/A | |
| Does the plan include CRS planning requirements? | N/A | |

Source: FEMA/City of Lakeport

5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard Mitigation actions are essential to weaving long-term resiliency into all community and City recovery efforts so that at-risk infrastructure, development, and other City assets are stronger and more resilient for the next severe storm event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps jurisdictions become more resilient and sustainable. It is often most efficient to fund all eligible infrastructure mitigation through FEMA's Public Assistance mitigation program if the asset was damaged in a storm or other hazard event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial. Integration of mitigation into post disaster recovery efforts should be considered by as part of post disaster redevelopment and mitigation policies and procedures.

The City's EOP, through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return Lakeport to its normal state of affairs. Mitigation is emphasized as a major component of recovery efforts.

Mitigation Strategy Funding Opportunities

An understanding of the various funding streams and opportunities will enable the City to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant pre- and post-funding opportunities include the following.

FEMA HMA Grants

Cal OES administers three main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, and (3) Flood Mitigation Assistance Program. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant.

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Community Development Block Grants

The California Department of Housing and Community Development administers the State's Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight or meet an urgent need. Grant funds can generally be used in federally declared disaster areas for CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

Small Business Loans

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

Increased Cost of Compliance

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to \$30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under NFIP.

5.2 Goals and Objectives

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goal's development and the identification and prioritization of mitigation alternatives by the HMPC.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard profiles, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the City of Lakeport.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the City;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of sample goals to consider. They were told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was given three index cards and asked to write a goal statement on each. Goal statements were collected and grouped into similar themes during the meeting. The goal statements were then grouped into similar topics. New goals from the HMPC were discussed until the team came to consensus. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, which provide the direction for reducing future hazard-related losses within the City of Lakeport Planning Area (including the LFPD).

Goal 1: Minimize risk and vulnerability of Lakeport to hazards and protect lives and prevent losses to property, economy, and the environment

- Provide protection for existing and future development
- Provide protection for critical facilities, utilities, and services and minimize disruption
- Provide protection for public health and safety

Goal 2: Improve Lakeport's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event

- Reduce the number of emergency incidents and disaster occurrences
- Improve local capacity to prepare for disasters
- Continued improvements to infrastructure, equipment, facilities, etc. to meet public safety needs
- Improve and maintain emergency communications for community residents and visitors
- Increase the use of shared resources, data sharing, mutual aid and jurisdictional cooperation
- Upgrade and maintain disaster/emergency plans, with a long-term focus to address changing community needs to prevent, minimize, and recover from disasters

- Develop/improve warning, evacuation, and sheltering procedures and information for residents, businesses, visitors, individuals with access and functional needs, and animals

Goal 3: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote preparedness and self-responsibility to reduce hazard-related losses

- Enhance hazard mitigation and preparedness programs
- Establish a Citywide public information program that utilizes a variety of outreach strategies and mechanisms to reach all Lakeport residents and visitors
- Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.

Goal 4: Increase and maintain wildfire prevention and protection in Lakeport

- Reduce the wildfire risk and vulnerability in Lakeport
- Focus on fuels/vegetation management throughout the community
- Improve coordination of mitigation efforts throughout the community

Goal 5: Improve community resiliency to flooding in Lakeport

- Reduce the flood risk and vulnerability in Lakeport
- Identify and implement development plan for City floodplains

5.3 Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated. Only those hazards that were determined to be a priority hazard for purposes of mitigation action development were considered further in the development of hazard-specific mitigation actions.

These priority hazards (in alphabetical order) are:

- Aquatic Biological Hazards: cyanobacterial bloom
- Aquatic Biological Hazards: quagga mussel
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: 1%/0.2% Annual Chance
- Flood: Localized/Stormwater
- Hazardous Materials Transport
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains, Snow, and Storms
- Severe Weather: High Winds

➤ Wildfire

The HMPC eliminated the hazards identified below from further consideration in the development of mitigation actions because the risk of a hazard event in the City is unlikely or nonexistent, the vulnerability of the City is low, capabilities are already in place to mitigate negative impacts, or the City does not have the authority or control over mitigation of the hazard. The eliminated hazards are:

- Severe Weather: Freeze and Cold
- Landslide and Debris Flows*
- Levee Failure
- Seiche
- Volcano and Geothermal gas release

*This was initially a hazard of concern, but after reviewing the vulnerability assessment, the HMPC noted no areas where landslide mitigation actions were needed in the City. As such, this is considered a low significance hazard for mitigation planning.

Priority hazards for the LCFPD are shown in their annex to this Plan.

It is important to note, however, that **all the hazards addressed in this plan are included in the City's multi-hazard public education mitigation action as well as in other multi-hazard, emergency management actions.**

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that support the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the NFIP's Community Rating System:

- Prevention
- Property protection
- Structural projects
- Natural resource protection
- Emergency services
- Public information

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a detailed review and discussion of the six mitigation categories to assist in the review and identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE; sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more

important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

The Mitigation Strategy Meeting Handout, which included hazard summaries, mitigation action categories, sample hazard actions, and prioritization criteria is included in Appendix C.

With these criteria in mind, HMPC members were each given a set of nine colored dots, three each of red, blue, and green. The dots were assigned red for high priority (worth five points), blue for medium priority (worth three points), and green for low priority (worth one point). The team was asked to use the dots to prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.4. The cost-effectiveness of any mitigation alternative will be considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this Plan.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a

determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized action plan for the City of Lakeport Planning Area.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the City of Lakeport and the Lakeport Fire Protection District can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-2 identifies the City mitigation actions for this LHMP, while Table 5-3 identifies the LFPD mitigation actions. For each mitigation action item included in Table 5-2, and Table 5-3 the section that follows includes a detailed mitigation implementation strategy by mitigation action for all City and District actions. Detailed mitigation actions for the LFPD can be found in their annex.

Table 5-2 and Table 5-3 identify the mitigation actions and benefiting jurisdiction for each action. Following this summary table of mitigation actions, a detailed implementation description is included for each mitigation action identified in the table. The implementation of any mitigation action in this Plan is subject to available funding of the City and LFPD as the primary implementing jurisdictions for this LHMP.

As described throughout this LHMP, Lakeport and the LFPD have many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this LHMP focuses only on those mitigation actions that are both reasonable and realistic for the City and District to consider for implementation over the next 5-years covered by this Plan. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-2 for the City and Table 5-3 for the LFPD. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this Plan came down to the actual priorities of the City and District, individuals and departments based in part on department direction, staffing, and available funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this LHMP Update during annual plan reviews and the formal 5-year update process.

It is also important to note that the City and District have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents and programs, such as community

wildfire protection plan/fire plans, stormwater plans, and capital improvement budgets and reports. These actions are considered to be part of this Plan, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this LHMP.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; reprioritization due to funding availability and/or other criteria; and City Council and District board approval. The City and LFPD are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the City and District to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

It should be noted that some of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. **In addition, the public outreach and education action, as well as many of the emergency services and other multi-hazard actions, apply to all hazards regardless of hazard priority.** Collectively, this Lakeport multi-hazard mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of the City and District to implement over the next 5-years covered by this Plan.

Table 5-2 City of Lakeport's Mitigation Actions

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Multi-Hazard Mitigation Actions | | | | | |
| Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan | Lakeport | X | X | | Prevention |
| Action 2.Public Awareness, Education, Outreach, and Preparedness Program Enhancements. | Lakeport and LFPD | X | X | X | Public Information |
| Action 3.EOP Update | Lakeport and LFPD | X | X | | Prevention Emergency Services |
| Action 4.Establish Back Up Power/Generators for Critical Facilities | Lakeport and LFPD | X | X | | Property Protection Emergency Services |
| Action 5.Sirens Project - Community Warning System Designed to Ensure Sound Reaches all Incorporated Areas | Lakeport and LFPD | X | X | | Emergency Services Public Information |
| Action 6.Continuity of Operations Planning | Lakeport | X | X | | Prevention Emergency Services |
| Action 7.Training and Exercise | Lakeport and LFPD | X | X | | Prevention Emergency Services |
| Action 8.Update Local Emergency Services Ordinance | Lakeport | X | X | | Prevention Emergency Services |
| Action 9.Update Development Requirements for Undergrounding Utilities Associated with New Development | Lakeport | | | | Prevention Property Protection |
| Action 10. Mass Care Planning | Lakeport and LFPD | X | X | | Prevention Emergency Services |
| Action 11. In Low-lying Flood-prone Areas Strengthen Base Under Pavement to Prevent Deterioration of Pavement/Asphalt Areas | Lakeport | X | X | X | Property Protection Natural Resource Protection |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Action 12. Establish a Post-Disaster Recovery Action Plan | Lakeport | X | X | | Emergency Services Public Information |
| Aquatic Biological Hazards: Cyanobacterial Bloom Actions | | | | | |
| Action 13. Install Water Aerators in Stagnant Areas | Lakeport | X | X | | Property Protection Natural Resource Protection |
| Action 14. Establish Additional Testing Areas within Key Areas of the City (e.g., swimming area) and Training of Staff | Lakeport | | | | Property Protection Natural Resource Protection Public Information |
| Action 15. Establish Nutrient Management Program; Consider Dredging, Paving Roads, Erosion Control, Runoff Basins, Sewer Collection Systems, Etc. | Lakeport | X | X | | Prevention Property Protection Natural Resource Protection |
| Aquatic Biological Hazards: Quagga Mussel Actions | | | | | |
| Action 16. Quagga/Zebra Mussel Threat to Clear Lake: Enhance Public Education | Lakeport | X | X | | Prevention Natural Resource Protection Public Information |
| Action 17. Quagga Mussel Training | Lakeport | X | X | | Prevention Natural Resource Protection Public Information |
| Dam Failure Actions | | | | | |
| Action 18. WWTP Dam - Increase Reservoir Capacity | Lakeport and LFPD | X | X | X | Prevention Property Protection Structural Projects |
| Drought and Water Shortage Actions | | | | | |
| Action 19. Implement Intertie Projects in Annexation Areas | Lakeport and LFPD | X | X | | Property Protection |
| Action 20. Adoption of State Model Water Efficiency Landscape Ordinance (MWELO) | Lakeport | | | | Prevention |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|---|
| Earthquake Actions | | | | | |
| Action 21. Develop and Implement Non-Structural Mitigation Program | Lakeport | X | X | | Property Protection |
| Action 22. Unreinforced Masonry (URM) and Soft Story Inventory and Retrofits | Lakeport | X | X | | Property Protection Structural Projects |
| Action 23. Retrofit 302 N Main St | Lakeport | X | X | | Property Protection Structural Projects |
| Flood Actions | | | | | |
| Action 24. Flood Insurance Promotion | Lakeport | X | X | X | Public Information |
| Action 25. Armor Streambeds & Lakefront | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 26. Stormwater Projects: Box Culvert/Drainage Enhancements Multiple Areas | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 27. Elevation Projects - Repetitive Loss and Other Areas | Lakeport | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 28. Continue Headwall (Redirock) 100 feet to east from Main Street | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 29. Evaluate and Mitigate Erosion Shoreline Erosion Impacts from High Winds/Wave Action (Possible Seawall) | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 30. Safety Surfacing Library Park | Lakeport | X | X | X | Property Protection Natural Resource Protection |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|---|
| Action 31. Continuation of Sea Wall at Boat Ramp Parking (North of 5th to 3rd Street) | Lakeport | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 32. Identify and Implement Drainage/Streambed Clearance Projects | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Localized Flood Actions | | | | | |
| Action 33. Enclose Open Ditches | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 34. Stormwater Projects: Upsize Project Improvements to Provide More Volume to Increase Drainage Capacities | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Action 35. Storm Drainage Related Flooding | Lakeport and LFPD | X | X | X | Property Protection Structural Projects Natural Resource Protection |
| Hazardous Materials Transport Actions | | | | | |
| Action 36. Multi-Agency Spill Response Plan | Lakeport and LFPD | | | | Prevention Emergency Services |
| Severe Weather: Extreme Heat and Climate Change Actions | | | | | |
| Action 37. Heat Contingency Plan | Lakeport and LFPD | | | | Prevention Emergency Services |
| Wildfire Actions | | | | | |
| Action 38. Defensible Space/ Fuel Reduction Projects | Lakeport and LFPD | X | X | | Prevention Property Protection Structural Projects Natural Resource Protection |
| Action 39. Establish Goat Mitigation Plan | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Action 40. Establish a Local Firewise Community | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |
| Action 41. Roofing/Eve Vent Retrofit and Adopt More Restrictive Wildfire Codes | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |
| Action 42. Public Safety Power Shutoff (PSPS) Multi-jurisdictional Task Force, Training, and Exercises | Lakeport and LFPD | X | X | | Prevention Property Protection Natural Resource Protection |

Table 5-3 Lakeport Fire Protection District's Mitigation Actions

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP | Mitigation Type |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|--|
| Multi-Hazard Mitigation Actions (Climate Change, Drought and Water Shortage, Earthquake, Hazardous Materials Transport, Localized Flood, Wildfire) | | | | | |
| Action 43. Relocate and Replace Fire Station 50 | LFPD and Lakeport | X | X | | Prevention Structural Projects Emergency Services |
| Action 44. Community Wildfire Protection Plan (CWPP) | LFPD and Lakeport | X | X | | Prevention Structural Projects Emergency Services |
| Action 45. Community Wildfire Action Plan | LFPD and Lakeport | X | X | | Prevention Property Protection Natural Resource Protection |

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Current General Plan Safety Element is not compliant with all State statutory requirements.

Project Description: Specifically, AB 2140 requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. This project will update the General Plan Safety Element to include LHMP recommendations and address consistency with State statutory requirements.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: City of Lakeport Planning Department

Project Priority: \$10-15,000

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding: Lakeport General Fund, CAL OES & FEMA grant funding

Timeline: 2020

Action 2. Public Awareness, Education, Outreach, and Preparedness Program Enhancements

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Educate the community on how to seek information before, during, and after a disaster.

Project Description: Improve/Enhance public education, engagement, and preparedness, mitigation, response, and recovery programs for all hazards using multi-media, educate, messaging, target audiences; promote self-responsibility; sustainability. Public awareness activities foster changes in behavior leading towards a culture of risk reduction.

Other Alternatives: Continue with limited hazard-based public outreach efforts

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing public outreach efforts.

Responsible Office/Partners: Lakeport Community Development Department and Public Works Department

Project Priority: High

Cost Estimate: City Staff Time, other costs TBD

Benefits (Losses Avoided): Protect Life and Property, Public Awareness, Community Involvement

Potential Funding: FEMA/State Grants, City of Clearlake General Fund

Timeline: Immediate/On-going

Action 3. *EOP Update*

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: The Emergency Operation Plan exists to ensure that the City is ready to respond to a variety of threats and hazards. The EOP should be consistent with SEMS and NIMS and are coordinated with state and federal plans. To ensure that plans are actionable for use during an emergency, key stakeholders from the City and non-governmental groups are engaged in the development and exercise of these plans.

Project Description: Update and Maintain EOP (Emergency Operations Plan) with all Annexes

Other Alternatives: Do Nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Service Ordinance

Responsible Office/Partners: Lakeport Emergency Management

Project Priority: High

Cost Estimate: 5000.00

Benefits (Losses Avoided): Health and Safety

Potential Funding: Grants, General Fund

Timeline: 1 year

Action 4. *Establish Back Up Power/Generators for Critical Facilities*

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Power interruptions are very likely in emergency event or natural disaster. A back-up source should be immediately available to continue services required for health of safety of population and environment.

Project Description: Procure and install permanent/mobile generators assigned to specific critical facilities.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineering/Consultant

Responsible Office/Partners: City of Lakeport

Project Priority: Medium

Cost Estimate: \$1,000,000

Benefits (Losses Avoided): Reliability of services for health and safety.

Potential Funding: Grants/Low Interest Loans

Timeline: 2 Years

Action 5. *Sirens Project – Community Warning System Designed to Ensure Sound Reaches all Incorporated Areas*

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Emergency event or natural disaster (particularly wildfire) may disable traditional emergency communication systems, thus preventing notification to residents. A back-up early warning audible siren system should be available.

Project Description: Outdoor sirens are located throughout the City. Audible alarm system needs to be capable of reaching all City of Lakeport residents. Sirens should be capable of activating individually or simultaneously in the event of a city-wide emergency.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Community Development Department (site planning, design/aesthetics, public participation), Public Works Department (system maintenance), Consultant (site planning including relevant alarm signal coverage study)

Responsible Office/Partners: City of Lakeport

Cost Estimate: \$150,000.00

Benefits (Losses Avoided): Health and safety of local population

Potential Funding: Grants/Low Interest Loans

Timeline: 5 Years

Project Priority: Medium

Action 6. *Continuity of Operations Planning*

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Continuity of Operations as defined in the national continuity policy implementation plan and the national security presidential directive 51/homeland security presidential directive -20 is an effort within individual executive departments and agencies to ensure that primary missional essential functions continue to be performed during a wide range of emergencies including localized acts of nature, accidents, and technological or attack related emergencies.

Project Description: Update Continuity of Operations Plan

Other Alternatives: Do nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented: EOP, Emergency Services Ordinance

Responsible Office/Partners: City of Lakeport Planning

Project Priority: High

Cost Estimate: 5,000

Benefits (Losses Avoided): Life, Health and Safety

Potential Funding: General fund, Grants

Timeline: 1 Year

Action 7. Training and Exercise

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: The City will continue to make available emergency management training to enhance its capabilities to minimize the impact of disasters and emergencies on the public.

Project Description: Update Emergency training and exercise program for key personnel.

Other Alternatives: Do Nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Service Ordinance

Responsible Office/Partners: City of Lakeport Emergency Management

Project Priority: High

Cost Estimate: 5,000.00

Benefits (Losses Avoided): Health and Safety

Potential Funding: Grants, General Fund

Timeline: 1 year

Action 8. *Update Local Emergency Services Ordinance*

Hazards Addressed: Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Current Local Emergency Services Ordinance is not consistent with Cal-OES requirement and general City OES operations/procedures.

Project Description: Update Local Emergency Services Ordinance to incorporate recommendations in the Local Hazard Mitigation Plan (LHMP) and be consistent with statutory requirements.

Other Alternatives: N/A

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lakeport Municipal Code

Responsible Office/Partners: Lakeport Police Department; Community Development Department; and, Public Works Department

Cost Estimate: \$3-7k

Benefits (Losses Avoided): Aid in reducing losses during natural disasters and ensure City of Lakeport remains eligible for State and Federal disaster related funds.

Potential Funding: Lakeport General Fund, CAL OES & FEMA grant funding

Timeline: 2020

Project Priority: High

Action 9. *Update Development Requirements for Undergrounding Utilities Associated with New Development*

Hazards Addressed: Heavy Rains and Storm Events, High Winds, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Current City of Lakeport development standards do not require utility undergrounding for all new residential and commercial development projects.

Project Description: Consider revising existing development standards within the Lakeport Municipal Code requiring utility undergrounding for all new residential and commercial development projects.

Other Alternatives: Pursue funding for the undergrounding of existing above ground utilities citywide.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lakeport Municipal Code

Responsible Office/Partners: Lakeport Community Development Department

Project Priority: Low

Cost Estimate: \$3-5k

Benefits (Losses Avoided): Reduce property losses and utility outage times associated with storm and wildland fire events. Life safety.

Potential Funding: Lakeport General Fund, CAL OES & FEMA grant funding

Timeline: 3-5 years

Action 10. Mass Care Planning

Hazards Addressed: Multi Hazard (Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: A Mass Care Plan should provide a structure in which to effectively direct, manage, and control the following activities:

- Mass Care – the provision of shelter, feeding, basic first aid, bulk distribution of needed items and related services (such as support for companion animals) to persons affected by a large-scale incident.
- Housing – the provision of short-term emergency housing for persons displaced from their residence because of a disaster incident. Depending on the severity of the incident, disaster housing may take various forms: (a) Evacuation Center, (b) Short Term Emergency Sheltering, (c) Long Term Sheltering, (d) Interim Housing, and (e) Permanent Housing.
- Basic Health Services – the provision of physical and behavioral health services to support the shelter population. This includes first aid, contagious disease monitoring and control, refill of prescription medications, and monitoring of people with chronic health conditions. It also includes coordination with neighborhood health clinics and use of the Medical Health Mutual Aid System to address local shortfalls.
- Human Services – the provision of very basic supplemental services to support the personal and/or immediate recovery needs of disaster victims. Attention is focused on more vulnerable persons -- persons who because of age, disability, or language may need additional assistance to benefit from the mass care services described above. Effective service delivery requires coordination with non-governmental organizations.

Project Description: Develop a Mass Care Plan

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: LHMP, EOP

Responsible Office/Partners: Public Health, City of Lakeport, Leap, Consultant

Project Priority: High

Cost Estimate: \$20,000

Benefits (Losses Avoided): Reduced risk to life safety.

Potential Funding: Grants, City Funds

Timeline: 5 Years

Action 11. *In Low-lying Flood-prone Areas Strengthen Base Under Pavement to Prevent Deterioration of Pavement/asphalt Areas*

Hazards Addressed: Multi-hazard (hazards requiring evacuation or being affected by flooding)

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: During floods, the roadway become inundated. Traffic continues to use the roadway for evacuation and access even during flooding due to lack of other access.

Project Description: Reconstruct streets with more moisture resistant structures (full depth asphalt) to resist loading during flood events. The two locations are Esplanade at Konocti and E Street.

Other Alternatives: Continue to repair damaged roadway after events.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lakeport City Engineer/Consultant

Responsible Office/Partners: City Engineer

Project Priority: High

Cost Estimate: @ Konocti (2900 sf @ \$18/sf = \$52,200; @ E St (3600 sf @ \$18/sf = \$64,800

Benefits (Losses Avoided): Avoids continue maintenance after flood events. Provides access during flooding events without severe damage.

Potential Funding: Grants

Timeline: 1 year

Action 12. *Establish a Post-Disaster Recovery Action Plan*

Hazards Addressed: Multi-Hazard (Aquatic Biological Hazards: cyanobacterial bloom, Aquatic Biological Hazards: quagga mussel, Climate Change, Dam Failure, Drought and Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized/Stormwater, Hazardous Materials Transport, Landslide and Debris Flows, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains, Snow, and Storms, Severe Weather: High Winds, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: When disasters strike, it is imperative for the City to be able to recover and resume normal operations as quickly as possible. Recovery encompasses both short-term and long-term recovery elements. The amount of time it takes for the City's infrastructure, resources, and the economy to recover will impact the stability of the community moving forward.

Project Description: Create a post-disaster recovery plan that outlines the procedures for public information, post-disaster damage assessments, code enforcement, permitting requirements, financial recovery, and redundant operations.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Annex to Emergency Operations Plan

Responsible Office/Partners: City of Lakeport Emergency Services, Department of Utilities, Community Development and Planning Department

Project Priority: High

Cost Estimate: \$50,000

Benefits (Losses Avoided): A more resilient, stable community and avoided economic loss.

Potential Funding: Grants

Timeline: 1-3 years

Aquatic Biologic Hazards: Cyanobacteria Actions

Action 13. *Install Water Aerators in Stagnant Areas*

Hazards Addressed: Aquatic Biologic Hazards: Cyanobacteria

Goals Addressed: 1, 2, 3

Issue/Background: Cyanobacteria or Bluegreen Algae are bacteria capable of photosynthesis - creating their own energy from the sun. These organisms occur naturally in surface water such as lakes, ponds, rivers and streams. When conditions are right - excess nutrients, warm temperatures, and sunshine, they can rapidly form blooms of Harmful Algal Blooms characterized by the presence of toxins produced by the bacteria.

Project Description: Installation of water aerators near the swim area adjacent to Library Park.

Other Alternatives: Do nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented: Cyanobacterial Program

Responsible Office/Partners: Lakeport Public Works

Project Priority: Medium

Cost Estimate: \$10,000

Benefits (Losses Avoided): Tourism, Health & safety

Potential Funding: General Fund, Grants

Timeline: 5 years

Action 14. *Establish Additional Testing Areas within Key Areas of the City (e.g., Swimming Area) and Training of Staff*

Hazards Addressed: Aquatic Biologic Hazards: Cyanobacteria

Goals Addressed: 1, 2, 3

Issue/Background: Cyanobacteria or Bluegreen Algae are bacteria capable of photosynthesis - creating their own energy from the sun. These organisms occur naturally in surface water such as lakes, ponds, rivers and streams. When conditions are right - excess nutrients, warm temperatures, and sunshine, they can rapidly form blooms of Harmful Algal Blooms characterized by the presence of toxins produced by the bacteria.

Project Description: Provide training and materials for more frequent testing of toxins in expanded areas.

Other Alternatives: Continued participation in the County Cyanobacteria Work Group

Existing Planning Mechanism(s) through which Action Will Be Implemented: Safety Element

Responsible Office/Partners: Lakeport Public Works

Project Priority: Medium

Cost Estimate: \$10,000

Benefits (Losses Avoided): Tourism, Health & safety

Potential Funding: General Fund, Grants

Timeline: 5 years

Action 15. *Establish Nutrient Management Program; Consider Dredging, Paving Roads, Erosion Control, Runoff Basins, Sewer Collection Systems, Etc.*

Hazards Addressed: Aquatic Biological Hazards Cyanobacteria, Flood (1%, 0.2%, and Localized)

Goals Addressed: 1, 2, 3

Issue/Background: Eutrophic lakes are nutrient rich and very productive, supporting the growth of algae and aquatic plants (macrophytes). Factors contributing to its eutrophication include a fairly large drainage basin to contribute mineral nutrients to the water, shallow and wind mixed water, and no summertime cold water layer to trap the nutrients

Project Description: Require all development projects to address water quality impacts through the CEQA review process and through strict enforcement of the City's Erosion Control Ordinance to prevent siltation of water courses. Condition development projects to ensure protection of groundwater and watercourses by using Best Management Practices (BMPs). BMPs may include the following:

- Provide vegetative swale or buffer areas, which could be incorporated into landscaped areas to slow down runoff velocities and allow sediments and other pollutants to settle.
- Provide in-line storage of stormwater to reduce peak discharge, allow settling of pollutants, and reduce potential for downstream erosion.
- Perform street and parking lot cleaning to remove potential debris and pollutants that could be picked up and conveyed by stormwater.
- Design parking lots to direct stormwater to storm drains inlets and away from garbage disposal areas.

Other Alternatives: Discourage construction during wet months to prevent siltation.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Safety Element of the General Plan, Lakeport Municipal Code

Responsible Office/Partners: Lakeport Community Development and Public Works Departments

Project Priority: High

Cost Estimate: 100,000

Benefits (Losses Avoided): \$1,000,000

Potential Funding: General Fund, Grants, Bond Measures

Timeline: 5 Years

Aquatic Biological Hazards: Quagga Mussel Actions

Action 16. Quagga/Zebra Mussel Threat to Clear Lake: Enhance Public Education

Hazards Addressed: Aquatic Biologic Hazards: Quagga Mussels

Goals Addressed: 1, 2, 3

Issue/Background: Clear Lake is a source of public drinking water for more than 5,000 Lakeport residents and is a vital component of the area's tourism industry as it provides a variety of recreational opportunities.

Quagga and Zebra Mussels are highly invasive species that pose a known threat to Clear Lake according to Lake County Water Resources Department and Lakeport City staff. There is concern these invasive mussels can spread into Clear Lake via recreational boats previously used in mussel-infested areas. The mussels reproduce quickly, disrupting the ecosystem, and have the potential to clog and damage drinking water intakes and motorboat engines, and litter beaches with jagged, foul smelling shells.

Project Description: Enhance public education regarding the threat to Clear Lake from invasive mussel species. Focus on increased water system infrastructure maintenance costs and relationship to utility rates as well as the threat to the Lakeport area's tourism economy.

The public education project will work to increase public awareness of invasive mussel species, which fosters the possibility of early detection and rapid eradication.

Public education will focus on using City's website and social media outlets (Facebook and Twitter). The City found a recent (2016) research paper that concludes "social media is a potentially powerful way to advertise and educate the public on invasive species." The study also notes that "the internet and social media can be a great way to engage the interest across age groups."

The development of a written educational pamphlet about invasive mussels for distribution at City offices and municipal events is another component of the public education project.

Other Alternatives: Restricting motorized watercraft use in Clear Lake to prevent the introduction of invasive mussel species. However, significant watercraft restrictions could detrimentally impact the local economy and are therefore discouraged.

Existing Planning Mechanism(s) through which Action Will Be Implemented: City of Lakeport staff – Social Media and City Website coordinators. City of Lakeport and/or Vendor to prepare, install and maintain public information signage about invasive mussels near City's boat launch facilities. Vendor for printing services (informational pamphlet)

Responsible Office/Partners: City of Lakeport

Project Priority: Medium

Cost Estimate: \$7,500.00

Benefits (Losses Avoided): Continued operation of public water intake equipment; continuance of all recreational opportunities associated with Clear Lake

Potential Funding: Grants/Low Interest Loans/General Fund

Timeline: 2 Years

Action 17. Quagga Mussel Training

Hazards Addressed: Aquatic Biologic Hazards: Quagga Mussel

Goals Addressed: 1, 2, 3

Issue/Background: Quagga and zebra Mussels are an invasive species of the same genus, *Dreissena*. The two species appear similar and can be mistaken for the other. These mussels are native to Eurasia and have spread across the United States. They have the ability to multiply rapidly and have no natural predator in the United States. When established in a waterbody the mussels become an ecological and economical threat. They can remove food and nutrients necessary for other species, clog pipes, damage boat motors. Quagga and zebra mussels are the size of a thumbnail (see Figure 4-13). The introduction of quagga mussels (often referred to as *Dreissenids*) to the Pacific Southwest Region brings the potential to extend devastating impacts into a geographical area already challenged with water related problems. Figure 4-13 Quagga and Zebra Mussels Source: US Fish and Wildlife Service Zebra mussels are an invasive species first recognized in Lake St. Clair, near Detroit, Michigan, in 1988; shortly thereafter, the quagga mussel was identified. Since then, the Quagga mussel has rapidly spread across much of the western United States and in 2007 was detected at Lake Mead in Nevada. Later surveys found Quagga mussels in Lake Mohave in Nevada, Lake Havasu in Arizona, and the Colorado River Aqueduct System which serves Southern California. In California the first confirmed find of zebra mussels occurred at San Justo Lake in 2008. These mussels have the ability to survive for a number of days on land by their ability to retain moisture. As a result, there is concern these mussels can spread into Clear Lake by transportation on recreational boats. The mussels reproduce quickly, disrupting the ecosystem, and have the potential to clog drinking water intakes and motorboat engines, and litter beaches with jagged, foul smelling shells. Figure 4-14 is an example of mussels clogging a pipe.

Project Description: Training for Park Staff to participate in the County's educational public outreach program.

Other Alternatives: Do nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lakeport Public Works

Project Priority: Low

Cost Estimate: \$1,000.00

Benefits (Losses Avoided): Tourism, Health & safety

Potential Funding: General Fund, Grants

Timeline: 5 years

Dam Failure Actions

Action 18. *WWTP Dam – Increase Reservoir Capacity*

Hazards Addressed: Dam Failure, Flood (1% and 0.2%, as well as Localized Flood)

Goals Addressed: 1, 2, 3, 5

Issue/Background: Flood events contribute excessive I&I due to rain and high lake levels. This causes excessive flows to be processed through the plant and finally stored. The reservoir becomes inundated and capacity runs out quickly which may result in a major spill event of secondary treated wastewater into our waterways and finally the lake. This is a major environmental impact and subject to huge fines.

Project Description: Remove material from the West side of the reservoir to gain more capacity.

Other Alternatives: Mitigate I&I

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineering/Consultant

Responsible Office/Partners: City of Lakeport

Project Priority: Medium

Cost Estimate: \$5,000,000

Benefits (Losses Avoided): Environmental impacts/ Fines

Potential Funding: Grants, low-interest loans

Timeline: 5 years

Drought and Water Shortage Actions

Action 19. Implement Intertie Projects in Annexation Areas

Hazards Addressed: Drought/Water Supply, Wildfire

Goals Addressed: 1, 2, 3

Issue/Background: Interties with other potable water sources creates redundancy for supply.

Project Description: Research potential sources and engineer interties accordingly.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: In conjunction with other water agencies

Responsible Office/Partners: City Engineering/Consultant

Project Priority: Medium

Cost Estimate: \$500,000

Benefits (Losses Avoided): Reliability, drought mitigation.

Potential Funding: Grants/Low Interest Loans

Timeline: 10 years

Action 20. Adoption of State Model Water Efficiency Landscape Ordinance (MWELo)

Hazards Addressed: Drought & Water Supply

Goals Addressed: 1, 2, 3

Issue/Background: Current City of Lakeport irrigation and landscape standards are not consistent with State MWELo regulations.

Project Description: Update City of Lakeport irrigation and landscape requirements to be consistent with State MWELo standards and develop monitoring program to ensure ongoing maintenance of public and private development projects.

Other Alternatives: Consider adopting other MWELo equivalent specific plan for City of Lakeport

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lakeport Municipal Code

Responsible Office/Partners: Lakeport Community Development Department

Cost Estimate: \$5-10k

Benefits (Losses Avoided): Reduce demand to local water system and avoid potential penalties from State due to non-compliance.

Potential Funding: Lakeport General Fund, CAL OES & FEMA grant funding

Timeline: 3-5 years

Project Priority: Medium

Earthquake Actions

Action 21. Develop and Implement Non-Structural Mitigation Program

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3,

Issue/Background: Areas of the City are at risk from earthquake impacts. Certain locations need to secure fuel tanks, goods on shelves, batteries for power chimneys, LPG shut-offs, towers, and steeples.

Project Description: Follow procedures in FEMA publication 74-FM “Earthquake Hazard Mitigation for Nonstructural Impacts”

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lakeport Community Development Department/Public Works

Project Priority: Low

Cost Estimate: Staff time

Benefits (Losses Avoided): Reduced risk to architectural elements, buildings utility systems, furniture, and contents damage. Reduces potential injury to residents.

Potential Funding: Possible grant funds

Timeline: As soon as funding is available.

Action 22. Unreinforced Masonry (URM) and Soft Story Inventory and Retrofits

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3

Issue/Background: Pre-1900s masonry buildings in the City and some 2-story properties are at a high risk of collapse during earthquake shaking. The 1906 San Francisco Earthquake caused some damages in the city. Some 2nd story and all 3rd stories were removed from buildings at that time. In 1990, the City adopted a URM ordinance (#696)

Project Description: Secure or remove all parapets, cornices, and masonry veneer more than 4' above grade after design by civil or structural engineer. Re-evaluate per ASCE 41-13.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: Chapter 15.05 of the City Municipal Code. Existing URM retrofit list. Need a soft story inventory list.

Responsible Office/Partners: Lakeport Community Development, Building Official

Project Priority: Medium

Cost Estimate: To be determined on a case-by-case basis.

Benefits (Losses Avoided): Reduced risk of building collapse during times of earthquake shaking. Reduced risk of injury and death.

Potential Funding: Grants and local funding.

Timeline: Dependent on funding.

Action 23. Retrofit 302 N Main St

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3

Issue/Background: URM buildings identified in 1990-93 were all brought into compliance with the exception of 302 N Main

Project Description: Seismic upgrades are in progress with current project.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lakeport Community Development

Project Priority: Medium

Cost Estimate: Unknown

Benefits (Losses Avoided): Reduced risk to people and property during earthquakes.

Potential Funding: Grants and local funding

Timeline: When funding is available

Flood: 1%/0.2% Annual Chance, Heavy Rain and Storm, and Wind Actions

Action 24. *Flood Insurance Promotion*

Hazards Addressed: Flood (1% and 0.2% annual chance)

Goals Addressed: 1, 2, 3

Issue/Background: General public is not greatly aware of available flood insurance options and potential gaps in their existing coverage.

Project Description: Increase public awareness of Flood Insurance options to mitigate losses associated with future flood events.

Other Alternatives: Consider partnerships with other local jurisdictions and non-profit organizations to increase awareness of flood insurance options.

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Website, City Social Media, City Handouts & Publications

Responsible Office/Partners: Lakeport Community Development Department

Project Priority: Medium

Cost Estimate: \$1-5k

Benefits (Losses Avoided): Reduce and mitigate losses associated with future flood events.

Potential Funding: Lakeport General Fund, CAL OES & FEMA grant funding

Timeline: Ongoing

Action 25. *Armor Streambeds & Lakefront*

Hazards Addressed: Flood (1% and 0.2% annual chance)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Flooding has historically been one of Lakeport's major safety concerns. Clear Lake and its tributary drainages have a long history of flooding. Flooding in Lakeport historically results from two distinct types of events: shoreline flooding due to high lake levels and wind velocity, and stream bank flooding caused by high intensity cloudburst storms over one or more of the drainage areas. Conditions in the winter tend to be conducive to both types of flood conditions at the same time.

Project Description: Install geo structures and rip rap to minimize soil erosion and volume, velocity of surface runoff as well as wave action.

Other Alternatives: Continue to develop, update and implement a City Capital Improvement Program for drainage and work with the Lake County Watershed Protection District to eliminate the most important drainage problems in the Lakeport Planning Area

Existing Planning Mechanism(s) through which Action Will Be Implemented: General Plan Safety Element Section X-1- Flood Damage Prevention Ordinance-Floodplain Mitigation Plan-Local Hazard Mitigation Plan

Responsible Office/Partners: Lakeport Public Works/Community Development.

Cost Estimate: \$1,000,000.00

Benefits (Losses Avoided): \$3,000,000.00

Potential Funding: General Fund, Grants, Bond Measures

Timeline: 5 Years

Project Priority: High

Action 26. *Stormwater Projects: Box Culvert/Drainage Enhancements Multiple Areas*

Hazards Addressed: Flood (1% and 0.2% annual chance, as well as Localized)

Goals Addressed: 1, 2, 3, 4

Issue/Background: Flooding has historically been one of Lakeport's major safety concerns. Clear Lake and its tributary drainages have a long history of flooding. Flooding in Lakeport historically results from two distinct types of events: shoreline flooding due to high lake levels and wind velocity, and stream bank flooding caused by high intensity cloudburst storms over one or more of the drainage areas. Conditions in the winter tend to be conducive to both types of flood conditions at the same time.

Project Description: Upsize existing culverts, install new box culverts where needed.

Other Alternatives: Continue the annual inspection of the drainage systems and informing residents and property owners of illegal structures and debris that must be removed.

Existing Planning Mechanism(s) through which Action Will Be Implemented: General Plan Safety Element Section X-1- Flood Damage Prevention Ordinance-Floodplain Mitigation Plan-Local Hazard Mitigation Plan

Responsible Office/Partners: Lakeport Public Works / Community Development.

Cost Estimate: \$5,000,000.00

Benefits (Losses Avoided): \$10,000,000.00

Potential Funding: General Fund, Grants, Bond Measures

Timeline: 5 Years

Project Priority: High

Action 27. *Elevation Projects – Repetitive Loss and Other Areas*

Hazards Addressed: Flood (1% and 0.2% annual chance)

Goals Addressed: 1, 2, 3, 5

Issue/Background: There are 25 RL properties listed in the 2009 Assessment by URS GIS files. This list may need to be updated.

Project Description: Encourage owners to apply for elevation funding through FEMA. Assist with applications for funding where available and applicable.

Other Alternatives: Remove dwellings and deed restrict property.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lakeport Community Development Department

Project Priority: Medium – would start with the severe repetitive loss property on Esplanade.

Cost Estimate: In excess of \$1 million.

Benefits (Losses Avoided): Reduced risk to flooding for people and property.

Potential Funding: FEMA grant funding

Timeline: As soon as finding is available.

Action 28. *Continue Headwall (Redirock) 100 feet to east from Main Street*

Hazards Addressed: Flood (1% and 0.2% annual chance), Bank Erosion causing lake sedimentation during high water flows.

Goals Addressed: 1, 2, 3, 5

Issue/Background: The south bank of Forbes Creek continues to erode during high water events. Past action has undermined the headwall at Main Street and is the subject of a current potential damage replacement project.

Project Description: This project extends from the Main Street headwall (to be constructed under the 2019 Flood Damage repair) to approximately 100 feet downstream. The project corrects past erosion and provides a durable channel lining.

Other Alternatives: Fix erosion after it occurs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineer or Consultant for design of bank lining and erosion restoration.

Responsible Office/Partners: City of Lakeport

Project Priority: High

Cost Estimate: \$6,300 per foot or \$630,000 total project cost/

Benefits (Losses Avoided): Continued bank erosion including damage to adjacent parking lot.

Potential Funding: Grants

Timeline: Needs immediate attention. One year to implement after environmental approvals.

Action 29. Evaluate and Mitigate Erosion Shoreline Erosion Impacts from High Winds/Wave Action (Possible Seawall)

Hazards Addressed: Flooding and wave impact due to high winds, Erosion, High Winds

Goals Addressed: 1, 2, 3, 5

Issue/Background: Lakeshore Boulevard parallels the bank of Clearlake between the curve north of Ashe Street and north of Jones Street. A large portion of this shoreline was damaged including the roadway in 2012 and again in 2017. This section was repaired using FHWA funds in 2017. A portion is left unprotected just south of this project (230 lf).

Project Description: Install Rip Rap protection to match the repairs just to the north.

Other Alternatives: Maintain existing conditions after damage

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineer/Consultant

Responsible Office/Partners: City Engineer

Project Priority: Medium

Cost Estimate: 230 lf @ \$775=\$178,250

Benefits (Losses Avoided): Protect shoreline and roadway from erosion and damage during flooding events and wave action due to high winds

Potential Funding: Grants

Timeline: Including design, environmental, and permitting, the project should take approximately 3 to 4 years to complete

Action 30. *Safety Surfacing Library Park*

Hazards Addressed: Flood (1% and 0.2% annual chance)

Goals Addressed: 1, 2, 3, 5

Issue/Background: The Playground areas are currently located in a low-lying area of the Park. When the lake level reaches flood stage the engineered wood, fibers that currently serve as the safety surfacing, become inundated with flood water. As a result, the entire surfacing needs to be removed and replaced.

Project Description: Fill in the depressions where the playgrounds are located and install a poured in place safety surface.

Other Alternatives: Do Nothing

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: Lakeport Public Works / Parks

Cost Estimate: 250,000.00

Benefits (Losses Avoided): 250,000

Potential Funding: Grants, General Fund

Timeline: 5 years

Project Priority: Low

Action 31. *Continuation of Sea Wall at Boat Ramp Parking (North of 5th to 3rd Street)*

Hazards Addressed: Flood (1% and 0.2% annual chance), Erosion, High Winds

Goals Addressed: 1, 2, 3, 5

Issue/Background: Portions of the shoreline between

Project Description: The project includes removal of ineffective shoreline rip rap and replacement with a sheetpile wall between existing sections of sheet pile wall. To gaps exist. The portion north of the 3rd

street boat ramp is approximately 215 feet long. The one north of the 5th Street boat ramp is approximately 200 feet long

Other Alternatives: Continued ongoing repair of the rip rap and back erosion after each damage event.

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineer/Consultant

Responsible Office/Partners: City Engineer

Project Priority: Medium

Cost Estimate: \$2,000 per foot or \$830,000 for both gaps

Benefits (Losses Avoided): The existing seawall made of sheet pile has performed without damage through numerous storm events. Completion of the sheet pile walls will eliminate damage repair after each major event, two such events occurred in 2017 and 2019.

Potential Funding: Grants

Timeline: Including design, environmental, and permitting, the project should take approximately 3 to 4 years to complete

Action 32. *Identify and Implement Drainage/Streambed Clearance Projects*

Hazards Addressed: Flood (1% and 0.2% annual chance)

Goals Addressed: 1, 2, 3, 5

Issue/Background: Flooding has historically been one of Lakeport's major safety concerns. Clear Lake and its tributary drainages have a long history of flooding. Flooding in Lakeport historically results from two distinct types of events: shoreline flooding due to high lake levels and wind velocity, and stream bank flooding caused by high intensity cloudburst storms over one or more of the drainage areas. Conditions in the winter tend to be conducive to both types of flood conditions at the same time.

Project Description: Maintain unobstructed water flow in the storm drainage system.

Other Alternatives: Organize City-led stream clean-up projects in coordination with community groups, volunteer organizations and citizens.

Existing Planning Mechanism(s) through which Action Will Be Implemented: General Plan Safety Element Section X-1- Flood Damage Prevention Ordinance-Floodplain Mitigation Plan-Local Hazard Mitigation Plan

Responsible Office/Partners: Lakeport Public Works / Community Development.

Project Priority: High

Cost Estimate: \$100,000

Benefits (Losses Avoided): \$1,000,000.00

Potential Funding: General Fund, Grants, Bond Measures

Timeline: 5 Years

Flood: Localized/Stormwater Actions

Action 33. *Enclose Open Ditches*

Hazards Addressed: Localized Flooding

Goals Addressed: 1, 2, 3, 5

Issue/Background: During the development of Lakeport, portions of creeks were channeled into underground storm drainage systems. These systems were usually designed for 100-year capacity. However, the open ditches are immediately adjacent to various streets and pose a hazard to drivers at all times whether flowing with winter runoff or minimal summer flows due to depth, open channels were left between developments, resulting in deep open ditches alongside collector roads. These ditches require maintenance to protect adjacent improvements in addition to creating a potential hazard from drivers on the collector roads.

Project Description: The following roadways have such open ditches. Included are pipe sizes provided by the City of Lakeport Master Drainage Plan: Martin Street – West of Estep to Trailer Park (890 lf of 78 inch pipe); S. Russel near 2nd to Compton near Spur (750 lf of 78 inch pipe); 16th Street from Hartley east 245 lf (66 inch pipe).

Other Alternatives: Maintain existing ditches

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineer and Consultant

Responsible Office/Partners: City Engineer

Project Priority: Medium

Cost Estimate: Martin Street (890 lf @ \$600/lf = \$534,000), S. Russel/Compton (750 lf @ \$600/lf = \$450,000 & 16th Street (245 lf @ \$525/lf=\$128,625. Total project cost: \$1,112,625.

Benefits (Losses Avoided): Flooding of roadways and private property during peak rainfall events. Provide safe shoulders on collector streets.

Potential Funding: Grants

Timeline: Including design, environmental, permitting, the project should take approximately 3 to 4 years to complete

Action 34. *Stormwater Projects: Upsize Project Improvements to Provide More Volume to Increase Drainage Capacities*

Hazards Addressed: Localized Flooding

Goals Addressed: 1, 2, 3, 5

Issue/Background: The existing storm water capacity is severely undersized between 16th street and the lake. This causes flooding during moderate to heavy rainfall events. Upstream development has provided sufficient storm drainage capacity to avoid flooding. However, the constricted downstream ditch and culvert flows cause the water to backup and flood streets and property. This prevents this area from being removed from FEMA flood maps.

Project Description: The project would complete the increased system capacity from the ditch along 16th street (included as its own item) to outlet into the Lake in accordance with the City of Lakeport Master Drainage Plan.

Other Alternatives: Repair damage as it routinely occurs

Existing Planning Mechanism(s) through which Action Will Be Implemented: City Engineer and Consultant

Responsible Office/Partners: City Engineer

Project Priority: Medium

Cost Estimate: 1265 lf of 66 inch to 73 inch pipe @ \$900/lf = \$1,138,500

Benefits (Losses Avoided): Removal of area from 100-year flood zone and avoidance of localized flooding.

Potential Funding:

Timeline: Planning, design, permitting and construction: ~ 4 years

Action 35. *Storm Drainage Related Flooding*

Hazards Addressed: Localized Flooding

Goals Addressed: 1, 2, 3, 5

Issue/Background: Heavy rains cause intermittent flooding in areas where storm drainage system is undersized.

Project Description: Revise and update both the 1980 Storm Drainage Master Plan and 2003 Floodplain Management Plan

Other Alternatives: Smaller improvement projects

Existing Planning Mechanism(s) through which Action Will Be Implemented: Storm Drainage Master Plan and Floodplain Management Plan.

Responsible Office/Partners: Lakeport Public Works/Engineering

Project Priority: Medium

Timeline: 2-5 years

Cost Estimate: \$20-40,000 for study. Projects estimated to be \$4 to \$8 million.

Benefits (Losses Avoided): Reduced risks from flooding to people and property. Possibly remove properties from Special Flood Hazard Zone

Potential Funding: Grants

Hazardous Materials Transport Actions

Action 36. *Multi-Agency Spill Response Plan*

Hazards Addressed: Hazardous Materials Releases

Goals Addressed: 1, 2, 3

Issue/Background: Immediate dangers from the unexpected release of hazardous materials include fires, explosions and environmental degradation. The release of some toxic gases may cause immediate death, disablement, or sickness if absorbed through the skin, injected, ingested, or inhaled. Contaminated water resources may be unsafe and unusable, depending on the amount of contaminant. Some chemicals cause painful and damaging burns if they come in direct contact with skin. Contamination of air, ground, or water may result in harm to fish, wildlife, livestock, and crops. The release of hazardous materials into the environment may cause debilitation, disease, or birth defects over a long period of time.

Accidents involving the transportation of hazardous materials could be just as catastrophic as accidents involving stored chemicals, possibly more so, since the location of a transportation accident is not predictable. The 2018 Draft Lake County CA Hazard Mitigation Plan details numerous HazMat incidents in Lake County in the past 45+ years and suggests “it is likely a hazardous materials incident will occur in Lake County every 5.2 years.” Clear Lake is a source of Lakeport’s public drinking water and a significant HazMat spill in proximity of Clear Lake has the potential to impact the availability of potable water to the Lakeport community.

Project Description: The Multi-Agency Spill Response Plan (MASRP) should include all necessary protocols to ensure timely and thorough response to HazMat spills affecting land or water in the Lakeport vicinity. Plan should address potential for HazMat spills while in-transit and at fixed sites. The MASRP should also address the following:

- Coordination among local agencies and the State (confirm contact info, resources, roles and responsibilities)
- Dissemination of public information
- Clean up procedures including evacuation, spill control, spill response and cleanup
- Spill reporting protocols

Other Alternatives: Do not develop a Multi-Agency Spill Response Plan

Existing Planning Mechanism(s) through which Action Will Be Implemented: Consultant (plan preparation), City of Lakeport / Various Public Agencies (Plan implementation and maintenance)

Responsible Office/Partners: City of Lakeport / Various Departments, Lakeport Fire Protection District, County of Lake Environmental Health, County of Lake Water Resources, County of Lake Public Works, California Department of Transportation, City of Clearlake (possible)

Cost Estimate: \$40,000.00

Benefits (Losses Avoided): Health and safety of local population; protection of public drinking water supply

Potential Funding: Grants/Low Interest Loans

Timeline: 3 Years

Project Priority: Medium

Severe Weather and Climate Change Actions

Action 37. *Heat Contingency Plan*

Hazards Addressed: Extreme Heat and Climate Change

Goals Addressed: 1, 2, 3

Issue/Background: The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that “over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined.” This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves.

As temperatures increase, California, including Lakeport, will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. Heat emergencies are often slow to develop and usually hurt vulnerable populations. According to the CAS report and the 2018 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). The 2017 Lake County (CA) Climate Change and Health Profile Report includes an analysis of projected temperature changes in Lake County that suggests the annual average temperature could rise by more than five (5) degrees (to 60.5°F) by 2100 in a High Emissions Scenario.

These temperature changes and increased potential for sustained heat waves could lead to an increase in deaths and illness related to extreme heat in Lakeport.

Project Description: A Heat Contingency Plan will describe the City of Lakeport’s role during heat-related emergencies and provides guidance for City government, other governmental agencies, local businesses, community-based organizations, and faith-based organizations, in the preparation for, and response to, emergency incidents of extreme heat.

Stanislaus County in northern California has adopted a FEMA-funded Extreme Heat Contingency Plan which can potentially serve as a model for the City of Lakeport plan.

Lakeport’s plan should address the following:

Coordination among local agencies and the State (confirm roles and responsibilities) • Disseminating public information • Identify potential Cool Zones for Lakeport and surrounding area • Identifying potential Cooling Centers • Coordinating and publicizing Cool Zones • Risk communication and monitoring at risk populations • Determine need and benefit for activating Cooling Centers • Transportation needs assessment for vulnerable populations

Other Alternatives: Do not develop Heat Contingency Plan

Existing Planning Mechanism(s) through which Action Will Be Implemented: Consultant (plan preparation), City of Lakeport / Various Departments (Plan implementation and maintenance)

Responsible Office/Partners: City of Lakeport, Lakeport Senior Center, County of Lake (possible)

Project Priority: Medium

Cost Estimate: \$40,000.00

Benefits (Losses Avoided): Health and safety of local population

Potential Funding: Grants/Low Interest Loans

Timeline: 3 Years

Wildfire Actions

Action 38. *Defensible Space/ Fuel Reduction Projects*

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4

Issue/Background: The wildlands of California are naturally fire prone. Past land and fire management practices have had the effect of increasing the intensity, rate of spread, as well as the annual acreage burned on these lands, primarily due to the hazardous fuel conditions.

Project Description: Hazardous fuel reduction generally requires the reduction of surface and ladder fuels. It may also require thinning out dense tree stands, preserving mature sized trees. It can be accomplished using fire, biological methods, chemical and/or mechanical treatments to remove or modify fuels in wildland areas.

Other Alternatives: Promote the use of defensible space in order to reduce the risk of structure fires.

Existing Planning Mechanism(s) through which Action Will Be Implemented: General Plan Safety Element Section X-1 - Local Hazard Mitigation Plan

Responsible Office/Partners: Lakeport Public Works / Community Development.

Project Priority: High

Cost Estimate: \$1,000,000.00

Benefits (Losses Avoided): \$10,000,000.00

Potential Funding: General Fund, Grants, Bond Measures

Timeline: 5 Years

Action 39. *Establish Goat Mitigation Plan*

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4

Issue/Background: Wildfires present a significant hazard to the Lakeport community. The threat of wildfire has the potential to cause damage to life and property. Goat mitigation planning can help to reduce this risk.

Project Description: Goat mitigation or Managed Grazing:

➤ Creates Fire Breaks

- Reduces Fuel Loads
- Increases Spatial Distance Between Shrubs and Trees
- Prunes Tree Ladder Fuels up to Six Feet off the Ground
- Helps Restore Post-Fire Environments

Other Alternatives: Implement other fuel reduction projects

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City of Lakeport, Lakeport Fire Protection District, Fire wise community members

Project Priority: High

Cost Estimate: 20,000.00

Benefits (Losses Avoided): Life and property

Potential Funding: Grants, bonds, General Fund

Timeline: 3 Years

Action 40. *Establish a Local Firewise Community*

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4

Issue/Background: Wildfires present a significant hazard to the Lakeport community. The most recent evidence of this risk was a week-long mandatory evacuation of the entire city in 2018 due to the Mendocino Complex Fire, the largest wildfire complex in modern California history. The Firewise USA program provides a collaborative framework for neighbors to reduce wildfire risks at the local level. The national recognition program's criteria are designed to empower and engage residents living in wildfire prone areas with a plan and actions that can increase their home's chances of surviving a wildfire, while also making it safer for firefighters.

Project Description: Establish and maintain Lakeport as a Firewise community in accordance with the standards established by the National Fire Protection Association. The Firewise program should include an Action Plan which is a prioritized list of risk reduction projects/investments for the Lakeport community, along with suggested homeowner actions and education activities that participants will strive to complete annually, or over a period of multiple years. Action plans are developed by the local board/committee heading the Firewise project and must be updated at least every three years.

Other Alternatives: Do not establish Lakeport as a Firewise community

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lakeport Fire Protection District, Lake County Fire Safe Council, Firewise USA / National Fire Protection Association,

Responsible Office/Partners: Lakeport Fire Protection District, Lake County Fire Safe Council, City of Lakeport, CalFire

Cost Estimate: \$5,000.00

Benefits (Losses Avoided): Health and safety of local population; protection of structures and other improvements in community

Potential Funding: Grants/Fire Protection District Funds/City General Fund

Timeline: 5 Years

Project Priority: Medium

Action 41. Roofing/Eve Vent Retrofit and Adopt More Restrictive Wildfire Codes

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4

Issue/Background: Wildfire has entered the City Limits in the past. Recent disasters show the urban areas of the City to be vulnerable.

Project Description: This project seeks to address issues with codes that exist and add additional restrictions. Address the most vulnerable existing structures first.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Lakeport Municipal Code

Responsible Office/Partners: Lakeport Community Development Department

Project Priority: High

Cost Estimate: To be determined on case-by-case basis for retrofit. Codes portion of this action would have a cost of staff time.

Benefits (Losses Avoided): Reduced risk to wildfires.

Potential Funding: Unknown

Timeline: Within 5 years

Action 42. *Public Safety Power Shutoff (PSPS) Multi-jurisdictional Task Force, Training, and Exercises*

Hazards Addressed: Wildfire, Extreme Heat, High Winds,

Goals Addressed: 1, 2, 3, 4

Issue/Background: To help reduce the risk of wildfire and keep people, homes, and businesses safe, PG&E begin proactively turning off power for safety as part of a PSPS in areas of extreme fire risk.

Project Description: A multi-jurisdictional task force/working group will be formed to determine how the community can prepare for and maintain critical services during these power shutdowns. This effort will include setting policies and training and exercising for PSPS events. Public outreach will also be a component of this project. Key issues include identifying and establishing backup power supplies for critical facilities, people reliant on powered medical devices; medicine and other perishables requiring refrigeration, and cell phone and other communication systems.

Other Alternatives: Each jurisdiction to establish independent protocols for addressing PSPSs

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Operation Plans (EOPs)

Responsible Office/Partners: County OES, Sutter Hospital, and key City and agency staff

Cost Estimate: Staff time; >\$20,000

Benefits (Losses Avoided): Ensure the Health and Safety of area residents and visitors.

Potential Funding: Staff time, grant funds, private partners

Timeline: Immediately

Project Priority: High



Chapter 6 Plan Adoption

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

The purpose of formally adopting this LHMP is to secure buy-in from the City of Lakeport and Lakeport Fire Protection District, raise awareness of the Plan, and formalize the Plan's implementation. The adoption of this LHMP completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. This adoption also establishes compliance with AB 2140 for the City requiring adoption by reference or incorporation into the Safety Element of the Lakeport General Plan. Two resolutions were created – one for the City of Lakeport and one for the Lakeport Fire Protection District.

The governing board for each participating jurisdiction has adopted this 2019 Local Hazard Mitigation Plan by passing a resolution. A copy of the generic resolutions and the executed copies are included in Appendix D: Adoption Resolutions.



Chapter 7 Plan Implementation and Maintenance

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of this 2019 LHMP is critical to the overall success of hazard mitigation planning. This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the Plan. The chapter also discusses incorporating the LHMP into existing planning mechanisms and how to address continued public involvement.

7.1 Implementation

Once adopted, this LHMP faces the truest test of its worth: implementation. While this Plan contains many worthwhile actions, the City and LFPD will need to decide which action(s) to undertake first. Two factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Low or no-cost actions most easily demonstrate progress toward successful LHMP implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the LHMP recommendations and their underlying principles into other plans and mechanisms, such as general and strategic plans, stormwater plans, Community Wildfire Protection Plans (CWPPs), Emergency Operations Plans (EOPS), evacuation plans, and other hazard and emergency management planning efforts for Lakeport. The City and LFPD already implement policies and programs to reduce losses to life and property from hazards. This LHMP builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of the City of Lakeport and LFPD. Implementation can be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Lakeport community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities.

Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions. This could include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the City and LFPD will be in a better position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and

federal programs and earmarked funds, benefit assessments, and other state and federal grant programs, including those that can serve or support multi-objective applications.

Responsibility for Implementation of Goals and Activities

The appointed officials and staff appointed to head each department within the City and LFPD are charged with implementation of various activities in this LHMP. During the annual reviews as described later in this section, an assessment of progress on each of the goals and activities in this LHMP should be determined and noted. At that time, recommendations were made to modify timeframes for completion of activities, funding resources, and responsible entities. On an annual basis, the priority standing of various activities may also be changed. Some activities that are found not to be doable may be deleted from this LHMP entirely and activities addressing problems unforeseen during development of the Plan may be added.

7.1.1. Role of Hazard Mitigation Planning Committee (HMPC) in Implementation and Maintenance

With adoption of this LHMP, Lakeport will be responsible for Plan implementation and maintenance. The HMPC identified in Appendix A (or a similar committee) will reconvene annually each year to ensure mitigation strategies are being implemented and the City continues to maintain compliance with the NFIP and other applicable mitigation programs. As such, Lakeport will continue its relationship with the HMPC, and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for City decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the City implement the Plan's recommended actions for which no current funding exists;
- Monitor and assist in the implementation and update of this LHMP;
- Report on Plan progress and recommended changes to the City governing board; and
- Inform and solicit input from the public.

The primary duty of the City is to see this LHMP successfully carried out and to report to their governing board and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the City website.

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate Plan implementation and to update this LHMP as progress, roadblocks, or changing circumstances are recognized.

7.2.1. Maintenance Schedule

The Lakeport Department of Public Works is responsible for initiating LHMP reviews. In order to monitor progress and update the mitigation strategies identified in the mitigation action plan, the Lakeport Public Works Department, the LFPD, and the HMPC will revisit this Plan annually and following a hazard event. The HMPC will meet annually to review progress on Plan implementation. The HMPC will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this LHMP anticipated to be fully approved and adopted in late-2019, the next LHMP Update for the City of Lakeport will occur in 2024.

7.2.2. Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in this LHMP. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).
- Increased vulnerability resulting from unforeseen or new circumstances.

Updates to this LHMP will:

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

Changes will be made to this LHMP to accommodate actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, City and LFPD priorities, and/or funding resources. All mitigation actions will be reviewed as well during the monitoring and update of this LHMP to determine feasibility of future implementation. Updating of this LHMP will be by written changes and submissions, as the HMPC deems appropriate and necessary, and as approved by the City and LFPD governing boards. In keeping with the five-year update process, the HMPC will convene public meetings to solicit public input on this LHMP and its routine maintenance and the final product will be again adopted by the City Council and the governing board for other participating jurisdictions.

Annual Plan Review Process

For this LHMP review process, Lakeport Department of Public Works, as lead will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of this LHMP. The LHMP is intended to be a living document. The review of this 2019 LHMP will normally occur on an annual basis each year and will be conducted by the HMPC as follows:

- The Lakeport Department of Public Works will place an advertisement in the local newspaper advising the public of the date, time, and place for each annual review of the LHMP and will be responsible for leading the meeting to review this LHMP.
- Notices will be mailed to the members of the HMPC, federal, state, and local agencies, non-profit groups, local planning agencies, representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- City officials will be noticed by email and telephone or personal visit and urged to participate.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted, and a copy of the current Plan will be available for public comment on the Lakeport LHMP website.
- After the review meeting, minutes of the meeting and an annual report will be prepared by the HMPC and forwarded to the news media (public) and all City departments. The report will also be presented to the Lakeport City Council for review, and a request will be made that the City Council take action to recognize and adopt any changes resulting from the review.
- A copy of the 2019 LHMP will be continually posted on the City's website as will the annual status report.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating this LHMP. More specifically, the reviews should include the following information:

- City growth or change in the past year.
- The number of substantially damaged or substantially improved structures by flood zone.
- The renovations to City infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center (EOC) and whether or not the event resulted in a presidential disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the City or closure of offices, schools, or public services.
- The dates of hazard events descriptions.
- Documented damages due to the event.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures and other school access routes due to the hazard and the length of time closed.
- Assessment of the number of City buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the City and how and if the policy changes can or should be incorporated into the LHMP.
- Review of the status of implementation of projects and actions (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of this 2019 LHMP recommendations and their underlying principles into other City and District plans and mechanisms. Where possible, the City and District will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this plan, mitigation is most successful

when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this LHMP's capability assessment, the City and LFPD already implement policies and programs to reduce losses to life and property from hazards. This LHMP builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- City and District general and strategic plans
- City and District Emergency Operations Plans and other emergency management efforts
- City regulations and requirements
- Climate plans
- Fire plans
- Flood/stormwater plans
- Capital improvement plans and budgets
- Other plans and policies outlined in the capability assessment
- Other plans, regulations, and practices with a mitigation focus

HMPC members involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this LHMP with these other plans, programs, etc., as appropriate. As described in Section 7.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other City and District program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the LHMP into existing programs and planning mechanisms include:

1. As recommended by Assembly Bill 2140, the City should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plan. Evidence of such adoption (by formal, certified resolution) shall be provided to CAL OES and FEMA.
2. Integration of wildfire actions identified in this mitigation strategy and those established in existing and in process CWPPs and other City and District fire mitigation plans and programs. Key people responsible for mitigation of the wildfire hazard in the City and District participated on the HMPC. City and District wildfire projects were identified and integrated into this LHMP. Actual implementation of these projects will likely occur through existing fire department plans and programs and as part of the City and District specific CWPP to be developed as identified in the mitigation strategy of this LHMP.
3. Integration of this LHMP into City Stormwater and Flood plans. It is anticipated that this LHMP will be used to inform any stormwater and flood plan updates and conversely risk and vulnerability data and flood mitigation strategies contained in these other plans will be integrated into future updates of this LHMP for the City.

4. Use of the LHMP risk assessment and other information to update the hazard analysis in future updates of the City’s Emergency Operations Plans and other emergency planning efforts for the City and District.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other program and planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this LHMP.

7.2.4. Continued Public Involvement

Continued public involvement is imperative to the overall success of this LHMP’s implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the Plan implementation and seek additional public comment. The LHMP maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated City meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Annual Reviews

The public will be noticed by placing an advertisement in the newspaper specifying the date and time for the review and inviting public participation. The HMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the HMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise this LHMP. In reconvening, the HMPC will identify a public outreach strategy involving the greater public. The strategy will include a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held and public comments will be solicited on the next plan update draft.



Prelude to Jurisdictional Annex

For this 2019 City of Lakeport LHMP, the **Jurisdictional Annex for the Lakeport Fire Protection District (LFPD)** works in conjunction with the Base Plan, details the hazard mitigation planning elements specific to LFPD, beyond the City which is covered in the Base Plan. This Annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan, as the umbrella document for this planning effort. As such, all Chapters 1-7 of the Base Plan and associated appendices, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction.

The Jurisdictional Annex provide additional information specific to LFPD, with a focus on providing additional details on the risk assessment and mitigation strategy beyond that provided in the Base Plan.



Annex A Lakeport Fire Protection District

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Lakeport Fire Protection District (LFPD). This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the District, with a focus on providing additional details on the risk assessment and mitigation strategy for the District.

A.2 Planning Process

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

Table A-1 LFPD Planning Team

| Name | Position/Title | How Participated |
|-----------------|--------------------------|---|
| Doug Hutchinson | Fire Chief (now retired) | Planning Team meetings. Filled out hazard identification table. Assisted with capability assessment. Provided historic hazards. |
| Rick Bergem | Fire Chief | Planning team meetings. Assisted with capabilities. Provided mitigation actions. |
| Bill Gabe | Board Director | Planning team meetings. Assisted with capabilities. Provided mitigation actions. |

A.3 District Profile

The community profile for the District is detailed in the following sections. Figure A-1 displays a map and the location of the District within Lake County and relative to the City of Lakeport.

This map illustrates the Lakeport Fire Protection District, which covers a large area in northern California, primarily within Lake County and extending into Mendocino County. The district's boundary is shown as a red dashed line. Key features include:

- Fire Stations:** Two are marked. Station 50 is located in the City of Lakeport, indicated by a yellow star with a red center. Station 52 is located north of the city, indicated by a red circle.
- Geography:** The map shows various lakes such as Hidden Lake, Eachus Lake, Burger Lake, Ora Lake, Clear Lake, and Highland Springs Reservoir. Several creeks are also labeled, including Scotts Creek, Rodman Slough, Forbes Creek, Manning Creek, Thompson Creek, Adobe Creek, Hill Creek, and Highland Creek.
- Infrastructure:** Highways 29 and 175 are shown as black lines. Major roads are depicted as thin grey lines.
- Administrative Areas:** The City of Lakeport is outlined with a thick black border. Surrounding counties (Mendocino, Glenn, Colusa, Yolo, Sonoma, Napa) are shown in light tan.
- Elevation:** A legend indicates four elevation ranges: 0 - 1,500 ft (green), 1,501 - 3,000 ft (yellow), 3,001 - 5,000 ft (orange), and 5,001 - 7,059 ft (light brown).

An inset map titled "LAKE COUNTY INSET" provides a broader regional context, showing the location of Lakeport relative to other nearby cities like Eureka and Ukiah, and highlighting the district's extent within Lake County.

A.3.1. Overview and Background

The Lakeport Fire Protection District was formed in 1956. Lakeport Fire Protection District is an independent all-risk fire district. The LFPD is located in the county seat of Lake County, on the west shore of Clear Lake, California's largest natural fresh-water lake. Lakeport Fire responds to over 3,100 calls per year including structure and wildland Fires, vehicle accidents, technical rescue, hazardous materials, and medical aid. The District's Main Station (Station 50) is staffed with 4 personnel on duty at all times.

The District is a combination department, paid and volunteer. Paid staff includes 1 Chief, 3 Captains, 6 Firefighters, and 1 Administrative Assistant. Volunteer staff includes 1 Deputy Chief, 3 Lieutenants, 5 Fire Apparatus Engineers, and 20 Firefighters. Station 52, located in North Lakeport, is staffed by the Lakeport County Fire Chief's Association operated EMS Inter-facility transfer ambulances and volunteer firefighters.

A.4 Hazard Identification

LFPD's planning team identified the hazards that affect the District and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to the District (see Table A-2).

Table A-2 LFPD – Hazard Identification Assessment

| Hazard | Geographic Extent | Likelihood of Future Occurrences | Magnitude/Severity | Significance | Climate Change Influence |
|--|-------------------|----------------------------------|--------------------|--------------|--------------------------|
| Aquatic Biological Hazards: cyanobacterial bloom | Significant | Highly Likely | Negligible | Low | Medium |
| Aquatic Biological Hazards: quagga mussel | Significant | Highly Likely | Negligible | Low | Low |
| Climate Change | Extensive | Likely | Limited | Medium | – |
| Dam Failure | Limited | Occasional | Negligible | Low | Medium |
| Drought and Water Shortage | Extensive | Likely | Critical | High | Medium |
| Earthquake (major/minor) | Extensive | Unlikely/Highly Likely | Catastrophic | High | Low |
| Flood: 1%/0.2% Annual Chance | Significant | Likely | Negligible | Low | Medium |
| Flood: Localized/Stormwater | Significant | Highly Likely | Negligible | Low | Medium |
| Hazardous Materials Transport | Significant | Likely | Limited | Medium | Low |
| Landslide and Debris Flows | Limited | Highly Likely | Negligible | Low | Medium |
| Levee Failure | Limited | Unlikely | Negligible | Low | Low |
| Seiche | Limited | Unlikely | Limited | Low | Low |
| Severe Weather: Extreme Cold and Freeze | Extensive | Likely | Limited | Low | Medium |
| Severe Weather: Extreme Heat | Extensive | Highly Likely | Limited | Low | High |
| Severe Weather: Heavy Rains, Snow, and Storms | Extensive | Highly Likely | Limited | Low | High |
| Severe Weather: High Winds | Extensive | Highly Likely | Critical | Low | Low |
| Volcano and Geothermal Gas Release | Extensive | Unlikely/Highly Likely | Critical | Low | Low |
| Wildfire | Extensive | Highly Likely | Catastrophic | High | Medium |
| <p>Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> <p>Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence: Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact</p> | | | | | |

A.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile LFPD's hazards and assess the District's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the District is included in this Annex. This vulnerability assessment analyzes the property, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the District. For more information about how hazards affect the City of Lakeport as a whole, see Chapter 4 Risk Assessment in the Base Plan.

A.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section A.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the District and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describe how the hazards and risks differ across the Planning Area.

A.5.2. Vulnerability Assessment and Assets at Risk

This section identifies LFPD's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the District. This data is not hazard specific but is representative of total assets at risk within the District.

Assets at Risk and Critical Facilities

This section considers the District's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. A definition of critical facilities can be found in Section 4.3.1 of the Base Plan.

LFPD has facilities located in the City of Lakeport, as well as facilities located in the unincorporated County abutting the City of Lakeport. Table A-3 lists particular critical facilities and other District assets identified by the LFPD planning team as important to protect in the event of a disaster. They are separated into those LFPD's facilities in the City, and those in the unincorporated County. LFPD's physical assets, valued at over \$10.5 million, consist of the buildings and infrastructure to support LFPD's operations.

Table A-3 LFPD Critical Facilities, Infrastructure, and Other District Assets

| Jurisdiction / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|-------------------------|----------------------|--------------------------|----------------|----------------------------|
| City of Lakeport | | | | |
| Fire Station 50 | FIRE STATION | | | |

| Jurisdiction / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|-------------------------------|---------------------------|--------------------------|--------------------|----------------------------|
| | BUILDING | | | |
| | FACILITY | 1 | \$4,356,500 | \$0 |
| | FIRE STATION Total | 1 | \$4,356,500 | \$0 |
| | EQUIPMENT | | | |
| | AMBULANCE | | | |
| | M5011 | 1 | \$0 | \$180,000 |
| | M5012 | 1 | \$0 | \$180,000 |
| | M5014 | 1 | \$0 | \$35,000 |
| | M5015 | 1 | \$0 | \$180,000 |
| | PUMPER | | | |
| | E5011 | 1 | \$0 | \$440,000 |
| | E5012 | 1 | \$0 | \$420,000 |
| | QUINT | | | |
| | T5011 | 1 | \$0 | \$1,200,000 |
| | S-10 UTILITY | | | |
| | U5211 | 1 | \$0 | \$40,000 |
| | UTILITY | | | |
| | C500 | 1 | \$0 | \$45,000 |
| | U5011 | 1 | \$0 | \$40,000 |
| | WILDLAND | | | |
| | E5021 | 1 | \$0 | \$380,000 |
| | E5031 | 1 | \$0 | \$350,000 |
| | EQUIPMENT | 12 | \$0 | \$3,490,000 |
| | Total | 13 | \$4,356,500 | \$3,490,000 |
| City of Lakeport Total | | 13 | \$4,356,500 | \$3,490,000 |
| Unincorporated Lake County | | | | |
| Fire Station 52 | FIRE STATION | | | |
| | BUILDING | | | |
| | FACILITY | 1 | \$1,950,000 | \$0 |
| | FIRE STATION Total | 1 | \$1,950,000 | \$0 |
| | EQUIPMENT | | | |
| | AMBULANCE | | | |
| | (UNKNOWN) | 2 | \$0 | \$0 |
| | PUMPER | | | |
| | E5211 | 1 | \$0 | \$440,000 |

| Jurisdiction / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|---|----------------------|--------------------------|--------------------|----------------------------|
| | WATER TENDER | | | |
| | WT5011 | 1 | \$0 | \$330,000 |
| | EQUIPMENT Total | 4 | \$0 | \$770,000 |
| | Total | 5 | \$1,950,000 | \$770,000 |
| Unincorporated Lake County Total | | 5 | \$1,950,000 | \$770,000 |
| | | | | |
| Grand Total | | 18 | \$6,306,500 | \$4,260,000 |

Source: LFPD

Natural Resources

LFPD has a variety of natural resources of value to the District. These natural resources parallels that of Lakeport. Information can be found in Section 4.3.1 of the Base Plan.

Historic and Cultural Resources

LFPD has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Lakeport. Information can be found in Section 4.3.1 of the Base Plan.

Growth and Development Trends

Growth in the District parallels that of Lakeport. Information can be found in Section 4.3.1 of the Base Plan.

Future Development

The District has no control over future development in areas the LFCPD protects. Future development in these areas parallels that of the City and Lake County as a whole. More general information on growth and development in Lakeport as a whole can be found in “Growth and Development Trends” in Section 4.3.1 City of Lakeport Vulnerability and Assets at Risk of the Base Plan.

A.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table A-2 as high or medium significance hazards. Impacts of past events and vulnerability of the District to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the City of Lakeport). This section focuses on the vulnerability of the LFPD to identified hazards of concern.

An estimate of the vulnerability of the District to each identified priority hazard, in addition to the estimate of probability of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on

past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

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

Climate Change

Likelihood of Future Occurrence—Likely

Vulnerability—Medium

Hazard Profile and Problem Description

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

Location

Climate change is a global phenomenon. It is expected to affect the District, City of Lakeport, Lake County, and State of California.

Extent

There is no scale to measure the extent of climate change. Climate change exacerbates other hazard, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known, but is feared to be tens to hundreds of years.

Past Occurrences

Climate change has never been directly linked to any declared disasters in California. The District Planning Team noted no past occurrences of climate change.

Vulnerability to Climate Change

All Californians are vulnerable to the health impacts of climate change. Even if one is fortunate to live, work, study, or play in a place without direct contact with wildfires, flooding, or sea level rise, no one can entirely avoid excessive heat or the indirect effects of extreme weather events.

Impacts

The following are impacts that could occur as a result of climate change:

- Temperature increases
- Decreased precipitation
- Reduced snowpack
- Reduced tourism
- Ecosystem change
- Sensitive species stress
- Increase wildfire

While the effect to District facilities is not high from climate change, impacts to vegetation in the District that may be fuel for wildfires does affect the District.

Assets at Risk

There are no known assets at risk from climate change at this time for the District. The District noted that the effects of climate change to District assets may not be known for many years to come.

Future Development

The District could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. For example, extended drought can have an effect on Clear Lake as well as the agricultural industry in the area surrounding the District.

Drought and Water Shortage

Likelihood of Future Occurrence–Likely

Vulnerability–High

Hazard Profile and Problem Description

Drought and water shortage have the potential to affect the entire District. Impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts are those related to water intensive activities such as agriculture, municipal usage, commerce, and wildlife preservation. Also, during a drought and water shortage, allocations go down and water costs increase, which results in reduced water availability. Voluntary conservation measures are a normal and ongoing part of system operations and actively implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems. Drought and water shortage conditions can also cause soil to

compact and not absorb water well, potentially making an area more susceptible to flooding and erosion. Drought can worsen wildfires in the District, as it dries out vegetation that can then be fuel for wildfires. It is during times of drought that water supply for fire suppression purposes can become an issue.

Location

Drought is a regional phenomenon that affects the entire District.

Extent

Drought is tracked by the US Drought Monitor. The Drought Monitor includes a scale to measure drought intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Drought has a slow onset and long duration. Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer in Mediterranean climates, such as in California. This is particularly true in Northern California where drought impacts are delayed for most of the population by the wealth of stored surface and ground water. The drought complications normally appear more than a year after a drought begins. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. The State has conducted some empirical studies on the economic effects of fallowed lands with regard to water purchased by the State's Water Bank; but these studies do not quantitatively address the situation in Lakeport. It can be assumed, however, that the loss of production in one sector of the economy would affect other sectors. Drought has the potential to affect the entire City.

There is no established scientific scale to measure water shortage. The speed of onset of water shortage tends to be lengthy. The duration of water shortage can vary, depending on the severity of the drought that accompanies it. Factors for extent include the nature, source, and reliability of water. The District has sufficient water supply, which reduces the extent of drought impacts in the District.

Past Occurrences

There have been past occurrences of drought and water shortage within the District boundaries in 2014 – 2016, as discussed in Section 4.2.10. During these times, there was an impact on dry fuels within the District as well as limited water supply to suppress major building fires.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual

drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of District to drought is Districtwide, but impacts may vary and include reduction in water supply and an increase in dry fuels. Impacts to the District would be mostly from secondary risks to drought and water shortage – mostly from wildfires and their related impacts to property damage and life security, as well as the lack of water for fire suppression.

Impacts

The most significant qualitative impacts associated with drought in the District are those related to water intensive activities such as wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Mandatory conservation measures are typically implemented during extended droughts. Water quality deterioration and increased cyanobacterial bloom are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Assets at Risk

Drought and water shortage are not expected to affect District facilities. The District may see an increase in the number of calls during these times.

Future Development

According to the HMPC, the District has access to water through the City's groundwater as well as surface water. However, population growth in the City will add additional pressure to water suppression efforts during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth.

Earthquake (major/minor)

Likelihood of Future Occurrence–Unlikely/Highly Likely

Vulnerability–High

Hazard Profile and Problem Description

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

Location

According to the California Geological Survey (CGS) and US Geological Survey (USGS), no faults underlie the District boundaries. The District is at risk to faults outside of the District boundaries. Locations of faults outside the District boundaries can be found in Section 4.2.11 of the Base Plan.

Extent

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Past Occurrences

There has been no state or federal disaster declarations from earthquake. The District Planning Team noted no past occurrences that affected the District.

Vulnerability to Earthquake

The District is located in an active earthquake area and the potential exists for a significant seismic event in the future. Immediately east of the City, between the City limits and Clear Lake, there is a potentially active rupture zone. Potentially active rupture zones are faults which have been active in the past 2,000 years. Little is known about this shoreline fault rupture zone, however, it represents a potentially significant hazard and must be taken into consideration when development occurs in the vicinity. Within the past 200 years, no major earthquakes have occurred along faults in Lake County.

Impacts

Impacts from earthquake to the District include damages to District facilities and possible injury to District personnel.

Assets at Risk

All assets within the District are at risk from an earthquake. Newer District facilities are built to code and expected shaking in the District is not expected to be high for these buildings. However, there are older building in the District that were built before code changes took effect, and are at risk to earthquake.

Future Development

Although new growth and development would fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur. LFPD takes seismic risk into account when siting new facilities.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Likely

Vulnerability–Low

Hazard Profile and Problem Description

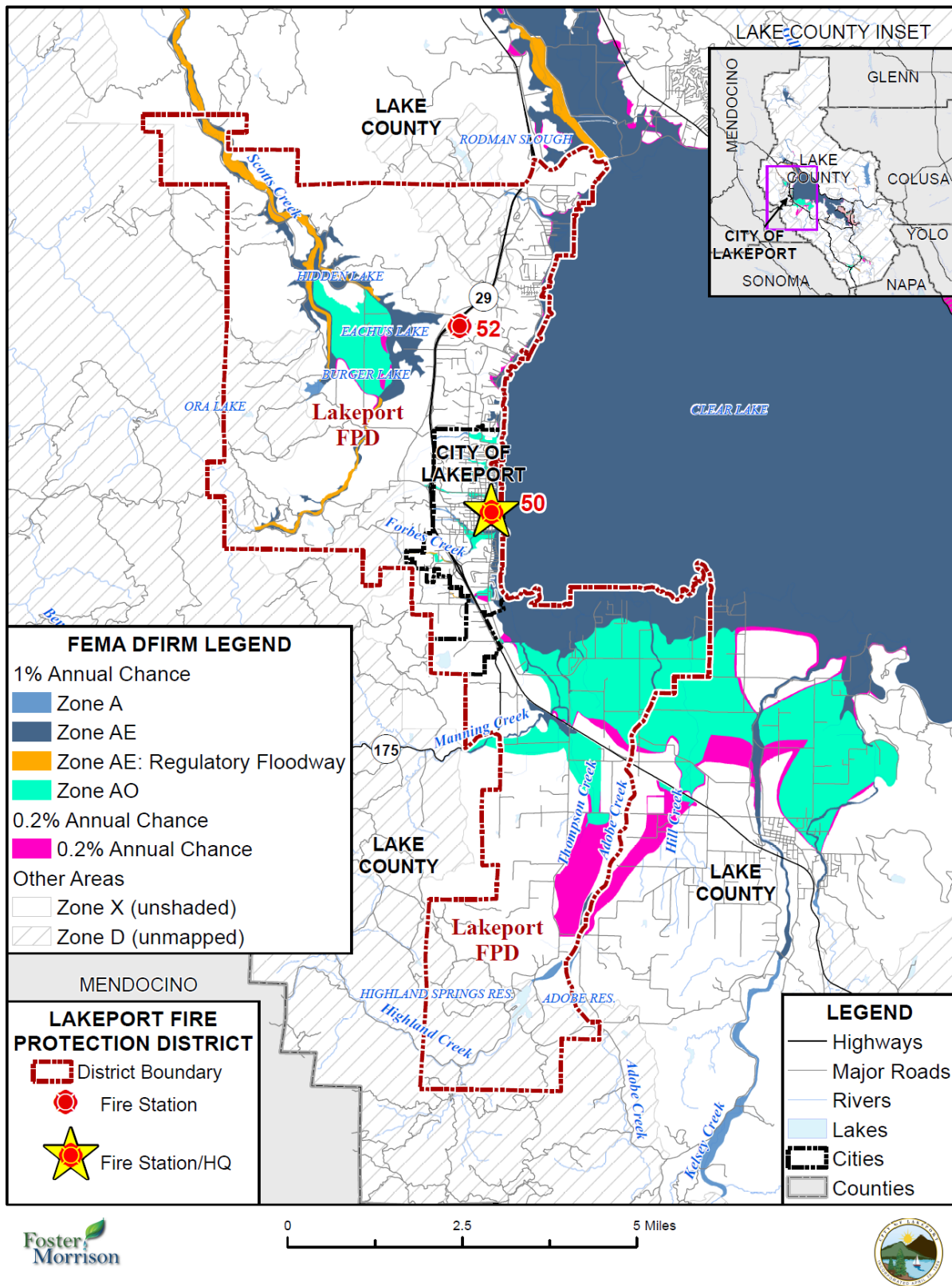
Note: Although considered by the District to be a low significance hazard, due to its importance in the City, County, and State of California, a flood hazard profile and vulnerability assessment is included here.

Flooding is the rising and overflowing of a body of water onto normally dry land. History clearly highlights floods as one of the natural hazards impacting the District. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Location

Portions of the District fall in the 1% and 0.2% annual chance floodway. This can be seen in Figure A-2.

Figure A-2 Lakeport Fire Protection District Facilities and DFIRM Flood Zones



Data Source: FEMA DFIRM 9/30/2005, Lakeport County FPD, Lake County GIS, Cal-Atlas; Map Date: 11/20/2018.

Extent

As shown in Figure A-2, some of the District's boundary is subject to areas of 1% and 0.2% annual chance floods. GIS analysis of the DFIRM flood zones and the District service area was performed. Results were broken up by flooding extent by flood zone for the District in both the City of Lakeport and the unincorporated County. This can be seen in Table A-4. As shown in the table for the District, in the City of Lakeport 0.6% and 0.0% of the acres in the City fall in the 1% and 0.2% annual chance floodplains, respectively. In the unincorporated County, 10.9% and 1.3% of the acres of District territory fall in the 1% and 0.2% annual chance floodplains, respectively.

Table A-4 Lakeport Fire Protection District – Flood Extents

| Flood Zone | Total Acres | % of Total Acres |
|---|---------------|------------------|
| City of Lakeport | | |
| 1% Annual Chance Flood | 289 | 0.6% |
| 0.2% Annual Chance Flood | 10 | 0.0% |
| Other Areas | 1,390 | 3.0% |
| City of Lakeport Total | 1,689 | 3.6% |
| Unincorporated Lake County | | |
| 1% Annual Chance Flood | 5,103 | 10.9% |
| 0.2% Annual Chance Flood | 619 | 1.3% |
| Other Areas | 39,266 | 84.1% |
| Unincorporated Lake County Total | 44,988 | 96.4% |
| | | |
| Grand Total | 46,678 | 100.0% |

Source: FEMA DFIRM 9/30/2005, Lakeport Fire Protection District

No District facilities are located in these flood zones. Flood extents are usually measured in depths and aerial extent of flooding. Expected flood depths in the District vary. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the District's location next to Clear Lake.

Past Occurrences

The District has experienced flooding in 1998 due to the high lake levels from the series of storms and then again in 2017. Flooding in the low-lying areas of the District occurred in both events.

Vulnerability to Flood

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods 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 structural and property damages. Predominantly, the effects of flooding are generally confined to areas near the

waterways and Clear Lake. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

Impacts

Impacts from flooding include damages to infrastructure and District facilities. None of the District facilities fall in the mapped DFIRM floodplains. However, the District has several areas where there is some annual flooding issues. One of the main locations is on Scotts Valley Road. This location floods annually, requiring a long drive around via Hendricks Road. Also, several homes in the area become inaccessible due to the high water and would require specialized high clearance vehicles to access.

Assets at Risk

None of the District facilities fall in the mapped DFIRM floodplains. Therefore, no assets are considered to be at risk. However, the District did note that, though outside the floodplain, their Main Street fire station is subject to flooding during high flood events

Future Development

Future development by the District would be performed to existing building codes. The City of Lakeport and Lake County floodplain ordinances would be followed when siting the buildings.

Hazardous Materials Transport

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

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

Location

Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. In Lakeport, hazardous materials routes include Highway 29. These are shown in Figure A-3, with a one-mile buffer zone on each side of these routes. In addition, while most routes are known, the District does not have a quantified amount of hazardous materials that are transported through it en route to local deliveries or to adjoining counties.

[illegible]

Extent

Accidents involving the transportation of hazardous materials could be just as catastrophic as accidents involving stored chemicals, possibly more so, since the location of a transportation accident is not predictable. The U.S. Department of Transportation divides hazardous materials into nine major hazard classes. A hazard class is a group of materials that share a common major hazardous property, i.e., radioactivity, flammability, etc. These hazard classes were discussed in Section 4.2.14 of the Base Plan.

Highways and railways constitute a major threat due to the myriad chemicals and hazardous substances, including radioactive materials, transported in vehicles, trucks, and rail cars. While most routes are known, the District has not quantified the amount of hazardous materials that are transported through it en route to adjoining counties.

GIS analysis of the hazardous materials buffer zones and the District service area was performed. Results were broken up by route for the District in both the City of Lakeport and the unincorporated County. This can be seen in Table A-6.

Table A-5 Lakeport Fire Protection District – Hazardous Materials Extents

| Flood Zone | Total Acres | % of Total Acres |
|---|---------------|------------------|
| City of Lakeport | | |
| HWY 175 | 0 | 0.0% |
| HWY 29 | 1,204 | 2.6% |
| HWY 29 and HWY 175 | 484 | 1.0% |
| Outside of Hazardous Materials Routes | 1 | 0.0% |
| City of Lakeport Total | 1,689 | 3.6% |
| Unincorporated Lake County | | |
| HWY 175 | 5,649 | 12.1% |
| HWY 29 | 6,174 | 13.2% |
| HWY 29 and HWY 175 | 3,690 | 7.9% |
| Outside of Hazardous Materials Routes | 29,539 | 63.2% |
| Unincorporated Lake County Total | 45,051 | 96.4% |
| | | |
| Grand Total | 46,740 | 100.0% |

Source: CalTrans, Lakeport Fire Protection District

Past Occurrences

Many local routes are used to deliver hazardous materials. Many of these roads come near Clear Lake, or through residential neighborhoods within the District, however no events have occurred.

Vulnerability to Hazardous Materials Transport

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Impacts include loss of life, damages to infrastructure, damages to property, and damages to critical facilities. Should hazardous materials be spilled in Clear Lake, damages to the marine environment may occur.

Impacts

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

Assets at Risk

During a hazardous materials transportation spill, it is generally the people that are at risk to the effects of the spill. During a spill, buildings, property, and their values are at a lesser risk; however, given the location of hazardous materials routes in the District, an analysis is performed here. Analysis results for the District is summarized in Table A-6 for both the areas in Lakeport and the unincorporated County.

Table A-6 Lakeport Fire Protection District – Count and Value of Facilities in Hazardous Material Buffer Zones

| Jurisdiction / Hazardous Materials Route / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|---|----------------------|--------------------------|----------------|----------------------------|
| City of Lakeport | | | | |
| HWY 29 | | | | |
| Fire Station 50 | FIRE STATION | | | |
| | BUILDING | | | |
| | FACILITY | 1 | \$4,356,500 | \$0 |
| | FIRE STATION Total | 1 | \$4,356,500 | \$0 |
| | EQUIPMENT | | | |
| | AMBULANCE | | | |
| | M5011 | 1 | \$0 | \$180,000 |
| | M5012 | 1 | \$0 | \$180,000 |
| | M5014 | 1 | \$0 | \$35,000 |

| Jurisdiction / Hazardous Materials Route / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|---|------------------------|--------------------------|--------------------|----------------------------|
| | M5015 | 1 | \$0 | \$180,000 |
| | PUMPER | | | |
| | E5011 | 1 | \$0 | \$440,000 |
| | E5012 | 1 | \$0 | \$420,000 |
| | QUINT | | | |
| | T5011 | 1 | \$0 | \$1,200,000 |
| | S-10 UTILITY | | | |
| | U5211 | 1 | \$0 | \$40,000 |
| | UTILITY | | | |
| | C500 | 1 | \$0 | \$45,000 |
| | U5011 | 1 | \$0 | \$40,000 |
| | WILDLAND | | | |
| | E5021 | 1 | \$0 | \$380,000 |
| | E5031 | 1 | \$0 | \$350,000 |
| | EQUIPMENT Total | 12 | \$0 | \$3,490,000 |
| | Total | 13 | \$4,356,500 | \$3,490,000 |
| HWY 29 Total | | 13 | \$4,356,500 | \$3,490,000 |
| City of Lakeport Total | | 13 | \$4,356,500 | \$3,490,000 |
| Unincorporated Lake County | | | | |
| HWY 29 | | | | |
| Fire Station 52 | FIRE STATION | | | |
| | BUILDING | | | |
| | FACILITY | 1 | \$1,950,000 | \$0 |
| | FIRE STATION Total | 1 | \$1,950,000 | \$0 |
| | EQUIPMENT | | | |
| | AMBULANCE | | | |
| | (UNKNOWN) | 2 | \$0 | \$0 |
| | PUMPER | | | |
| | E5211 | 1 | \$0 | \$440,000 |
| | WATER TENDER | | | |
| | WT5011 | 1 | \$0 | \$330,000 |
| | EQUIPMENT Total | 4 | \$0 | \$770,000 |
| | Total | 5 | \$1,950,000 | \$770,000 |
| HWY 29 Total | | 5 | \$1,950,000 | \$770,000 |
| Unincorporated Lake County Total | | 5 | \$1,950,000 | \$770,000 |

| Jurisdiction / Hazardous Materials Route / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|---|----------------------|--------------------------|--------------------|----------------------------|
| | | | | |
| Grand Total | | 18 | \$6,306,500 | \$4,260,000 |

Source: Cal Trans, Lakeport Fire Protection District

Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route. District facilities may be located in these zones, as necessary, since they respond to these events.

Wildfire

Likelihood of Future Occurrence–Highly Likely

Vulnerability–Extremely High

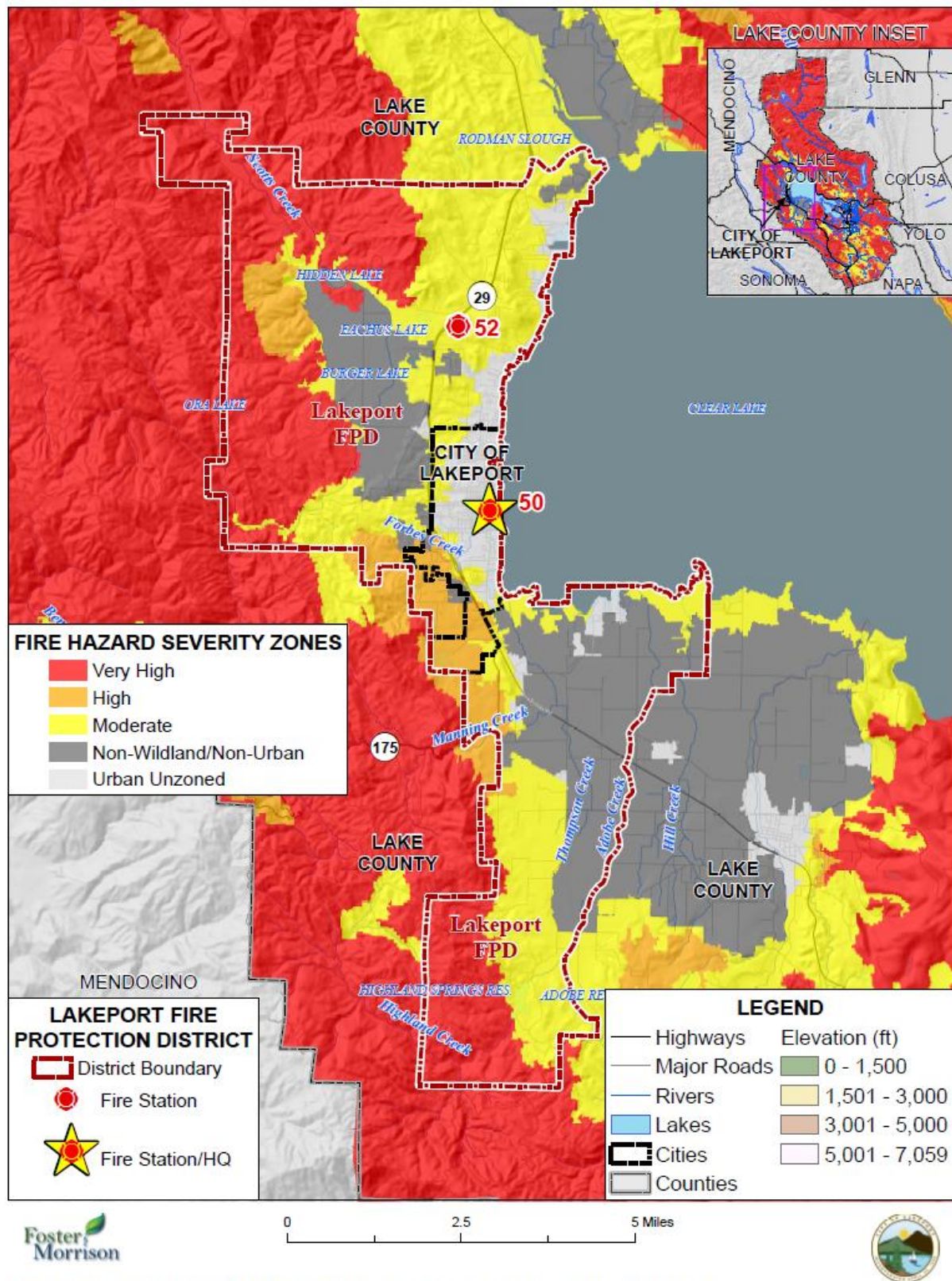
Hazard Profile and Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for Lake County, the City of Lakeport and the District. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. However, in recent years, wildfire season is more of a year around event. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds.

Location

Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions. CAL FIRE has mapped Fire Hazard Severity Zones in Lake County. Those areas in and around the District are shown on Figure A-4.

Figure A-4 Lakeport Fire Protection District Facilities in Fire Hazard Severity Zones



Extent

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Extents are measured by CAL FIRE in the following categories:

- Very High
- High
- Moderate
- Non-Wildland/Non-Urban
- Urban/Unzoned

GIS analysis of the FHSZs and the District service area was performed. Results were broken up by FHSZ for the District in both the City of Lakeport and the unincorporated County. This can be seen in Table A-7. As shown in the table, in the City of Lakeport 1.0% and 0.6% of the acres in the City fall in the high and moderate FHSZs, respectively. In the unincorporated County, 56.4% falls in the very high FHSZ, 5.3% falls in the high FHSZ, and 18.8% falls in the moderate FHSZ.

Table A-7 Lakeport Fire Protection District – Wildfire Extents

| Flood Zone | Total Acres | % of Total Acres |
|---|---------------|------------------|
| City of Lakeport | | |
| High | 466 | 1.0% |
| Moderate | 302 | 0.6% |
| Non-Wildland/Non-Urban | 52 | 0.1% |
| Urban Unzoned | 869 | 1.9% |
| City of Lakeport Total | 1,689 | 3.6% |
| Unincorporated Lake County | | |
| Very High | 26,292 | 56.4% |
| High | 2,488 | 5.3% |
| Moderate | 8,770 | 18.8% |
| Non-Wildland/Non-Urban | 6,555 | 14.1% |
| Urban Unzoned | 831 | 1.8% |
| Unincorporated Lake County Total | 44,936 | 96.4% |
| | | |
| Grand Total | 46,625 | 100.0% |

Source: CAL FIRE, Lakeport Fire Protection District

Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time, or may have durations lasting for a week or more.

Past Occurrences

Fire has played a significant historical role in defining the current vegetative strata in Lake County and Lakeport. The District has responded to almost all of the past occurrences outside of the District. These events include, but are not limited to:

July and August of 2018 – The River Fire occurred in the District. 23 residences and 17 outbuildings were destroyed or damaged. LCFPD assisted in firefighting efforts.

1981 – The Cow Mountain Fire occurred in the District. District firefighters fought the fire. Before it could be extinguished, 11 structures were destroyed.

1981 – A wildfire occurred in the District that destroyed 4 structures before it could be extinguished. The fire occurred near 6th Street.

More information can be found in Section 4.2.19 of the Base Plan.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern, with some areas of the Planning Area being at greater risk than others as described further in this section. CAL FIRE has mapped areas at risk of fires in the eastern hills surrounding. CAL FIRE has also designated the majority of land within City limits east of SR 53 as a very high fire hazard zone, Cal Fire's highest fire hazard designation. The periphery of Clearlake is a wild land urban interface (WUI) area where structures are at significant risk of fire exposure. Poor road conditions and inadequate water suppression infrastructure can limit the ability of fire crews from successfully fighting fires. An abundance of dead vegetation on the property paired with construction using non-fire-resistant building materials can also increase the potential for structural losses in fires. A number of environmental variables influence home and business exposure to wildfires. Extended periods of hot and dry weather combined with wind are often key variables determining the duration and severity of fires.

Impacts

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

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities.

The ongoing serious drought has exacerbated and continues to exacerbate the risk of major wildland/urban interface fires in or near the District. This puts both District facilities and personnel at risk from wildfire.

Assets at Risk

LFPD provided the locations and values of District facilities. These facilities were mapped in GIS. Lake County, including Lakeport and the unincorporated County, has mapped CAL FIRE Fire Hazard Severity Zones (FHSZs) in order to perform the wildfire analysis. District facilities that fall into each FHSZ can be seen in Table A-8, broken out by areas inside the City and areas in the unincorporated County.

Table A-8 Lakeport Fire Protection District – Count and Value of Facilities by FHSZ

| Jurisdiction / Fire Hazard Severity Zones / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|--|---------------------------|--------------------------|--------------------|----------------------------|
| City of Lakeport | | | | |
| Urban Unzoned | | | | |
| Fire Station 50 | FIRE STATION | | | |
| | BUILDING | | | |
| | FACILITY | 1 | \$4,356,500 | \$0 |
| | FIRE STATION Total | 1 | \$4,356,500 | \$0 |
| | EQUIPMENT | | | |
| | AMBULANCE | | | |
| | M5011 | 1 | \$0 | \$180,000 |
| | M5012 | 1 | \$0 | \$180,000 |
| | M5014 | 1 | \$0 | \$35,000 |
| | M5015 | 1 | \$0 | \$180,000 |
| | PUMPER | | | |
| | E5011 | 1 | \$0 | \$440,000 |
| | E5012 | 1 | \$0 | \$420,000 |
| | QUINT | | | |
| | T5011 | 1 | \$0 | \$1,200,000 |
| | S-10 UTILITY | | | |
| | U5211 | 1 | \$0 | \$40,000 |
| | UTILITY | | | |
| | C500 | 1 | \$0 | \$45,000 |
| | U5011 | 1 | \$0 | \$40,000 |
| | WILDLAND | | | |
| | E5021 | 1 | \$0 | \$380,000 |
| | E5031 | 1 | \$0 | \$350,000 |

| Jurisdiction / Fire Hazard Severity Zones / Facility | Facility / Equipment | Facility / Content Count | Building Value | Contents Replacement Value |
|--|---------------------------|--------------------------|--------------------|----------------------------|
| | EQUIPMENT Total | 12 | \$0 | \$3,490,000 |
| Urban Unzoned Total | | 13 | \$4,356,500 | \$3,490,000 |
| City of Lakeport Total | | 13 | \$4,356,500 | \$3,490,000 |
| Unincorporated Lake County | | | | |
| Moderate | | | | |
| Fire Station 52 | FIRE STATION | | | |
| | BUILDING | | | |
| | FACILITY | 1 | \$1,950,000 | \$0 |
| | FIRE STATION Total | 1 | \$1,950,000 | \$0 |
| | EQUIPMENT | | | |
| | AMBULANCE | | | |
| | (UNKNOWN) | 2 | \$0 | \$0 |
| | PUMPER | | | |
| | E5211 | 1 | \$0 | \$440,000 |
| | WATER TENDER | | | |
| | WT5011 | 1 | \$0 | \$330,000 |
| | EQUIPMENT Total | 4 | \$0 | \$770,000 |
| | Total | 5 | \$1,950,000 | \$770,000 |
| Moderate Total | | 5 | \$1,950,000 | \$770,000 |
| Unincorporated Lake County Total | | 5 | \$1,950,000 | \$770,000 |
| | | | | |
| Grand Total | | 18 | \$6,306,500 | \$4,260,000 |

Source: CAL FIRE, Lakeport Fire Protection District

Future Development

When siting development, the District takes fire risk into account. The District builds all facilities to code, which reduces the District's future risk to wildfires.

A.6 Capability Assessment

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

A.6.1. Regulatory Mitigation Capabilities

Table A-9 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the District.

Table A-9 LFPD's Regulatory Mitigation Capabilities

| Plans | Y/N Year | Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions? |
|--|-------------|---|
| Comprehensive/Master Plan | N | City and County have these. |
| Capital Improvements Plan | N | Has not been completed. |
| Economic Development Plan | N | City has this. |
| Local Emergency Operations Plan | Y | The District falls under the County's plan |
| Continuity of Operations Plan | N | |
| Transportation Plan | N | City/County |
| Stormwater Management Plan/Program | N | City/County |
| Engineering Studies for Streams | N | City/County |
| Community Wildfire Protection Plan | Y | County wide plan currently being updated |
| Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation) | N | |
| Building Code, Permitting, and Inspections | Y/N | Are codes adequately enforced? |
| Building Code | Y | City/County |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | N | |
| Fire department ISO rating: | 4/4Y | |
| Site plan review requirements | Y | |
| Land Use Planning and Ordinances | | |
| Zoning ordinance | N | City/County |
| Subdivision ordinance | N | City/County |
| Floodplain ordinance | N | City/County |
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) | N | City/County |
| Flood insurance rate maps | N | City/County |
| Elevation Certificates | N | City/County |
| Acquisition of land for open space and public recreation uses | N | City/County |
| Erosion or sediment control program | N | City/County |

| |
|---|
| Other |
| How can these capabilities be expanded and improved to reduce risk? |
| These capabilities could be expanded with additional staffing and funding |

Source: LFPD

A.6.2. Administrative/Technical Mitigation Capabilities

Table A-10 identifies the District staff/roles responsible for activities related to mitigation and loss prevention in the District.

Table A-10 LFPD's Administrative and Technical Mitigation Capabilities

| Administration | Y/N | Describe capability Is coordination effective? |
|---|--------------|--|
| Planning Commission | N | |
| Mitigation Planning Committee | N | |
| Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems) | N | |
| Mutual aid agreements | Y | Yes |
| Other | | |
| Staff | Y/N FT/PT | Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective? |
| Chief Building Official | N | |
| Floodplain Administrator | N | |
| Emergency Manager | N | |
| Community Planner | N | |
| Civil Engineer | N | |
| GIS Coordinator | N | |
| Other | N | |
| Technical | | |
| Warning systems/services (Reverse 911, outdoor warning signals) | Y | Air horns and loudspeakers on fire apparatus |
| Hazard data and information | N | |
| Grant writing | N | |
| Hazus analysis | N | |
| Other | N | |
| How can these capabilities be expanded and improved to reduce risk? | | |
| These capabilities could be expanded with additional staffing and funding | | |

Source: LFPD

A.6.3. Fiscal Mitigation Capabilities

Table A-11 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table A-11 LFPD's Fiscal Mitigation Capabilities

| Funding Resource | Access/ Eligibility (Y/N) | Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions? |
|---|---------------------------------|--|
| Capital improvements project funding | N | |
| Authority to levy taxes for specific purposes | Y | Currently being used for daily operations, however rates and tax base are limited. |
| Fees for water, sewer, gas, or electric services | N | |
| Impact fees for new development | Y | Currently being assessed, however not much development occurring, and can only be used for capital expenditures. |
| Storm water utility fee | N | |
| Incur debt through general obligation bonds and/or special tax bonds | Y | Has not been use. |
| Incur debt through private activities | N | |
| Community Development Block Grant | Y | Has not been used |
| Other federal funding programs | Y | Have used AFG for equipment and apparatus |
| State funding programs | Y | Have used for equipment |
| Other | | |
| How can these capabilities be expanded and improved to reduce risk? | | |
| These capabilities could be expanded with additional staffing and funding | | |

Source: LFPD

A.6.4. Mitigation Education, Outreach, and Partnerships

Table A-12 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information. More information can be found below the table.

Table A-12 LFPD's Mitigation Education, Outreach, and Partnerships

| Program/Organization | Yes/No | Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities? |
|--|--------|---|
| Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. | N | |

| Program/Organization | Yes/No | Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities? |
|---|--------|---|
| Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education) | N | |
| Natural disaster or safety related school programs | N | |
| StormReady certification | N | |
| Firewise Communities certification | N | |
| Public-private partnership initiatives addressing disaster-related issues | N | |
| Other | N | |
| How can these capabilities be expanded and improved to reduce risk? | | |
| These capabilities could be expanded with additional staffing and funding. | | |

Source: LFPD

A.6.5. Other Mitigation Efforts

LFPD has many other ongoing mitigation efforts and past projects that include the following:

- The District performs public building Fire Safety Inspections
- The District provides plan reviews for new construction
- The District conducts pre fire safety planning

A.7 Mitigation Strategy

A.7.1. Mitigation Goals and Objectives

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

A.7.2. Mitigation Actions

The planning team for the District identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. Only those hazards that were determined to be a priority hazard for purposes of mitigation action development were considered further in the development of hazard-specific mitigation actions.

These priority hazards (in alphabetical order) are:

- Climate Change
- Drought and Water Shortage

- Earthquake
- Flood: 1%/0.2% Annual Chance
- Hazardous Materials Transport
- Wildfire

The HMPC eliminated the hazards identified below from further consideration in the development of mitigation actions because the risk of a hazard event in the City is unlikely or nonexistent, the vulnerability of the District is low, capabilities are already in place to mitigate negative impacts, or the City does not have the authority or control over mitigation of the hazard. The eliminated hazards are:

- Aquatic Biological Hazards: cyanobacterial bloom
- Aquatic Biological Hazards: quagga mussel
- Dam Failure
- Flood: Localized/Stormwater
- Landslide and Debris Flows
- Levee Failure
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Cold
- Severe Weather: Heavy Rains, Snow, and Storms
- Severe Weather: High Winds
- Seiche
- Volcano and Geothermal gas release

It should be noted that many of the projects submitted by each jurisdiction in Table 5-2 in the Base Plan benefit the LFPD whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of the District to implement over the next 5-years covered by this Plan.

Multi-Hazard Actions

Action 1. Relocate and Replace Fire Station 50

Hazards Addressed: Multi-hazard – Earthquake, Flood, Wildfire

Goals Addressed: 1, 2, 3, 4, 5

Issue/Background: Station 50 was constructed in 1928 as a automobile sales business and it is both showing its age and delayed maintenance. A recent roof leak caused damage to office furnishing, and equipment and, although temporarily repaired, needs a \$90,000 repair according to procured estimates. Black mold has also been discovered after this leak, although it appears at this time remediated. But the now 90-year-old building is in need of major rehabilitation beyond the roof. It has had several remodels and additions through the years, often ill-conceived. The City of Lakeport purchased this building in 1945 and it served as both city hall including police and fire and fire departments, until City offices relocated to another abandoned then donated building 3 blocks away. Although the fire department continues to solely

occupy this building, it lacks a diesel exhaust removal system which leads to contamination of the offices, living quarters, kitchen, meeting room, and apparatus bay with toxic exhaust fumes from fire apparatus. Further the structure comes nowhere near any kind of seismic safety standards. Lakeport received major damage from the 1906 SF earthquake; the adjacent Rodger Creek Fault can be triggered by San Andreas Fault activity.

Project Description: Demolish existing building and construct new fire station, or identify new location and construct.

Other Alternatives: Relocating to Park Way Station

Existing Planning Mechanisms through which Action will be Implemented: New Construction

Responsible Office: Lakeport Fire Protection District, City of Lakeport, Lake County

Priority (H, M, L): High

Cost Estimate: \$1.5 to 2.0 million

Potential Funding: FEMA, AFG, USDA, HUD, DHS

Benefits (avoided Losses): Potential loss of firefighting/EMS apparatus due to seismic activity. Eliminate potential health hazards to personnel.

Schedule: 2-3 years after securing funding

Action 2. *Community Wildfire Protection Plan (CWPP)*

Hazards Addressed: Wildfire, Climate Change, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4

Issue/Background: The City of Lakeport is at a high risk to loss of property and life from wildland urban interface fires. The risk and vulnerability of the District to these wildfires is compounded by other priority hazards such as Climate Change, Drought and Water Shortage.

Project Description: This project seeks to create a Community Wildfire Protection Plan (CWPP), specific to the District and the City that identifies project priorities to reduce risks and hazards from wildfire.

Other Alternatives: Continue participation in the Countywide CWPP

Existing Planning Mechanisms through which Action will be Implemented: There is no existing planning mechanism that exists for this action. This action would create a planning mechanism.

Responsible Office: Lakeport Fire Protection District, City of Lakeport, Lake County

Priority (H, M, L): High

Cost Estimate: Staff time

Potential Funding: Existing budgets, grant funding

Benefits (avoided Losses): Reduced risk to property, increased life safety.

Schedule: 2-3 years

Action 3. Vegetation Abatement

Hazards Addressed: Wildfire, Climate Change, Drought and Water Shortage

Goals Addressed: 1, 2, 3, 4

Issue/Background: Lakeport has had a long history of wildfires. These fires are exacerbated by drought, heat, high winds, and climate change. These conditions put people and property at greater risk to wildfire.

Project Description: In order to reduce wildfire risk, LFPD seek to establish defensible space with the result of fuels reduction, thus lowering the risk to structures from wildfires.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Vegetation abatement ordinance. FireWise program. Community Risk Reduction Program.

Responsible Office: Lakeport Fire Protection District, City of Lakeport

Priority (H, M, L): High

Cost Estimate: To be determined

Potential Funding: CAL FIRE and GEMA grants

Benefits (avoided Losses): Reduced risk to property, increased life safety.

Schedule: within 5 years



Appendix A Planning Process

A.1 Lists of HMPC Invites/Stakeholders

Table A-1 Initial LHMP Invite List

| Department and Title | Name | Email |
|------------------------------------|----------------------|-------------------------------------|
| Public | Adckinjo Esutoki | adckinjo@att.net |
| Clearlake Public Works | Adeline Brown | abrown@clearlake.ca.us |
| Public | Arnaud Hubert | arnaudh@yahoo.com |
| Public | Betsy Cawn | epi-center@sbcglobal.net |
| Public | Ellen Karnowski | nature1194@hotmail.com |
| Public | Jim Knox | jknoxol@digitalpath.net |
| Public | Joan Moss | do.it.n@hotmail.com |
| Public | John Colon | jjcolon@adidam.org |
| Public | Judy Cox | Judithc98@gmail.com |
| Public | Leroy Stilwell | leroy@adidam.org |
| Public | Mike Dunlap | lomike@earthlink.net |
| Siegler Springs Firewise | Magdalena Valderrama | magdalenavh@sscra.org |
| Public | Tom Benton | tom.benton@vom.com |
| Hidden Valley Lake CSD | Alyssa Gordon | agordon@hvlcsd.org |
| Lakeport Public Works | Andrew Britton | abritton@cityoflakeport.com |
| Big Valley Rancheria | Anthony Jack | ajack@big-valley.net |
| Elem Indian Colony | Augustin Garcia | a.garcia@elemindiancolony.org |
| Lake County Planning | Bill Davidson | william.davidson@lakecountycal.gov |
| Lakeport Police Chief | Brad Rasmussen | brasmussen@lakeportpolice.org |
| PG&E | Brian Bottair | brian.bottari@pge.com |
| Lake County Community Development | Byron Turner | byron.turner@lakecountycal.gov |
| Cal Fire | Chris Vallerga | chris.vallerga@fire.ca.gov |
| Lake County | Chris Veach | Christopher.Veach@lakecountycal.gov |
| Koi Nation | Darren Beltran | kn@koination.com |
| Lake County Health Services | Denise Pomeroy | denise.pomeroy@lakecountycal.gov |
| Lake County Air Quality | Doug Gearhart | dougg@lcaqmd.net |
| Former Lakeport Fire Chief | Doug Hutchison | chief500@lakeportfire.com |
| Scotts Valley Band of Pomo Indians | Irenia Quitiquit | iquitiquit@svpomo.org |
| Lake County Special Districts | Janet Coppinger | janet.coppinger@lakecountycal.gov |

| Department and Title | Name | Email |
|--------------------------------------|----------------------|--|
| North Shore Fire - Chief | Jay Beristianos | chief800@northshorefpd.com |
| Elem Indian Colony Drinking Water | Karola Kennedy | kkarolaepa@gmail.com |
| Lake County | Katherine Vanderwall | katherine.vanderwall@lakecountycal.gov |
| Habematolel Pomo of Upper Lake | Linda Rose | lrosas@hpultribe-nsn.gov |
| Lake County GIS | Lon Sharp | Lon.Sharp@lakecountycal.gov |
| Lakeport City Manager | Margaret Silveria | msilveira@cityoflakeport.com |
| Public | Melanie Garrett | melanie.fgarrett@gmail.com |
| Lakeport Public Works | Michelle Humphrey | mhumphrey@cityoflakeport.com |
| National Weather Service | Michelle Mead | michelle.mead@noaa.gov |
| Robinson Rancheria | Mike Schaver | mschaver@robinsonrancheria.org |
| Public | Mike Josephson | beef8458@aol.com |
| Lakeport Finance Director | Nicholas Walker | nwalker@cityoflakeport.com |
| Lake Pillsbury FPD | Phillip Harrison | LPFPD953@gmail.com |
| Lake County Assessor | Richard Ford | Richard.Ford@lakecountycal.gov |
| Lake County Office of Education | Rob Young | ryoung@lakecoe.org |
| Lakeport Public Works | Ron Ladd | rladd@cityoflakeport.com |
| Cal Fire | Rudy Baltazar | rudy.baltazar@fire.ca.gov |
| Big Valley Band of Pomo Indians | Sarah Ryan | sryan@big-valley.net |
| Lake County Director of Public Works | Scott DeLeon | Scott.DeLeon@lakecountycal.gov |
| Cal Fire | Sean O'Hara | sohara@fire.ca.gov |
| Habematolel Pomo of Upper Lake | Sherry Treppa | streppa@hpultribe-nsn.gov |
| Lake County | Steve Hajik | Steven.Hajik@lakecountycal.gov |
| City of Clearlake PD | Tim Celli | timcelli90@gmail.com |
| City of Clearlake PD | Tim Hobbs | thobbs@clearlakepd.org |
| Lakeport Public Works | Doug Grider | dgrider@cityoflakeport.com |
| Clearlake Public Works | Doug Herren | dherren@clearlake.ca.us |
| Lake County Environmental Health | Jasjit Kang | jasjit.kang@lakecountycal.gov |
| Public | Leeann McKay | mrsleeannmckay@gmail.com |
| Middletown Rancheria | Sally Peterson | speterson@middletownrancheria.com |
| Lake County Sheriff | Brian Martin | brian.martin@lakecountycal.gov |
| Lake County Sheriff's Department | Chris Macedo | chris.macedo@lakecountycal.gov |
| Lake County OES | Dale Carnathan | dale.carnathan@lakecountycal.gov |
| Lake County OES | Teresa Stewart | teresa.stewart@lakecountycal.gov |
| Cal OES Mitigation | Victoria La Mar-Hass | Victoria.laMar-Haas@CalOES.ca.gov |
| Lake County | Willie Sepeta | fdchf700@yahoo.com |
| Foster Morrison | Jeanine Foster | jeanine.foster@fostermorrison.com |
| Lakeport Community Development Dir. | Kevin Ingram | kingram@cityoflakeport.com |

| Department and Title | Name | Email |
|--|---------------|----------------------------|
| Lakeport Community Development Depart. | Daniel Chance | dchance@cityoflakeport.com |
| Lakeport Public Works - Utilities | Paul Harris | pharris@cityoflakeport.com |
| Lakeport Public Works - Utilities | Alex Sharp | asharp@cityoflakeport.com |

Table A-2 HMPC Participant List

| Department and Title | Name | Email |
|--|-------------------|-----------------------------------|
| Clearlake Public Works | Adeline Brown | abrown@clearlake.ca.us |
| Lakeport Public Works - Utilities | Alex Sharp | asharp@cityoflakeport.com |
| Hidden Valley Lake CSD | Alyssa Gordon | agordon@hvlcsd.org |
| Lakeport Public Works | Andrew Britton | abritton@cityoflakeport.com |
| Public | Betsy Cawn | epi-center@sbcglobal.net |
| Ledoc | Bill Eaton | wge@usa.net |
| Lakeport FPD | Bill Gabe | Hobbgage327@yahoo.com |
| Lakeport Police Chief | Brad Rasmussen | brasmussen@lakeportpolice.org |
| Howell Consulting | Brenna Howell | brenna@brennahowell.com |
| Lake County OES | Dale Carnathan | dale.carnathan@lakecountycal.gov |
| HPUL Tribe | Damon Jones | djones@hpultribe-nsn.gov |
| Lakeport Community Development Depart. | Daniel Chance | dchance@cityoflakeport.com |
| Lake County Water Resources | David Cowan | David.cowan@lakecountycal.gov |
| Lakeport Public Works | Doug Grider | dgrider@cityoflakeport.com |
| Former Lakeport Fire Chief | Doug Hutchison | chief500@lakeportfire.com |
| Lake County Public Health | Erin Gustafson | Erin.gustafson@lakecountycal.gov |
| Hidden Valley Lake CSD | Ernesto Ruvalcaba | eruvalcaba@civicspark.lgc.org |
| Public | George Spark | mecies@oridugyn.net |
| Cal Fire | Jake Hannan | jakehannan@fire.ca.gov |
| Foster Morrison | Jeanine Foster | jeanine.foster@fostermorrison.com |
| City of Lakeport Public Works | Jim Kennedy | jkennedy@cityoflakeport.com |
| Lakeport Administrative Services | Kelly Brendia | kbrindia@cityoflakeport.com |
| Lakeport Community Development Dir. | Kevin Ingram | kingram@cityoflakeport.com |
| Habematolel Pomo of Upper Lake | Linda Rose | lrosas@hpultribe-nsn.gov |
| Lake County GIS | Lon Sharp | Lon.Sharp@lakecountycal.gov |
| Lakeport City Manager | Margaret Silveria | msilveira@cityoflakeport.com |
| Cal Fire | Matt Ryan | Mike.wink@fire.ca.gov |
| Small Business Consultant | Melanie Garrett | melaniefae@theravensmouth.com |
| Hidden Valley Lake CSD | Michael Burley | mburley@civicspark.lgc.org |
| Lakeport Public Works | Michelle Humphrey | mhumphrey@cityoflakeport.com |

| Department and Title | Name | Email |
|--|-----------------|----------------------------------|
| Lakeport Finance Director | Nicholas Walker | nwalker@cityoflakeport.com |
| Public | Oliver Kleven | okleven@att.net |
| Lakeport Public Works - Utilities | Paul Harris | pharris@cityoflakeport.com |
| Lakeport FPD | Rick Begem | Chief500@lakeportfire.com |
| Lakeport Public Works | Ron Ladd | rladd@cityoflakeport.com |
| Lake County OES | Teresa Stewart | teresa.stewart@lakecountysa.gov |
| Lake County BOD | Tina Scott | Tina.scott@lakecountysa.gov |
| City of Lakeport Community Development | Tom Carlton | tcarlton@cityoflakeport.com |
| Lake County Water Resources | Yuliya Osetrova | Yuliya.osetrova@lakecountysa.gov |

A.2 Website for Hazard Mitigation Plan

Local Hazard Mitigation Plan Draft



FEMA defines **Hazard Mitigation** as any action taken to reduce or eliminate the long-term risk to human life and property from hazards. Hazard mitigation planning is a process for state and local governments to identify community-level policies and actions to mitigate and thus reduce the impacts of natural hazards.

In accordance with the Disaster Mitigation Act of 2000, the City of Lakeport is developing a Local Hazard Mitigation Plan (LHMP). The purpose of the LHMP development process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in the City. Wildfire, drought, flood, and other severe weather hazards are just a few of the hazards to the Lakeport community. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with a DMA-compliant, FEMA- approved LHMP are eligible for FEMA pre- and post-disaster grant funding and are better positioned to respond and recover when disasters occur.

Opportunities for Input

Members of the community have a very important role in this process. A draft of the 2019 LHMP Update will be available on this website in early summer of 2019 for review and comment by the public and all interested stakeholders.

Planning team and public meetings will also be held as part of the plan development process. In addition to plan participation by the City of Lakeport and stakeholders from other local, state and federal agencies, the public is encouraged to attend and participate in our upcoming public meetings. Information on specific meeting times and locations are detailed below.

Upcoming Meetings

| Upcoming Meetings | Date/Time/Location |
|---------------------|--|
| LHMP Public Meeting | Wednesday, July 10, 2019 1pm-3pm Lakeport City Hall – City Council Chambers |

You can download the Lakeport Public Review Draft at https://www.dropbox.com/sh/w2k7do5t1wbxrg8/AAA2kdnV3IL5wq_MU1ftxcDra?dl=0.

A.3 Kickoff Meeting

A.3.1. Kickoff Meeting Invite to Stakeholders

From: Michelle Humphrey <mhumphrey@cityoflakeport.com>

Sent: Tuesday, November 13, 2018 3:52 PM

To: adckinjo@att.net; abrown@clearlake.ca.us; arnaudh@yahoo.com; epi-center@sbcglobal.net; nature1194@hotmail.com; jknoxol@digitalpath.net; do.it.n@hotmail.com; jjcolon@adidam.org; Judithc98@gmail.com; QRSRSPeace@gmail.com; tom.benton@vom.com; win.cary3243@gmail.com; agordon@hvlcsd.org; Andrew Britton <abritton@cityoflakeport.com>; ajack@big-valley.net; a.garcia@elemindiancolony.org; william.davidson@lakecountyca.gov; Brad Rasmussen <brasmussen@lakeportpolice.org>; brian.bottari@pge.com; byron.turner@lakecountyca.gov; iquitquit@svpomo.org; janet.coppinger@lakecountyca.gov; chief800@northshorefpd.com; jfuzell@ucanr.edu; karen.tait@lakecountyca.gov; kkarolaepa@gmail.com; katherine.vanderwall@lakecountyca.gov; cnegrete@middletownrancheria.com; chris.vallerga@fire.ca.gov; Christopher.Veach@lakecountyca.gov; kn@koination.com; denise.pomeroy@lakecountyca.gov; dougg@lcaqmd.net; agordon@hvlcsd.org; Andrew Britton <abritton@cityoflakeport.com>; ajack@big-valley.net; a.garcia@elemindiancolony.org; william.davidson@lakecountyca.gov; Brad Rasmussen <brasmussen@lakeportpolice.org>; brian.bottari@pge.com; byron.turner@lakecountyca.gov; cnegrete@middletownrancheria.com; chris.vallerga@fire.ca.gov; Christopher.Veach@lakecountyca.gov; kn@koination.com; denise.pomeroy@lakecountyca.gov; dougg@lcaqmd.net; Lars.Ewing@lakecountyca.gov; firesafelc@gmail.com; lrosas@hpultribe-nsn.gov; Lon.Sharp@lakecountyca.gov; Margaret Silveira <msilveira@cityoflakeport.com>; melanie.fgarrett@gmail.com; michelle.mead@noaa.gov; mschaver@robinsonrancheria.org; beef8458@aol.com; Nicholas Walker <nwalker@cityoflakeport.com>; d.cowan@lakecountyca.gov; LPPFD953@gmail.com; Richard.Ford@lakecountyca.gov; ryoung@lakeco.e.gov; Robert.Massarelli@lakecountyca.gov; Roger.sigtermans@CalOES.ca.gov; Ron Ladd <rladd@cityoflakeport.com>; rudy.baltazar@fire.ca.gov; sryan@big-valley.net; Scott.DeLeon@lakecountyca.gov; sohara@fire.ca.gov; streppa@hpultribe-nsn.gov; Steven.Hajik@lakecountyca.gov; timcelli90@gmail.com; thobbs@clearlakepd.org; Doug Grider <dgrider@cityoflakeport.com>; dherren@clearlake.ca.us; jasjit.kang@lakecountyca.gov; mrsleeannmckay@gmail.com; speterson@middletownrancheria.com; teresa.jolin@lakecountyca.gov
Cc: brian.martin@lakecountyca.gov; chris.macedo@lakecountyca.gov; dale.carnathan@lakecountyca.gov; teresa.stewart@lakecountyca.gov; Victoria.laMar-Haas@CalOES.ca.gov; fdchf700@yahoo.com; Jeanine Foster <jeanine.foster@fostermorrison.com>; Kevin Ingram <kingram@cityoflakeport.com>; Daniel Chance <dchance@cityoflakeport.com>; Paul Harris <pharris@cityoflakeport.com>; Alex Sharp <asharp@cityoflakeport.com>
Subject: 2020 City of Lakeport Hazard Mitigation Plan Kickoff Meeting

Good Afternoon:

The City of Lakeport is kicking off efforts to develop a Local Hazard Mitigation Plan (LHMP). The purpose of the LHMP process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in the City. The Disaster Mitigation Act of 2000 (DMA 2000) requires that local governments have a FEMA-approved LHMP in place in order to be eligible for certain pre- and post-disaster mitigation funding to protect communities from future disaster-related losses. You are receiving this notice because we would like to invite you to take part in this plan update as a member of the Hazard Mitigation Planning Committee (HMPC).

City and agency participation and coordination is a requirement of an approved plan, as is the inclusion of any hazard data, information, and mitigation projects your department or agency

agency may want to see included in this plan. Thus, your input will be critical to the success of this project. Participation includes:

- Attending and participating in the HMPC meetings (5 anticipated over the next 6-8 months)
- Providing available data/information requested of the HMPC
- Reviewing and providing comments on the plan drafts

City of Lakeport, Department of Public Works, is taking the lead on coordinating this project for the City. A project kickoff meeting will be held at the following location and time:

***Wednesday November 28, 2018 from 1pm - 4:00 pm
Lakeport City Hall
Council Chambers
225 Park Street
Lakeport, CA 95453***

The kickoff meeting will explain the process and how you can be involved. A public stakeholder meeting will also be held the evening of the same day of the kickoff meeting. Details on the public meetings will be forthcoming.

Please RSVP and plan on attending or delegating attendance to this important meeting.

Sincerely,

Michelle Humphrey

City of Lakeport
Administrative Specialist
Department of Public Works
Phone # : 707-263-3578
Fax # 707-263-1514
mhumphrey@cityoflakeport.com

A.3.2. Kickoff Meeting Agenda

CITY OF LAKEPORT LOCAL HAZARD MITIGATION PLAN (LHMP) HMPC MEETING #1 November 28, 2018

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC)
4. Planning for Public Input
5. Coordinating with other Agencies
6. Hazard Identification
7. Schedule
8. Data Needs
9. Questions and Answers

A.3.3. Kickoff Meeting Sign-in Sheets

1 of 2

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Kickoff Meeting #1
November 28, 2018

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|-------------------|----------------------------------|-------------------|--|
| Michael Burley | mburley@civic-spark.lgc.org | | Hidden Valley Lake CSD |
| Ernesto Ruvalcaba | eruvacaba@civicspark.lgc.org | | Hidden Valley Lake CSD |
| Teresa Stewart | teresa.stewart@lakecounty.ca.gov | 263-3450 | LCSD - OES |
| Linda Rosas-Bice | lrosas@healthcare-nrn.gov | 275-0737 | Hagerman/Local PMG of Upper Kings Trike |
| Matt Ryan | mike.wink@fire.ca.gov | 889.4225 | CAL FIRE |
| Douglas Gaudin | dgaudin@cityoflakeport.com | 263-3528 | City of Lakeport |
| Andrew Britton | abritton@cityoflakeport.com | 263-3578 | City of Lakeport |
| Alex Sharp | asharp@cityoflakeport.com | | City of Lakeport |
| Paul Harris | pharris@cityoflakeport.com | 707-263-3528 | City of Lakeport |
| Dan Chaniz | DCHANIZ@CITYOF LAKEPORT.COM | 707-263-3050 #205 | CITY OF LAKEPORT |
| Jale Carnathan | jale.carnathan@lakecounty.ca.gov | 707-263-3455 | LCSD - OES |
| Nick Walker | nwalker@cityoflakeport.com | 707-263-5615 | City of Lakeport |
| Ken Ladd | kladd@cityoflakeport.com | 707-263-5615 | City of Lakeport |

2 of 2.

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Kickoff Meeting #1
November 28, 2018

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|--|--------------------------------|--------------|--|
| Kelly Brundia Lakeport H&D/City Center | Kbrundia@cityoflakeport.com | 263-5615 | Lakeport Admin Svcs |
| Alyssa Gordon WQS | agordon@hulcs.org | 987-9209 | HVCSO |
| Melanie Garrett | melanie.fue@theravensmouth.com | 707-666-5541 | small biz consultant communications/marketing |
| Jim Kennedy | kennedy@cityoflakeport.com | 707-484-5948 | City of Lakeport |
| Patricia Laun EPI-Center | | | |
| Michelle Humphrey | mhumphrey@cityoflakeport.com | 707 263 3578 | P.W. |
| Barad Rasmussen | brasmussen@seas | 707 367-6035 | PD Lakeport |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

A.4 Risk Assessment Meetings

A.4.1 Emailed Invites to Risk Assessment Meetings

-----Original Appointment-----

From: Michelle Humphrey <mhumphrey@cityoflakeport.com>

Sent: Tuesday, December 18, 2018 5:07 PM

To: Michelle Humphrey; Doug Grider; Ron Ladd; Jeanine Foster

Subject: LHMP Meeting Hold on Calendar

When: Wednesday, February 20, 2019 9:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).

Where: City Hall Council Chambers

Hello

This is just a SAVE the DATE for the next meeting with Jeanine.

I will send out an official invite to the entire LHMP kick off team when we get back from the Holidays.

Thanks,

Michelle

-----Original Appointment-----

From: Michelle Humphrey <mhumphrey@cityoflakeport.com>

Sent: Tuesday, January 15, 2019 10:31 AM

To: Michelle Humphrey; Alex Sharp; Alyssa Gordon; Andrew Britton; Betsy Cawn; Brad Rasmussen; Dale Carnathan; Daniel Chance; Dave Cowan; Doug Grider; Doug Hutchinson; Erin Gustafson; Ernesto Ruvalcaba; George Spurr; Jan Coppinger; Jason Ferguson; Jim Kennedy; Kelly Buendia; Kevin Ingram; Linda Rosas; Margaret Silveira; Matt Ryan; Melanie Garrett; Michael Burley; Nicholas Walker; Paul Harris; Rob Young; Ron Ladd; Teresa Stewart; Tina Scott; Tom Carlton; Willy Sapeta; Jeanine Foster

Subject: Lakeport Hazard Mitigation Plan - Risk Assessment Meeting

When: Wednesday, February 20, 2019 9:00 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).

Where: Lakeport City Hall - Council Chambers

Hazard Mitigation Planning Committee:

The City of Lakeport will host the LHMP Risk Assessment Meeting from 9:00 A.M to 12:00 P.M at City Hall on February 20, 2019.

We hope to see you all there.

Kindest Regards,

Michelle Humphrey
Administrative Specialist

A.4.2. Risk Assessment Meeting Agenda

**City of Lakeport
Local Hazard Mitigation Plan (LHMP) Update
Risk Assessment Meeting
February 20, 2018**

1. Introductions
2. Status of the DMA Planning Process
3. Review (and discussions/input) of the Risk Assessment
4. Review of Data Needs
5. Next Steps

A.4.3.

Risk Assessment Meeting Sign in Sheets

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2 – Risk Assessment
February 20, 2019

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|--|-----------------------------------|----------------|---|
| Michelle Humphrey | | 263 3578 | City of Lakeport |
| Jeanine Foster | jeanine.foster@cityoflakeport.com | 707-243-7171 | Foster Wilson |
| Tina Scott/ Boss | Tina.Scott@lakeport.ca.gov | 849-4414 | |
| Jake Hannan B1418 | jakehannan@fire.ca.gov | (707) 339-0195 | CAL FIRE |
| Arick Walker | nwalkr@lakeport.ca.gov | 245-2725 | City of Lakeport |
| Puliya Ostrava | puliya.ostrava@lakeport.ca.gov | 263-2344 | WR |
| David Cowan | david.cowan@lakeport.ca.gov | 11 | " |
| Bill Kelly | bill.kelly@lakeport.ca.gov | 707-349-5955 | Sageport Fire |
| Andrew Britton Compliance Officer | abritton@cityoflakeport.com | 707-243-3578 | City of Lakeport |
| Onk Gustafson | erin.gustafson@lakeport.ca.gov | 263-7090 | LC Public Health |
| Deborah Jones Solid Waste Technician | djones@lakeport.ca.gov | 707-245-1015 | HPLU |
| Tim Kennedy PW | tkennedy@cityoflakeport.com | 707-484-5948 | City of Lakeport |

February 20, 2019

[illegible]

A.5 Mitigation Strategy Meetings

A.5.1. Email Invites to Mitigation Strategy Meetings

From: Michelle Humphrey <mhumphrey@cityoflakeport.com>
Sent: Tuesday, March 19, 2019 1:45 PM
To: Alex Sharp <asharp@cityoflakeport.com>; Alyssa Gordon <agordon@hvlcsd.org>; Andrew Britton <abritton@cityoflakeport.com>; Betsy Cawn <epi-center@sbcglobal.net>; Bill Gabe <billgabe327@yahoo.com>; Brad Rasmussen <brasmussen@lakeportpolice.org>; Dale Carnathan <dale.carnathan@lakecountyca.gov>; Damon Jonas <Djonas@hpultribe.nsn.gov>; Daniel Chance <dchance@cityoflakeport.com>; Dave Cowan <david.cowan@lakecountyca.gov>; Doug Grider <dgrider@cityoflakeport.com>; Doug Hutchinson <chief500@lakeportfire.com>; Erin Gustafson <erin.gustafson@lakecountyca.gov>; Ernesto Ruvalcaba <eruvalcaba@civicspark.lgc.org>; George Spurr <gspurr@cityoflakeport.com>; Jake Hannan B1418 <jake.hannan@fire.ca.gov>; Jan Coppinger <janet.coppinger@lakecountyca.gov>; Jason Ferguson <jferguson@lakeportpolice.org>; Jim Kennedy <jkennedy@cityoflakeport.com>; Kelly Buendia <kbuendia@cityoflakeport.com>; Kevin Ingram <kingram@cityoflakeport.com>; Linda Rosas <rosas@hpultribe.nsn.gov>; Margaret Silveira <msilveira@cityoflakeport.com>; Matt Ryan <mike.wink@fire.ca.gov>; Melanie Garrett <melaniefae@theravensmouth.com>; Michael Burley <mburley@civicspark.lgc.org>; Michelle Humphrey <mhumphrey@cityoflakeport.com>; Nicholas Walker <nwalker@cityoflakeport.com>; Paul Harris <pharris@cityoflakeport.com>; Rob Young <ryoung@lakeco.eo.gov>; Ron Ladd <rladd@cityoflakeport.com>; Teresa Stewart <teresa.stewart@lakecountyca.gov>; Tina Scott <tina.scott@lakecountyca.gov>; Tom Carlton <tcarlton@cityoflakeport.com>; Willy Sapeta <fdchf700@yahoo.com>; yuliya osetrova <yuliya.osetrova@lakecountyca.gov>
Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>
Subject: Lakeport Local Hazard Mitigation Planning Team Meeting

All,

You are invited to the next set of meetings for the LHMP – the Mitigation Strategy Meetings scheduled as follows:

Tuesday/Wednesday April 2 (1pm – 4pm) & 3 (9am – noon). City of Lakeport, City Hall Council Chambers, 225 Park Street, Lakeport, CA 95453

Please see attached Chapter 4 – Risk Assessment - in advance of these upcoming meetings:

Tuesday/Wednesday April 2 (1pm – 4pm) & 3 (9am – noon). City of Lakeport, City Hall Council Chambers, 225 Park Street, Lakeport, CA 95453

Please see attached Chapter 4 – Risk Assessment - in advance of these upcoming meetings:

Chapter 4 – Risk Assessment. A draft, in-progress Risk Assessment document is available for review and input. It can be downloaded from the following Dropbox link: <https://www.dropbox.com/sh/r9hmoyicku4o1l3/AADatyMI3StQELEgGSe-tiTHa?dl=0>. There is a folder titled First Draft of Risk Assessment that contains a pdf copy of Chapter 4, as well as an items to complete document.

There are still a few gaps and we are working to incorporate some additional information. Anything highlighted in yellow are areas where we still need some local input from the planning team. The green highlighting are items for us to complete, in some cases with input from the planning team. Please take some time to review.

Prep for Upcoming Mitigation Strategy meetings. Identify and bring your mitigation projects to the meetings!! These are the two most important meetings for this plan: **Please make sure everyone attends that has mitigation projects to include in the LHMP for all identified priority hazards.** Attached is a **FEMA publication – Mitigation Ideas** that has mitigation ideas organized by hazard. Take a look – it is easy to skim through. I am also attaching the Mitigation Action Worksheet that will need to be completed for each mitigation project/action to be included in the plan - just in case you want to complete for any projects and bring to the meeting.

Please let me know if anyone has questions. Thanks very much and see you at the meetings.

****The City of Lakeport, in complying with the Americans with Disabilities Act (ADA), requests individuals who require special accommodations to access, attend and/or participate in the City meeting due to disability, to please contact the City Clerk's Office, (707) 263-5615, 72 hours prior to the scheduled meeting to ensure reasonable accommodations are provided.**

Michelle Humphrey

City of Lakeport
Administrative Specialist
Department of Public Works
Phone # : 707-263-3578
Fax # 707-263-1514
mhumphrey@cityoflakeport.com

A.5.2. Mitigation Strategy Meeting Agenda

City of Lakeport Local Hazard Mitigation Plan (LHMP) Mitigation Strategy Meetings April 2 & 3, 2019

HMPC Meeting #3:

1. Introductions
2. Status of the DMA Planning Process
3. Risk Assessment Update
4. Outstanding Items
5. Develop Updated Plan Goals and Objectives
6. Identify and Review Mitigation Alternatives/Projects

HMPC Meeting #4:

1. Introductions
2. Identify and discuss Mitigation Alternatives/Projects
3. Review Mitigation Selection Criteria
4. Prioritize Mitigation Projects
5. Mitigation Action Worksheet
6. Review of Schedule/Next Steps

A.5.3. Mitigation Strategy Meeting Sign in Sheets

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3
April 2, 2019

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|----------------|-----------------------------|-------------------|---|
| Alex Sharp | asharp@cityoflakeport.com | | |
| Bill GABE | billgabe327@lakeport.ca | 707-349-5755 | Fire |
| Bill Eaton | wge@usa.net | 707-533-8638 | Ledac |
| Sara | mtm@phrcityoflakeport.com | 707 263 3578 | P.W. |
| Ron LADO | lad@cityoflakeport.com | | P.W. |
| Oliver Kleven | okleven@att.net | 510-861-2176 | |
| Andrew Britton | abritton@cityoflakeport.com | 707 263 3578 x403 | Lakeport PD |
| Jim Kennedy | kenne@cityoflakeport.com | 707-484-5448 | PW |
| Pick Berge | chief500@lakeportfire.com | 707-263-4396 | FD |
| DAN CHANCE | DCHANCE@CITYOF LAKEPORT.COM | 707 263-3056 #203 | CD |
| Em Gushkin | em.gushkin@lakecountycsa | 707-263-1800 | Public Health |
| | | | |
| | | | |

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #4
April 3, 2019

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|--------------------------------------|--------------------------------|-------------------------|---|
| <i>Scotty</i> | mhampreya@cityoflakeport.com | 263-3578 | P.W city of lakeport. |
| <i>Bill Hardy</i> | bill@ABE327@yahoo.com | 707-349-5755 | Fire Dist. |
| <i>Elm Gustafson, Health Officer</i> | erin.gustafson@lakecountycasiv | 707-263-1510 | Public Health |
| <i>George Spaul</i> | mecies@prodigy.net | 707-367-5620 | city |
| <i>Jim Kennedy</i> | jkennedy@cityoflakeport.com | 707-484-5948 | PW |
| <i>Andrews Britton</i> | abritton@cityoflakeport.com | 707-263-3578 | Lakeport PW |
| <i>Dan Chance</i> | DCHANCE@CITY OF LAKEPORT.COM | 707-263-3056 Ext 203 | CDD |
| <i>Tom Carlton, Bldg Officer</i> | tcarlton@cityoflakeport.com | 263-5615 Ext 202 | City Lkpt CDD |
| <i>Rick Bergem</i> | chief500@lakeportfire.com | 263-4396 | Fire Dept. |
| <i>Jeanine Foster</i> | jeanine.foster@fosterfire.com | 303-717-7171 | Foster Fire |
| <i>Brenna Howell</i> | brenna@brennahowell.com | 916-207-8635 | Howell Contracting |
| | | | |
| | | | |

A.6 Final Team Meeting

A.6.1. Final Team Meeting Invite

From: Michelle Humphrey <mhumphrey@cityoflakeport.com>

Sent: Monday, June 24, 2019 5:29 PM

To: Alex Sharp <asharp@cityoflakeport.com>; Alyssa Gordon <agordon@hvlcsd.org>; Andrew Britton <abritton@cityoflakeport.com>; Betsy Cawn <epi-center@sbcglobal.net>; Bill Gabe <billgabe327@yahoo.com>; Brad Rasmussen <brasmussen@lakeportpolice.org>; Dale Carnathan <dale.carnathan@lakecountyca.gov>; Damon Jonas <Djonas@hpultribe.nsn.gov>; Daniel Chance <dchance@cityoflakeport.com>; Dave Cowan <david.cowan@lakecountyca.gov>; Doug Grider <dgrider@cityoflakeport.com>; Erin Gustafson <erin.gustafson@lakecountyca.gov>; Ernesto Ruvalcaba <eruvalcaba@civicspark.lgc.org>; George Spurr <gspurr@cityoflakeport.com>; Jake Hannan B1418 <jake.hannan@fire.ca.gov>; Jan Coppinger <janet.coppinger@lakecountyca.gov>; Jason Ferguson <jferguson@lakeportpolice.org>; Jim Kennedy <jkennedy@cityoflakeport.com>; Kelly Buendia <kbuendia@cityoflakeport.com>; Kevin Ingram <kingram@cityoflakeport.com>; Linda Rosas <lrosas@hpultribe.nsn.gov>; Margaret Silveira <msilveira@cityoflakeport.com>; Matt Ryan <mike.wink@fire.ca.gov>; Melanie Garrett <melaniefae@theravensmouth.com>; Michael Burley <mburley@civicspark.lgc.org>; Michelle Humphrey <mhumphrey@cityoflakeport.com>; Nicholas Walker <nwalker@cityoflakeport.com>; Paul Harris <pharris@cityoflakeport.com>; Rick <chief500@lakeportfire.com>; Rob Young <ryoung@lakeco.e.org>; Ron Ladd <rladd@cityoflakeport.com>; Teresa Stewart <teresa.stewart@lakecountyca.gov>; Tina Scott <tina.scott@lakecountyca.gov>; Tom Carlton <tcarlton@cityoflakeport.com>; Willy Sapeta <fdchf700@yahoo.com>; yuliya osetrova <yuliya.osetrova@lakecountyca.gov>

Cc: Jeanine Foster <jeanine.foster@fostermorrison.com>; wshock@mchsi.com

Subject: LHMP Public Review Draft and Public Meeting

Hello Everyone,

Please see below information on the final steps for the City of Lakeport LHMP:

LHMP Public Review Draft and Public Meeting. The LHMP Public Review Draft is up on the City website for public review and comment at: https://www.cityoflakeport.com/news_detail_T14_R21.php There is a Public Review Draft that includes:

Complete pdf of the plan
Pdf of chapters only
Pdf of annex for the LFPD
Pdf of appendices

A hard copy of the LHMP has also been placed at City Hall for review. A public meeting on the Draft LHMP Update will be held Wednesday, July 10 from 1-3:00 pm at the City of Lakeport Council Chambers. A press release is being issued by the City. Please help get the word out to the public.

Final HMPC Meeting. Also, our final planning team meeting is scheduled for Thursday, July 11 from 9 – 11, at the City of Lakeport Council Chambers. It is important that everyone attend this final meeting to address any public comments received and to finalize all input to the plan.

Final LHMP Input. All final planning team input to the Draft LHMP needs to be provided **no later than July 18**. Please take this time to download and review the document from the City website.

Also note that the yellow highlighted areas in the document are where we still need planning team input. The green highlighted areas will be filled in by Foster Morrison. This information is critical to ensure our plan will be approved by Cal OES and FEMA.

If you have any questions, please contact myself or Jeanine.foster@fostermorrison.com or 303.717.7171.

Thank you for your continued engagement in the process.

Michelle Humphrey
City of Lakeport Public Works
707-263-3578 ext 405

A.6.2. Final Team Meeting Agenda

AGENDA
City of Lakeport
Local Hazard Mitigation Plan (LHMP)
Final HMPC Meeting #5
July 11, 2019

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Public Input: Data/Projects
5. Next Steps

A.6.3.

Final Team Meeting Sign in Sheet

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #5
July 11, 2019

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|----------------------------------|----------------------------------|---------------|---|
| Nichelle Humphrey Admin Spec. | n Humphrey@cityoflakeport.com | 707 263 3578 | Public Works - City of Lakeport |
| Rick Bergem | chief500@lakeportfire.com | 707-263-4396 | Fire Dept |
| Alex Sharp | asharp@cityoflakeport.com | | Public Works - City of Lakeport |
| Andrew Britton | abritton@cityoflakeport.com | 263 4103 | " " |
| Mark Waller | nwalker@cityoflakeport.com | 263-5615 | City of Lakeport |
| Paul Harris | pharris@cityoflakeport.com | 263-5615 403 | RW |
| Dan Chance | DChance@cityoflakeport.com | 263-5613 | COD |
| Erin Gustafson | erin.gustafson@lakeportfire.com | 707-263-403 | Public Health |
| Kuliyga Ostroma | yuliyga.ostroma@lakeportfire.com | 707 263 2344 | Water Resources LC |
| Ron Ladd | rladd@cityoflakeport.com | 707-416-8458 | C.O.C. |
| Tom Carlton CEO | tcarrlton@cityoflakeport.com | 263 3056 x202 | C.O.C. C.D.P. |
| Douglas Girdler Director | dgirdler@cityoflakeport.com | 707-263-3598 | Public Works - City of Lakeport |
| Jim Kennedy | jkennedy@cityoflakeport.com | 707-484-5948 | PW |

A.7 Public Involvement

A.7.1. Kickoff Meeting Press Release



LOCAL HAZARD MITIGATION PLAN MEETING

The City of Lakeport is developing a Local Hazard Mitigation Plan (LHMP). The purpose of the LHMP is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in our City. Wildfire, drought, flood, and other severe weather hazards are just a few of the hazards to the Lakeport community.

The LHMP will form the foundation for Lakeport's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction.

Lakeport must prepare a FEMA-approved LHMP to remain eligible for FEMA pre- and post-disaster grant funding and to be better prepared to respond and recover when disasters occur.

Members of the community have an important role in the development of the LHMP. Planning team and public meetings will be held as part of the plan development process. In addition to participation by the City of Lakeport and stakeholders from other local, state and federal agencies, the public is encouraged to attend and participate in our upcoming public meetings.



—
**WEDNESDAY
NOVEMBER 28, 2018
6:00 PM**
—

**COUNCIL CHAMBERS
LAKEPORT CITY HALL
225 PARK STREET
LAKEPORT**
—

For more information on this project and how to be involved, contact Michelle Humphrey at (707) 263-3578 x405 or via email at mhumphrey@cityoflakeport.com

CITY OF LAKEPORT

225 Park Street
Lakeport, CA 95453
707.263.5615

cityoflakeport.com

Follow us on Facebook &
Twitter!

A.7.2. Kickoff Meeting Article Lake County Record Bee 11/15/2018



A.7.3. Kickoff Meeting Article on Lake County News Website – 11/20/2018

Monday, 25 February 2019

LAKE COUNTY NEWS
Award winning independent local news from the shores of Clear Lake, California | www.lakeconews.com

Home ▾ News ▾ Home&Garden Pets Calendar Contact us ▾ Arts & Life Letters

City of Lakeport to host meeting on local hazard mitigation plan

LAKE COUNTY NEWS REPORTS POSTED ON TUESDAY, 20 NOVEMBER 2018 03:43 [f](#) [t](#) [G+](#) [in](#) [p](#) 20 NOVEMBER 2018

LAKEPORT, Calif. – A local hazard mitigation plan is being developed by the city of Lakeport.

The city will host a meeting on the plan's development from 6 to 7:30 p.m. Wednesday, Nov. 28, in the council chambers at Lakeport City Hall, 225 Park St.

Fires, drought, floods and severe weather are just a few of the hazards to be addressed in the plan.

While hazards such as these cannot be prevented, a hazard mitigation plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction.

Additionally, only communities with a Federal Emergency Management Agency-approved hazard mitigation plan are eligible to apply for both pre- and post-disaster mitigation grant funding.


Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster.

Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through hazard mitigation planning.

The people most aware of potential hazards are the people who live and work in the affected community.


In addition to plan participation by local, state and federal agencies, the community is seeking all interested community members to hear

A.7.4. Kickoff Meeting Public Meeting Invite– City of Lakeport Website



CITY OF LAKEPORT

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[RESIDENTS](#)
[BUSINESS](#)
[LOCAL GOVERNMENT](#)
[DEPARTMENTS](#)
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Hot Topics

- [Local Hazard Mitigation Plan Workshop--Feb. 19th](#)
- [Current Job Openings!](#)
- [Emergency Telephone Notification System](#)
- [Requests for Proposals \(RFP\): Finance Department](#)
- [Input Needed: Local Hazard Mitigation Plan](#)
- [RFP for Eleventh Street Corridor Project](#)
- [Lake Walks Survey](#)
- [Fall 2018 Street Sweeping Schedule](#)
- [Online Voter Registration Links](#)
- [2018 Hazardous Weed Abatement Information](#)
- [Adopted Cannabis Ordinances](#)
- [Abandoned Vehicle Program Reactivation](#)
- [New Ordinance Regulating Solicitation](#)

Input Needed: Local Hazard Mitigation Plan



Get Involved!
HELP YOUR COMMUNITY BE HAZARD-READY!

City of Lakeport, CA:

A **Local Hazard Mitigation Plan** is being developed by the City of Lakeport. Fires, drought, floods, and severe weather are just a few of the hazards to be addressed in the plan. While hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through hazard mitigation planning.

The people most aware of potential hazards are the people that live and work in the affected community. In addition to plan participation by local, state and federal agencies, the community is seeking all interested community members to hear more about our Local Hazard Mitigation Planning project. We encourage attendance and participation from the general public at our upcoming public meeting to kick off the project.

COMMUNITY NEWS

[2/19/2019: LOCAL HAZARD MITIGATION PLAN: HELP YOUR COMMUNITY BE HAZARD-READY!](#)

[2/6/2019: JOIN THE 2020 CENSUS TEAM](#)

[View News Archive](#)

THE GAZEBO CITY NEWSLETTER

[Volume 2018, Issue 2 \(282kb\)](#)

UPCOMING EVENTS

[3/5/2019: City Council Meeting](#)

[3/19/2019: City Council Meeting](#)

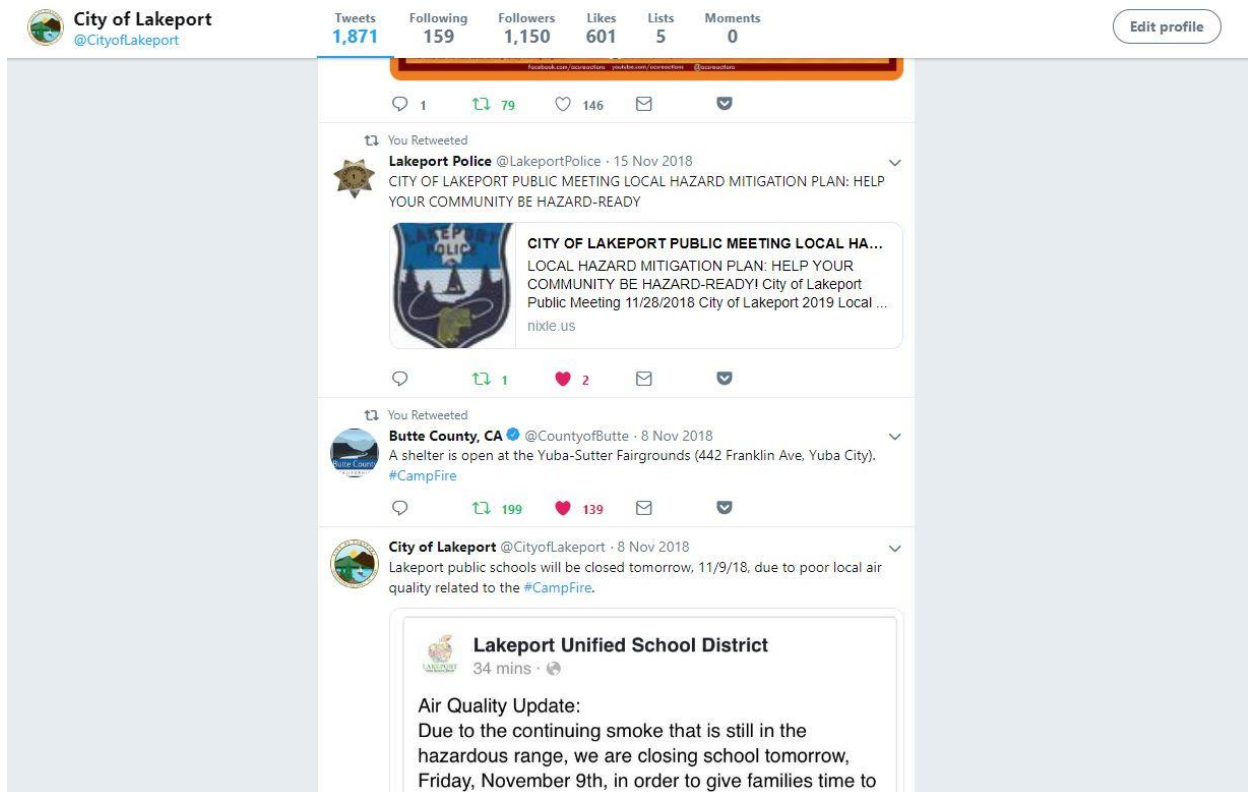
[4/2/2019: City Council Meeting](#)

[4/16/2019: City Council Meeting](#)

[5/7/2019: City Council Meeting](#)

[View Event Calendar](#)

A.7.5. Kickoff Meeting Public Meeting Invite on Twitter



A.7.6. Kickoff Meeting Invite on City Facebook Page

Page
Inbox
Manage Jobs
Notifications
Insights
Publishing To...
More
Settings
Help



City of Lakeport
@CityofLakeport

Home
About
Photos
Reviews
Videos
Events
Twitter
Posts
Services
Shop
Groups
Notes
Offers
Jobs
Community
Info and Ads
Promote
Manage Promotions



City of Lakeport
November 27, 2018

Wednesday night's public meeting is a great opportunity to help the Lakeport community develop a new Hazard Mitigation Plan! See the flyer for details or email mhumphrey@cityoflakeport.com to learn more!



+ Add a Button

Search for posts on this Page

Visitor Posts



Rachel Hembree
January 16 at 8:28 PM

Where can we get sandbags?! 🌧️ My garage is flooding!

Like Comment Message



Ariana Siva
November 11, 2018 at 6:00 AM

Lake County's turn.

Like Comment Share



Dan Fitzsimmons
October 31, 2018 at 2:44 PM

Like Comment Share

English (US) · Español · Português (Brasil) · Français (France) · Deutsch

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Facebook © 2019

A.7.7. Kickoff Meeting – Public Agenda

**CITY OF LAKEPORT
LOCAL HAZARD MITIGATION PLAN (LHMP)
PUBLIC MEETING #1
NOVEMBER 28, 2018**

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. Hazard Identification and Profiles
4. Opportunities for Public Participation and Input
5. Schedule
6. Questions and Answers

A.7.8. Kickoff Meeting – Public Sign in Sheets

1 of 2

SIGN-IN SHEET City of Lakeport LOCAL HAZARD MITIGATION PLANNING PROJECT Public Meeting #1 November 28, 2018

| Name/Title | Email Address | Phone | Organization/ Affiliation |
|---------------|----------------------------|--------------|------------------------------|
| Bill Eaton | wge@usa.net | 707-533-8638 | Sterling Shover |
| Nathan Maxman | nmaxman@gmail.com | 707-245-3855 | |
| George Sporen | gsporen@cityoflakeport.com | 707-367-5070 | city Council |
| Marye Rudolph | sillyreindeer@yahoo.com | 707-245-0465 | |
| Julio Ambroz | Julio@amresto.com | 707-972-9169 | American Restoration |
| Ron LADD | Rladd@cityoflakeport.com | 707-263-5615 | |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #1
November 28, 2018

| Name/Title | Email Address | Phone | Organization/ Affiliation |
|-------------------|----------------------------------|--------------|------------------------------|
| Tina Scott | Tina.Scott@lakecounty.ca.gov | 849.4414 | BOS |
| Jordan Blough | bloughj@lacoassociates.com | 707-463-0333 | LACO Associates |
| Erin Gustafson | erin.gustafson@lakecounty.ca.gov | 707-263-1090 | LC Public Health |
| Tristen Merich | Tristen@firstpilebuilders.com | 707-391-8585 | American Restoration |
| Kevin M. Ingram | Kingram@cityoflakeport.com | 707-263-5615 | City of Lakeport |
| BRAHMAN, STEVEN | BRASMAN@LAKELAKEPORTCA.GOV | 707-263-5491 | Lakeport Police |
| Margaret Silveira | msilveira@cityoflakeport.com | 707-263-5615 | City of Lakeport |
| J Taylor | SPARKTHOMAS@LAKELAKEPORTCA.GOV | | City of Lakeport P.W. |
| Nicholas Humphrey | nhumphrey@cityoflakeport.com | 707-263-3578 | City of Lakeport |
| | | | |
| | | | |
| | | | |
| | | | |

A.7.9. Risk Assessment Meeting Notice on Twitter


City of Lakeport
 @CityofLakeport

Tweets
1,872

Following
159

Followers
1,150

Likes
601

Lists
5

Moments
0

Edit profile


City of Lakeport @CityofLakeport · 9s

The public meeting next Tuesday (2/19) is a great opportunity to help the #Lakeport community develop our new Hazard Mitigation Plan! See the flyer for details! #LakeCountyCA #HazardMitigation #PublicMeeting



3,144 Tweets

Monica Witt
 3,341 Tweets

#WellnessWednesday
 1,628 Tweets

#dataday

#WednesdayWisdom
 78.7K Tweets

Broncos
 35.9K Tweets

#GalentinesDay
 Women celebrate their gal pals on Galentine's Day

© 2019 Twitter About Help Center Terms
 Privacy policy Cookies Ads info


City of Lakeport @CityofLakeport · Feb 6

Great #job opportunity with the @uscensusbureau! We need your help to ensure that EVERY resident in #LakeCountyCA is counted in the 2020 Census! #CompleteCount2020

A.7.10. Risk Assessment Meeting Announcement on Facebook

The screenshot shows a Facebook event page for a public meeting. The event is titled "Public Meeting: Local Hazard Mitigation Plan" and is scheduled for Tuesday, February 19, 2019, at 1 PM to 2:30 PM PST at the Lakeport City Hall. The event is hosted by the City of Lakeport and the Lakeport Public Works Department. The page includes a cover image with the text "LOCAL HAZARD MITIGATION PLAN PUBLIC MEETING TUESDAY FEBRUARY 19 1 pm to 2:30 pm @ LAKEPORT CITY HALL". Below the cover image, there is a section for "About" and "Discussion". The "About" section contains the following text: "The City of Lakeport is preparing a Local Hazard Mitigation Plan. Fires, drought, floods, and severe weather are just a few of the hazards to be addressed in the plan. We are seeking all interested community members to hear more about the Local Hazard Mitigation Planning project. We encourage attendance and participation from the general public at our upcoming public meeting regarding Risk Assessment." Below the "About" section, there is a section for "About Lakeport Public Works Department" which includes a photo of the department and a description: "Lakeport Public Works Department Government Organization City of Lakeport CA Public Works Department page. The department includes Water, Sewer, Streets, Underground and Parks divisions." On the right side of the page, there is a "Related Events" section listing several other events, including "Evening Meeting & Social", "Lake Friends of NRA Annual B...", "Clearlake K9 Benefit dinner/ d...", "Redding Sportsman's Expo", "Operation Color Run - 5K Walk...", and "Konocti Challenge 2019".

Events

Events
Calendar
Birthdays
Discover
Hosting

+ Create Event

**LOCAL HAZARD MITIGATION PLAN
PUBLIC MEETING
TUESDAY FEBRUARY 19
1 pm to 2:30 pm @ LAKEPORT CITY HALL**

FEB 19 Public Meeting: Local Hazard Mitigation Plan
Public · Hosted by City of Lakeport and Lakeport Public Works Department

★ Interested ✓ Going

Tuesday, February 19, 2019 at 1 PM – 2:30 PM PST
6 days ago

City of Lakeport Show Map

About Discussion

6 Went · 17 Interested
Share this event with your friends

Details

The City of Lakeport is preparing a Local Hazard Mitigation Plan. Fires, drought, floods, and severe weather are just a few of the hazards to be addressed in the plan. We are seeking all interested community members to hear more about the Local Hazard Mitigation Planning project. We encourage attendance and participation from the general public at our upcoming public meeting regarding Risk Assessment.

About Lakeport Public Works Department

Lakeport Public Works Department
Government Organization
City of Lakeport CA Public Works Department page. The department includes Water, Sewer, Streets, Underground and Parks divisions.

Related Events See More

Evening Meeting & Social
Thursday PST at Don Angel Cel...
80 guests
Interested · Going

Lake Friends of NRA Annual B...
Sat, Apr 6 PDT at 401 Martin St, ...
236 guests
Interested · Going

Clearlake K9 Benefit dinner/ d...
Sat, Jun 1 PDT at 3245 Bowers...
475 guests
Interested · Going

Redding Sportsman's Expo
Sat, Apr 6 PDT at Redding Civic...
163 guests
Interested · Going

Operation Color Run - 5K Walk...
Sat, Apr 27 PDT at 350 Lange S...
777 guests
Interested · Going

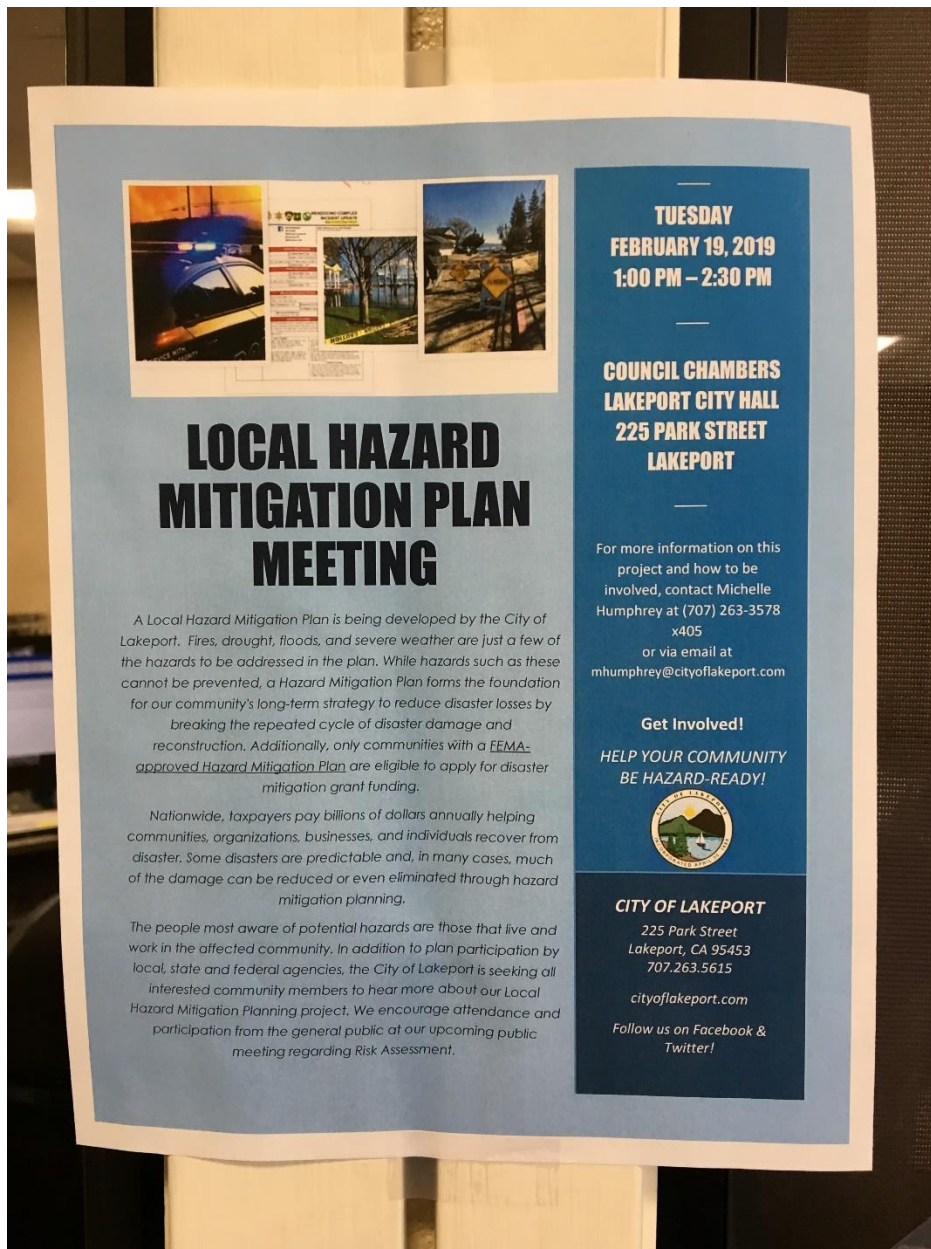
Konocti Challenge 2019
Sat, Oct 5 PDT at Skylark Shore...
236 guests
Interested · Going

English (US) · Español · Português (Brasil) · Français (France) · Deutsch

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Facebook © 2019

A.7.11. Public Outreach for Risk Assessment Meeting (posted in City Hall)



A.7.12. Risk Assessment Meeting – Public Notice on Nixle

Message sent via Nixle | [Go to nixle.com](https://nixle.com) | [Unsubscribe](#)



Monday February 11, 2019, 11:18 AM

Lakeport Police Department

Community: LAKEPORT HAZARD MITIGATION PLAN MEETING: 02/19/19 FROM 1-2:30 PM AT CITY HALL, 225 PARK STREET

Dear Brad Rasmussen,

Get Involved!

HELP YOUR COMMUNITY BE HAZARD-READY!

City of Lakeport, CA: A Local Hazard Mitigation Plan is being developed by the City of Lakeport. Fires, drought, floods, and severe weather are just a few of the hazards to be addressed in the plan. While hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through hazard mitigation planning.

The people most aware of potential hazards are the people that live and work in the affected community. In addition to plan participation by local, state and federal agencies, the community is seeking all interested community members to hear more about our Local Hazard Mitigation Planning project. We encourage attendance and participation from the general public at our upcoming public meeting regarding Risk Assessment:

February 19, 2019

Public Meeting: **1:00 -2:30**

Location **City Hall, Council Chambers, 225 Park Street, Lakeport CA**

For additional information, please contact Michelle Humphrey at (707) 263-3578 or email at mhumphrey@cityoflakeport.com

A.7.13. Risk Assessment Meeting Invite – Nextdoor.com



View on Nextdoor



Chief of Police Brad Rasmussen, Lakeport Police
Department **AGENCY**

Get Involved! HELP YOUR COMMUNITY BE HAZARD-READY! City of Lakeport, CA: A Local Hazard Mitigation Plan is being developed by the City of Lakeport. Fires, drought, floods, and severe weather are just a few of the hazards to be addressed in the plan. While hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are... [See more](#)

Crime & Safety · Feb 11 to subscribers of Lakeport Police Department



Thank



Private message



View or Reply

This message is intended for brasmussen@lakeportpolice.org. [Unsubscribe here.](#)
Nextdoor, 875 Stevenson Street, Suite 700, San Francisco, CA 94103

A.7.14. Risk Assessment Meeting Invite – Lake County Chamber

CITY OF LAKEPORT

*Over 130 years of community
pride, progress and service.*

City Manager's Report February 2019



Lakeport Hazard Mitigation Plan Meeting

Get involved and help your community be hazard-ready!

**Public Meeting: Tuesday, February 19, 2019, 1:00-2:30 p.m.
City Hall, Council Chambers, 225 Park Street, Lakeport**

A Local Hazard Mitigation Plan is being developed by the City of Lakeport. Fires, drought, floods, and severe weather are just a few of the hazards to be addressed in the plan. While hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction.

Only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through hazard mitigation planning.

The people most aware of potential hazards are the people living and working in the affected communities. In addition to Plan participation by local, state and federal agencies, we are seeking interested community members to hear more about our Local Hazard Mitigation Plan project.

The general public is encouraged to participate in the upcoming public meeting regarding Risk Assessment. For more information, please contact Michelle Humphrey at 263-3578 or email at mhumphrey@cityoflakeport.com.

Lakeport Police Department Report for 2018

During his recent annual report to the City Council, Chief Brad Rasmussen noted he is pleased with department response times in 2018 compared with the previous year. Calls are reported in different priority levels with priority one, emergencies, having an average of three minutes response time.

225 PARK STREET • LAKEPORT, CALIFORNIA 95453 • TELEPHONE (707) 263-5615 • FAX (707) 263-8584

A.7.15. Risk Assessment Meeting – Public Agenda

**CITY OF LAKEPORT
LOCAL HAZARD MITIGATION PLAN (LHMP)
PUBLIC MEETING #2
FEBRUARY 29, 2019**

1. Introductions
2. LHMP Project Overview and Status
3. Risk Assessment Overview
4. Next Steps/Schedule
5. Questions and Answers

A.7.16.

Risk Assessment Meeting – Public Sign in Sheets

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #2 - Risk Assessment
February 19, 2019

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|--------------------|-----------------------------|----------------------|---|
| Jessica Harris | jessharris158@hotmail.com | 707-349-5434 | — |
| Lucas Arredondo | | 707-349-5434 | |
| Merry Jo Velasquez | merryjo.velasquez@yahoo.com | | |
| DAVID VELASQUEZ | djvelasquez@citlink.net | 651.238-7833 | |
| Bill GABE | billgabe327@yahoo.com | 349 707 5755 | LAKEPORT FIRE DISTRICT BOARD MEMBER |
| TARA GABE | iamtara923@gmail.com | 707.533.9536 | — |
| George Spurr | gspurr@cityoflakeport.ca | 707.367.5010 | city council |
| Keith Rutledge | keithr@sherwoodfirewise.org | 456.9571 | Sherwood Firewise |
| Brian Weller | brianw@sherwoodfirewise.org | 458 4499 | SHERWOOD FIREWISE |
| BESSY CAWEN | | 262-97700 | TRUF |
| Rob Young | ryoung@lakecoe.org | 262-4100 | LCOE |
| Susan Kueh | | | |
| David Poorn | | | 94512 T59C |

Lucy Green grendreg@gmail.com 227-6298 Resident

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #2 - Risk Assessment
February 19, 2019

| Name/Title | Email Address | Phone | Department/Organization/ Affiliation |
|-------------------|-----------------------------------|---------------|---|
| Ken LADY | klady@cityoflakeport.com | 416-8458 | C.O.C. |
| William G. Eelton | wge@usa.net | 707 533 8638 | private |
| Paul / Kylene | doregan@mcnsi.com | 263 0587 | — |
| Nick Walker | nwalker@cityoflakeport.com | 295-2725 | City of Lakeport |
| Walter Hoeck | walterhoeck@gmail.com | 262-1748 | |
| Kevin M. Ingram | kingram@cityoflakeport.com | 263-5615 x201 | COO/City of Lakeport |
| Nathan Speed | nathan.speed1@gmail.com | 707-228-6637 | |
| Erin Gustafson | erin.gustafson@cityoflakeport.com | 707-263-1810 | Public Health |
| Joan Vignone | joan.vignone@gmail.com | 707 262 1582 | Home Doctor |
| Douglas Gividen | dgividen@cityoflakeport.com | 707-263-3578 | Lakeport D.R.U. |
| M BAKER | m.baker195@gmail.com | 413 3126 | |
| Debra Franklin | debrafranklin@gmail.com | 263-8651 | resident |
| Michelle Humphrey | mhumphrey@cityoflakeport.com | 263-3578 | City Employee. P.W. |

A.7.17. Press Release Invite to Final Review of Plan – Public



City of Lakeport Invites Comments on their Hazard Mitigation Plan!

HELP YOUR COMMUNITY BE HAZARD-READY!

City of Lakeport CA: A Local Hazard Mitigation Plan (LHMP) is being developed by the City of Lakeport in conjunction with the Lakeport Fire Protection District. Fires, floods, earthquakes, and severe weather are just a few of the hazards to the Lakeport community. While natural hazards such as these cannot be prevented, a Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for both pre- and post-disaster mitigation grant funding.

The process began in November 2018 with an initial public meeting and the establishment of a planning committee comprised of City departments and other key stakeholders. The plan is scheduled to be finalized and submitted to Cal OES and FEMA in July 2019.

Public Review Draft

The Public Review Draft of the LHMP is available online (pdf format) at https://www.cityoflakeport.com/news_detail_T14_R21.php. It is also available (in printed copy) at the following Lakeport location: City Hall

Open Public Meetings

A final public meeting to review and provide comments on the Public Review draft LHMP is scheduled as follows:

July 10, 2019 – 1:00 – 3:00 pm

City of Lakeport City Hall in the Council Chambers

225 Park Street

Lakeport, CA 95453

We encourage attendance and input from the general public at our upcoming meeting.

Comments on the Public Review Draft

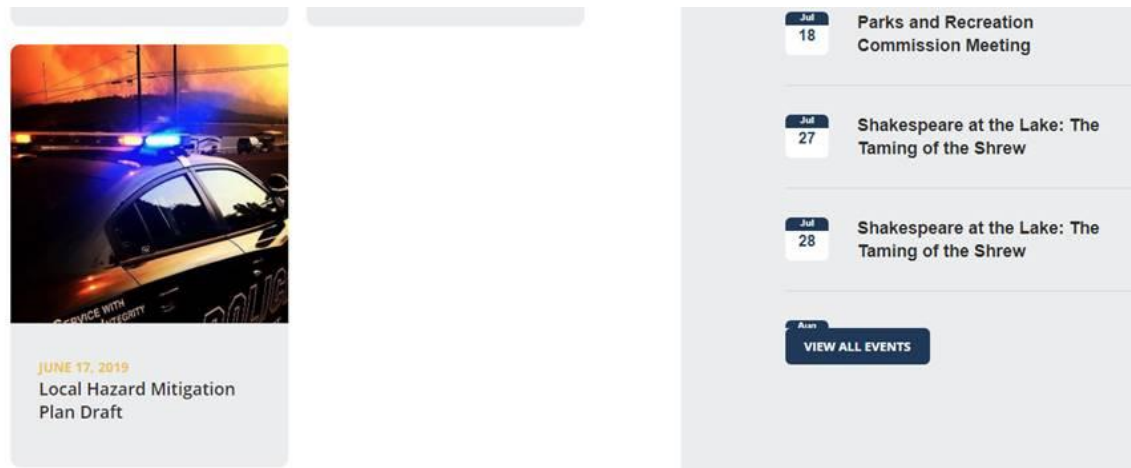
There are several options for providing comments on the LHMP Public Review Draft:

- Email comments to Jeanine.foster@fostermorrison.com or mhumphrey@cityoflakeport.com
- Drop off written comments or send by mail to: City of Lakeport Public Works Department, Attn. Michelle Humphrey 225 Park Street, Lakeport CA 95453
- Bring comments to the public meeting

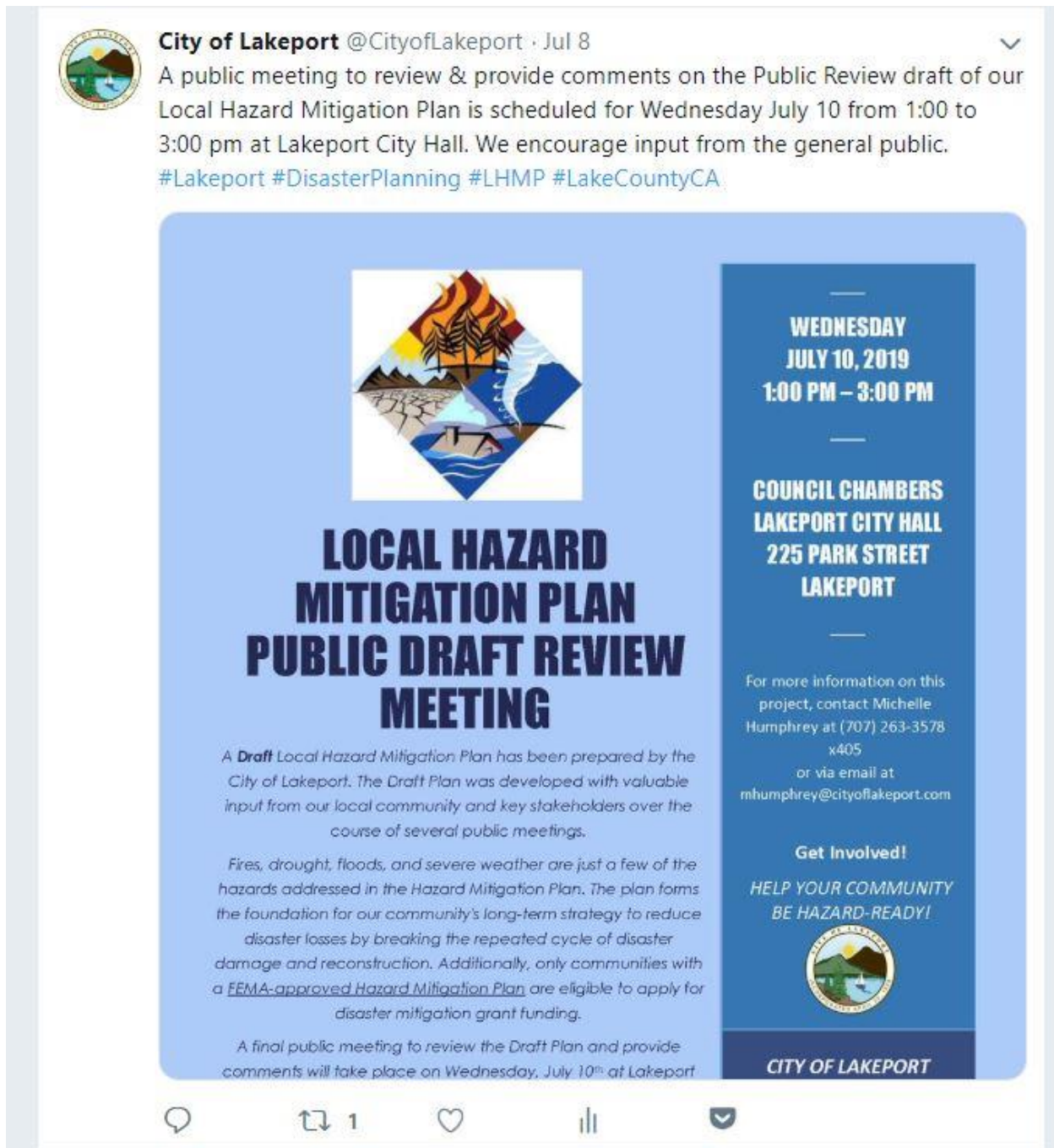
For More Information

Contact Michelle Humphrey at 707-263-3578 email at mhumphrey@cityoflakeport.com

A.7.18. Website Invitation to Final public Meeting



A.7.19. Advertisement to Public for Final Plan Review on Twitter



A.7.20. Advertisement to Public for Final Plan Review on Facebook





City of Lakeport *Post included mtg flyer*

Published by Janel Chapman [?] · July 8 at 4:15 PM ·



A Draft Local Hazard Mitigation Plan has been prepared by the City of Lakeport. The Draft Plan was developed with valuable input from our local community and key stakeholders over the course of several public meetings which began in November 2018.

Fires, drought, floods, and severe weather are just a few of the hazards addressed in the Hazard Mitigation Plan. The plan forms the foundation for our community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Additionally, only communities with a FEMA-approved Hazard Mitigation Plan are eligible to apply for disaster mitigation grant funding.

The Public Review Draft of the LHMP is available online (pdf format) at https://www.cityoflakeport.com/news_detail_T14_R21.php . It is also available (printed copy) at Lakeport City Hall.

Open Public Meeting

A final public meeting to review and provide comments on the Public Review draft LHMP is scheduled for July 10, 2019 from 1:00 pm to 3:00 pm at Lakeport City Hall.

We encourage attendance and input from the general public at this week's meeting.

Comments on the Public Review Draft

There are several options for providing comments on the LHMP Public Review Draft:

- Email comments to Jeanine.foster@fostermorrison.com or mhumphrey@cityoflakeport.com
- Drop off written comments or send by mail to: City of Lakeport Public Works Department, Attn. Michelle Humphrey 225 Park Street, Lakeport CA 95453
- Bring comments to the public meeting

For More Information

Contact Michelle Humphrey at 707-263-3578 or via email at mhumphrey@cityoflakeport.com

A.7.21. Public Meeting Invitation in June 25 Lake County Chamber e-Letter



Local Hazard Mitigation Plan – Public Meeting
Wednesday, July 10, 1:00-3:00 PM
City Council Chambers, City Hall
225 Park Street, Lakeport

FEMA defines Hazard Mitigation as any action taken to reduce or eliminate the long-term risk to human life and property from hazards. Hazard mitigation planning is a process for state and local governments to identify community-level policies and actions to mitigate and thus reduce the impacts of natural hazards to the citizens, property and critical infrastructure.

In accordance with the Disaster Mitigation Act of 2000, the City of Lakeport is developing a Local Hazard Mitigation Plan (LHMP) that addresses wildfire, drought, flood and severe weather among other hazards. The LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with a DMA-compliant, FEMA-approved LHMP are eligible for FEMA pre- and post-disaster grant funding and are better positioned to respond and recover when disasters occur.

The final steps in the Lakeport LHMP include public review of the draft plan on **Wednesday, July 10, 1:00-3:00 p.m.** at Lakeport City Hall. The document may be found at: https://www.cityoflakeport.com/news_detail_T14_R21.php.

A copy of the plan is available at City Hall. Please contact Michelle Humphrey, City of Lakeport Public Works, (707) 263-3578, ext. 405, or mhumphrey@cityoflakeport.com.

Margaret Silveira, City Manager

225 PARK STREET • LAKEPORT, CALIFORNIA 95453 • TELEPHONE (707) 263-5615 • FAX (707) 263-8584

A.7.22. Public Meeting Invitation in July 2 Lake County Chamber e-Letter

Madi volunteered at the Seventh Day Adventist Church and Kelseyville High School evacuation centers during the recent fires in Lake County. She set up tents and organized donations to assist fire victims. Throughout high school, Madi worked at Quail Run Fitness and Park Place restaurant, finding it challenging to balance school, work and sports.

Among her many personal goals, Madi wants to establish herself as a successful woman and show her parents that their efforts were worth the sacrifices they made while raising her.

Jason Ferguson, Madi's father, served with the Lake County Sheriff's Office for two years, 1996-1998, and has been with the Lakeport Police Department since 1998.



Madison Ferguson receiving scholarship funds from City Manager Margaret Silveira.

Local Hazard Mitigation Plan – Public Meeting
Wednesday, July 10, 1:00-3:00 PM, City Council Chambers, City Hall

Margaret Silveira, City Manager

225 PARK STREET • LAKEPORT, CALIFORNIA 95453 • TELEPHONE (707) 263-5615 • FAX (707) 263-8584

A.7.23. Final Review of Plan – Public Agenda

AGENDA
City of Lakeport
Local Hazard Mitigation Plan (LHMP)
Final Public Meeting
July 10, 2019

1. Introductions
2. Status of the LHMP Update Process
3. Addressing Public Comments
4. Final HMPC Input: Data/Projects
5. Next Steps

A.7.24.

Final Review of Plan – Public Sign in Sheets

SIGN-IN SHEET
City of Lakeport
LOCAL HAZARD MITIGATION PLANNING PROJECT
Final Public Meeting
July 10, 2019

| Name/Title | Email Address | Phone | Organization/ Affiliation |
|--------------------------------------|------------------------------|---------------|------------------------------|
| Michelle Humphrey | mhumphrey@cityoflakeport.com | 263 3578 | City of Lakeport |
| Andrew Britton Compliance Officer | abritton@cityoflakeport.com | 263 3578 | City of Lakeport |
| Ren LADD P.W. | rladd@cityoflakeport.com | 2 63-3578 | C.O.L. |
| Alex Sharp | ASharp@cityoflakeport.com | 263-5615 | C.O.L. |
| Dave CHANCE | DMCHANCE@CITYOF-LAKEPORT.COM | 263-5615 | DD |
| Dan Reeson | Dreeson@cityoflakeport.com | 262-5005 | SWW |
| Douglas Guidici | Dguidici@cityoflakeport.com | 263-0751 | City of Lakeport |
| Tom Carlton CEO | tcCarlton@cityoflakeport.com | 263-5615 x202 | C.O.L. |
| Nick Waller | nwallen@cityoflakeport.com | 263-5615 | |
| | | | |
| | | | |
| | | | |

A.8 Meeting Handouts

Below are the handouts for each meeting. Handouts specific to the Risk Assessment Meeting can be found in Appendix C.

A.8.1. Kickoff Meeting Handouts for Public and HMPC Meetings

Lake County State and Federal Disaster Declarations, 1950-2018

| Year | Disaster Name | Disaster Type | Disaster Cause | Disaster # | State Declaration # | Federal Declaration # |
|-----------|--|---------------|----------------|--------------|---------------------|-----------------------|
| 2018 | Mendocino Complex Fires | Fire | Fire | DR-4382 | — | 8/4/2018 |
| 2017 | California Wildfires | Fire | Fire | DR-4344 | — | 10/10/2017 |
| 2017 | Sulphur Fire | Fire | Fire | FM-5221 | — | 10/9/2017 |
| 2017 | California Severe Winter Storms, Flooding, Mudslides | Flood | Storms | DR-4308 | — | 4/1/2017 |
| 2017 | California Severe Winter Storms, Flooding, Mudslides | Flood | Storms | DR-4301 | — | 2/14/2017 |
| 2016 | Clayton Fire | Fire | Fire | FM-5145 | — | 8/14/2016 |
| 2015 | Valley Fire and Butte Fire | Fire | Fire | DR-4240 | — | 8/22/2015 |
| 2015 | Valley Fire | Fire | Fire | FM-5112 | — | 9/12/2015 |
| 2015 | Rocky Fire | Fire | Fire | FM-5093 | — | 7/29/2015 |
| 2014 | California Drought | Drought | Drought | GP 2014-13 | 1/17/2014 | — |
| 2012 | Wye Fire | Fire | Fire | FM-5004 | — | 8/13/2012 |
| 2006 | 2006 June Storms | Flood | Storms | DR 1646 | — | 6/5/2006 |
| 2005/2006 | 2005/06 Winter Storms | Flood | Storms | DR-1628 | — | 2/3/2006 |
| 2005 | Hurricane Katrina Evacuations | Economic | Hurricane | EM-3248 2005 | — | 9/13/2005 |
| 2003 | State Road Damage | Road Damage | Flood | GP 2003 | 1/1/2003 | — |
| 2001 | Energy Emergency | Economic | Greed | GP 2001 | 1/1/2001 | — |
| 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 | Lake County Fire | Fire | Fire | DC-96-03 | — | 8/1/1996 |

| Year | Disaster Name | Disaster Type | Disaster Cause | Disaster # | State Declaration # | Federal Declaration # |
|------|--|---------------|----------------|------------|---|-----------------------|
| 1995 | California Severe Winter Storms, Flooding, Landslides, Mud Flows | Flood | Storms | DR-1046 | Proclaimed | 3/12/1995 |
| 1995 | 1995 Severe Winter Storms | Flood | Storms | DR-1044 | 1/6/95-3/14/95 | 1/13/1995 |
| 1987 | 1987 Fires | Fire | Fire | GP | 9/10/87, 9/3/87 | — |
| 1986 | 1986 Storms | Flood | Storms | DR-758 | 2/18-86-3/12/86 | 2/18/1986 |
| 1985 | Hidden Valley Lake Fire | Fire | Fire | FM-2055 | — | 7/11/1985 |
| 1983 | Winter Storms | Flood | Flood | DR-677 | 12/8/82-3/21/83 | 2/9/1983 |
| 1980 | April Storms | Flood | Storms | — | 4/1/1980 | — |
| 1979 | Gasoline Shortage | Economic | OPEC | — | 5/8/1979-11/13/79 | — |
| 1977 | 1977 Drought | Drought | Drought | EM-3023 | 1/20/1977 | — |
| 1972 | 1972 Freeze | Freeze | Freeze | — | 7/13/1972 | — |
| 1970 | 1970 Freeze | Freeze | Freeze | — | 5/1/70, 5/19/70, 6/8/70, 6/10/70, 7/24/70 | — |
| 1970 | 1970 Northern California Flooding | Flood | Flood | DR 283 | 1/27/1970 - 3/2/1970 | 2/16/1970 |
| 1964 | 1964 Late Winter Storms | Flood | Storms | DR-183 | — | 12/24/1964 |
| 1963 | 1963 Floods and Rains | Flood | Storms | DR-145 | 2/7/63, 2/26/63, 2/29/63, & 4/22/63 | 2/25/63 |
| 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 |
| 1950 | 1950 Floods | Flood | Flood | OCD 50-01 | 11/21/1950 | — |

Source: Cal OES, FEMA

Lake County – State and Federal Disaster Declarations Summary 1950-2012

| Disaster Type | Federal Declarations | | State Declarations | |
|--|----------------------|---|--------------------|--|
| | Count | Years | Count | Years |
| Drought | 0 | — | 2 | 1977, 2014 |
| Economic | 0 | — | 2 | 1979, 2001 |
| Fire | 10 | 1985, 1996, 2012, 2015 (three times), 2016, 2017(twice), 2018 | 1 | 1987 |
| Flood (including heavy rains and storms) | 15 | 1955, 1958, 1963, 1964, 1970, 1983, 1986, 1995 (two times), 1997, 1998, 2005/2006, 2006, 2017 (two times) | 14 | 1950, 1955, 1958 (twice), 1963 (twice), 1970, 1980, 1983, 1986, 1995 (twice), 1997, 1998 |
| Freeze | 0 | — | 2 | 1970, 1972 |
| Hurricane | 1 | 2005 | 0 | — |
| Road Damage | 0 | — | 1 | 2003 |
| Totals | 24 | — | 22 | — |

Source: Cal OES, FEMA

*Lake County NCDC Storm Events 1/1/1950-6/31/2018**

| Event Type | Number of Events | Deaths | Deaths (indirect) | Injuries | Injuries (indirect) | Property Damage | Crop Damage |
|----------------|------------------|----------|-------------------|-----------|---------------------|---------------------|-------------|
| Blizzard | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Debris Flows | 2 | 0 | 0 | 0 | 0 | \$300,000 | \$0 |
| Drought | 15 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Flash Flood | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Flood | 10 | 1 | 0 | 1 | 0 | \$23,410,000 | \$0 |
| Frost/Freeze | 2 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Hail | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heat | 1 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heavy Rain | 5 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Heavy Snow | 3 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| High Wind | 12 | 0 | 0 | 0 | 0 | \$168,000 | \$0 |
| Strong Wind | 1 | 0 | 0 | 0 | 0 | \$1,000 | \$0 |
| Wildfire | 12 | 5 | 0 | 25 | 5 | \$1,500,000 | \$0 |
| Winter Storm | 62 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Winter Weather | 6 | 0 | 0 | 0 | 0 | \$0 | \$0 |
| Total | 134 | 6 | 0 | 26 | 5 | \$25,379,000 | \$0 |

Source: NCDC

*Note: Losses reflect totals for all impacted areas

Hazards Comparison List

| Lakeport Safety Element and EOP Hazards | Lake County LHMP | 2018 State of California Plan Applicable Hazards | Proposed 2018/2019 Hazards |
|---|--|--|--|
| – | Agricultural Hazards | Insects/Pests | Agricultural Hazards |
| – | Aquatic Biological Hazards: cyanobacterial bloom | Aquatic Invasive Species | Aquatic Biological Hazards: cyanobacterial bloom |
| – | Aquatic Biological Hazards: quagga mussel | Aquatic Invasive Species | Aquatic Biological Hazards: quagga mussel |
| – | Climate Change | Climate Change & Related Hazards | Climate Change |
| Dam Failure | Dam Failure | Dam Failure | Dam Failure |
| Water Supply Quality | Drought and Water Shortage | Droughts and Water Shortage | Drought and Water Shortage |
| Earthquake | Earthquake | Earthquake | Earthquake |
| Flood | Flood: 1%/0.2% Annual Chance | Riverine, Stream, and Alluvial Flood | Flood: 1%/0.2% Annual Chance |
| Storm Drainage | Flood: Localized/Stormwater | Riverine, Stream, and Alluvial Flood | Flood: Localized/Stormwater |
| Hazardous Materials | Hazardous Materials Transport | Hazardous Materials Release/Oil Spills | Hazardous Materials Transport |
| Landslide | Landslide and Debris Flows | Landslide and Other Earth Movements | Landslide and Debris Flows |
| – | Levee Failure | Levee Failure | Levee Failure |
| Seiches | -- | Tsunami and Seiche | Seiche |
| – | Severe Weather: Extreme Heat | Extreme Heat/Freeze | Severe Weather: Extreme Heat |
| – | Severe Weather: Heavy Rains, Snow, and Storms | Severe Weather and Storms | Severe Weather: Heavy Rains, Snow, and Storms |
| – | Severe Weather: High Winds | Severe Weather and Storms | Severe Weather: High Winds |
| – | Subsidence | – | Subsidence |
| – | Volcano and Geothermal Gas Release | Volcano | Volcano and Geothermal Gas Release |
| Wildland and Urban Fire | Wildfire | Wildfire | Wildfire |

City of Lakeport Hazard Identification Table

| Hazard | Geographic Extent | Probability of Future Occurrences | Magnitude/Severity | Significance | Climate Change Influence |
|---|-------------------|-----------------------------------|--------------------|--------------|--------------------------|
| Agricultural Hazards | | | | | |
| Aquatic Biological Hazards: cyanobacterial bloom | | | | | |
| Aquatic Biological Hazards: quagga mussel | | | | | |
| Climate Change | | | | | |
| Dam Failure | | | | | |
| Drought and Water Shortage | | | | | |
| Earthquake | | | | | |
| Flood: 1%/0.2% Annual Chance | | | | | |
| Flood: Localized/Stormwater | | | | | |
| Hazardous Materials Transport | | | | | |
| Landslide and Debris Flows | | | | | |
| Levee Failure | | | | | |
| Seiche | | | | | |
| Severe Weather: Extreme Heat | | | | | |
| Severe Weather: Heavy Rains, Snow, and Storms | | | | | |
| Severe Weather: High Winds | | | | | |
| Subsidence | | | | | |
| Volcano and Geothermal Gas Release | | | | | |
| Wildfire | | | | | |
| <div> <div> Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years. </div> <div> Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact </div> </div> | | | | | |

City of Lakeport
2019 Local Hazard Mitigation Plan
Participating Jurisdiction: Vulnerability & Capability Worksheets

Risk and Vulnerability Questions

Localized/Stormwater Flooding

1. Please describe the localized/stormwater flood issue specific to your jurisdiction in paragraph form. In addition, please complete a table similar to the below example detailing types and location of localized/stormwater flooding problems. If available, also attach a map of problem areas.

Text Description

Localized Flooding Areas

| Road Name | Flooding | Pavement Deterioration | Washouts | High Water/ Creek Crossing | Landslides/ Mudslides | Debris | Downed Trees |
|-----------|----------|------------------------|----------|-------------------------------|--------------------------|--------|--------------|
| | | | | | | | |
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Landslides, Mudslides, and Debris Flow

1. Please describe the landslide, mudslide, hillside erosion and debris flow issues specific to the City in paragraph form. In addition, please complete a table similar to the below example detailing types and location of landslide, mudslide, and debris flow problems. If available, also provide a map of problem areas.

Text Description:

Table 2 Landslides, Mudslides, and Debris Flow Areas

| Location | Detail Nature and Extent of Landslide Issues | |
|----------|--|--|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
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Earthquake Vulnerability

1. Number of unreinforced masonry buildings. If available, please provide an inventory of URM buildings specific to your jurisdiction. Include any tables and/or maps. Is this a layer available in GIS?

Special Populations

1. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.

Development Trends

1. Describe development trends and expected growth areas and how they relate to hazard areas and vulnerability concerns/issues. Please provide zoning maps and maps and tables detailing areas targeted for future development within your jurisdiction.

CAPABILITY ASSESSMENT

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. Please complete the tables and questions in the worksheet as completely as possible.

Planning and Regulatory

The following planning and land management tools are typically used by local jurisdictions to implement hazard mitigation activities. Please indicate which of the following your jurisdiction has in place. If your jurisdiction does not have this capability or authority, please indicate in the comments column if a higher level of government has the authority.

| Plans | Y/N Year | Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions? |
|--|-------------|---|
| General Plan | | |
| Capital Improvements Plan | | |
| Economic Development Plan | | |
| Local Emergency Operations Plan | | |
| Continuity of Operations Plan | | |
| Transportation Plan | | |
| Stormwater Management Plan/Program | | |
| Engineering Studies for Streams | | |
| Community Wildfire Protection Plan | | |
| Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation) | | |
| Building Code, Permitting, and Inspections | Y/N | Are codes adequately enforced? |
| Building Code | | |
| Building Code Effectiveness Grading Schedule (BCEGS) Score | | |
| Fire department ISO rating: | | |
| Site plan review requirements | | |
| Land Use Planning and Ordinances | Y/N | Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced? |
| Zoning ordinance | | |
| Subdivision ordinance | | |
| Floodplain ordinance | | |

| |
|--|
| Natural hazard specific ordinance (stormwater, steep slope, wildfire) |
| Flood insurance rate maps |
| Elevation Certificates |
| Acquisition of land for open space and public recreation uses |
| Erosion or sediment control program |
| Other |
| How can these capabilities be expanded and improved to reduce risk? |
| |

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your jurisdiction. For smaller jurisdictions without local staff resources, if there are public resources at the next higher level government that can provide technical assistance, please indicate so in the comments column.

| Administration | Y/N | Describe capability Is coordination effective? |
|--|--------------|--|
| Planning Commission | | |
| Mitigation Planning Committee | | |
| Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems) | | |
| Mutual aid agreements | | |
| Other | | |
| Staff | Y/N FT/PT | Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective? |
| Chief Building Official | | |
| Floodplain Administrator | | |
| Emergency Manager | | |
| Community Planner | | |
| Civil Engineer | | |
| GIS Coordinator | | |
| Other | | |
| Technical | Y/N | Describe capability Has capability been used to assess/mitigate risk in the past? |
| Warning systems/services (Reverse 911, outdoor warning signals) | | |

| |
|---|
| Hazard data and information |
| Grant writing |
| Hazus analysis |
| Other |
| How can these capabilities be expanded and improved to reduce risk? |
| |

Fiscal

Identify whether your jurisdiction has access to or is eligible to use the following financial resources for hazard mitigation

| Funding Resource | Access/ Eligibility (Y/N) | Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions? |
|---|---------------------------------|--|
| Capital improvements project funding | | |
| Authority to levy taxes for specific purposes | | |
| Fees for water, sewer, gas, or electric services | | |
| Impact fees for new development | | |
| Storm water utility fee | | |
| Incur debt through general obligation bonds and/or special tax bonds | | |
| Incur debt through private activities | | |
| Community Development Block Grant | | |
| Other federal funding programs | | |
| State funding programs | | |
| Other | | |
| How can these capabilities be expanded and improved to reduce risk? | | |
| | | |

Education and Outreach

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

| Program/Organization | Yes/No | Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities? |
|---|--------|--|
| Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. | | |
| Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education) | | |
| Natural disaster or safety related school programs | | |
| StormReady certification | | |
| Firewise Communities certification | | |
| Public-private partnership initiatives addressing disaster-related issues | | |
| Other | | |
| How can these capabilities be expanded and improved to reduce risk? | | |
| | | |

National Flood Insurance Program (NFIP) Worksheet

Use this worksheet to collect information on your community's participation in and continued compliance with the NFIP, as well as identify areas for improvement that could be potential mitigation actions.

| NFIP Topic | Comments |
|---|--|
| Insurance Summary | |
| How many NFIP policies are in the community? What is the total premium and coverage? | 41 policies FM TO GET PREMIUMS \$10,798,700 coverage |
| How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage? | 1 paid claim \$750.00 No substantial damage claims |
| How many structures are exposed to flood risk within the community? | FM to complete |
| Describe any areas of flood risk with limited NFIP policy coverage | |
| Staff Resources | |
| Is the Community Floodplain Administrator or NFIP Coordinator certified? | |
| Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability) | |
| What are the barriers to running an effective NFIP program in the community, if any? | |
| Compliance History | |
| Is the community in good standing with the NFIP? | |
| Are there any outstanding compliance issues (i.e., current violations)? | |
| When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)? | |
| Is a CAV or CAC scheduled or needed? | |
| Regulation | |
| When did the community enter the NFIP? | FM to complete |
| Are the FIRMs digital or paper? | FM to complete |
| Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways? | |
| Provide an explanation of the permitting process. | |
| Community Rating System | |
| Does the community participate in CRS? | |
| What is the community's CRS Class Ranking? | |
| What categories and activities provide CRS points and how can the class be improved? | |
| Does the plan include CRS planning requirements? | |

| Prepared by: | Date | Email | Phone |
|--------------|------|-------|-------|
| | | | |

HISTORIC HAZARD EVENTS WORKSHEET

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

| | | |
|--|---|--|
| Type of event | | |
| Nature and magnitude of event | | |
| Location | | |
| Date of event | | |
| Injuries | | |
| Deaths | | |
| Property damage | | |
| Infrastructure damage | | |
| Crop damage | | |
| Business/economic impacts | | |
| Road/school/other closures | | |
| Other damage | | |
| Insured losses | | |
| Federal/state disaster relief funding | | |
| Opinion on likelihood of occurring again | | |
| Source of information | | |
| Comments | | |
| | Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 5628 West Long Place Littleton, CO 80123 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com | |
| Prepared by: | | |
| Phone: | | |
| Email: | | |
| Date: | | |

A.8.2. Risk Assessment Meeting Handouts for HMPC Meeting

AGENDA
City of Lakeport
Local Hazard Mitigation Plan (LHMP)
HMPC Meeting #2 - Risk Assessment
February 20, 2019

6. Introductions
7. Status of the DMA Planning Process
8. Review of Risk Assessment
9. Review of Data Needs
10. Next Steps

Contact Info:

Jeanine Foster (jeanine.foster@fostermorrison.com) (303.717.7171)

Foster Morrison Consulting, Ltd.

Brenna Howell (brenna@brennahowell.com)

Howell Consulting, Inc.

Hazard Identification & Profiles: City of Lakeport

| Hazard | Geographic Extent | Likelihood of Future Occurrences | Magnitude/Severity | Significance | Climate Change Influence |
|---|-------------------|----------------------------------|--------------------|--------------|--------------------------|
| Aquatic Biological Hazards: cyanobacterial bloom | Significant | Highly Likely | Critical | High | Medium |
| Aquatic Biological Hazards: quagga mussel | Significant | Highly Likely | Critical | High | Low |
| Climate Change | Extensive | Likely | Limited | Medium | – |
| Dam Failure | Limited | Occasional | Critical | High | Medium |
| Drought and Water Shortage | Extensive | Likely | Critical | High | High |
| Earthquake (major/minor) | Extensive | Unlikely/Highly Likely | Catastrophic | Medium | Low |
| Flood: 1%/0.2% Annual Chance | Significant | Likely | Critical | High | Medium |
| Flood: Localized/Stormwater | Significant | Highly Likely | Limited | Medium | Medium |
| Hazardous Materials Transport | Significant | Likely | Critical | Medium | Low |
| Landslide and Debris Flows | Limited | Highly Likely | Limited | Medium | Medium |
| Levee Failure | Limited | Unlikely | Negligible | Low | Low |
| Seiche | Limited | Unlikely | Limited | Low | Low |
| Severe Weather: Extreme Cold and Freeze | Extensive | Likely | Limited | Low | Medium |
| Severe Weather: Extreme Heat | Extensive | Highly Likely | Limited | Medium | High |
| Severe Weather: Heavy Rains, Snow, and Storms | Extensive | Highly Likely | Limited | Medium | Medium |
| Severe Weather: High Winds | Extensive | Highly Likely | Critical | Medium | Low |
| Volcano and Geothermal Gas Release | Extensive | Unlikely/ Highly Likely | Critical | Low | Low |
| Wildfire | Extensive | Highly Likely | Catastrophic | High | High |
| <div> <div> Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area </div> <div> Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years. </div> <div> Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence: Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact </div> </div> | | | | | |

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: City of Lakeport Planning Area

Aquatic Biological Hazards: Cyanobacterial Bloom

- Cyanobacteria (blue green algae) is becoming an increasingly significant hazard in Clear Lake. Cyanobacteria can produce toxins that can be harmful for animals and people when consumed at high levels.
- Cyanobacterial bloom is an annual event in Clear Lake. The severity of it varies by year. Biologists predict that this phenomenon is likely to recur for an unknown period of time. Although research has demonstrated only low levels of cyanotoxins to date, the risk for toxin production in algal blooms is known to vary widely with time and location.
- DETAILS ON PAST OCCURRENCES, EXTENT, IMPACTS/CONCERNS TO THE CITY?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Aquatic Biological Hazards: Quagga Mussel

- Quagga and zebra mussels are an invasive non-native species that breed very fast, have no known predators, and can quickly colonize new areas within California waters. Once established, these mussels can clog water intake and delivery pipes, dam intake gates and pipes, adhere to boats, pilings, and most hard and some soft substrates.
- While Quagga Mussels have not been found in Clear Lake, they have been found during boat inspections in the County/City?
- ANY UNIQUE ISSUES/IMPACTS/CONCERNS TO THE CITY?
- Likelihood of Future Occurrence: Likely
- Vulnerability: High
- Priority Hazard

Climate Change

- The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- In Lakeport, each year it seems to get a bit warmer and snow seems to start at higher levels. Rain events also seem to be of greater intensity.
- ANY HMPIC INPUT ON CLIMATE CHANGE ISSUES IN LAKEPORT?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal OES and National Performance of Dam's data, there are 21 dams in Lake County constructed for flood control, storage, electrical generation, and recreational purposes. Of these, 11 are high hazard, 4 are significant hazard, and 6 are low hazard.
- Dams of concern to the City includes only one dam: Lakeport Wastewater Treatment Plant Dam, owned by the City.
- ARE THERE ANY PAST OCCURRENCES OF DAM FAILURES/DESCRIBE INUNDATION AREA?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High?
- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Lakeport planning area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels were the highest they've been in 22 years. However, drought has started to creep back in to the Northern California area.
- 2 disaster declarations (1977 and 2014) for Lake County since 1950. There have been 15 NCDC drought events in Lake County. All of these were for the 2014-2016 drought, but no damages, injuries, or losses were reported in the NCDC database.
- HMPC – CAN YOU PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED IN THE CITY RECENTLY DUE TO THE MOST RECENT DROUGHT. WHAT HAS BEEN IMPACTED THE MOST? WHAT IS THE PRIMARY SOURCE OF WATER AND HOW HAS WATER SUPPLY BEEN AFFECTED IN THE CITY?
- Likelihood of Future Occurrence: Likely – Drought; Occasional – Water Shortage
- Vulnerability: Medium
- Priority Hazard

Earthquake

- Within the past 200 years, no major earthquakes have occurred along faults in Lake County. The San Andreas fault and the Healdsburg fault, 30 and 15 miles away, respectively are two significant faults of concern to the City. Both of these faults have been responsible for moderate to major seismic events in the past. The maximum earthquake magnitudes observed to date are 8.5 for the San Andreas fault and 6.75 (Richter Scale) for the Healdsburg fault.
- Throughout Lake County there are several small active faults, with most centered in the Cobb Mountain area. Minor earthquakes occur almost daily in the south county geothermal fields near the geysers influenced region.
- The poorly consolidated younger alluvium that occupies valley floor areas of the county near Clear Lake basin are considered to have high to very high potential for liquefaction.
- The U.S. Geological Survey (USGS) issues National Seismic Hazard Maps as reports that provide acceleration and probabilities for various time periods. This data indicates that the expected severity of earthquakes in the region is moderate to high.

- There have been no disaster declarations in the County. No major earthquakes have been recorded within the County and City; although the City has felt ground shaking from earthquakes with epicenters located elsewhere. HMPC – WERE THERE ISSUES/DAMAGES IN THE CITY FROM THE HISTORICAL EARTHQUAKES? DO CITY BUILDINGS NEED TO BE EVALUATED FOR EARTHQUAKE RETROFITS? IS THERE A URM INVENTORY?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Likely – minor earthquake
- Vulnerability: Medium
- Priority Hazard

Flood Hazards

100/500 year

- Historically, portions of Lakeport have always been at risk to flooding because of its annual percentage of rainfall in the winter, the proximity to Clear Lake and local streams and drainages. The 2014 Preliminary FIS noted that flooding in the planning area results from prolonged heavy rainfall over tributary areas during the period from November through March.
- Of the 22 state and 23 federal declarations from 1950-present– 14 state and 15 federal declarations were for severe winter weather, storms, heavy rains, or flooding. Flooding is an ongoing issue for the planning area.
- HMPC - REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS. CHECK EOC ACTIVATIONS. PROVIDE RESULTS OF PA WORKSHEETS POST FLOOD EVENTS.
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the City – occurs annually.
- IDENTIFY LOCALIZED FLOODING PROBLEM AREAS. PROVIDE DETAILS ON PAST OCCURRENCES IN THESE AREAS? PICTURES/DESCRIPTIONS. PROVIDE RESULTS OF PA WORKSHEETS POST FLOOD EVENTS.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Hazardous Materials Transport

- Most of the hazardous materials transported through and near the Lakeport is carried by truck on the State Highways. Other roads are used as needed for local deliveries.
- In Lakeport, hazardous materials routes include Highways 29. 175 buffer zone near City.
- KEY AREAS OF CONCERN WITHIN THE CITY INCLUDE?
- NEED INFORMATION ON PAST OCCURRENCES THAT AFFECTED THE CITY.
- The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's (PHMSA) tracks transportation incidents: 9 incidents have happened in transport since 1987; 5 of these at 1275 Craig Ave - UPS

- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Landslides and Debris Flows

- There have been no disaster declarations associated with landslides in Lake County. The NCDC contains no records of landslides.
- The Lakeport GP noted : Landslides are a significant geologic constraint to development in the Lakeport Planning Area. The landslide potential of an area is a function of the area's hydrology, geology, and seismic characteristics. Clay soils, which underlie many hillsides in Lakeport are particularly susceptible to sliding. Although landslides generally occur in areas with steep slopes, they may occur on slopes with a grade of 20% or less in geologically unstable areas.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES – BOTH SLOPED AREAS WITHIN THE CITY AND AREAS THAT MIGHT BE AFFECTED BY LANDSLIDING FROM AREAS WITHIN THE COUNTY?
- CAN THE CITY PROVIDE INFORMATION ON PAST LANDSLIDE EVENTS?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Levee Failure

- Agricultural and engineer levees exist throughout the County. However, there are no levees in or near Lakeport that protect the City or would affect the City if they failed.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Extremely Low
- Non-Priority Hazard

Severe weather

Extreme Cold and Freeze

- Annual occurrences of cold temperatures. Lowest recorded daily extreme was 9°F on Dec 9, 1972. In a typical year, maximum temperatures fall below 32°F on 75.5 days, with no days falling below 0°F.
- Only 1 extreme heat event (NCDC) from 1993-2018; No state or federal disaster declarations
- PLEASE PROVIDE DETAILS ON EXTREME COLD AND FREEZE EVENTS IN THE CITY. ISSUES/CONCERNS/IMPACTS
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Low
- Non-Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures. The highest recorded daily extreme was 114°F on June 30, 1977. In a typical year, maximum temperatures exceed 90°F on 77.5 days.
- Only 1 extreme heat event (NCDC) from 1993-2018; No state or federal disaster declarations

- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS IN THE CITY. ISSUES/CONCERNS/IMPACTS
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy rains, snow, and storms

- Significant County/City history: annual occurrences. Snow extremely rare.
- The NCDC data recorded 78 hail, heavy rains, and storms events for Lake County since 1950.
- There have been 15 federal declarations since 1950 for flooding and severe storms.
- PLEASE PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS IN THE CITY.
- Severe storms/heavy rains are the primary cause of most major flooding
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

High Winds

- Significant County/City history: annual occurrences
- The NCDC data recorded 13 high wind events for Lake County since 1950.
- PLEASE PROVIDE DETAILS ON HIGH WIND EVENTS IN THE CITY.
- High winds exacerbate wildfires
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard?

Seiche

- A seiche is a standing wave oscillating in a body of water. A seiche occurring in Clear Lake, is possible, but one causing significant damage to shorelines and developed areas is remote. Causes of a seiche include earthquake activity and landslides, debris flows into the lake.
- ARE THERE SPECIFIC AREAS WITHIN THE CITY THAT ARE LIKELY TO BE THE GREATEST CONCERN?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Non-Priority Hazard

Volcano

- Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Clear Lake volcano is the closest, with last significant activity 10,000 years ago.
- The area has intense geothermal activity, caused by a large, still hot silicic magma chamber about 14 km wide and 7 km beneath the surface. The area has numerous geothermal sources and mineral springs that release (potentially harmful) gases through surface vents. Hydrogen sulfide, carbon dioxide and methane gases leach out from underground magma through hot springs and during volcanic activity.
- Numerous recent events of geothermal gas releases. BUT DOES THIS AFFECT THE CITY?

- SIGNIFICANT PAST OCCURRENCES? MAJOR ISSUES? PROBLEM AREAS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Non-Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Lakeport Planning Area
- Numerous named fires causing a variety of damages and impacts throughout the County and Cities.
- Any ignition has the potential to become an out of control wildfire.
- 10 federal disaster declarations for Wildfire since 1950 in the County; 8 of these since 2012
- FOR THE 8 FEDERAL DISASTER DECLARATION FIRES SINCE 2012, CAN YOU PROVIDE INFORMATION SPECIFIC TO THE CITY ON: AREA AFFECTED, STRUCTURES LOST, DAMAGES, IMPACTS, EVACUATIONS, CLOSURES ETC.
- WHICH FIRES HAVE IMPACTED LAKEPORT? HOW?
- The City's #1 Natural Hazard with potentially catastrophic outcomes
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

A.8.3. Risk Assessment Meeting Handouts for Public Meeting

City of Lakeport 2018/2019 Hazards

- Aquatic Biological Hazards: cyanobacterial bloom
- Aquatic Biological Hazards: quagga mussel
- Climate Change
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: (100/500 year)
- Flood: Localized/Stormwater
- Hazardous Materials Transportation
- Landslide and Debris Flows
- Levee Failure
- Seiche
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms
- Severe Weather: High Winds
- Volcanic and Geothermal Gas Release
- Wildfire

City of Lakeport Historic Hazard Worksheet (Past Occurrences)

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

| | | |
|--|---|--|
| Type of event | | |
| Nature and magnitude of event | | |
| Location | | |
| Date of event | | |
| Injuries | | |
| Deaths | | |
| Property damage | | |
| Infrastructure damage | | |
| Crop damage | | |
| Business/economic impacts | | |
| Road/school/other closures | | |
| Other damage | | |
| Insured losses | | |
| Federal/state disaster relief funding | | |
| Opinion on likelihood of occurring again | | |
| Source of information | | |
| Comments | | |
| | Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 5628 West Long Place Littleton, CO 80123 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com | |
| Prepared by: | | |
| Phone: | | |
| Email: | | |
| Date: | | |

A.8.4. Mitigation Strategy Meeting Handouts

These can be found in Appendix C of this Plan.

A.8.5. Final Meeting Handouts for HMPC

Items to Complete

| Page # | Section | Item |
|--------------|---------|---|
| 2-4 | 2.4 | Verify commercial base |
| 4-145, 4-147 | 4.2.19 | Other past wildfire info |
| 4-171 | 4.3.1 | Future populations |
| 4-176 | 4.3.1 | Disadvantaged populations; population projections |
| 4-252 | 4.3.12 | Landslide future development question |
| 4-276 | 4.4.1 | Fill out table |
| 4-292 | 4.4.2 | Fill out table |
| 4-293 | 4.4.3 | Fill out tables |
| 4-294 | 4.4.4 | Fill out tables |
| 5-10 | 5.4 | Need climate change action |
| Annex A-31 | A.7.2 | Need more actions. Need earthquake, drought, hazmat, and more wildfire. |
| App. A-1 | A.1 | Need the departments and titles column filled out |

A.8.6. Final Meeting Handouts for Public

CITY OF LAKEPORT Local Hazard Mitigation Plan (LHMP) FINAL PUBLIC MEETING

Hazards List

- Aquatic Biological Hazards: Cyanobacterial Bloom*
- Aquatic Biological Hazards: Quagga Mussel*
- Climate Change*
- Dam Failure*
- Drought and Water Shortage*
- Earthquake*
- Flood: (100/500 year)*
- Flood: Localized/Stormwater*
- Hazardous Materials Transportation*
- Landslide and Debris Flows
- Levee Failure
- Seiche
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat*
- Severe Weather: Heavy Rains and Storms*
- Severe Weather: High Winds*
- Volcanic and Geothermal Gas Release
- Wildfire*

*Priority Hazard

Mitigation Strategy: Goals

Goal 1: Minimize risk and vulnerability of Lakeport to hazards and protect lives and prevent losses to property, economy, and the environment

- Provide protection for existing and future development
- Provide protection for critical facilities, utilities, and services and minimize disruption
- Provide protection for public health and safety

Goal 2: Improve Lakeport's capabilities to plan for/prevent/mitigate hazard-related losses and to be prepared for, respond to, and recover from a disaster event

- Reduce the number of emergency incidents and disaster occurrences
- Improve local capacity to prepare for disasters
- Continued improvements to infrastructure, equipment, facilities, etc. to meet public safety needs
- Improve and maintain emergency communications for community residents and visitors
- Increase the use of shared resources, data sharing, mutual aid and jurisdictional cooperation
- Upgrade and maintain disaster/emergency plans, with a long-term focus to address changing community needs to prevent, minimize, and recover from disasters

- Develop/improve warning, evacuation, and sheltering procedures and information for residents, businesses, visitors, individuals with access and functional needs, and animals risk areas

Goal 3: Increase community outreach, education, and awareness of risk and vulnerability to hazards and promote preparedness and self-responsibility to reduce hazard-related losses

- Enhance hazard mitigation and preparedness programs
- Establish a Citywide public information program that utilizes a variety of outreach strategies and mechanisms to reach all Lakeport residents and visitors
- Inform and educate residents and businesses about all hazards they are exposed to, where they occur, what they can do to mitigate exposure or damages.

Goal 4: Increase and maintain wildfire prevention and protection in Lakeport

- Reduce the wildfire risk and vulnerability in Lakeport
- Focus on fuels/vegetation management throughout the community
- Improve coordination of mitigation efforts throughout the community

Goal 5: Improve community resiliency to flooding in Lakeport

- Reduce the flood risk and vulnerability in Lakeport
- Identify and implement development plan for City floodplains

Mitigation Strategy: Mitigation Actions

City of Lakeport

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|
| Multi-Hazard Mitigation Actions | | | | |
| Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan | Lakeport | X | X | |
| Action 2.Public Awareness, Education, Outreach, and Preparedness Program Enhancements. | Lakeport and LFPD | X | X | X |
| Action 3.EOP Update | Lakeport and LFPD | X | X | |
| Action 4.Establish Back Up Power/Generators for Critical Facilities | Lakeport and LFPD | X | X | |
| Action 5.Sirens Project - Community Warning System Designed to Ensure Sound Reaches all Incorporated Areas | Lakeport and LFPD | X | X | |
| Action 6.Continuity of Operations Planning | Lakeport | X | X | |
| Action 7.Training and Exercise | Lakeport and LFPD | X | X | |
| Action 8.Update Local Emergency Services Ordinance | Lakeport | X | X | |
| Action 9.Update Development Requirements for Undergrounding Utilities Associated with New Development | Lakeport | | | |
| Action 10. Mass Care Planning | Lakeport and LFPD | X | X | |
| Action 11. In Low-lying Flood-prone Areas Strengthen Base Under Pavement to Prevent Deterioration of Pavement/Asphalt Areas | Lakeport | X | X | X |
| Action 12. Establish a Post-Disaster Recovery Action Plan | Lakeport | X | X | |
| Aquatic Biological Hazards: Cyanobacterial Bloom Actions | | | | |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|
| Action 13. Install Water Aerators in Stagnant Areas | Lakeport | X | X | |
| Action 14. Establish Additional Testing Areas within Key Areas of the City (e.g., swimming area) and Training of Staff | Lakeport | | | |
| Action 15. Establish Nutrient Management Program; Consider Dredging, Paving Roads, Erosion Control, Runoff Basins, Sewer Collection Systems, Etc. | Lakeport | X | X | X |
| Aquatic Biological Hazards: Quagga Mussel Actions | | | | |
| Action 16. Quagga/Zebra Mussel Threat to Clear Lake: Enhance Public Education | Lakeport | X | X | |
| Action 17. Quagga Mussel Training | Lakeport | X | X | |
| Climate Change Actions | | | | |
| Action 18. | | | | |
| Dam Failure Actions | | | | |
| Action 19. WWTP Dam - Increase Reservoir Capacity | Lakeport and LFPD | X | X | X |
| Drought and Water Shortage Actions | | | | |
| Action 20. Implement Intertie Projects in Annexation Areas | Lakeport and LFPD | X | X | |
| Action 21. Adoption of State Model Water Efficiency Landscape Ordinance (MWELO) | Lakeport | | | |
| Earthquake Actions | | | | |
| Action 22. Develop and Implement Non-Structural Mitigation Program | Lakeport | X | X | |
| Action 23. Unreinforced Masonry (URM) and Soft Story Inventory and Retrofits | Lakeport | X | X | |
| Action 24. Retrofit 302 N Main St | Lakeport | X | X | |
| Flood Actions | | | | |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|
| Action 25. Flood Insurance Promotion | Lakeport | X | X | X |
| Action 26. Armor Streambeds & Lakefront | Lakeport | X | X | X |
| Action 27. Stormwater Projects: Box Culvert/Drainage Enhancements Multiple Areas | Lakeport | X | X | X |
| Action 28. Continue Headwall (Redirock) 100 feet to east from Main Street | Lakeport | X | X | X |
| Action 29. Evaluate and Mitigate Erosion Shoreline Erosion Impacts from High Winds/Wave Action (Possible Seawall) | Lakeport | X | X | X |
| Action 30. Safety Surfacing Library Park | Lakeport | X | X | X |
| Action 31. In Low-lying Flood-prone Areas Strengthen Base Under Pavement to Prevent Deterioration of Pavement/asphalt Areas | Lakeport | X | X | X |
| Action 32. Continuation of Sea Wall at Boat Ramp Parking (North of 5th to 3rd Street) | Lakeport | X | X | X |
| Action 33. Identify and Implement Drainage/Streambed Clearance Projects | Lakeport | X | X | X |
| Localized Flood Actions | | | | |
| Action 34. Enclose Open Ditches | Lakeport | X | X | X |
| Action 35. Stormwater Projects: Upsize Project Improvements to Provide More Volume to Increase Drainage Capacities | Lakeport | X | X | X |
| Action 36. Storm Drainage Related Flooding | Lakeport | X | X | X |
| Hazardous Materials Transport Actions | | | | |
| Action 37. Multi-Agency Spill Response Plan | Lakeport and LFPD | | | |
| Landslide and Debris Flows Actions | | | | |
| Action 38. | | | | |
| Severe Weather: Extreme Heat, Heavy Rains, Storms, and Winds Actions | | | | |

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP |
|--|--------------------------|-----------------------------|----------------------------|--------------------------------|
| Action 39. Heat Contingency Plan | Lakeport | | | |
| Wildfire Actions | | | | |
| Action 40. Defensible Space/ Fuel Reduction Projects | Lakeport and LFPD | X | X | |
| Action 41. Establish Goat Mitigation Plan | Lakeport and LFPD | X | X | |
| Action 42. Establish a Local Firewise Community | Lakeport and LFPD | X | X | |
| Action 43. Roofing/Eve Vent Retrofit and Adopt More Restrictive Wildfire Codes | Lakeport and LFPD | X | X | |

Lakeport Fire Protection District

| Action Title | Benefitting Jurisdiction | Address Current Development | Address Future Development | Continued Compliance with NFIP |
|---|--------------------------|-----------------------------|----------------------------|--------------------------------|
| Multi-Hazard Mitigation Actions | | | | |
| Action 44. Relocate and Replace Fire Station 50 | | X | X | |
| Earthquake and Landslide Actions | | | | |
| Action 45. | | | | |
| Hazardous Materials Actions | | | | |
| Action 46. | | | | |
| Floods, Localized Floods, Heavy Rains and Storms Actions | | | | |
| Action 47. | | | | |
| Wildfire Actions | | | | |
| Action 48. Community Wildfire Protection Plan | | X | X | |



Appendix B References

2008 Lake County Community Wildfire Protection Plan

2013 Lake County Drought Management Plan

2014 California Climate Adaptation Strategy

2017 Sulphur Fire WERT Report

2018 Lake County Local Hazard Mitigation Plan

2018 State of California Hazard Mitigation Plan

2018 State of California Multi-Hazard Mitigation Plan

Baynature.org Clear Lake Algae Problems (<https://baynature.org/article/satellites-to-the-rescue-for-clear-lake-algae-problems/>)

CAL FIRE

CAL FIRE GIS Datasets

Cal OES Dam Inundation Data

Cal-Atlas

Cal-DWR Disadvantage Community Mapping Tool

California Adaptation Planning Guide

California Department of Finance

California Department of Fish and Wildlife

California Department of Parks and Recreation Office of Historic Preservation

California Department of Water Resources Best Available Maps

California Department of Water Resources Division of Safety of Dams

California Division of Mines and Geology

California Geologic Survey

California Natural Diversity Database

California Natural Resource Agency

California State Water Resources Control Board

California's Adaptation Planning Guide: Understanding Regional Characteristics

California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources

California's Fourth Climate Change Assessment

California's Sustainable Groundwater Management Act

CalTrans Truck Network

City of Lakeport 2025 General Plan Background Report

City of Lakeport 2025 General Plan Land Use Element

City of Lakeport 2025 General Plan Safety Element

City of Lakeport Emergency Operations Plan

City of Lakeport General Plan

City of Lakeport General Plan Environmental Impact Report

City of Lakeport General Plan Safety Element

Climate Change and Health Profile Report – Lake County

Climate Institute

Climate.org website (<http://climate.org/algae-cyanobacteria-blooms-and-climate-change/>)

Federal Emergency Management Agency

FEMA - Understanding Your Risks—Identifying Hazards and Estimating Losses.

FEMA Disaster Declaration Database

FEMA Hazus 4.0

FEMA Lake County Digital Flood Insurance Rate Map 9/30/2005

FEMA Lake County Flood Insurance Study 9/30/2005

FEMA Lake County Flood Insurance Study 9/30/2005

FEMA Lake County Preliminary Flood Insurance Study 6/18/2014

FEMA Multi-Hazard Identification and Risk Assessment

FEMA National Flood Insurance Program

FEMA NFIP Data for Lakeport

Final Clear Lake Watershed Sanitary Survey 2012 Update

Harmful Cyanobacteria Blooms and Their Toxins in Clear Lake and The Sacramento-San Joaquin Delta

HMPC input

Intergovernmental Panel on Climate Change

Lake County 2008 General Plan

Lake County Assessor's Data

Lake County Climate and Health Profile Report

Lake County Emergency Operations Plan

Lake County GIS

Lake County News: *Updated U.S. Volcanic Threat Assessment puts Clear Lake Volcanic Field in 'high' risk category.* October 28, 2018.

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NASA

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National Climate Assessment

National Drought Mitigation Center

National Drought Mitigation Center Drought Impact Reporter

National Integrated Drought Information System

National Interagency Fire Center

National Levee Database

National Oceanic and Atmospheric Administration

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National Weather Service

NOAA Storm Prediction Center

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University of California, Santa Cruz

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US Census Bureau

US Environmental Protection Agency

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Western Regional Climate Center

World Health Organization



Appendix C Mitigation Strategy

City of Lakeport Local Hazard Mitigation Plan Mitigation Strategy Meetings April 2 & 3, 2019

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AGENDA

City of Lakeport Local Hazard Mitigation Plan (LHMP) Mitigation Strategy Meetings April 2 & 3, 2019

HMPC Meeting #3:

1. Introductions
2. Status of the DMA Planning Process
3. Risk Assessment Status
4. Develop Plan Goals and Objectives
5. Identify and discuss Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

1. Introductions
2. Identify and discuss Mitigation Alternatives/Actions/Projects
3. Review Mitigation Selection Criteria
4. Prioritize Mitigation Projects
5. Review of Schedule/Data Needs

Mitigation Strategy Meetings

Day 1

Hazard Identification & Profiles

| Hazard | Geographic Extent | Likelihood of Future Occurrences | Magnitude / Severity | Significance | Climate Change Influence |
|--|-------------------|----------------------------------|----------------------|--------------|--------------------------|
| Aquatic Biological Hazards: cyanobacterial bloom | Significant | Highly Likely | Critical | High | Medium |
| Aquatic Biological Hazards: quagga mussel | Significant | Highly Likely | Critical | High | Low |
| Climate Change | Extensive | Likely | Limited | Medium | – |
| Dam Failure | Limited | Unlikely | Critical | Medium | Medium |
| Drought and Water Shortage | Extensive | Likely | Critical | High | High |
| Earthquake (major/minor) | Extensive | Unlikely/Highly Likely | Catastrophic | Medium | Low |
| Flood: 1%/0.2% Annual Chance | Significant | Likely | Critical | High | Medium |
| Flood: Localized/Stormwater | Significant | Highly Likely | Limited | Medium | Medium |
| Hazardous Materials Transport | Significant | Likely | Critical | Medium | Low |
| Landslide and Debris Flows | Limited | Highly Likely | Limited | Medium | Medium |
| Levee Failure | Limited | Unlikely | Negligible | Low | Low |
| Seiche | Limited | Unlikely | Limited | Low | Low |
| Severe Weather: Extreme Cold and Freeze | Extensive | Likely | Limited | Low | Medium |
| Severe Weather: Extreme Heat | Extensive | Highly Likely | Limited | Medium | High |
| Severe Weather: Heavy Rains, Snow, and Storms | Extensive | Highly Likely | Limited | Medium | Medium |
| Severe Weather: High Winds | Extensive | Highly Likely | Critical | Medium | Low |
| Volcano and Geothermal Gas Release | Extensive | Unlikely/ Highly Likely | Critical | Low | Low |
| Wildfire | Extensive | Highly Likely | Catastrophic | High | High |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Geographic Extent</p> <p>Limited: Less than 10% of planning area</p> <p>Significant: 10-50% of planning area</p> <p>Extensive: 50-100% of planning area</p> <p>Likelihood of Future Occurrences</p> <p>Highly Likely: Near 100% chance of occurrence in next year, or happens every year.</p> <p>Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.</p> <p>Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.</p> <p>Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.</p> </div> <div style="width: 65%;"> <p>Magnitude/Severity</p> <p>Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths</p> <p>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</p> <p>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</p> <p>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</p> <p>Significance</p> <p>Low: minimal potential impact</p> <p>Medium: moderate potential impact</p> <p>High: widespread potential impact</p> <p>Climate Change Influence:</p> <p>Low: minimal potential impact</p> <p>Medium: moderate potential impact</p> <p>High: widespread potential impact</p> </div> </div> | | | | | |

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 90% 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: City of Lakeport

Aquatic Biological Hazards: Cyanobacterial Bloom

- Cyanobacteria (blue green algae) is becoming an increasingly significant hazard in Clear Lake. Cyanobacteria can produce toxins that can be harmful for animals and people when consumed at high levels.
- Cyanobacterial bloom is an annual event in Clear Lake. The severity of it varies by year. Biologists predict that this phenomenon is likely to recur for an unknown period of time. Although research has demonstrated only low levels of cyanotoxins to date, the risk for toxin production in algal blooms is known to vary widely with time and location.
- DETAILS ON PAST OCCURRENCES, EXTENT, IMPACTS/CONCERNS TO THE CITY?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Aquatic Biological Hazards: Quagga Mussel

- Quagga and zebra mussels are an invasive non-native species that breed very fast, have no known predators, and can quickly colonize new areas within California waters. Once established, these mussels can clog water intake and delivery pipes, dam intake gates and pipes, adhere to boats, pilings, and most hard and some soft substrates.
- While Quagga Mussels have not been found in Clear Lake, they have been found during boat inspections in the County/City?
- ANY UNIQUE ISSUES/IMPACTS/CONCERNS TO THE CITY?
- Likelihood of Future Occurrence: Likely
- Vulnerability: High
- Priority Hazard

Climate Change

- The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- In Lakeport, each year it seems to get a bit warmer and snow seems to start at higher levels. Rain events also seem to be of greater intensity.
- ANY HMPC INPUT ON CLIMATE CHANGE ISSUES IN LAKEPORT?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal OES and National Performance of Dam's data, there are 21 dams in Lake County constructed for flood control, storage, electrical generation, and recreational purposes. Of these, 11 are high hazard, 4 are significant hazard, and 6 are low hazard.
- Dams of concern to the City includes only one dam: Lakeport Wastewater Treatment Plant Dam, owned by the City.
- ARE THERE ANY PAST OCCURRENCES OF DAM FAILURES/DESCRIBE INUNDATION AREA?
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High?
- Priority Hazard

Drought and Water Shortage

- Historical drought data for the Lakeport planning area and region indicate there have been 5 significant droughts in the last 84 years.
- Since 2012, snowpack levels in California had dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. However, snowpack levels increased in 2016 and in 2017 snowpack levels were the highest they've been in 22 years. However, drought has started to creep back in to the Northern California area.
- 2 disaster declarations (1977 and 2014) for Lake County since 1950. There have been 15 NCDC drought events in Lake County. All of these were for the 2014-2016 drought, but no damages, injuries, or losses were reported in the NCDC database.
- WHAT HAS BEEN IMPACTED THE MOST? WHAT IS THE PRIMARY SOURCE OF WATER AND HOW HAS WATER SUPPLY BEEN AFFECTED IN THE CITY?
- Likelihood of Future Occurrence: Likely – Drought; Occasional – Water Shortage
- Vulnerability: Medium
- Priority Hazard

Earthquake

- Within the past 200 years, no major earthquakes have occurred along faults in Lake County. The San Andreas fault and the Healdsburg fault, 30 and 15 miles away, respectively are two significant faults of concern to the City. Both of these faults have been responsible for moderate to major seismic events in the past. The maximum earthquake magnitudes observed to date are 8.5 for the San Andreas fault and 6.75 (Richter Scale1) for the Healdsburg fault.
- Throughout Lake County there are several small active faults, with most centered in the Cobb Mountain area. Minor earthquakes occur almost daily in the south county geothermal fields near the geysers influenced region.
- The poorly consolidated younger alluvium that occupies valley floor areas of the county near Clear Lake basin are considered to have high to very high potential for liquefaction.
- The U.S. Geological Survey (USGS) issues National Seismic Hazard Maps as reports that provide acceleration and probabilities for various time periods. This data indicates that the expected severity of earthquakes in the region is moderate to high.

- There have been no disaster declarations in the County. No major earthquakes have been recorded within the County and City; although the City has felt ground shaking from earthquakes with epicenters located elsewhere.
- WERE THERE ISSUES/DAMAGES IN THE CITY FROM THE HISTORICAL EARTHQUAKES? DO CITY BUILDINGS NEED TO BE EVALUATED FOR EARTHQUAKE RETROFITS? IS THERE A URM INVENTORY?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Likely – minor earthquake
- Vulnerability: Medium
- Priority Hazard

Flood Hazards

100/500 year

- Historically, portions of Lakeport have always been at risk to flooding because of its annual percentage of rainfall in the winter, the proximity to Clear Lake and local streams and drainages. The 2014 Preliminary FIS noted that flooding in the planning area results from prolonged heavy rainfall over tributary areas during the period from November through March.
- Of the 22 state and 23 federal declarations from 1950-present– 14 state and 15 federal declarations were for severe winter weather, storms, heavy rains, or flooding. Flooding is an ongoing issue for the planning area.
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS. CHECK EOC ACTIVATIONS. PROVIDE RESULTS OF PA WORKSHEETS POST FLOOD EVENTS.
- Likelihood of Future Occurrence: 100-Occasional; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the City – occurs annually.
- IDENTIFY LOCALIZED FLOODING PROBLEM AREAS. PROVIDE DETAILS ON PAST OCCURRENCES IN THESE AREAS? PICTURES/DESCRIPTIONS. PROVIDE RESULTS OF PA WORKSHEETS POST FLOOD EVENTS.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Hazardous Materials Transport

- Most of the hazardous materials transported through and near the Lakeport is carried by truck on the State Highways. Other roads are used as needed for local deliveries.
- In Lakeport, hazardous materials routes include Highways 29, 175 buffer zone near City.
- KEY AREAS OF CONCERN WITHIN THE CITY INCLUDE?
- NEED INFORMATION ON PAST OCCURRENCES THAT AFFECTED THE CITY.

- The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's (PHMSA) tracks transportation incidents: 9 incidents have happened in transport since 1987; 5 of these at 1275 Craig Ave - UPS
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Landslides and Debris Flows

- There have been no disaster declarations associated with landslides in Lake County. The NCDC contains no records of landslides.
- The Lakeport GP noted : Landslides are a significant geologic constraint to development in the Lakeport Planning Area. The landslide potential of an area is a function of the area's hydrology, geology, and seismic characteristics. Clay soils, which underlie many hillsides in Lakeport are particularly susceptible to sliding. Although landslides generally occur in areas with steep slopes, they may occur on slopes with a grade of 20% or less in geologically unstable areas.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES – BOTH SLOPED AREAS WITHIN THE CITY AND AREAS THAT MIGHT BE AFFECTED BY LANDSLIDING FROM AREAS WITHIN THE COUNTY?
- CAN THE CITY PROVIDE INFORMATION ON PAST LANDSLIDE EVENTS?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Levee Failure

- Agricultural and engineer levees exist throughout the County. However, there are no levees in or near Lakeport that protect the City or would affect the City if they failed.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Extremely Low
- Non-Priority Hazard

Severe weather

Extreme Cold and Freeze

- Annual occurrences of cold temperatures. Lowest recorded daily extreme was 9°F on Dec 9, 1972. In a typical year, maximum temperatures fall below 32°F on 75.5 days, with no days falling below 0°F.
- Only 1 extreme heat event (NCDC) from 1993-2018; No state or federal disaster declarations
- PLEASE PROVIDE DETAILS ON EXTREME COLD AND FREEZE EVENTS IN THE CITY. ISSUES/CONCERNS/IMPACTS
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Low
- Non-Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures. The highest recorded daily extreme was 114°F on June 30, 1977. In a typical year, maximum temperatures exceed 90°F on 77.5 days.
- Only 1 extreme heat event (NCDC) from 1993-2018; No state or federal disaster declarations
- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS IN THE CITY. ISSUES/CONCERNS/IMPACTS
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy rains, snow, and storms

- Significant County/City history: annual occurrences. Snow extremely rare.
- The NCDC data recorded 78 hail, heavy rains, and storms events for Lake County since 1950.
- There have been 15 federal declarations since 1950 for flooding and severe storms.
- PLEASE PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS IN THE CITY.
- Severe storms/heavy rains are the primary cause of most major flooding
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

High Winds

- Significant County/City history: annual occurrences
- The NCDC data recorded 13 high wind events for Lake County since 1950.
- PLEASE PROVIDE DETAILS ON HIGH WIND EVENTS IN THE CITY.
- High winds exacerbate wildfires
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard?

Seiche

- A seiche is a standing wave oscillating in a body of water. A seiche occurring in Clear Lake, is possible, but one causing significant damage to shorelines and developed areas is remote. Causes of a seiche include earthquake activity and landslides, debris flows into the lake.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: Medium
- Non-Priority Hazard

Volcano

- Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Clear Lake volcano is the closest, with last significant activity 10,000 years ago.
- The area has intense geothermal activity, caused by a large, still hot silicic magma chamber about 14 km wide and 7 km beneath the surface. The area has numerous geothermal sources and mineral springs

that release (potentially harmful) gases through surface vents. Hydrogen sulfide, carbon dioxide and methane gases leach out from underground magma through hot springs and during volcanic activity.

- Numerous recent events of geothermal gas releases. BUT DOES THIS AFFECT THE CITY?
- SIGNIFICANT PAST OCCURRENCES? MAJOR ISSUES? PROBLEM AREAS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Non-Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Lakeport Planning Area
- Numerous named fires causing a variety of damages and impacts throughout the County and Cities.
- Any ignition has the potential to become an out of control wildfire.
- 10 federal disaster declarations for Wildfire since 1950 in the County; 8 of these since 2012
- FOR THE 8 FEDERAL DISASTER DECLARATION FIRES SINCE 2012, CAN YOU PROVIDE INFORMATION SPECIFIC TO THE CITY ON: AREA AFFECTED, STRUCTURES LOST, DAMAGES, IMPACTS, EVACUATIONS, CLOSURES ETC.
- WHICH FIRES HAVE IMPACTED LAKEPORT? HOW?
- The City's #1 Natural Hazard with potentially catastrophic outcomes
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

City of Lakeport Priority Hazards

- Aquatic Biological Hazards: cyanobacterial bloom
- Aquatic Biological Hazards: quagga mussels
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake
- Flood: 1%/0.2% annual chance
- Flood: Localized/Stormwater
- Hazardous Materials Transport
- Landslide, Mud, and Debris Flows
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds
- Wildfire

Non-Priority Hazards:

- Severe Weather: Freeze and Cold
- Levee Failure
- Seiche
- Volcano/Geothermal gas release

Mitigation Strategy: Goals

The most important element of the LHMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

1. Mitigation Goals
2. Mitigation Actions
3. Action (Implementation) Plan

Mitigation Goals

Up to now, the HMPC has been involved in collecting and providing data for the City of Lakeport Local Hazard Mitigation Plan. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of the Lakeport planning area to identified hazards and includes an assessment of the area's current capabilities for countering these threats through existing policies, regulations, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals will lead us to incorporating these improvements into the Mitigation Strategy portion of the plan. Our planning goals should provide direction for what loss reduction activities can be undertaken to make the planning area more disaster resistant.

Mitigation Goals are general guidelines that represent the community's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation cost, schedule, and means are not considered. Goals are public policy statements that:

- Represent basic desires of the jurisdiction;
- Encompass all aspects of planning area, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.

Goals statements will form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.

The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.

Finally, before we formulate our goals, we should discuss other planning area goals from other regional/county/city programs and priorities. This keeps us from "reinventing the wheel," as well as being consistent with Multi-Objective Management --- or "MOM" --- where communities strive for efficiency by combining projects/needs that are similar in nature or location. Utilizing "MOM" effectively can result in

identifying multiple sources of funding that can be “packaged” and broadening the supporting constituency base by including “outcomes” desired by various stakeholder groups.

Types/Sources of other area mitigation plans and programs include:

- General Plans
- Stormwater Program and Plans
- Flood/Watershed Management Plans and Studies
- Drought Plans
- Community Wildfire Protection Plans
- Strategic Fire Plans
- Dam Emergency Action Plans
- Emergency Operations Plans
- Climate Adaptation Plans
- Other?

Sample Goals from other Plans

Goals from the 2018 California State Hazard Mitigation Plan

1. Significantly reduce life loss and injuries.
2. Minimize damage to structures and property, as well as minimizing interruption of essential services and activities.
3. Protect the environment.
4. Promote community resilience through integration of hazard mitigation with public policy and standard business practices.

Goals from the City of Lakeport 2025 General Plan, 2009

Land Use Element

OBJECTIVE LU5: To develop a long-term solution to issues regarding the supply, storage, and distribution of potable water to protect the health, safety, and welfare of lakeport residents and improve the economic stability of the community.

OBJECTIVE LU7: o develop and maintain a storm drainage system which ensures the safety AND WELFARE OF RESIDENTS, VISITORS AND PROPERTY IN LAKEPORT.

Safety Element

OBJECTIVE S1: To protect the community from injury, loss of life and property damage resulting from natural catastrophes and any hazardous conditions relating to seismic, geologic, and flooding hazards.

OBJECTIVE S2: To reduce the impact of pollution as well as hazardous materials and hazardous waste on the well-being and health of the community.

OBJECTIVE S3: To maintain an effective emergency response system.

OBJECTIVE S3: Reduce the risk of damage and destruction from wild land fires.

Objective SA 1.4: Reduce the risk of loss of life, personal injury and damage to property resulting from seismic hazards.

Goal SA 3: A community with low impact risk of hazardous materials on its well-being and health.

Objective SA 3.1: Protect public health from the hazards associated with the transportation, storage and disposal of hazardous wastes.

Goal SA 4: An effective emergency response system.

Objective SA 4.1: Build local capacity to prepare for disasters and coordinate with other regional stakeholders.

Objective SA 4.2: Establish essential emergency relief facilities that will function adequately in the event of a disaster.

Objective SA 4.4: Inform the public of what actions to take in the event of an emergency or disaster.

Objective SA 4.4: Designate emergency evacuation routes to provide a means to evacuate the community

Lake County Community Wildfire Protection Plan (CWPP), 2009: Purpose

- To identify priority projects that reduce risks and hazards from wildfire while protecting conservation values in Lake County. Goals are to be achieved principally through prioritization and implementation of fuel hazard reduction, fire safety, community education, and fire-protection projects and activities.
- To provide community priorities for conservation-based fuel reduction on public lands, and to provide community direction for federal land management in Lake County.
- To provide conservation-based, fire-safety educational information to residents of Lake County.
- To provide a positive balance among fire prevention, conservation, and wildlife protection.
- To coordinate fire protection strategies across property boundaries, including evacuation planning and preparation.
- To encourage the integration of private land management goals with community needs and expectations for fire safety.
- To create ecologically sustainable biomass utilization and removal projects within Lake County.
- To provide a guiding document for future actions of the Lake County Fire Safe Council, land management agencies, private landowners, and local emergency service providers.
- To provide a guiding document for governmental agencies in developing fire safe practices and policies.
- To meet the requirements under the National Fire Plan and other government funding sources.

Goals Development

You will each be given 3 sticky notes. On each note you will write what you think the goals for this mitigation planning effort should be. To get you started, provided below are possible goals for this mitigation plan. You may reword these or develop your own. These goal statements should serve as examples. It is vital that our Hazard Mitigation Planning Committee establish its own goals. Use one note card for each goal. The purpose of the goal development is to reach a consensus on plan goals.

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 200/500-year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of technology

When done, we will:

- Pin/tape them to the wall/easel-chart and arrange them by category
- Combine and reword them into 3-4 goals for the plan.

Mitigation Strategy Meetings Day 2

Mitigation Strategy: Actions

Mitigation Actions are specific projects and activities that help achieve the goals and accomplish risk reduction in the community.

Categories of Mitigation Measures

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
 - ✓ Subdivision regulations
 - ✓ Building Codes
 - Fire-Wise Construction
 - ✓ Floodplain development regulations
 - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
 - ✓ NOAA Weather Radio
 - ✓ Sirens
 - ✓ “Reverse 911” (Emergency Notification System)
- Emergency Response
 - ✓ Evacuation & Sheltering
 - ✓ Communications
 - ✓ Emergency Planning
 - Activating the EOC (emergency management)
 - Closing streets or bridges (police or public works)
 - Shutting off power to threatened areas (utility company)
 - Holding/releasing children at school (school district)
 - Ordering an evacuation (mayor)
 - Opening emergency shelters (Red Cross)
 - Monitoring water levels (engineering)
 - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)

- ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
- ✓ Lifeline Utilities Protection
- Post-Disaster Mitigation
- Building Inspections
 - ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- Retrofitting/disaster proofing
 - ✓ Floods
 - Wet/Dry floodproofing (barriers, shields, backflow valves)
 - Relocation/Elevation
 - Acquisition
 - Retrofitting
 - ✓ High Winds/Tornadoes
 - Safe Rooms
 - Securing roofs and foundations with fasteners and tie-downs
 - Strengthening garage doors and other large openings
 - ✓ Winter Storms
 - Immediate snow/ice removal from roofs, tree limbs
 - “Living” snow fences
 - ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
 - Anchoring, bracing, shear walls
 - Dewatering sites, agricultural practices
 - Catch basins
 - ✓ Drought
 - Improve water supply (transport/storage/conservation)
 - Remove moisture competitive plants (Tamarisk/Salt Cedar)
 - Water Restrictions/Water Saver Sprinklers/Appliances
 - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
 - Create incentives to consolidate/connect water services
 - Recycled wastewater on golf courses
 - ✓ Wildfire, Grassfires
 - Replacing building components with fireproof materials
 - Roofing, screening
 - Create “Defensible Space”
 - Installing spark arrestors
 - Fuels Modification

- ✓ Noxious Weeds/Insects
 - Mowing
 - Spraying
 - Replacement planting
 - Stop overgrazing
 - Introduce natural predators

➤ Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the naturally beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices

Best management practices (“BMPs”) are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground’s surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project’s design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

4. Avoidance: setting construction projects back from the stream.
5. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
6. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained

- Dumping Regulations
- Set-back regulations/buffers

- Fuels Management
- Water Use Restrictions
- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they “stop” flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Strategy: Action Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation action(s) and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Term Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- Does measure address area with highest risk?
- Does measure protect ...
 - ✓ The largest # of people exposed to risk?
 - ✓ The largest # of buildings?
 - ✓ The largest # of jobs?
 - ✓ The largest tax income?
 - ✓ The largest average annual loss potential?
 - ✓ The area impacted most frequently?

- ✓ Critical Infrastructure (access, power, water, gas, telecommunications)
- Timing of Available funding
- Visibility of Project
- Community Credibility

Mitigation Action Prioritization Instructions

Our Team recommendations are listed on flip-chart paper around the room.

You each have 3 sets of colored dots:

- 3 red dots
- 3 blue dots
- 3 green dots

The red dots are for high priority (5 points each)

The blue dots are for medium priority (3 points each)

The green dots are for low priority (1 point each)

Place your dots on the recommendations, using the different colors to indicate your priority. You may use as many of your dots, of any color, on any recommendation --- or you may spread them out using as few of your dots as you wish. The dots will indicate the consensus of the team.

Use your list of criteria to help you make your determinations.

After the totals are counted, we will discuss them further to confirm or change any of the results as we see fit.

Mitigation Action Worksheet

| | |
|---|--|
| Jurisdiction: | |
| Mitigation Action/Project Title: | |
| Hazards Addressed: | |
| Issue/Background: | |
| Project Description: | |
| Other Alternatives: | |
| Existing Planning Mechanism(s) through which Action Will Be Implemented: | |
| Responsible Office/Partners: | |
| Cost Estimate: | |
| Benefits (Losses Avoided): | |
| Potential Funding: | |
| Timeline: | |
| Project Priority: | |

| | |
|--------------------------------|--|
| Worksheet completed by: | |
| Name and Title: | |
| Phone: | |

Lakeport
Local Hazard Mitigation Plan
Mitigation Strategy Meetings: Mitigation Actions v/1
March 2 &3, 2019

| Responsible Department/ Staff | Mitigation Action Title | Hazards Addressed | Points/ Worksheet Status |
|-------------------------------|---|--|--------------------------|
| | Public awareness, education, outreach, and preparedness program enhancements for all hazards (multi-media, educate and clarify various emergency systems, messaging and training; promote self- responsibility) | Multi-hazard | 30 |
| | Incorporate LHMP Update by reference through council adoption into the safety element of the General Plan | Multi-hazard | N/A* |
| | Sirens Project – Assessment of system and ensure sound reaches all areas/map areas of coverage | Multi-hazard | 29 |
| | Alert and Warning Program Enhancement/Education | Multi-hazard | 2 |
| | Update and maintain EOP with all annexes | Multi-hazard | 32 |
| | Establish emergency training and exercise program for key personnel | Multi-hazard | 14 |
| | Evacuation planning and signage for all hazards; include establishment of sheltering in place requirements. and refuge areas | Multi-hazard | 39 |
| | Mass Care planning to include establishment of refuge areas (at risk populations, medical, ADA, animals, and with outreach components) | Multi-hazard | 20 |
| | Identification of vulnerable populations | Multi-hazard/ | 3 |
| | Continuity of Operations Planning | Multi-hazard | |
| | Recovery Planning | Multi-hazard | N/A* |
| | Ham Radio Group coordination and integration into ER planning | Multi-hazard | 9 |
| | Establish backup power/generators for critical facilities | Multi-hazard | 32 |
| | Evaluate and update local emergency services ordinance | Multi-hazard | 22 |
| | Establish nutrient management program; consider dredging, paving roads, erosion control, runoff basins, sewer collection systems, etc. | Aquatic Biologic Hazards: Cyanobacteria | N/A |
| | Establish additional testing areas within key areas of the City (e.g., swimming area) and training of staff | Aquatic Biologic Hazards: Cyanobacteria | 4 |
| | Install water aerators in stagnant areas | Aquatic Biologic Hazards: Cyanobacteria | 10 |
| | Enhance Public Education (additional signage, water bill info, cross training of staff) | Aquatic Biologic Hazards: Quagga Mussels | 3 |

| Responsible Department/ Staff | Mitigation Action Title | Hazards Addressed | Points/ Worksheet Status |
|-------------------------------|--|--|--------------------------|
| | Establish permanent boat inspection and washing/decontamination station at 5 th street boat washing station | Aquatic Biologic Hazards: Quagga Mussels | 1 |
| | WWTP Dam – increase pond storage | Dam Failure | 3 |
| | Enforce MELO ordinance | Drought & Water Supply | 1 |
| | Establish reclaimed water lines (purple pipe) for irrigation of parks and other City areas | Drought & Water Supply | 1 |
| | Implement intertie projects in annexation areas | Drought & Water Supply | 2 |
| | Development and implementation of Integrated Regional Water Management Plan | Drought & Water Supply | N/A |
| | URM and soft story inventory and retrofits | Earthquake | 6 |
| | Retrofit 302 N. Main Street | Earthquake | 0 |
| | Develop/implement non-structural mitigation program | Earthquake | 1 |
| | Update and implement stormwater master plan | Flood | 5 |
| | Remapping of storm drain improvement project areas | Flood | 15 |
| | Flood insurance promotion | Flood | 1 |
| | Identify and implement drainage/streambed clearance projects | Flood | 17 |
| | Treatment Plant reservoir – replace and repair I & I issues/increase storage area of reservoir | Flood | 13 |
| | Armor stream beds | Flood | 12 |
| | Stormwater projects: box culvert/drainage enhancements multiple areas | Flood | 18 |
| | Stormwater projects: Upsize project improvements to provide more volume to increase drainage capacities | Flood | 15 |
| | Enclose open ditches | Flood | 12 |
| | Continue Headwall (readyrock wall) 100 feet to east from Main street | Flood | 11 |
| | Forbes Creek Brush Clearance work with Fish and Game | Flood | 9 |
| | Continuation of sea wall | Flood/high winds | 23 |
| | In low-lying flood-prone areas strengthen base under pavement to prevent deterioration of pavement/asphalt areas | Flood | 9 |
| | Replace surfacing of playground in floodprone area to permanent surface | Flood | 14 |
| | Elevation projects (single family/multi-units) repetitive loss and other areas | Flood | 1 |
| | Develop Heat Contingency Plan with options for cooling center, transportation, public education | Extreme Heat | 10 |

| Responsible Department/ Staff | Mitigation Action Title | Hazards Addressed | Points/ Worksheet Status |
|-------------------------------|--|---|--------------------------|
| | Update development requirements for new development (residential and commercial) to underground utilities | Heavy Rains and Storm, High Winds | 0 |
| | Develop /enhance formalized tree trimming program in conjunction with PG&E. Evaluate need for Tree Ordinance | Heavy Rains and Storm, High Winds Wildfire | 7 |
| | Evaluate and mitigate erosion shoreline erosion impacts from high winds/wave action (seawall?) | High Winds | 11 |
| | Develop a multi-agency spill response plan | Hazardous Materials Transportation | 0 |
| | Relocate and replace fire station 50 | Earthquake/ Wildfire/ Local Flood | 33 |
| | Upgrades to water delivery systems, lines, and storage tanks (upgrade pipes to 1 inch for fire retrofit) | Drought/ Wildfire | 10 |
| | Expansion of water system to annexation areas | Drought/ Wildfire | 10 |
| | Develop CWPP for local City/District areas | Wildfire | 17 |
| | Establish local Firewise communities | Wildfire | 15 |
| | Debris clearance/defensible space projects in ROW areas with Caltrans (Hwy 29/ other areas?) | Wildfire | 7 |
| | Establish goat mitigation project | Wildfire | 6 |
| | City/District defensible space projects | Wildfire | 20 |
| | City/District fuel modification projects | Wildfire | 4 |
| | Roofing (Eve Vent) retrofit project (ember prevention) | Wildfire | 1 |
| | Adoption of more restrictive building/fire codes | Wildfire | 5 |

*N/A – scoring is not applicable; project added after mitigation strategy meetings



Appendix D Adoption Resolution

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by the participating jurisdictions and added to this appendix. A model resolution is provided below:

Resolution # _____

Sample Resolution: City of Lakeport

Adopting the City of Lakeport Local Hazard Mitigation Plan

Whereas, the City of Lakeport recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Lakeport fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the City of Lakeport Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the City of Lakeport desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the City of Lakeport Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the City of Lakeport, demonstrates the jurisdiction’s commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimacies the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the City of Lakeport adopts the City of Lakeport Local Hazard Mitigation Plan as an official plan; and

Be it resolved, that the City of Lakeport adopts the City of Lakeport Local Hazard Mitigation Plan by reference into the safety element of their general plan in accordance with the requirements of AB 2140, and

Be it further resolved, the City of Lakeport will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirements of AB 2140.

Passed: _____
(date)

Certifying Official

Sample Resolution: Lakeport Fire Protection District

Resolution # _____

Adopting the City of Lakeport Local Hazard Mitigation Plan

Whereas, (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, (Name of Government/District/Organization) fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Colusa County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Colusa County Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the (Name of Government/District/Organization), demonstrates the jurisdiction’s commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Colusa County Local Hazard Mitigation Plan as an official plan; and

Be it further resolved, (Name of Government/District/Organization) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan’s final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

Passed: _____
(date)

Certifying Official



Appendix E Critical Facilities

Table E-1 City of Lakeport – Critical Facility Inventory

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|------------------------------------|------------------------------------|----------------------|---|---------------------------|-------------------|--------------------------|---|---|
| At Risk Population Facilities | Assisted Living | Evergreen Lakeport Health Care | 1291 Craig Avenue | High | High | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Assisted Living | Rocky Point Care Center | 625 16th Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| At Risk Population Facilities | Assisted Living Senior Apt Complex | Sunshine Manor | 2031 Giselman Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Child Care | Head Start Pre-School Center | 2548 Howard Avenue | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Child Care | Head Start Pre-School Center (EHS) | 896 Lakeport Blvd | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | School | Clear Lake High School | 350 Lange Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| At Risk Population Facilities | School | Lakeport Continuation School | 455 S. Forbes Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | School | Lakeport Elem School | 150 Lange Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|--------------------|-------------------------------|------------------------|---|---------------------------|-------------------|--------------------------|---|---|
| At Risk Population Facilities | School | Mendo-Lake Comm College | 1005 Parallel Drive | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | School | Natural High School | 100 Lange Street | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| At Risk Population Facilities | School | Terrace School | 250 Lange Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| At Risk Population Facilities | Senior Apt Complex | Bella Vista Apt Complex | 1075 Martin Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Senior Apt Complex | Bevins Court Apartments | 958 Bevins Court | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Senior Apt Complex | Lakeview Apartments | 525 Bevins Street | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Senior Apt Complex | Martin Street Apartments | 1255 Martin Street | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| At Risk Population Facilities | Senior Apt Complex | Sunshine Manor | 2031 Giselman Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Animal | Main Street Veterinary Clinic | 2530 S. Main Street | High | Moderate | Zone X (unshaded) | HWY 29 | N | Y |
| Essential Services Facilities | Commerce | Brunos Shopmart | 355 Lakeport Boulevard | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|------------------|-----------------------------|---------------------|---|---------------------------|-------------------|--------------------------|---|---|
| Essential Services Facilities | Commerce | CVS | 949 11th Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Commerce | Fairgrounds | 401 Martin Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Commerce | Grocery Outlet | 1155 S. Main Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Commerce | Kmart | 2019 S. Main Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Commerce | Mendo Mill | 2465 S. Main Street | High | High | Zone X (unshaded) | HWY 29 | Y | Y |
| Essential Services Facilities | Commerce | Safeway Lakeport | 1071 11th Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Communications | Central Dispatch | 1373 Hoyt Avenue | High | Moderate | Zone D (unmapped) | HWY 29 | N | N |
| Essential Services Facilities | Communications | KNTI - Radio | 140 N. Main Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Communications | KXBX - Radio | 2190 S. Main Street | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Community Center | Community Center (Proposed) | 500 N. Main Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|----------------------------|--|----------------------|---|---------------------------|-------------------|--------------------------|---|---|
| Essential Services Facilities | Construction - Engineering | City of Lakeport - Public Works Yard | 591 Martin Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Fire - Rescue | Lakeport Fire - Station 50 | 445 N. Main Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Government | City Hall | 225 Park Street | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| Essential Services Facilities | Government | City of Lakeport - Courthouse | 255 N. Forbes Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Government | Department of Public Health | 922 Bevins Court | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Government | DMV | 965 Parallel Drive | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Government | Lakefront Public Park | 200 Park Street | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| Essential Services Facilities | Government | USPS | 1151 11th Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Law | Lake County OES Fire Emergency Operations Center | 1375 Hoyt Avenue | High | Moderate | Zone D (unmapped) | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|------------------|--|------------------------|---|---------------------------|-------------------|--------------------------|---|---|
| Essential Services Facilities | Law | Lakeport Police Station | 2025 S. Main Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Law | Sheriff Administration | 1220 Martin Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Law | Sheriff Main Station | 1220 Martin Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Adventist Health Clinic | 800 11th Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Davita Dialysis Treatment Center (current) | 800 11th Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Davita Dialysis Treatment Center (planned) | 244 Peckham Court | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Northlake Pharmacy | 347 Lakeport Boulevard | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Sutter Family Clinic | 987 Parallel Drive | High | High | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Tribal Health | 925 Bevins Court | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Clinic | Tribal Health Pediatrics | 359 Lakeport Boulevard | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|--------------------|----------------------------------|-------------------------|---|---------------------------|-------------------|--------------------------|---|---|
| Essential Services Facilities | Medical - Clinic | Ukiah Valley Rural Health Center | 487 S. Main Street #122 | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Medical - Hospital | Sutter Lakeside Hospital | 5176 Hill Road | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Ashe St Lift Station | 1949 Lakeshore Blvd | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | C Street Lift Station | 36 C Street | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Clearlake Ave Lift Station | 15 Clearlake Avenue | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Lakeport Blvd Lift Station | 1015 S. Main Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Lakeport Lagoons Lift Station | 1800 S. Main Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Larrecou Lane Lift Station | 591 Martin Street | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Linda Lane Lift Station | 695 Linda Lane | High | High | Zone X (unshaded) | HWY 29 | N | Y |
| Essential Services Facilities | Pump Stations | Martin Street Lift Station | 591 Martin Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|-------------------------------|------------------------|---|---------------------|---|---------------------------|-------------------|--------------------------|---|---|
| Essential Services Facilities | Pump Stations | Pier 1900 Lift Station | 1900 S. Main Street | High | Urban Unzoned | Zone AO | HWY 29 | N | N |
| Essential Services Facilities | Pump Stations | Rose Avenue Lift Station | 80 Rose Avenue | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Senior Activity Center | Lakeport Senior Center | 527 Konocti Avenue | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Sewer Treatment Plant | City of Lakeport - Sewer Treatment Plant | 795 Linda Lane | High | High | Zone X (unshaded) | HWY 29 | N | Y |
| Essential Services Facilities | Transportation | Lakeport USD Transportation Department | 2503 Howard Avenue | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Water Intake | City of Lakeport - Water Intake | 23 K Street | High | Urban Unzoned | Zone AE | HWY 29 | N | N |
| Essential Services Facilities | Water Storage | City of Lakeport - Ground Water Storage Tanks (2) | 1832 Riggs Road | High | Non-Wildland/Non-Urban | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Water Storage | City of Lakeport - Surface Water Storage Tank | 590 Konocti Avenue | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |

| Facility Category | Facility Type | Name | Address | Landslide Incidence and Susceptibility Area | Fire Hazard Severity Zone | DFIRM Flood Zone | Hazardous Material Route | Inundated from WWTP Dam Breach Scenario - North | Inundated from WWTP Dam Breach Scenario - North |
|--------------------------------|-----------------------|--|---------------------|---|---------------------------|-------------------|--------------------------|---|---|
| Essential Services Facilities | Water Treatment Plant | City of Lakeport - Water Treatment Plant | 590 Konocti Avenue | High | Urban Unzoned | Zone X (unshaded) | HWY 29 | N | N |
| Essential Services Facilities | Water Wells | City of Lakeport - Well | 1604 Riggs Road | High | Non-Wildland/Non-Urban | Zone X (unshaded) | HWY 29 | N | N |
| Hazardous Materials Facilities | Hazardous Material | Mendo-Lake Home Respiratory Services | 843 Parallel Drive | High | High | Zone X (unshaded) | HWY 29 | N | N |
| Hazardous Materials Facilities | Hazardous Material | Suburban Propane | 2255 S. Main Street | High | Moderate | Zone X (unshaded) | HWY 29 | N | N |

Source: City of Lakeport GIS



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