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2021 SAFETY ELEMENT UPDATE

DRAFT
October 2021





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Prepared By:

PlaceWorks

101 Parkshore Drive, Suite 112

Folsom, California 95630

t 916.245.7500



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1. INTRODUCTION

PURPOSE, SCOPE, AND CONTENT

The Safety Element conveys the City of Marysville's (City's) goals, policies, and actions to minimize the hazards to safety in and around Marysville. It identifies the natural and human-caused hazards that affect existing and future development and provides guidelines for protecting residents, employees, visitors, and other community members from injury and death. It describes present and expected future conditions and sets policies and standards for improved public safety. The Safety Element also seeks to minimize physical harm to the buildings and infrastructure in and around Marysville to reduce damage to local economic systems, community services, and ecosystems.

Some degree of risk is inevitable because the potential for many disasters cannot be completely eliminated and the ability to predict such disasters is limited. The goal of the Safety Element is to reduce the risk of injury, death, property loss, and other hardships to acceptable levels.

The Safety Element serves the following functions:

- Develops a framework by which safety considerations are introduced into the land use planning process.
- Facilitates the identification and mitigation of hazards for new development, and thus strengthens existing codes, project review, and permitting processes.
- Presents policies directed at identifying and reducing hazards in existing development.
- Strengthens earthquake, flood, inundation, and wildland fire preparedness planning and post-disaster reconstruction policies.
- Identifies how hazards are likely to increase in frequency and intensity in the future and provides policies to increase community resilience.

REGULATORY FRAMEWORK

Under state law, all counties and incorporated communities in California must prepare a General Plan, which must address several topics, one of which is public health and safety. The Safety Element addresses this topic in accordance with state requirements, which are laid out in California law, particularly Section 65302(g) of the California Government Code. State law requires that the Safety Element address the following:

- Protect the community from risks associated with a variety of hazards, including seismic activity, landslides, flooding, and wildfire, as required by the California Government Code Section 65302(g)(1).

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- Map and assess the risk associated with flood hazards, develop policies to minimize the flood risk to new development and essential public facilities, and establish effective working relationships among agencies with flood protection responsibilities, as required by California Government Code Section 65302(g)(2).
- Map and assess the risk associated with wildfire hazards, develop policies to reduce the wildfire risk to new land uses and essential facilities, ensure there is adequate road and water infrastructure to respond to wildfire emergencies, and establish cooperative relationships between wildfire protection agencies, as required by California Government Code Section 65302(g)(3).
- Assess the risks associated with climate change on local assets, populations, and resources. Note existing and planned development in at-risk areas and identify agencies responsible for providing public health and safety and environmental protection. Develop goals, policies, and objectives to reduce the risks associated with climate change impacts, including locating new public facilities outside of at-risk areas, providing adequate infrastructure in at-risk areas, and supporting natural infrastructure for climate adaptation, as required by California Government Code Section 65302(g)(4).
- Identify residential developments in any hazard area identified that do not have at least two emergency evacuation routes, as required by California Government Code Section 65302(g)(5).

RELATIONSHIP TO THE OFFICE OF EMERGENCY SERVICES

The Yuba County Office of Emergency Services (OES), part of the County Executive Administrator's Office, is responsible for providing emergency management services for the City of Marysville. Working with the City of Marysville, as well as the Marysville Fire Department and Marysville Police Department, OES helps to support and implement emergency mitigation and preparation activities in the city, secures resources for first responders, and coordinates with state and federal emergency agencies. Yuba County OES coordinates all emergency management between public safety and service providers.

RELATIONSHIP TO OTHER DOCUMENTS

The Marysville Safety Element does not exist in a vacuum but is instead one of several plans that address public safety and related topics. The Safety Element must be consistent with these other plans to minimize conflicts between documents and ensure that the City has a unified strategy to address public safety issues. The Safety Element incorporates information, technical analyses, and policies from these other documents where appropriate to help support this consistency.

Other General Plan Elements

The Safety Element is one of several elements of the Marysville General Plan. Other social, economic, political, and aesthetic factors must be considered and balanced with safety needs. Rather than compete with the policies of related elements, the Safety Element provides policy direction and designs safety improvements that complement the intent and policies of other General Plan elements. Crucial relationships exist between the Safety Element and the other General Plan elements. Several issues tie the elements together, including how land uses are determined in areas prone to natural hazards, what regulations limit

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development in these areas, and how hazards are mitigated for existing development. For instance, Land Use Element diagrams and policies must consider the potential for various hazards identified in the Safety Element and must be consistent with the policies to address those hazards. The Open Space Element is also closely tied to the Safety Element. Floodplains, for example, are not only hazard areas, but often serve as sensitive habitat for threatened or endangered species or provide recreation or passive open space opportunities for residents and visitors. As such, flood and inundation policies balance the need to protect public health and safety with the need to protect habitat and open space. Safety Element policies, especially those concerning evacuation routes and critical facilities, must also be consistent with those of the Circulation Element. The City's Circulation Plan routes are considered the backbone routes for evacuation purposes. Policies and information in this Safety Element should not conflict with those in other elements.

Yuba County Multi-Jurisdictional Local Hazard Mitigation Plan

Yuba County's Multi-Jurisdictional Local Hazard Mitigation Plan (MHMP) is a plan to identify and profile hazard conditions, analyze risk to people and facilities, and develop mitigation actions to reduce or eliminate hazard risks in Yuba County and in incorporated jurisdictions in the county. It was developed in accordance with the Disaster Mitigation Act of 2000 and followed the Federal Emergency Management Agency's (FEMA's) Local Hazard Mitigation Plan guidance. During the planning and development of the MHMP, the County partnered with several planning team members, including the City of Marysville. The mitigation actions in the MHMP include both short-term and long-term strategies and involve planning, policy changes, programs, projects, and other activities. The MHMP and the Safety Element address similar issues, but the Safety Element provides a higher-level framework and set of policies, and the MHMP focuses on more specific mitigation actions. The MHMP, as its name implies, focuses on mitigation-related actions; the Safety Element also includes policies related to emergency response, recovery, and preparation activities.

The MHMP incorporates a process where hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed to reduce or eliminate hazard risk. The implementation of these mitigation actions, which include both short- and long-term strategies, involve planning, policy changes, programs, projects, and other activities. The most recent version of Yuba County's MHMP can be found online at: https://www.yuba.org/departments/emergency_services/multi-hazard_mitigation.php.

Relationship to the Community Wildfire Protection Plan

The Yuba County Foothills Community Wildfire Protection Plan (CWPP) was published in 2014 and was developed for the Yuba County Watershed Protection and Fire Safe Council in collaboration with interested local parties and land management agencies. It provides a snapshot of current wildfire protection challenges and capabilities, identifies and prioritizes areas for hazardous fuel reduction, and recommends types and methods of vegetation management that may help protect the affiliated communities from wildfire losses.

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CLIMATE CHANGE VULNERABILITY

Changes to the global climate system are expected to affect future occurrences of natural hazards in and around Marysville. Many hazards that already affect Marysville—including high heat, extreme storms, wildfire, drought, and flooding—are projected to become more frequent and more intense in coming years and decades. In some cases, these trends have already begun. According to California’s *Statewide Summary Report: Fourth Climate Change Assessment*,¹ Marysville can expect the following changes to climate-related hazard events:

- Both droughts and floods are expected to become more frequent as precipitation is expected to occur in fewer, more intense storms due to climate change. Although Marysville is likely to experience little change in overall precipitation levels from climate change, the region is also expected to see an increase in the number of extreme precipitation events. As a result, floods are expected to occur more often in Marysville and climate change may expand the parts of the city that are considered flood-prone. Climate change is expected to increase the frequency and severity of droughts that cause soil to dry out and condense. During droughts, water levels in aquifers may also decline as groundwater is dependent on recharge from infiltration of precipitation. Groundwater is the sole source of water supply for Marysville. The water level that supplies wells in the city would also decrease. Well pumping would affect the total water supply as water pumped would likely exceed the rate aquifers are recharged by precipitation or other underground flow. When precipitation does return, more water runs off the surface rather than being absorbed into the ground, which can lead to floods. Warmer temperatures are expected to increase the rate of snowmelt in the Sierra during spring, which may also contribute to greater flooding at that time of year. This shift in snowmelt timing, coupled with the fact that precipitation will become more likely to fall as rain instead of snow, may reduce water availability later in the year, increasing the risk of drought in the late summer and autumn.
- Warmer temperatures are projected to cause an increase in extreme heat events, which in Marysville is a day with a high temperature of at least 105 degrees Fahrenheit (°F). Depending on future greenhouse gas (GHG) emission levels, the countywide number of extreme heat days is expected to rise from a historical average of 4 annually to up to between 20 and 34 days by the middle of the century (2041 to 2060), and to as high as between 46 and 58 by the end of the century (2070 to 2099). In addition to increases in extreme heat events, Marysville is expected to see an increase in the average daily high temperatures. Extreme heat poses a significant human health risk, especially to senior citizens, outdoor workers, and persons who do not have access to adequate cooling, including people experiencing homelessness. Some buildings and infrastructure systems may be damaged by very high temperatures, constraining their ability to meet community needs.

¹ Bedsworth, Louise, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja. (California Governor’s Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission). 2018. *Statewide Summary Report. California’s Fourth Climate Change Assessment*. Publication number: SUMCCCA4-2018-013.

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- Climate change can increase the rates of infection for various diseases because many of the animals that carry diseases are more active during warmer weather. There are a number of diseases that are linked to climate change and can be harmful to the health of Marysville community members, such as hantavirus pulmonary syndrome, Lyme disease, West Nile fever, and influenza. Many of these diseases are carried by animals, such as mice and rats, ticks, and mosquitos, which are usually seen as pests even if they do not cause infections. Warmer temperatures earlier in the spring and later in the winter can cause these animals to be active for longer periods, increasing the time that these diseases can be transmitted.
- Although wildfire risk in Marysville is low, hotter, drier weather is expected to lead to an increase in wildfires in the surrounding area and across Yuba County. Average annual acres burned by wildfires in Yuba County are projected to increase from 2,830 to 3,720 acres by midcentury and 5,540 acres by the end of the century. Across the region, more frequent and intense wildfires may also create poor air quality for Marysville. Significant regional wildfires may also displace residents in surrounding communities, which could result in those residents seeking temporary refuge in the city.
- Severe weather events, such as strong storms and high winds, may become more frequent and intense due to climate change. Climate change is expected to cause an increase in intense rainfall, which is usually associated with strong storm systems. Heavy rainfall may also contribute to an increased risk of landslides along the riverbanks of the Feather and Yuba Rivers. In Yuba County, most severe weather is linked to high winds. The types of dangers posed by severe weather vary widely and include injuries or deaths, damage to buildings and structures, fallen trees, roads blocked by debris, and fires sparked by lightning.

Vulnerability Assessment Results

Under California law, the Safety Element is required to include a vulnerability assessment that looks at how people, buildings, infrastructure, and other key community assets may be affected by climate change. The City conducted a Climate Change Vulnerability Assessment in spring of 2021, to analyze Marysville's susceptibility to climate-related hazards. The City of Marysville's Vulnerability Assessment, prepared in accordance with the most recent available guidance in the *California Adaptation Planning Guide*², assesses how nine different climate-related hazards (agricultural and ecosystem pests, air quality, drought, extreme heat, flooding, human health hazards, landslides, severe weather, and wildfire) may affect 67 different population groups and community assets. Each population or asset received a score of V1 (minimal vulnerability) to V5 (severe vulnerability) for each climate-related hazard. The Climate Change Vulnerability Assessment indicates that Marysville's populations and assets are most vulnerable to flooding, extreme heat, severe weather, and wildfire.

² https://resources.ca.gov/CNRALegacyFiles/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf

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Based on the Vulnerability Assessment prepared by PlaceWorks and communication with City staff, populations in Marysville tend to be vulnerable to extreme heat, human health hazards, severe weather, flooding, and declines in air quality, which directly affect health outcomes. As discussed previously, the most sensitive communities include outdoor workers, households in poverty, persons experiencing homelessness, and seniors living alone. Sensitive populations, especially those located on single-access roads, are also highly vulnerable to hazards, such as severe weather and flooding as well as indirect damage from ecosystem pests and diseases that can weaken trees and cause them to fall on properties.

Citywide, energy delivery is vulnerable to multiple hazards, including severe weather, such as high winds that can trigger public safety power shutoff (PSPS) events, extreme heat that reduces the capacity and strains the system, and wildfires that damage the system, ultimately disrupting energy service. These conditions can damage communication infrastructure, decreasing network capacity. There may be a higher demand for communication services during severe weather, potentially putting stress on the network and increasing the risk of service interruptions. Furthermore, energy delivery services, specifically electricity delivery, is subject to harm during extreme heat events. Extreme heat can lead to power outages by causing mechanical failure of grid equipment, heat damage to power lines, and by creating a high demand for electricity to power air conditioners, all of which place stress on the network. This is likely to lead to greater service disruptions.

PSPS events can also create vulnerabilities for Marysville community members. The vast majority of homes and businesses do not have backup power supplies, so a loss of electricity can cause a loss of refrigeration for food and medical supplies, limited cooking, limited or no heating or cooling (particularly dangerous during extreme heat or cold events), no lighting, and limited or no access to the Internet or other information systems. Many businesses are forced to close during a PSPS event, causing economic hardships and depriving community members of important services, such as grocery stores, gas stations, and banks/ATMs. PSPS events may also be harmful to people who depend on electrically powered medical devices. Some property owners have purchased backup power generators; however, these produce high levels of noise, pollution, and odors.

The City's water and wastewater treatment services may be impacted by flood events, which may damage water infrastructure and interrupt service. Increased flooding in the city may also impact the operation of railways, roads, and bridges, as well as electrical substations and transmission lines. Although the city is protected by a levee, evacuation routes would be greatly impacted from a significant flood event.

Although the scale of agriculture in Marysville is limited and small relative to other communities in the county, Marysville's agricultural industry is vulnerable to drought, flooding, extreme heat, and severe weather. Floods and severe weather can heavily harm or kill crops or livestock and damage infrastructure, reducing agricultural yields and necessitating costly repairs. Drought can reduce the amount of water available and raise water prices, reducing agricultural profits and/or requiring that farmers change their irrigation methods. Extreme heat can damage a number of different crops and can result in widespread animal illnesses or even death of livestock. As a result, agricultural yields and the cost of operations will likely be affected and impact local economies.

An increase in ecosystem pests and diseases, droughts, extreme heat, and wildfire create higher vulnerability for the Marysville's natural environments, including grassland, forest, woodland, and aquatic ecosystems. Drought and extreme heat can stress trees, weakening or killing a variety of native species and habitats. Droughts may imperil aquatic ecosystems. Although woodland and grassland in the region are adapted to infrequent, low-intensity wildfire, many native species are still vulnerable to large and intense

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wildfire events. Moreover, grasslands pose an extreme risk due to their high, easily ignitable fuel loads and the invasion of non-native species has greatly increased the risk of severe wildfire events. Ecosystem pests, such as bark beetles, have increased due to drought and higher temperatures that impact tree health and make them more vulnerable to pests and diseases. Such pests can decimate woodland habitats and these species may not be able to recover.

The Safety Element includes goals, policies, and implementation measures to increase community resilience and help lower vulnerability scores, particularly for the populations and assets that received a score of V4 or V5 in the Vulnerability Assessment. A full list of the Vulnerability Assessment results can be found in **Appendix A**.

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2. EXISTING CONDITIONS

This section outlines the existing and likely future hazardous conditions and other public safety issues in Marysville, including:

- Seismic and geologic hazards
- Flood and inundation hazards
- Fire hazards (urban and wildland)
- Agriculture and ecosystem hazards
- Hazardous materials management
- Public safety and emergency management
- Drought
- Extreme heat
- Severe weather

This section provides details pertaining to probable locations each hazard or issue is likely to occur (per availability of data), past notable events in and around Marysville, agencies responsible for providing protection from these public safety issues, and other background information required by California Government Code Section 65302(g)(4). Goals and policies are identified following the discussion of each hazard identified, and implementation measures that support one or more of the Safety Element policies are provided in Table S-1 at the end of this Safety Element.

The results of the Vulnerability Assessment are integrated into the hazards discussions for the public safety issues previously mentioned.

SEISMIC AND GEOLOGIC HAZARDS

Seismic and geologic hazards are risks caused by the movement of different parts of the Earth's crust or surface. Seismic hazards include earthquakes and hazardous events caused by them. Geologic hazards are other hazards involving land movements that are not linked to seismic activity and are capable of inflicting harm to people or property.

Seismic Hazards

Seismic activity causes pressure to build up along a fault, and the release of pressure results in ground shaking. This shaking itself is known as an earthquake. Earthquakes can also trigger other hazards, including surface rupture (cracks in ground surface), liquefaction (causing loose soil to lose its strength), landslides (damage to levees), and subsidence (sinking of the ground surface). Factors that affect the severity of damage and injury from an earthquake include the location of the earthquake epicenter, its magnitude, the time of day, and local construction materials and practices.

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Marysville is in an area of relatively low seismic activity and is not in a highly active fault zone. Nearby faults are primarily inactive and include faults of the Foothills Fault System, running south-southeastward near Loma Rica, Browns Valley, and Smartville. The Foothills Fault System includes the Prairie Creek Fault Zone, the Spenceville Fault, and the Swain Ravine Fault. These faults would have the greatest potential for damaging buildings in Marysville, especially the unreinforced masonry structures and structures built before 1960 without adequate anchorage of framing and foundations. No Alquist-Priolo Earthquake Fault Zones³ are located in the city. Regional faults are illustrated in **Figure 1**.

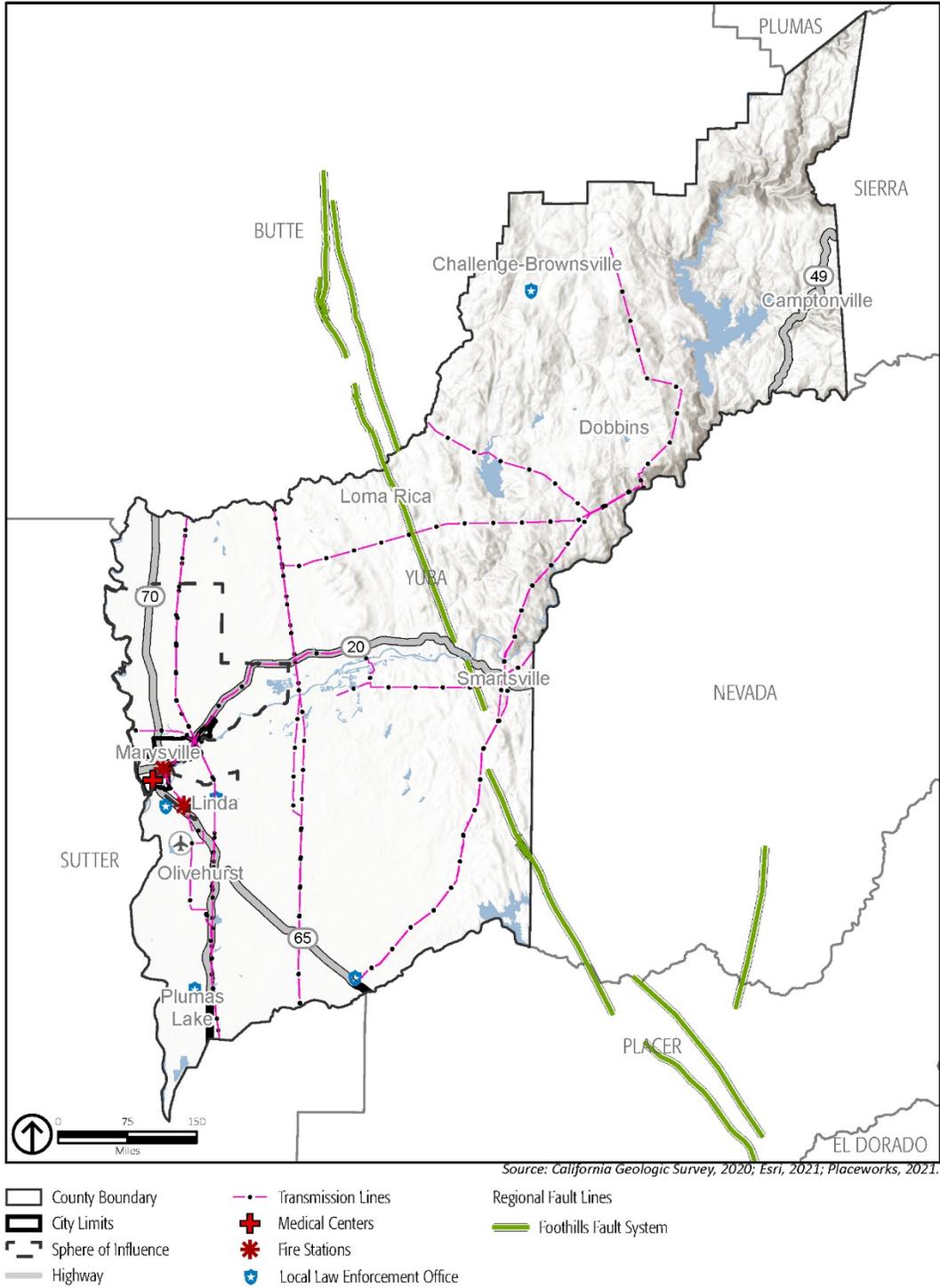
In the event of a major earthquake in the region, critical damage may occur to public and private buildings, homes, and structures, including those that provide emergency services (hospitals, fire stations, schools, emergency shelters) and essential services and infrastructure, such as roads and utility lines for water, gas, telephone, sewer, and storm drainage. Earthquakes could also damage the levees that provide critical flood protection to the city, which would require emergency repairs. Access and continuity of services may be interrupted, and services could be offline for extended periods. Damage to essential and critical structures require special attention in the public safety programs of the City. According to the City, there are many buildings that are known to be constructed of unreinforced masonry dating back to the 1850s. In a recent list of historic resources compiled by the City, 42 buildings were identified as being constructed of brick. It is assumed that many more unreinforced masonry buildings exist within the city since not all properties were ground-checked, and the list only represents historic properties and does not include properties outside of the corporate limits.

In addition to the direct physical damage that can result from the motion of the earthquake, damage can result from liquefaction and earthquake-induced fire. Liquefaction occurs where water-logged soils near the ground surface lose compaction during strong ground motion. This can cause building foundations to shift and can result in significant structural damage. Soils susceptible to liquefaction are typically found in areas of low-lying, current, or former floodplains. Portions of the city within or directly adjacent to the floodplains of the Feather and Yuba Rivers are areas of the greatest peak ground acceleration. These areas are likely to experience the strongest shaking during an earthquake event, which could result in severe liquefaction.

³ Alquist-Priolo Earthquake Fault Zones are regulatory zones surrounding the surface traces—a line on the Earth’s surface defining a fault—of active faults in California.

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FIGURE 1: REGIONAL FAULT LINES



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Geologic Hazards

Geologic hazards, such as landslides and erosion, depend on the geologic composition of the area. Landslides and rock falls may occur in sloped areas, especially areas with steep slopes, and usually in areas of loose and fragmented soil. Landslides, rockfalls, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results. They often occur as a consequence of seismic activity or heavy rainfall, either of which may cause slopes to lose structural integrity and slide. There are predictable relationships between local geology and landslides, rockfalls, and debris flows. Slope stability is dependent on many factors and interrelationships, including rock type, pore water pressure, slope steepness, and natural or human-made undercutting. Due to the level or nearly level terrain of the city, landslides are not a hazard of significant concern in Marysville.

In Marysville, landslides would be minor and likely be limited to banks along the Feather and Yuba Rivers where slopes are greater. However, landslides could also occur on the levees that provide critical flood protection to the city. Levees would need to be monitored and quickly repaired if damaged. **Figure 2** illustrates areas in Marysville that are most susceptible to landslides. These areas are concentrated primarily along the riverbanks and would avoid city infrastructure and buildings.

Marysville is susceptible to hazards related to erosion, or the geological process in which earthen materials are worn away and transported by natural forces such as water or wind, causing the soil to deteriorate. Eroded topsoil can be transported into streams and other waterways. Water erosion is the removal of soil by water and transportation of the eroded materials away from the point of removal. The severity of water erosion is influenced by slope, soil type, soil water storage capacity, nature of the underlying rock, vegetation cover, and rainfall intensity and period. The impact of soil erosion on water quality becomes significant, particularly as soil surface runoff. Highly erosive soils can damage roads, bridges, buildings, and other structures.

Expansive soils have a significant amount of clay particles that can give up water (shrink) or take on water (swell). The change in volume exerts stress on buildings and other loads placed on these soils. The occurrence of these soils is often associated with geologic units having marginal stability. Soils having high shrink-swell potential are common in the floodplains of the Feather River.

Soil liquefaction occurs when loosely spaced, water-logged sediments at or near the ground surface lose their strength in response to strong ground shaking. The soils most susceptible to liquefaction are clean, uniformly graded, loose, saturated, fine-grained soils. Earthquake can transform this granular soil material into a fluidlike substance similar to quicksand. Liquefaction potential varies across the county. Areas paralleling the Feather River, which contain clean sand layers with low relative densities and a relatively high water table, are estimated to have generally high liquefaction potential. Granular layers underlying certain areas in the Sacramento Valley have higher relative densities and thus have moderate liquefaction potential. Clean layers of granular materials older than the Holocene era are of higher densities and thus have low liquefaction potential.

The California State Hazard Mitigation Plan identifies volcanoes as one of the hazards that can adversely impact the state. However, there have been few losses in California from volcanic eruptions. Of the approximately 20 volcanoes in the state, only a few are active and pose a threat. Of these, Lassen Peak is the closest to the city, approximately 90 miles north of Marysville. While the city could be affected by a volcanic eruption, the damage resulting from a volcanic event would likely not be severe.

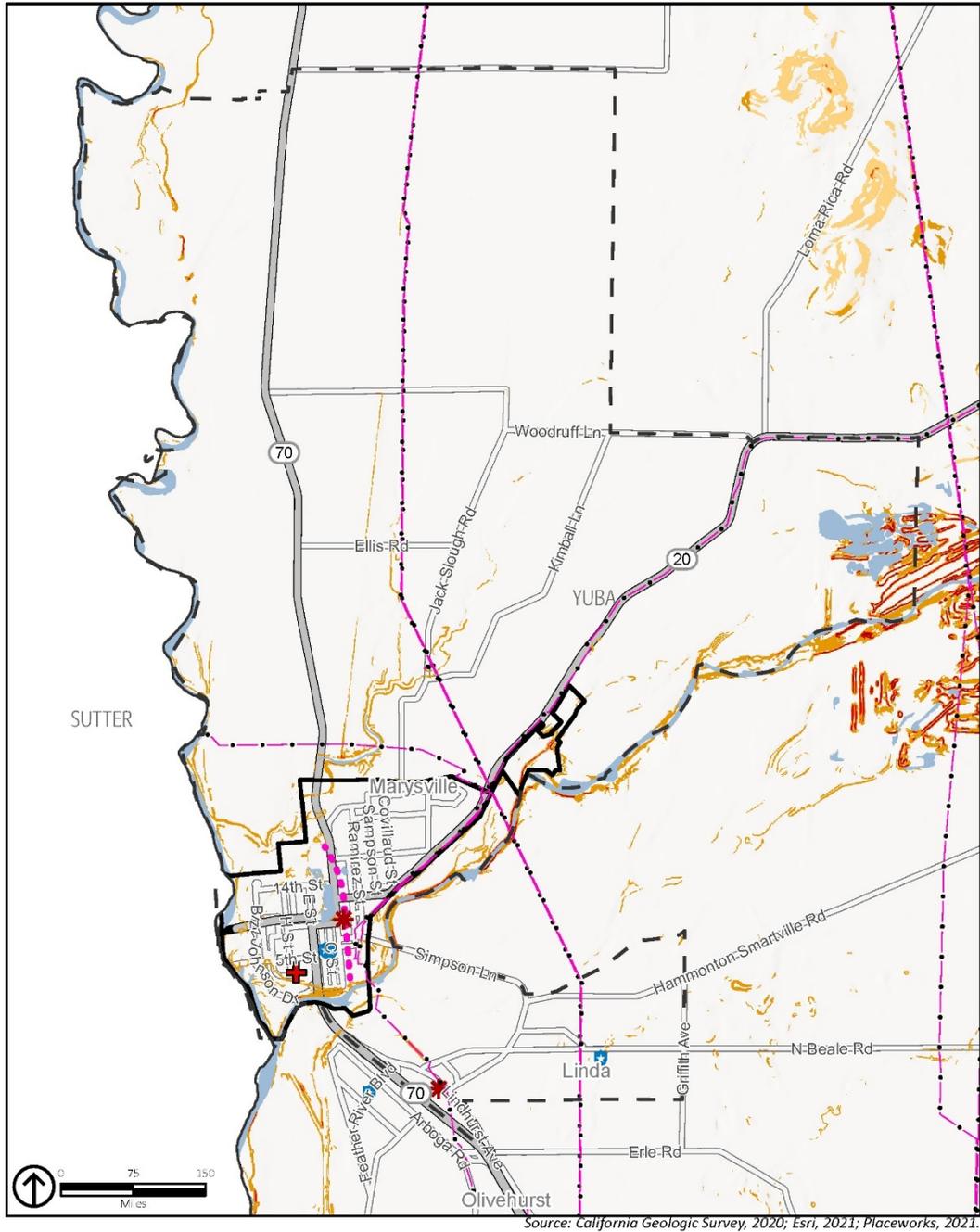
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The Sutter Buttes are the closest inactive volcanic features in the vicinity. According to the U.S. Geological Survey, the volcanic spires of the Sutter Buttes tower 2,000 feet above the farms and fields of the Central Valley, approximately 11 miles northwest of Marysville. The only volcano within the Central Valley is the Sutter Buttes and consists of a central core of volcanic domes surrounded by a large apron of fragmental volcanic debris. The Sutter Buttes are not part of the Cascade Range of volcanoes to the north, but instead are related to the volcanoes in the Coast Ranges to the west in the vicinity of Clear Lake, Napa Valley, and Sonoma Valley. Eruptions at the Sutter Buttes occurred in early Pleistocene time, 1.6 to 1.4 million years ago. Therefore, the Sutter Buttes are considered inactive and not likely to erupt.

Volcanic eruptions are usually preceded by weeks to months of precursory unrest, which manifests as ground deformation, earthquake swarms, and gas emissions. By monitoring the signals of unrest, scientists can make accurate eruption forecasts. Steam blasts commonly produce pits or craters. Explosive eruptions, which may create fiery flows of hot ash, are usually followed by the pushing up of a lava dome. Some less violent eruptions only produce lava flows. Volcanic eruptions typically last longer than other types of natural hazard events; the long duration of these events can tax emergency response and recovery efforts. Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away.

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FIGURE 2: LANDSLIDE SUSCEPTIBILITY



Source: California Geologic Survey, 2020; Esri, 2021; Placeworks, 2021.

- | | | | | | | | | | | | |
|---|--|---|--|---|---|--|--|--|--|---|--|
| <ul style="list-style-type: none"> County Boundary City Limits Sphere of Influence Highway | <ul style="list-style-type: none"> Transmission Lines PG&E High Pressure Gas Line + Medical Centers * Fire Stations + Local Law Enforcement Office | <p style="margin: 0;">Landslide Susceptibility Classes</p> <table border="0" style="width: 100%; font-size: small;"> <tr> <td style="width: 33%;"> 0</td> <td style="width: 33%;"> VI</td> <td style="width: 33%;"> IX</td> </tr> <tr> <td> III</td> <td> VII</td> <td> X</td> </tr> <tr> <td> V</td> <td> VIII</td> <td></td> </tr> </table> | 0 | VI | IX | III | VII | X | V | VIII | |
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Past Occurrences

Major earthquakes are rare in Marysville, but minor earthquakes do occur. Landslides are also rare in Marysville because of the city's flat terrain. The Lassen region, the volcanic region closest to Marysville, has been volcanically active for more than three million years. Its most recent eruptive activity occurred at Lassen Peak between 1914 and 1917. The Cascade Range volcanic chain has a long history of geologic activity that includes both earthquakes and volcanic eruptions. Volcanoes in the Cascade Range volcanic chain have erupted often over the past 40,000 years. Over the past 4,000 years, several eruptions have occurred at various sites along the Cascade Range volcanic chain at intervals ranging from 20 to 1,000 years, including the 1980 eruption of Mount St. Helens and the 1915 eruption of Lassen Peak.

Potential Changes to Geologic and Seismic Risk in Future Years

Likelihood of Future Occurrence

Geologic Risk

Geologic risks, such as landslides, are rare occurrences in Marysville. With significant rainfall, additional failures are likely in landslide hazard areas and minor landslides along riverbanks will likely occur when heavy precipitation occurs.

Seismic Risk

Earthquakes are likely to continue to occur on an occasional basis and are likely to be small. They may cause no substantive damage and may not even be felt by most people. Major earthquakes are rare, but a possibility in the region. No major earthquakes have been recorded within the city, although the city has felt ground shaking from earthquakes with epicenters located elsewhere. The probability that a strong earthquake will occur within the city is lower than in areas near the San Andreas Fault and the eastern Sierra Nevada. If serious shaking does occur, newer construction is in general more resistant to earthquakes than older construction because of improvements in building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motion.

Volcanic Activity Risk

Volcanoes in the Lassen area tend to erupt infrequently and may be inactive for periods lasting centuries or even millennia. The most recent eruptions in the Lassen area were the relatively small events that occurred at Lassen Peak between 1914 and 1917. However, the geologic history of the Lassen area indicates that volcanism there is episodic, having periods of relatively frequent eruptions separated by long, quiet intervals.

Climate Change and Geologic and Seismic Hazards

While climate change is unlikely to increase earthquake frequency or strength, the threats from seismic and geologic hazards are expected to continue. Climate change may result in precipitation extremes (i.e., wetter rainfall periods and drier dry periods). While total average annual rainfall may not change significantly, rainfall may be concentrated in more intense precipitation events. Heavy rainfall could cause an increase in the number of landslides or make landslides larger than normal. Increased wildfire frequency can destabilize hillsides due to loss of vegetation and change in soil composition, which can contribute to greater runoff

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and erosion. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour, is likely to cause more mudslides and landslides. Climate change is not anticipated to have a significant effect on the frequency or intensity of volcanic events.

POLICIES

GOAL CS-1: **Avoid the loss of life and injury and minimize property damage from seismic and related geological hazards.**

POLICY CS-1 The City shall require development projects to implement applicable state and local building code requirements, including structural and seismic safety measures, to reduce risks associated with seismic events and unstable or expansive soils.

POLICY CS-2 The City shall require erosion and sediment control plans that meet City standards for preventing increased discharge of sediment for:

- Projects that propose to grade more than 10,000 square feet of area having a slope greater than 10 percent;
- Clearing and grubbing areas of one acre or more regardless of slope;
- Projects where more than 2,500 square feet will be inadequately protected from erosion during any portion of the rainy season;
- Projects that involve grading will occur within 50 feet of any watercourse and levees; or
- Where the City determines that the grading will or may pose a significant erosion or sediment discharge hazard for any reason.

POLICY CS-3 The City shall require that grading activities be designed, per City standards, to avoid obstructing or impeding the natural flow of stormwaters, causing accelerated erosion or aggravating any existing flooding condition.

POLICY CS-4 The City shall require that peak off-site stormwater discharge from projects with engineered grading do not exceed pre-construction conditions unless the applicant demonstrates that downstream stormwater conveyance systems have sufficient capacity to handle the increased flow rate without exceeding established design standards, subject to City approval.

POLICY CS-5 The City shall require that grading activities and land disturbance are conducted such that the smallest practicable area of erodible land is exposed at any one time.

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- POLICY CS-6** The City shall require that grading activities preserve natural features, including vegetation, terrain, watercourses, and similar resources, wherever feasible.
- POLICY CS-7** The City shall continue to require that alterations to existing buildings and all new buildings be built according to the seismic requirements of the California Building Standard Code to reduce risks to structures and lives from seismic shaking hazards.
- POLICY CS-8** The City shall continue to require that geological and geotechnical investigations for new development proposals in areas with potential earthquake-induced liquefaction, landslides, or settlement. The City will restrict intensive developments and land uses along rivers and waterways where it is likely that erosion could cause property damage or threaten life during high-precipitation events.
- POLICY CS-9** The City shall develop a program to identify and mitigate hazards of unreinforced masonry buildings and encourage building retrofits that improve resiliency to seismic hazards.
- POLICY CS-10** The City shall enforce state laws aimed at identification, inventory, and retrofit of existing vulnerable structures, focusing on unreinforced masonry structures. The City shall also work to secure funding and other resources and establish inter-agency coordination to support this effort.

FLOOD HAZARDS

Flooding is the rising and overflowing of a body of water onto normally dry land. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide and can cause substantial damage to structures, landscapes, and utilities as well as life-safety issues. Floodwaters can transport large objects downstream, which can damage or remove stationary structures, such as dam spillways. Ground saturation from flooding can result in instability, collapse, or other damage to buildings and other structures. Floodwaters can also break utility lines and interrupt services. Standing water from floods can damage crops, roads, foundations, and electrical circuits. +

In Marysville, flood risks relate primarily to urban and flash flooding. Although the Feather and Yuba Rivers border the city, an existing levee system protects the city from riverine flooding during high flows; this levee system is being proactively reinforced, as described below. Excess rainfall is a well-known cause of flooding, particularly flash flooding. Other causes of flooding include dam or levee failure, or, in the case of urban flooding, storm drainage system overload.

Flooding can be caused by the accumulation of stormwater in low-lying areas with poor drainage, due to either the lack of infiltration or an insufficient overland drainage network. Flooding that occurs under these conditions is often called urban flooding. Urban flooding from storm drain overload can make roads impassable until the water recedes.

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Flash flooding occurs when streams exhibit a dramatic rise in water level in a short amount of time, typically less than six hours from rise to peak to recession along the length of the watershed. Flash floods can be caused by a number of factors, including rainfall, meltwater, or dam failure. Flash floods are distinguished from other types of flooding by the speed with which they occur—there are less than six hours between the triggering event and the onset of flooding.

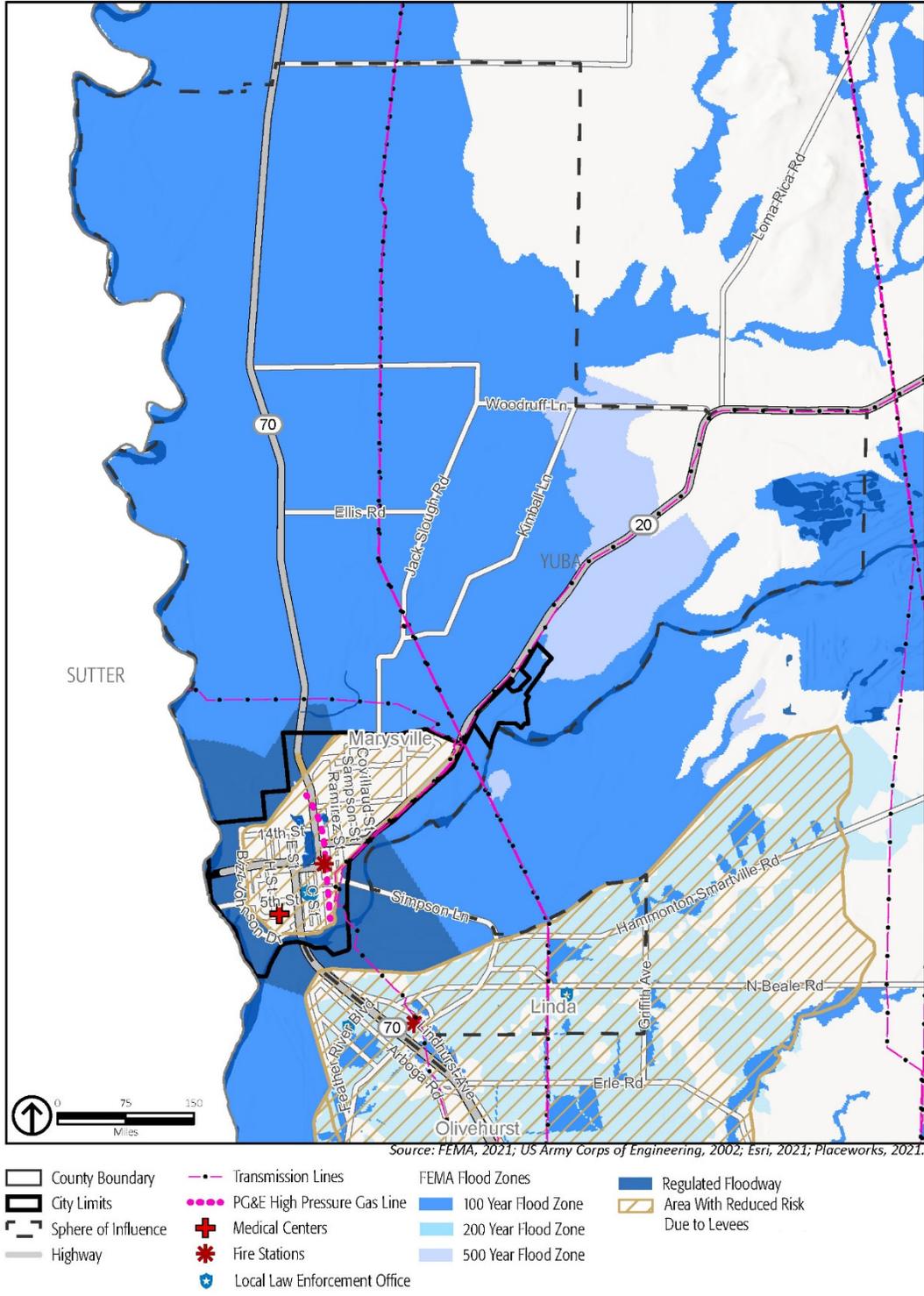
Areas at an elevated risk of flooding are generally divided into 100-, 200-, and 500-year flood zones. A 100-year flood zone has a 1-percent chance of experiencing a major flood in any given year; a 200-year flood zone has a 0.5-percent chance of flooding in any given year; and a 500-year flood zone has a 0.2-percent chance of flooding in any given year. **Figure 3** shows the 100- and 500-year flood zones in and around Marysville.

Agencies responsible for flood control in Marysville include the Yuba County Water Agency (YWA), the United States Army Corps of Engineers (USACE), FEMA, the Federal Insurance Administration (FIA), and the Department of Water Resources (DWR).

- The YWA is a public agency responsible for serving residents of Yuba County with a mission centered around flood risk reduction. Every year, the YWA invests millions of dollars into projects to further the primary mission of reducing flood risk for Yuba County. In Marysville, the YWA has helped fund the local cost-share component for the Marysville Ring Levee Project to protect the city from future flood.
- The USACE identifies the need for and constructs major flood-control facilities. It also develops flood and dam inundation maps and reports. The USACE is continuing repairs to the 7.5-mile-long Marysville Ring Levee, which completely surrounds and protects the city.
- FEMA manages the National Flood Insurance Program (NFIP), providing insurance to the public in communities that participate in the program. FEMA is the main federal government agency contact during natural disasters and publishes the Flood Insurance Rate Maps (FIRM), which identify the extent of flood potential in flood-prone communities based on a 100-year flood (or base flood) event.
- The FIA is the primary agency that delineates potential flood hazard areas and floodways through the FIRMs and the Flood Boundary and Floodway Map. Flood insurance is required of all homeowners who have federally subsidized loans.
- DWR is responsible for managing and protecting California's water. DWR works with other agencies to benefit the state's people, and to protect, restore, and enhance the natural and human environments. DWR also works to prevent and respond to floods, droughts, and catastrophic events that would threaten public safety, water resources and management systems, the environment, and property.

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FIGURE 3: FLOOD HAZARD ZONES



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Floodplains can change over time; the floodplain and watercourse of a stream can also be affected by anthropogenic (or human) influences, such as the development of land into residential or commercial structures and the resulting reduction of pervious land, resulting in increased stream flow, the construction of bridges or culverts, or the creation of levees or other impoundment structures that control the flow in the watercourse.

Dam Failure

Dam failure also poses a risk to the City of Marysville. The following dams present a downstream hazard to the City of Marysville: New Bullards Bar Dam, Virginia Ranch Dam (Merle Collins Lake), Oroville Dam, Thermalito Diversion, and Englebright Dam. Failure of these dams is generally considered a very unlikely event, although such events are not unprecedented. In 2017, Oroville Dam's spillways were damaged by heavy rains, prompting widespread evacuations due to fear of dam failure. Areas in the city that would be affected by inundation of these dams are illustrated in **Figure 4**.

Dam break floods are usually associated with intense rainfall or prolonged flood conditions. A dam failure is an uncontrolled release of water from a reservoir through a dam as a result of structural failures or deficiencies in the dam. Dam failures can range from fairly minor to catastrophic and can potentially harm human life and property downstream from the failure. In addition, ecosystems and habitats are destroyed as a result of waters flooding them. Although dam failures are very rare, these events are not unprecedented. Additionally, the older that dams get, the more potential exists for catastrophic dam failures. There are four major causes of dam failures, which include the following:

- **Overtopping:** These failures occur as a result of poor spillway design, leading to a reservoir filling too high with water, especially in times of heavy rainfall. Other causes of this type of failure include settling of the crest of the dam or spillway blockage.
- **Foundation defects:** These failures occur as a result of settling in the foundation of the dam, instability of slopes surrounding the dam, uplift pressures, and seepage around the foundation. All of these failures result in structural instability and potential dam failure.
- **Piping and seepage failures:** These failures occur as a result of internal erosion caused by seepage and erosion along hydraulic structures such as the spillways. Erosion as a result of animal burrows and cracks in the dam structure contribute to these failures as well.
- **Conduit and valve failure:** These failures occur as a result of problems with valves and conduits.

Other dam failures arise as a result of other miscellaneous causes. Many dam failures are also the secondary result of other natural disasters, such as earthquakes, landslides, extreme storms, or heavy snow-melt. Other causes include equipment malfunction, structural damage, and sabotage.

In Marysville, a major earthquake could cause a dam failure. Dams are constructed with safety features known as “spillways” that allow water to overtop the dam if the reservoir fills too quickly. Spillway overflow events, often referred to as “design failures,” result in increased discharges downstream and increased flooding potential. In a dam failure scenario, the greatest threat to life and property typically occurs in those areas immediately below the dam since flood depths and discharges generally decrease as

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the flood wave moves downstream. The primary danger associated with dam failure is the high-velocity flooding downstream of the dam and limited warning times for evacuation.

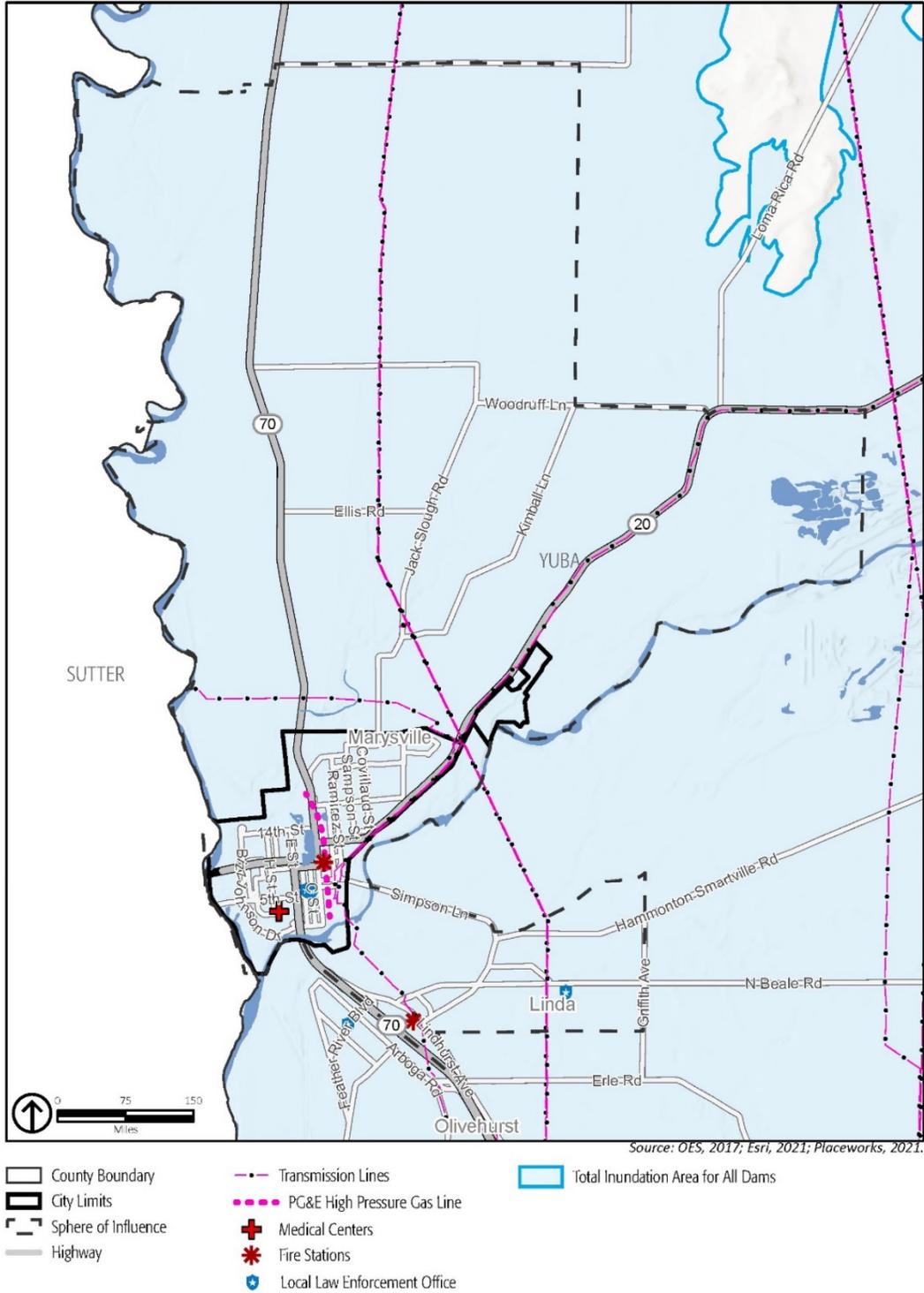
The Federal Energy Regulatory Commission, as required by federal law, has reviewed and approved comprehensive emergency action plans (EAPs) for each of these dams. The EAP minimizes the threat to public safety and the response time to an impending or actual sudden release of water from project dams. The EAP is also designed to provide emergency notification when flood water releases may present the potential for major flooding.

As mandated by the National Dam Inspection Act, the USACE has the authority and responsibility for conducting inspections of all dams. The purpose of these inspections is to check the structural integrity of the dam and associated appurtenant structures, ensuring protection of human life and property. Periodic inspections disclose conditions that might disrupt operation or dam safety.

The YWA, which owns and operates New Bullards Bar Dam, conducted a detailed review of potential seismic sources in relation to New Bullards Bar Dam in 2004. Of the identified or interfered lineaments or faults in the region identified by the California DWR, Division of Safety of Dams, most are believed to be inactive. The New Bullards Bar Dam is inspected visually three times per week for any changed conditions, such as increased leakage, cracking, or settlement. Downstream flows are continuously monitored by the Colgate Power Plant and the Pacific Gas and Electric Company (PG&E) Wise Power Plant. In addition, two seismic sensors are located at each end of the New Bullards Bar Dam. An earthquake of at least magnitude 5.5 within 50 miles of the dam triggers the YWA to inspect the dam.

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FIGURE 4: DAM INUNDATION ZONES



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Levee Failure

Most of the populated areas of the Sacramento Valley are protected by an extensive levee system, maintained by independent local levee districts and reclamation districts⁴ and overseen by the USACE, DWR, and the Bureau of Reclamation. Levee failure occurs when the structural integrity of the levee is compromised in some way. The City of Marysville is surrounded by a 7.5-mile-long levee, also known as the “Marysville Ring Levee,” which completely surrounds and protects the city. **Figure 5** shows the levee protection zone for Marysville.

As part of a multi-agency effort to reduce Yuba County’s flood risk, the YWA is partnering with USACE, Central Valley Flood Protection Board, and the Marysville Levee District to reinforce the 7.5-mile-long Marysville Ring Levee, slated for completion by 2024. Once these repairs are complete, the newly strengthened levee will provide up to a 300-year level of protection, meaning there is a 1-in-300 chance in any given year that a storm could come along that is bigger than the levees were designed to handle. That is one of the highest levels of flood protection for a city in central California. The levee system reduces flood risk for the City of Marysville, which is home to the region’s largest and only level-three trauma services hospital and the more than 10,000 jobs it supports, two state highways, and two Union Pacific Railroad mainlines.

Past Occurrences

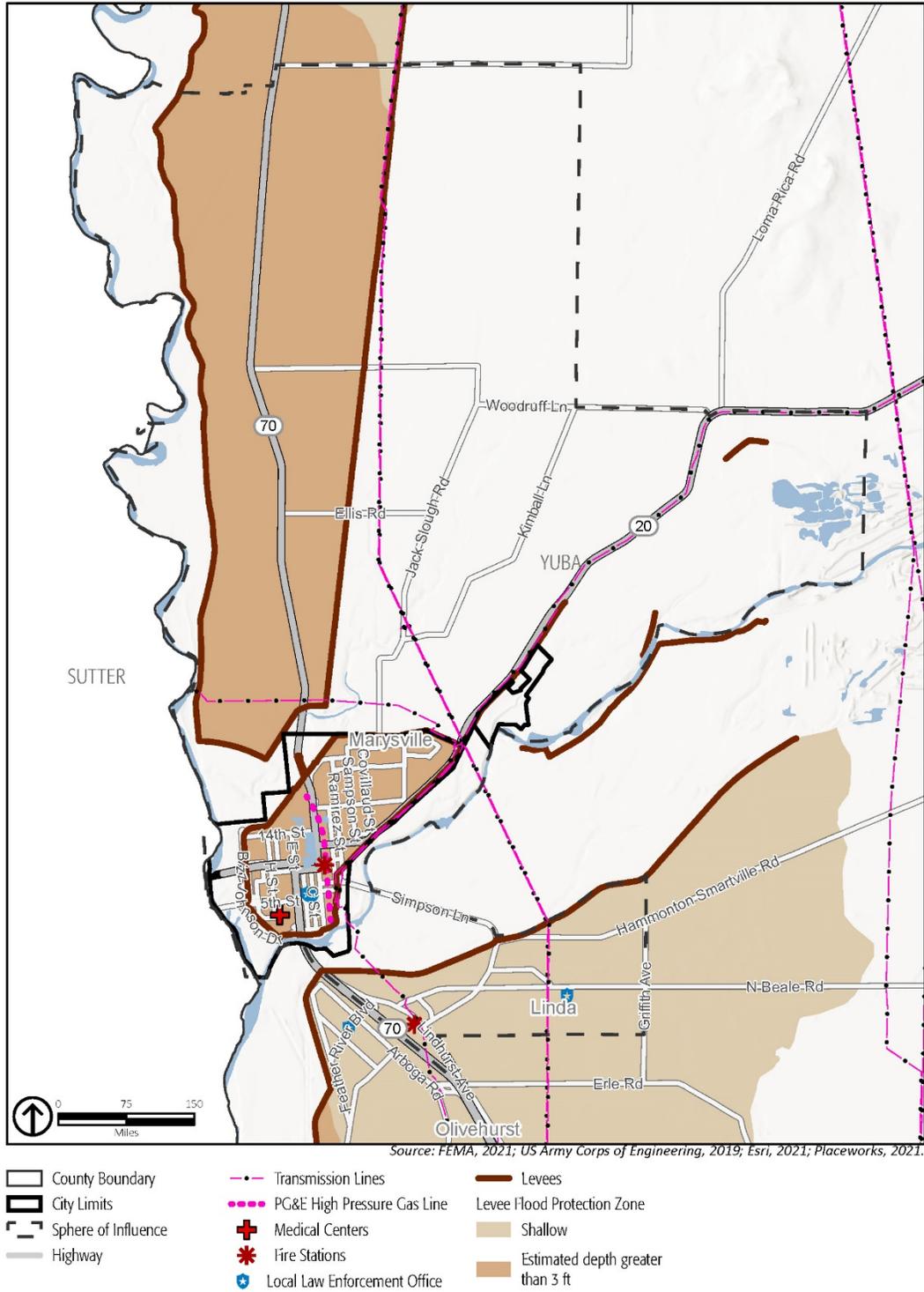
The history of flooding in Marysville is closely intertwined with its geographic position at the convergence of two significant river systems: The Feather River and the Yuba River. The Feather River is a principal tributary to the Sacramento River, draining a watershed of 3,222 square miles in the Sierra Nevada and Sacramento Valley. The Yuba River is a tributary to the Feather River, draining a watershed of 1,336 square miles. As a result, Yuba County and the communities surrounding Marysville have a long history of disastrous flooding. The floods of 1955, 1986, and 1997 caused significant property damage throughout the region. Thousands were forced to evacuate, people lost their lives, and communities suffered extensive property damage. During each of these flood events, the City of Marysville did not flood but was surrounded by raging floodwaters.

As previously discussed, in February 2017, Oroville Dam’s main and emergency spillways were damaged, prompting the evacuation of more than 180,000 people living downstream along the Feather River. This event was initially triggered by heavy rainfall during the 2017 California floods.

⁴ Within Yuba County, these districts are Reclamation District 784, Reclamation District 817, Reclamation District 10, Reclamation District 2103, and Three Rivers Levee Improvement Authority.

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FIGURE 5: LEVEE PROTECTION ZONE



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Potential Changes to Flood Risk in Future Years

Likelihood of Future Occurrence

Marysville is bordered by the Feather and Yuba Rivers, which put the city at risk to riverine flooding. However, the Marysville Levee Ring reduces the risk of a catastrophic event. Historically, Yuba County and the City of Marysville have been subject to previous flooding events primarily during the winter and spring months when river systems swell with heavy rainfall runoff. Normally, stormwater is kept within defined limits by a variety of storm drainage and flood-control measures. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 100- and 500-year floodplains and in other localized areas. As land uses and climate conditions shift and as improvements are made to flood-control channels, the size of these flood zones is likely to change.

The potential for levee failure in Marysville has decreased over the last several years. Beginning in 2010, USACE began levee repairs on the 7.5-mile-long Marysville Levee Ring that borders the Feather and Yuba Rivers, reducing flood risk for the entire city. A dam failure event is also likely to remain a risk to Marysville in future years, although the odds of such an event are expected to remain low.

Climate Change and Flooding

Floods are among the most damaging natural hazards in Marysville, and climate change is expected to make flood events more severe. Although climate change may not change average precipitation levels significantly, scientists expect that it will cause more years with extreme precipitation events. This means that more years are likely to see particularly intense storm systems that drop enough precipitation over a short enough period to cause flooding. Consequently, floods are expected to occur more often in and around Marysville, and climate change may expand the parts of the city that are considered flood-prone. Furthermore, earlier or more rapid winter snowmelt in the high elevation areas in and around Yuba County, as well as precipitation events that would have fallen as snow in a cooler climate, are expected to contribute to an increased flooding risk.

Some indirect effects of climate change may also increase flooding in Marysville. Climate change is expected to increase the frequency and severity of droughts that cause soil to dry out and become hard. Therefore, when precipitation does occur, more water runs off the ground's surface rather than being absorbed into the ground, which can lead to floods. Wildfires, which are expected to become more frequent due to climate change, cause a similar effect by baking the surface of the ground into a harder and more impenetrable layer adding to the already large expanse of impermeable surfaces throughout the city (e.g., roads, driveways, parking lots). Trees and other vegetation help slow water down, which allows the water to be absorbed into the soil and prevents it from becoming runoff. Therefore, changes to soil properties resulting from climate change may also increase flood risk.

While the risk and associated short- and long-term impacts of climate change are uncertain, experts in this field tend to agree that among the most significant impacts include those resulting from increased heat and precipitation events that cause increased frequency and magnitude of flooding. Increases in damaging flood events will cause greater property damage, public health and safety concerns, displacement, and loss of life. Displacement of residents can include both temporary and long-term displacement, increase in insurance rates, or restriction of insurance coverage in vulnerable areas.

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POLICIES

- GOAL CS-2:** **Avoid the risk of loss of life and injury and minimize the risk of damage to property from flooding and inundation hazards.**
- POLICY CS-11** The City shall identify contacts and coordinate with operators of nearby dams, including Oroville Dam, and develop a communications protocol in the event of an emergency, so the City is adequately informed and can respond to emergencies.
- POLICY CS-12** The City shall coordinate with the Yuba Water Agency and other appropriate entities to maintain locally and regionally effective strategies for the planning, construction, operation, and maintenance of drainage and flood-control facilities, as well as the Marysville Levee Ring.
- POLICY CS-13** The City shall use the best available flood hazard information and mapping from regional, state, and federal agencies to inform land use, zoning, and public facility investment decisions.
- POLICY CS-14** The City shall protect natural waterways from unnecessary alteration whenever flood protection structures or other forms of construction are proposed.
- POLICY CS-15** The City shall conduct structural retrofits of at-risk City-owned infrastructure to protect against flooding.
- POLICY CS-16** The City shall require all projects in Marysville to address and mitigate adverse impacts to the carrying capacity of local and regional storm drain systems.
- POLICY CS-17** The City shall prohibit construction near levees that would adversely affect the integrity of the levee or would impede maintenance, inspection, or planned levee expansion.
- POLICY CS-18** The City shall prohibit development along rivers and waterways that would reduce stream capacity, increase erosion, or cause deterioration of the channel.
- POLICY CS-19** The City shall require that new developments evaluate potential flood hazards and demonstrate compliance with state and federal flood standards prior to approval.
- POLICY CS-20** The City shall ensure that new development and infrastructure projects do not create or exacerbate flood risks elsewhere in Marysville or in neighboring communities.

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- POLICY CS-21** The City shall require all new residential development outside of the levee system to have the ground floor located above the 100-year flood base elevation, as defined on the Federal Emergency Management Agency’s Flood Insurance Rate Maps.
- POLICY CS-22** The City shall not approve permanent structures within a flood hazard area or an area of moderate flood hazard without demonstrating adequate flood protection.
- POLICY CS-23** The City shall require new developments to provide drainage improvements according to City standards.
- POLICY CS-24** The City shall strive to develop a standard for requiring a percentage of permeable surfaces on new and redevelopment projects consisting of one acre or more to reduce surface runoff.
- POLICY CS-25** The City shall work with its partner agencies to maintain Ellis Lake and East Ellis Lake to provide stormwater retention during storm events.

FIRE

Fire hazards include both wildfires and urban fires. 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 ignition sources, has created conditions for extensive wildfires. Wildfire is a low concern for the City of Marysville. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low-moisture content in the air and plant matter, an accumulation of vegetation, and high winds.

Three types of fires are of concern to Marysville: (1) wildfires, (2) wildland-urban interface fires, and (3) structural fires.

Wildfires

Wildfires occur on mountains, hillsides, and grasslands. Vegetation, wind, temperature, humidity, and slope are all factors that affect how these fires spread. In Marysville, native vegetation, such as oak woodland and grassland provide fuel that allows fire to spread easily across large tracts of land. These plant species are capable of regeneration after a fire, making periodic wildfires a natural part of the ecology of these areas. The climate of the Marysville region keeps the grass dry and more readily combustible during fire season. Seasonal drought conditions exacerbate fire hazards. Portions of the city are undeveloped and consist of highly flammable vegetation. In particular, the “river bottoms” areas, along the Yuba and Feather Rivers within the levee system, and open space in the northwestern portion of the city have a moderate fire risk. Much of the area outside these levees are left in a natural state, allowing combustible fuels to accumulate over long periods of time.

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Wildland-Urban Interface Fires

The wildland-urban interface is an area where buildings and infrastructure (e.g., cell towers, schools, water supply facilities) mix with areas of flammable wildland vegetation. This interface is sometimes divided into the defense zone (areas in close proximity to communities, usually about a quarter-mile-thick) and threat zones (an approximately one-and-a-quarter-mile buffer around the defense zone). Hundreds of homes now border major forests and brush areas throughout California. With thousands of people living near and visiting wildland areas, the probability of human-caused fires is growing. Wildfires and urban interface fires have occurred close to the city, especially in large areas of grassland and woodland.

In the wildland-urban interface, efforts to prevent ignitions and limit wildfire losses hinge on hardening structures and creating defensible space through a multi-faceted approach, which includes engineering, enforcement, education, emergency response, and economic incentive. Different strategies in the defense and threat zones of the wildland-urban interface help to limit the spread of fire and reduce the risk to people and property. Other efforts include Vegetation Management Program (VMP) activities. The VMP is a cost-sharing program that focuses on the use of prescribed fire, and some mechanical means, for addressing wildland fire fuel hazards and other resource management issues on State Responsibility Area (SRA) lands. The use of prescribed fire mimics natural processes, restores fire to its historic role in wildland ecosystems, and provides significant fire-hazard reduction benefits that enhance public and firefighter safety.

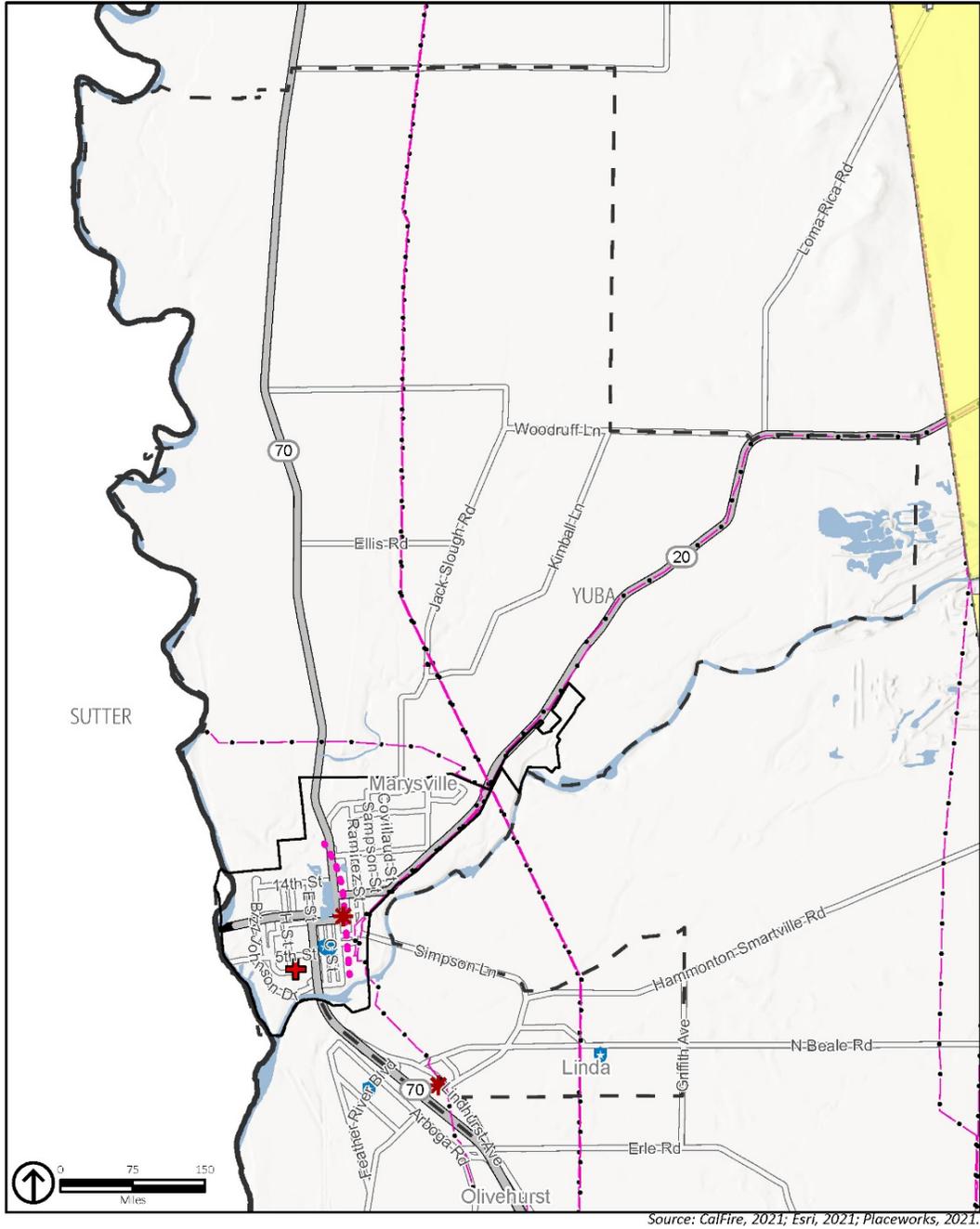
The City of Marysville is in a local responsibility area (LRA). LRAs include areas protected by local agencies, including city and county fire departments, and local fire protection districts. According to the California Department of Forestry and Fire Protection (CAL FIRE), LRAs are included in instances where Very High Fire Hazard Severity Zones are delineated. In Marysville, there are no Very High Fire Hazard Severity Zones. Consequently, the City of Marysville has no areas with delineated Fire Hazard Severity Zones. **Figure 6** shows the wildfire hazard severity zones in and around Marysville and **Figure 7** identifies the wildland-urban interface, as defined by CAL FIRE, as well as the levee ring interface that presents similar hazard conditions as wildland-urban interface areas due to the wild vegetation associated with the levees. The highest threat occurs along the Yuba River on the eastern side of the city, as well as the northwestern side, on land that is generally undeveloped with large areas of dry grass mixed with oak woodland.

Structural Fires

Urban fires occur in built-up environments, destroying buildings and other human-made structures. These disasters are often due to faulty wiring or mechanical equipment, combustible construction materials, or the absence of fire alarms and sprinkler systems. Structural fires are largely from human accidents, although deliberate fires (arson) may be a cause of some events. Older buildings that lack modern fire safety features may face greater risk of damage from fires. To minimize fire damage and loss, the City's Fire Code, based on the California Fire Code, sets standards for building and construction. It requires the provision of adequate water supply for firefighting, fire-retardant construction, and minimum street widths, among other things.

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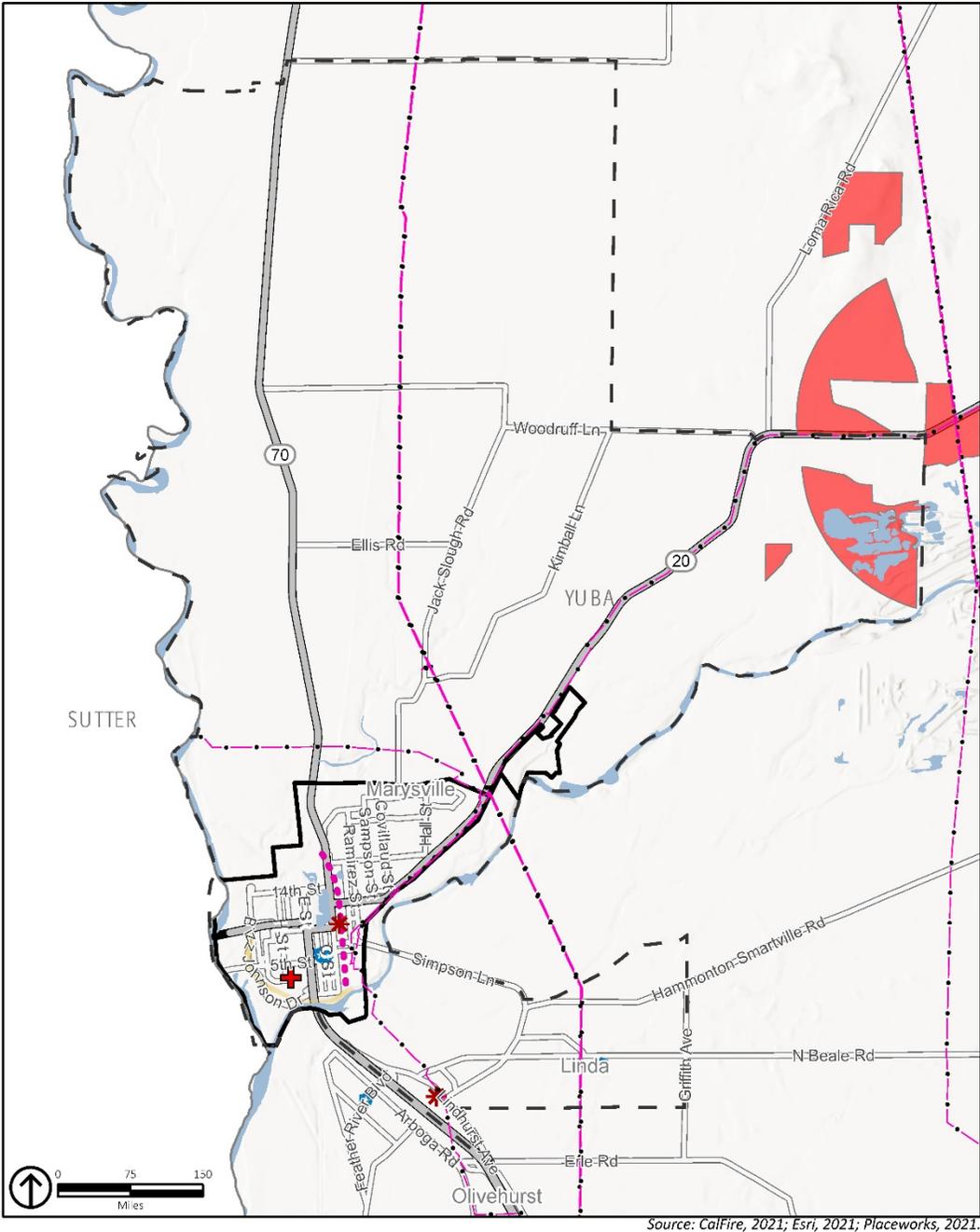
FIGURE 6: FIRE HAZARD SEVERITY ZONES



- | | | |
|---------------------|------------------------------|---------------------------|
| County Boundary | Transmission Lines | State Responsibility Area |
| City Limits | PG&E High Pressure Gas Line | Moderate |
| Sphere of Influence | Medical Centers | |
| Highway | Fire Stations | |
| | Local Law Enforcement Office | |

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FIGURE 7: WILDLAND-URBAN INTERFACE ZONES



Source: CalFire, 2021; Esri, 2021; Placeworks, 2021.

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> County Boundary City Limits Sphere of Influence Highway | <ul style="list-style-type: none"> Transmission Lines PG&E High Pressure Gas Line Medical Centers Fire Stations Local Law Enforcement Office | <ul style="list-style-type: none"> Wildland Urban Interface Levee Ring Interface |
|--|--|---|

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Past Occurrences

There is no record of historical fires within the Marysville city limits. However, some historical fires have occurred near the city. Notably, in 2009, the Riverbottom Fire burned 83 acres along the Feather River in Yuba City. The cause of the fire is unknown and forced several homeless people to evacuate from a homeless camp; no injuries or deaths were reported. The most recent fire was the 2020 Hollywood Trailer Park Fire, located east of Marysville near the banks of the Yuba River. The fire burned approximately 30 acres and forced residents to evacuate. The fire damaged at least 24 trailers near the old Hollywood Trailer Park. Structural fires of individual and older buildings have also occurred within Marysville.

Figure 8 shows the areas around Marysville that have been burned by wildfires.

Fire Protection

Fire protection in the planning area is provided by the City of Marysville. The Marysville Fire Department provides fire protection services in the City of Marysville for approximately 12,000 residents and services approximately 85 square miles of the unincorporated areas of Hallwood and District 10. The City of Marysville Fire Department is active in local mutual-aid agreements and receives and provides mutual aid to all area departments. The Marysville Fire Department also participates in the Statewide Mutual-Aid Plan and deploys as part of a local agency Strike Team on numerous occasions throughout California each year.

The Marysville Fire Department provides fire protection, emergency medical services, and disaster preparedness and response. Marysville has one fire station located at 107 9th Street. The Marysville Fire Department maintains approximately 9 pieces of equipment, 12 line-suppression staff, 1 fire inspector, 1 fire chief, 1 administrative assistant, and 12 reserve members. The department operates specialized apparatus, including a 105-foot aerial quint ladder truck, 3,000-gallon water tender, and a hazardous material response vehicle that services Yuba and Sutter Counties. The water supply service provider for Marysville is Cal Water.

Potential Changes to Fire Risk in Future Years

Likelihood of Future Occurrence

The wildfire season in Yuba County typically lasts from June through October. Extreme weather conditions during periods of low humidity, low fuel moisture, and high winds also contribute to the severity of any potential wildfires. Extreme weather conditions during periods of low humidity, low fuel moisture, and high winds also contribute to the severity of any potential wildfires. Fires occurring during these times typically burn hot and fast and are difficult to control unless initial suppression occurs immediately. However, wildfire for the City of Marysville is not a great concern since the city is not within a Fire Hazard Severity Zone. Nonetheless, open space areas with dry vegetation along the Yuba and Feather Rivers and ring levee remain susceptible to wildfires that can move quickly if accompanied by a stiff breeze.

Climate Change and Wildfire

Changing climate conditions are expected to increase the wildfire risk in and around Marysville. Warmer temperatures triggered by climate change can exacerbate drought conditions, which can kill or dry out plants, creating more fuel for wildfires. Warmer temperatures are also expected to increase the number of pest outbreaks, such as the western pine beetle, killing and weakening trees and increasing fuel load. These

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effects are likely to result in a fire season that begins earlier and lasts longer than it has historically. According to Cal-Adapt, the average area burned by wildfires per year in Yuba County is expected to increase from approximately 2,800 to 3,700 acres by midcentury, and to 5,500 acres per year by the end of this century.⁵

POLICIES

GOAL CS-3: **Avoid the risk of loss of life and injury and minimize risk of property damage from urban and wildland fires.**

POLICY CS-26 Prior to approval, the City shall require that new developments demonstrate compliance with state, county, and local standards for fire safety, as defined in the City of Marysville Building or Fire Codes.

POLICY CS-27 The City will encourage the retrofitting of older buildings to current safety standards in coordination with proposed major remodeling or additions.

POLICY CS-28 The City will ensure that its infrastructure, services, and critical assets are hardened against fire hazards and that governance and public services continue to function during and after a fire hazard event.

POLICY CS-29 The City will encourage and support work to regularly remove fuels from public and private lands to protect and maintain defensible spaces.

POLICY CS-30 The City will conduct and implement long-range fire safety planning, including stringent building, fire, subdivision, and municipal code standards, improved infrastructure, and improved mutual-aid agreements with the private and public sector.

POLICY CS-31 The City will require new development projects to pay on a fair-share basis for the Marysville fire station, equipment, and other fire suppression improvements necessary to provide adequate fire protection services.

POLICY CS-32 The City shall ensure the minimum required infrastructure and requisite facilities to suppress fires throughout the city, including sufficient road widths, adequate water pressure and fire hydrants, sufficient future water supply and long-term supply integrity, and clearly visible street signage.

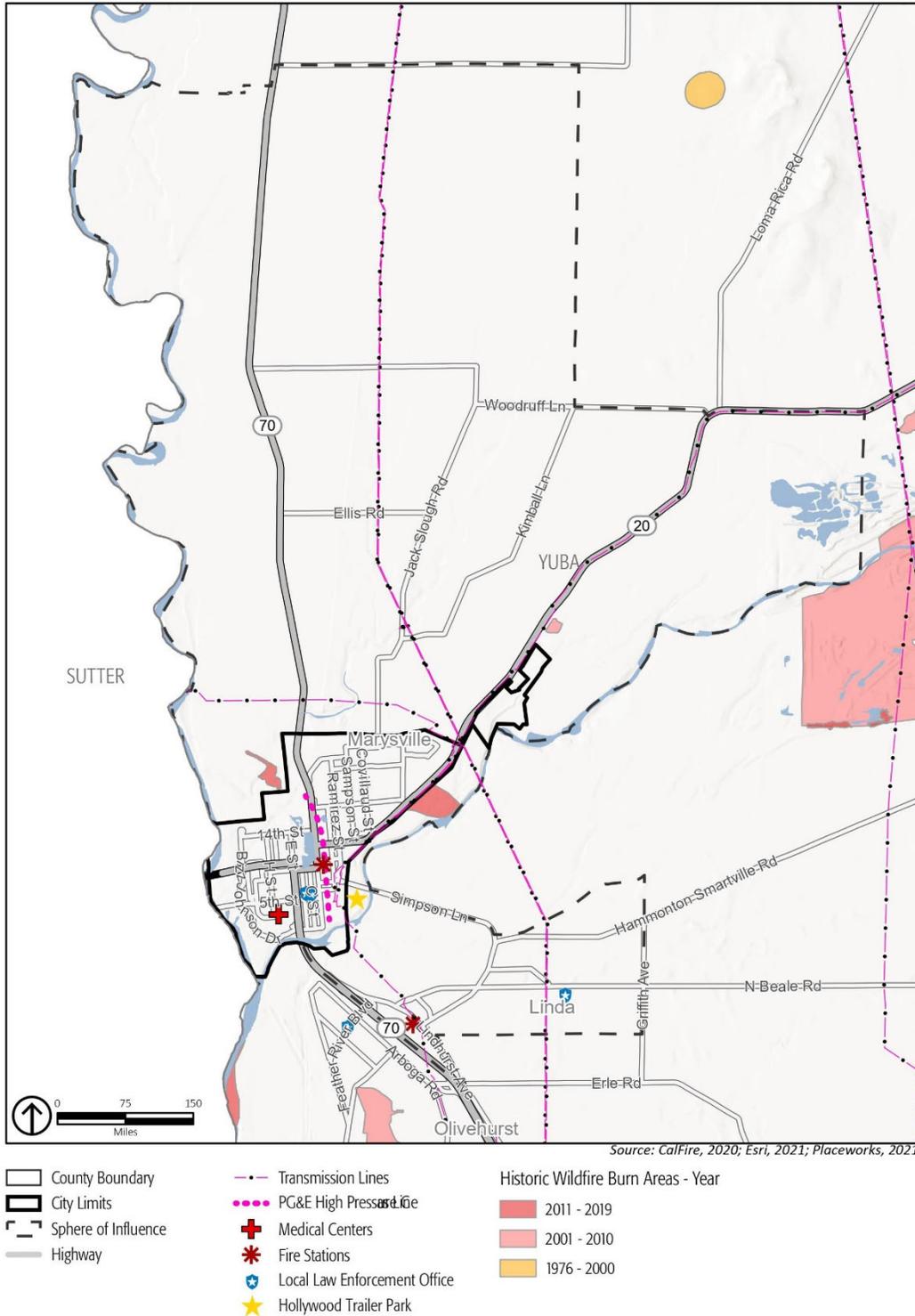
⁵ These estimates were generated by averaging the midcentury (2035–2064) and end-of-century (2070–2099) projections for average annual hectares burned by wildfires generated by four climate models: CanESM2, CNRM-CM5, HadGEM2-ES, and MIROC5. RCP Scenario 8.5 was used, corresponding to increasing levels of GHG emissions through the end of the century.

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- POLICY CS-33** The City, in coordination with Cal Water, shall work to ensure the long-term sustainability of water supplies to meet current and anticipated future firefighting needs.
- POLICY CS-34** The City shall coordinate with the Marysville Fire Department to develop high-visibility fire prevention programs, including those offering voluntary home inspections and promoting awareness of home fire prevention measures.
- POLICY CS-35** The City shall ensure that weed abatement is conducted on a regular and timely basis to ensure clearing of dry brush areas, including the Marysville Ring Levee. Weed abatement activities shall be conducted in a manner consistent with all applicable environmental regulations.
- POLICY CS-36** The City shall maintain inter-jurisdictional cooperation and coordination, including automatic-aid agreements with fire protection/suppression agencies in Yuba County.

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FIGURE 8: HISTORIC WILDFIRE BURN AREAS



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AGRICULTURE AND ECOSYSTEM HAZARDS

Approximately 272,480 acres, or 66 percent of Yuba County's total area, consist of agricultural croplands and pasture. Major crops include rice, walnuts, plums, and peaches. Dairy production in the county is also significant. In Marysville, the scale of agriculture production is limited and small relative to the agriculture production in communities throughout the county. Agriculture in the city is limited to areas adjacent to the city boundaries where land is occupied by rice fields and orchards.

Marysville is threatened by a number of insect pests that, under the right circumstances, can cause severe economic and environmental harm. Insects of concern to plants and crops include the melon fruit fly, Oriental fruit fly, Mediterranean fruit fly, gypsy moth, light brown apple moth, Japanese beetle, European grapevine moth, Asian citrus psyllid, and glassy-winged sharpshooter.

Potential Changes to Agriculture and Ecosystems

Likelihood of Future Occurrence

As long as severe weather events continue to be an ongoing concern for Marysville, the potential for ecosystem and agricultural losses remain. The primary causes of agricultural losses are severe weather events, such as drought, freeze, and insect infestations. These factors can also contribute to significant ecosystem loss, as can wildfire events.

Climate Change and Agriculture and Ecosystem Hazards

Many pests and organisms that carry diseases are most active during warmer months, so the threat of infection or infestation can be higher during this time of year. Temperatures are expected to get warmer earlier in the year and remain warmer until later in the year due to climate change, creating a wider window for pests and diseases to be active.

Climate change can also indirectly create a greater risk of agriculture and ecosystem pests and diseases. Many crop plants, trees, and livestock may be weakened by warmer temperatures and changes in precipitation. These weaker plants and animals may not be able to fend off infestations or infections as well as a stronger plant or animal, causing pests and diseases to affect more of the agricultural areas or ecosystem. These pests and diseases can inhibit plant and animal growth, damage plants and animals such that their products are less appealing and harder to sell, or lead to mortality. Moreover, excessive heat and prolonged dry and drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock.

Drought can reduce the amount of water available for crop irrigation, potentially reducing yield if farmers cannot find alternative supplies. Floods and severe weather can also severely harm or kill crops and damage infrastructure, reducing agricultural yields and requiring costly repairs.

POLICIES

GOAL CS-4: Ensure natural and agricultural lands within and adjacent to the city can better resist agriculture and forestry pests and diseases.

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POLICY CS-37 The City will protect and encourage the restoration of natural lands adjacent to agricultural areas to provide sufficient habitat for native pollinators and other species.

HAZARDOUS MATERIALS MANAGEMENT

Hazardous materials are materials that pose a significant risk to public safety or human or environmental health. These include toxic chemicals, flammable or corrosive materials, petroleum products, and unstable or dangerously reactive materials. They can be released through human error, malfunctioning or broken equipment, or as an indirect consequence of other emergencies (e.g., if a flood damages a hazardous material storage tank). Hazardous materials can also be released accidentally during transportation, as a consequence of vehicle accidents.

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 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.

Most hazardous materials in the community are being transported on truck routes along major roadways, such as State Route (SR) 20 and SR 70 that pass through Marysville. Since 1970, there have been 10 reported roadway hazardous materials incidents.

The Union Pacific Railroad passes through Marysville. Railroad tracks are elevated and trains transport hazardous materials. The track formerly owned by the Southern Pacific Railroad crosses the Feather River just north of Marysville. From southeast to northwest in the Yuba-Sutter area, The Union Pacific Railroad passes through Wheatland, Ostrom, Linda, Marysville, Berg, Sunset, and Live Oak. It also makes a dead-end detour to Beale Air Force Base. Although the risk is low, there is concern regarding the potential for train derailment. Marysville is constrained by levees and therefore, evacuation routes are limited in the event of an emergency.

Hazardous materials and waste within Marysville are managed by the Certified Unified Program Agency (CUPA), a micro-agency within the Yuba County Department of Environmental Health. The CUPA consolidates, coordinates, and makes consistent the regulatory activities of several hazardous materials and hazardous waste programs, including Hazardous Materials Management, California Accidental Release Prevention, Hazardous Waste Management, Underground Storage Tanks, Aboveground Storage Tanks, and Emergency Response.

Several state agencies monitor hazardous materials/waste facilities. Potential and known contamination sites are monitored and documented by the Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances and Controls (DTSC). A review of the leaking underground storage tank list produced by the RWQCB and the DTSC EnviroStor database indicates three school investigation cleanup sites at 12 East 18th Street, 16th and C Street, and 1904 Huston Street; two evaluation cleanup sites at 16th and Elm Street, and the entire block of B Street, 2nd Street, 3rd Street, and Chestnut Street; one voluntary cleanup site at 4th and A Street; and several leaking underground storage tank sites throughout the city.

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The City supports local regulating agencies in notifying the public if an imminent public health threat is posed by an outside factor. The transport of hazardous materials/wastes and explosives through the planning area is regulated by the California Department of Transportation (DOT). SR 20 and SR 70 are open to vehicles carrying hazardous materials/wastes. City streets are generally not designated as hazardous materials/waste transportation routes, but a permit may be granted on a case-by-case basis. Transporters of hazardous wastes are required to be certified by the DOT and manifests are required to track the hazardous waste during transport. The danger of hazardous materials/waste spills during transport does exist and will potentially increase as transportation of these materials increases on SR 20, SR 70, and the railroads. The Marysville Police Department, Marysville Fire Department, Yuba County OES, and the Yuba County Environmental Health Department are responsible for hazardous materials accidents at all locations within the city.

Potential Changes to Hazardous Materials in Future Years

Likelihood of Future Occurrence

The Union Pacific Railroad lines pass through the City of Marysville. Hazardous materials are regularly shipped via the rail line and an incident involving a rail accident within the city could have devastating effects. The City has little control over the types of materials that are shipped via the rail line. With regard to government activities, the content of shipments may be confidential for reasons of security and/or is generally unknown to the City. While the City has little influence over the types of material transported via the rail line, the potential for rail incidents can be reduced by ensuring that at-grade crossings within the city are operating in a safe and effective manner. SR 20 and SR 70 pass through the city as well. These are designated California Department of Transportation (Caltrans) hazardous materials routes.

Given that 10 highway hazardous materials incidents have happened since 1970, it is unlikely a hazardous materials incident will occur in the future. Moreover, according to Caltrans, most incidents are related to releases 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. However, increases in the frequency and intensity of hazards, such as floods and severe storms, may create a greater risk of hazardous materials releases during these events.

POLICIES

GOAL CS-5: **Protect the community from the harmful effects of hazardous waste and materials.**

POLICY CS-38 The City will require existing and new commercial and industrial uses involving the use, handling, transport, or disposal of hazardous materials within the city to disclose their activities in accordance with Yuba County guidelines and the requirements of state law. From among these facilities, identify which of these exist within identified hazard areas. Require new facilities to be appropriately designed, sited, and

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constructed to minimize damage from a hazard event, and encourage existing facilities to do the same.

POLICY CS-39 The City will carefully consider the siting of any uses utilizing, producing, or transporting hazardous materials and wastes and discourage their location around any residential, recreational, or open space, and public uses.

POLICY CS-40 The City shall require that applications for discretionary development projects that will generate hazardous wastes or use hazardous materials include detailed information on hazardous waste reduction, recycling, and storage.

POLICY CS-41 The City shall require that any business that handles a hazardous material prepare a plan for emergency response to a release or threatened release of a hazardous material, including providing updated information to emergency responders on the type and quantity of hazardous materials kept on-site.

POLICY CS-42 The City shall work with Yuba County, other surrounding communities, Caltrans, and Union Pacific to keep apprised of any hazardous materials release events that could threaten or impact Marysville and share resources to contain any materials released, particularly when surface or groundwater sources become threatened.

POLICY CS-43 The City shall coordinate and participate with partner agencies to educate its residents about the proper disposal methods for household hazardous wastes.

POLICY CS-44 The City shall require public disclosure of all companies, facilities, buildings, and properties that use, store, produce, and/or import/export any hazardous materials and wastes in the city. The City will maintain and share their inventory with the Yuba County Environmental Health Department.

POLICY CS-45 The City shall work with the Police and Fire Departments, Yuba County Office of Emergency Services, the Yuba County Environmental Health Department, and Department of Toxic Substances Control as necessary, to prepare a coordinated response plan for a potential train derailment and hazardous materials release event.

PUBLIC SAFETY AND EMERGENCY MANAGEMENT

Emergency Preparedness

Emergency preparedness activities in Marysville are conducted through the Marysville Fire Department and Police Department. Yuba County uses the CodeRED System, a phone system to alert residents and businesses in Yuba County who are affected, threatened, or might be endangered by an emergency event or a disaster, such as wildfires, floods, hazardous materials, severe weather, and certain law enforcement incidents. The CodeRED System is part of a group of alert and warning tools used in the county. The City

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of Marysville is also part of the Catapult Emergency Management System (EMS), an interactive, emergency notification system that allows law enforcement to communicate with schools quickly and effectively. The Marysville Police Department was the first in the country to use Catapult EMS. The system allows users to develop an emergency communication plan that stays clear, centralized, and informed at all times with teachers, sites, district, and law enforcement. Other systems include the Emergency Alert Systems (EAS) and the Emergency Digital Information System (EDIS).

The EAS is a national public warning system commonly used by state and local authorities to deliver important emergency information, such as weather and AMBER alerts, to affected communities. EAS participants – radio and television broadcasters, cable systems, satellite radio and television providers, and wireline video providers. FEMA, the Federal Communications System, and National Oceanic and Atmospheric Administration’s (NOAA’s) National Weather Service (NWS) work collaboratively to maintain the EAS and Wireless Emergency Alerts, which are the two main components of the national public warning system and enable authorities at all levels of government to send urgent emergency information to the public. The EDIS is a wireless data cast-based emergency and disaster information service operated by the State of California Governor’s Office of Emergency Services and is an enhancement to the EAS. These systems are available in multiple languages.

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During the 2018 Camp Fire, residents of Paradise, in nearby Butte County, were forced to evacuate their homes as the fire swept through the town and other nearby communities within 24 hours. The morning the fire sparked, the Butte County Sheriff’s Office coordinated the evacuation orders, using the CodeRED system. However, the rapid spread of the fire severed evacuation routes and gridlocked traffic. The system has the ability to alert zones in a community separately to avoid traffic congestion, or via mass messaging to all residents. As the conditions worsened throughout the day, the Sheriff’s Office attempted to use the CodeRED system to send mass alerts; however, fewer than half of all residents had registered for the optional service. Although the CodeRED system is designed to alert residents and businesses in Yuba County who are affected, threatened, or potentially endangered by an emergency event or a disaster, such as wildfires, the City of Marysville did not receive an early regional notification for the 2018 Camp Fire. Residents directly impacted by the wildfire event in Paradise and surrounding communities evacuated and relocated to communities such as Marysville. Consequently, the City of Marysville became overwhelmed with traffic and people seeking immediate refuge and relief. During events such as these, evacuation routes could be affected and limit emergency response procedures. For this reason, it is critical that early warning notification systems are used promptly to ensure safe and efficient evacuation for impacted communities, as well as regional response coordination efforts.

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Figure 9 shows residential properties that may only have one emergency evacuation route. The lack of multiple emergency access points limits roadway access for these properties, which may create difficulties if there is a need to evacuate. In addition, the entire city has limited access routes because of constraints such as the Marysville Ring Levee. Major state highways (i.e., SR 20 and SR 70) can become congested during peak traffic times, which may impede or affect the flow of traffic and emergency response times in the city. Consequently, primary evacuation routes, such as these major highways, may further strain access to and from properties during an emergency event. Therefore, it is important that the City work with Caltrans to identify bypass routes.

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FIGURE 9: EVACUATION-CONSTRAINED AREAS

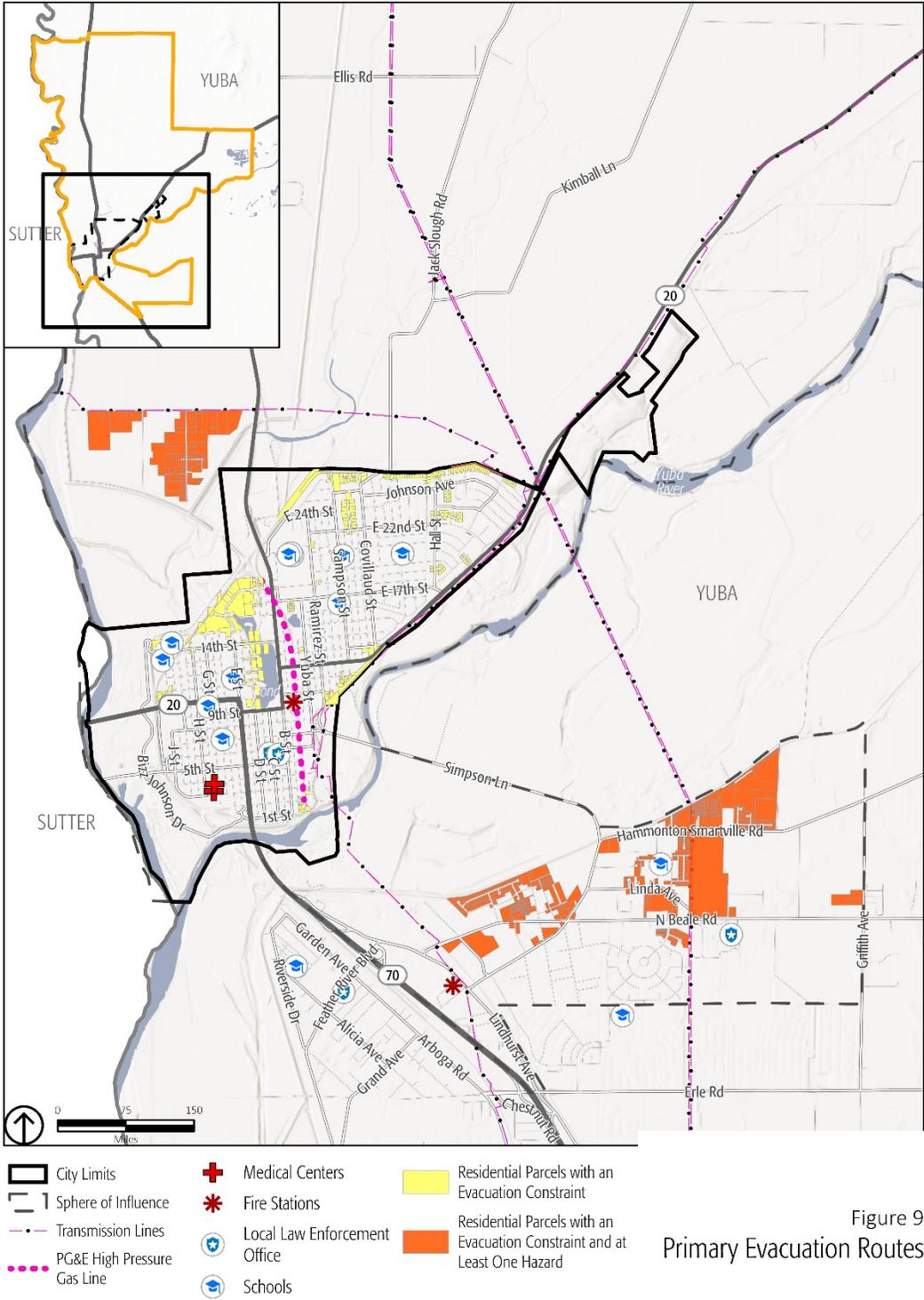


Figure 9
Primary Evacuation Routes

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Public Safety Power Shutoffs

Electricity utilities throughout California, including PG&E, have begun to occasionally “de-energize,” or turn off the electricity for power lines that run through areas where there is an elevated fire risk. This is intended to reduce the risk of power lines sparking or being damaged and starting a wildfire. As previously described, these activities, called PSPS events, result in a loss of power for customers served by the affected power lines. A PSPS event may occur at any time of the year, usually during high wind events and dry conditions. PSPS events may be limited to specific communities or they may affect broad swaths of the state. In October 2019, PG&E conducted two large-scale PSPS events, shutting off power to approximately 900,000 customers, including customers in Marysville. Several PSPS events also occurred in 2020. While smaller, these events still affected thousands of PG&E customers across Yuba County, including Marysville.

PSPS events can impact emergency management activities. A loss of power can make it more difficult for homes or businesses to receive emergency notifications if needed. PSPS events can also create vulnerabilities for community members that lack backup power supplies and depend on electricity for heating or cooling homes and buildings, lighting, and internet. PSPS events may also be harmful to people who depend on electrically powered medical devices. Additionally, community members may be faced with economic hardships and be deprived of important services, such as grocery stores, gas stations, and banks/ATMs. Traffic lights and other traffic-control systems may not work, which can complicate any evacuation needs and may hinder emergency response. Although critical public health and safety facilities often have backup generators, the loss of power may also disable other key infrastructure systems.

Mutual-Aid Agreements

The California Master Mutual-Aid Agreement has been adopted by the Standardized Emergency Management System and is designed to ensure that adequate resources, facilities, and other support are provided to jurisdictions whenever their own resources are insufficient to cope with the needs of a given emergency. The State Office of Emergency Services at Marysville serves the mutual-aid region that encompasses Yuba County.

Additional emergency management and response services in Marysville are provided through a mutual-aid agreement with CAL FIRE and local fire departments. CAL FIRE provides a variety of public safety services, including fire protection, medical aid, rescue, hazardous materials response, and educational safety programs. Other services consist of fire code enforcement and regulation, plan reviews, home and business inspections, and fire code permits.

POLICIES

GOAL CS-6: **Avoid the loss of life and minimize damage to property from natural and human-caused hazards by ensuring adequate emergency routes and response.**

POLICY CS-46 The City shall require new and existing large-scale developments in areas with known geologic and seismic, flood, and fire hazards to develop Emergency Preparedness Plans.

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- POLICY CS-47** The City shall coordinate with mutual-aid partners, other agencies, water providers, and regional dam operators, to establish a procedure for communication and implementation of evacuation routes.
- POLICY CS-48** The City shall continue to update and ensure that the Emergency Response Plan meets current federal, state, and local emergency requirements.
- POLICY CS-49** The City will coordinate with Caltrans to maintain Highways 20 and 70, 10th Street, and E Street, and the City will maintain Levee Road and B Street as primary emergency access and evacuation routes and improve other roads as necessary, such as Ramirez Street, 5th Street, and Covillaud Street to create additional evacuation routes. Caltrans will be the responsible agency for conducting maintenance and improvements along these state highways and roadways.
- POLICY CS-50** The City will review its facilities and collaborate with property owners of private community assets (e.g., meeting houses, lodges, faith-based buildings, etc.) to evaluate which of these facilities could become cooling centers, resilience hubs, or emergency shelters that provide safe places for residents during hazard events or emergency conditions (e.g., fire, extreme heat, flooding hazards). These places shall remain operational both during and after the hazard event, as needed.
- POLICY CS-51** The City will keep residents and stakeholders (e.g., businesses or interested parties) as up to date as possible on any emerging or current hazard events through extensive early-warning and notification systems that convey information to all residents, in multiple languages and formats to ensure it is widely accessible.
- POLICY CS-52** The City shall maintain a City Emergency Operations Plan to include the National Incident Management System (N.I.M.S.).
- POLICY CS-53** The City shall coordinate with local and State Emergency Management agencies using the Standardized Emergency Management System (S.E.M.S.) and National Incident Management System (N.I.M.S.) to facilitate multi-agency emergency response.
- POLICY CS-54** The City will ensure that communication, informational materials, and assistance in evacuation and short-term recovery activities is accessible to residents that speak languages other than English.
- POLICY CS-55** The City will collaborate with utilities (e.g., power, gas, water) to prepare for Public Safety Power Shutoff events and other potential infrastructure disruptions to increase local resilience.

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POLICY CS-56 The City shall continue to participate in drills and trainings with local emergency service providers to maintain and enhance a high level of service for community members.

POLICY CS-57 The City will monitor the effectiveness of public safety, preparedness, and hazard mitigation policies under changing climate conditions to continue to protect the community as local and regional conditions change.

CLIMATE-RELATED HAZARDS

Drought

A drought is a long period when precipitation levels are well below normal. This makes less water available for people (especially if the local water supply depends on surface water) and natural systems. The City of Marysville may experience water shortages during drought conditions, which could lead to mandatory water use restrictions. Less snow falling in mountainous areas causes water levels in lakes and reservoirs to drop, which can affect recreation activities. Local ecosystems that are not well adapted to drought conditions can be more easily harmed by it. During drought events, the flow of water in creeks and streams is reduced, creating more slow-moving or standing water. This can concentrate sediment and toxins in the low water levels, causing harm to plants and animals. Many fish species also prefer specific stream flow speeds, especially for spawning and egg incubation, and changes to stream velocity as a result of drought conditions can affect reproduction. Droughts can also indirectly lead to more wildfires, and the stress caused by water shortages can weaken plants, making them more susceptible to pests and diseases.

Past Occurrences

According to the State of California Hazard Mitigation Plan, Yuba County has experienced one drought that resulted in a state disaster declaration in 1991. Between the years 2012 and 2016, Northern California as a whole experienced one of the worst droughts in the state's recent history. These years experienced extremely low precipitation and below-average snowpack. The years 2013 and 2014 in particular displayed record-high dryness and a "ridiculously resilient ridge" of high atmospheric pressure that blocked and redirected atmospheric moisture northward, a meteorological pattern that climate models predict will become increasingly frequent in future years.

Potential Changes to Drought in Future Years

Likelihood of Future Occurrence

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 city continues to grow, so will the demand for water.

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Based on historical information, the occurrence of drought in California, including Yuba County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The impacts from drought include reduction in water supply and an increase in dry fuels.

More Frequent Droughts

Although droughts are a regular feature of California's climate, scientists expect that climate related hazards will lead to more frequent and intense droughts statewide. Overall, precipitation levels are expected to stay similar, and may even increase in some places. However, the state's current data say that there will be more years with extreme levels of precipitation, both high and low, as a result of climate change. This is expected to cause more frequent and intense droughts compared to historical norms. Higher air temperatures are expected to increase evaporation, causing more water loss from lakes and reservoirs, exacerbating drought conditions.

Drought conditions will also likely be made worse by changes to Yuba County's snowpack, which is the level of accumulated snow that builds up in the Sierra Nevada. Usually, this snow melts slowly over the year, helping to provide a regular supply of water during dry months. However, because of climate change, less precipitation is expected to fall as snow, leading to a smaller snowpack. More precipitation falling as rain and warmer temperatures over the course of the year are expected to cause the snowpack that does build up to melt faster. This may make water levels particularly low in late summer and early autumn, which are also often the hottest parts of the year.

Extreme Heat

While there is no universal definition of extreme heat, California guidance documents define extreme heat as temperatures that are hotter than 98 percent of historical high temperatures for the area, as measured between April and October 1961 to 1990. Days that reach this temperature are called extreme heat days. In Marysville, the extreme heat threshold is 105°F. An event with five extreme heat days in a row is called a heat wave.

Health impacts are the primary concern with this hazard, though economic impacts are also an issue. The Centers for Disease Control and Prevention (CDC) recognizes extreme heat as a substantial public health concern. Historically, NOAA data indicates that about 175 Americans succumb to the demands of summer heat, although this number has increased in recent years. From 2004 to 2018, studies by the U.S. Department of Health and Human Services indicate that there is an average of 702 deaths annually that are directly or indirectly linked to extreme heat.

Extreme heat events are dangerous because people exposed to extreme heat can suffer a number of heat-related illnesses, including heat cramps, heat exhaustion, and (most severely) heat stroke. 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. The elderly and individuals below the poverty level are the most vulnerable to extreme heat. Nursing homes and elder-care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. Areas with lower extreme heat thresholds are not necessarily at lower risk, as persons and community assets accustomed to cooler temperatures may be less prepared for extreme heat events.

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Very high temperatures can harm plants and animals that are not well adapted to them, including natural ecosystems. Extreme heat can increase the temperature of water in lakes, streams, creeks, and other water bodies, especially during drought events when water levels are lower. In some cases, water temperatures may exceed comfortable levels for a number of plants and animals, causing ecological harm. Outdoor workers in construction or landscaping are also much more exposed to the elements than most people, so they are more susceptible to extreme heat conditions and the potential illnesses associated with very high temperatures.

Indirectly, extreme heat puts more stress on power lines, causing them to run less efficiently. The heat also causes more demand for electricity (usually to run air conditioning units), and in combination with the stress on the power lines, may lead to brownouts and blackouts.

Potential Changes to Extreme Heat in Future Years

Likelihood of Future Occurrence

Extreme heat occurs on an annual basis, most commonly at the peak of the summer season. As Marysville is located in the valley of Yuba County at relatively low elevation, extremely high temperatures will continue to be a more common occurrence than cold temperatures.

Extreme Heat

The warmer temperatures brought on by climate change are likely to cause an increase in extreme heat events. Depending on the location and emissions levels, the number of extreme heat days is expected to rise. Marysville historically experiences four days each year where temperatures meet or exceed the extreme heat threshold of 105°F. According to the state Cal-Adapt database, the number of annual extreme heat days in Marysville is projected to increase to between 20 and 34 days by the middle of the century (2041 to 2060), and to as high as between 46 and 58 by the end of the century (2070 to 2099).

Overall, Marysville is expected to see an increase in the average daily high temperatures. Although the temperature increases may appear modest, the projected high temperatures are substantially greater than historical norms. These increases also make it more likely that an above-average high temperature will cross the extreme heat threshold. As temperatures increase, Marysville will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Severe Weather

Severe weather is generally any destructive weather event, but usually occurs in Marysville as localized storms that bring heavy rain, hail, lightning, and strong winds. Severe weather is usually caused by intense storm systems, although types of strong winds can occur without a storm. The types of dangers posed by severe weather vary widely and may include injuries or deaths, damage to buildings and structures, fallen trees, roads and railways blocked by debris, and fires sparked by lightning. Severe weather often produces high winds and lightning that can damage structures and cause power outages. Lightning from these storms can ignite wildfires and structure fires that can cause damage to buildings and endanger people. Objects can also be struck directly, which may result in an explosion, burn, or total destruction. These storms are most likely to occur during the late fall, winter, and spring. In Yuba County, most severe weather is linked to high winds. High winds, often accompanying severe storms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

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Marysville is subject to significant, non-tornadic (straight-line) winds. High winds, as defined by the National Weather Service, are sustained wind speeds of 40 miles per hour (mph) or greater lasting one hour or longer, or wind gusts 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.

High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Straight-line winds may exacerbate the effects of extreme temperatures and decrease visibility due to the movement of particulate matters through the air, as in dust and snowstorms. Winds may also exacerbate fire conditions by drying out ground cover, propelling fuel around the region, and increasing the ferocity of existing fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

During the rainy season, Marysville is prone to relatively strong thunderstorms, sometimes accompanied by funnel clouds and tornadoes. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm.

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

Potential Changes to Severe Weather in Future Years

Likelihood of Future Occurrence

According to historical hazard data, severe weather is an annual occurrence in Yuba County. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences in the county. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by severe weather, such as floods and fire, that have had the greatest impact on the county. In general, any severe storm that affects Yuba County has local effects in Marysville as well. Thunderstorms, high winds, and lightning can each have localized impacts on infrastructure, properties, and public safety. Transportation, including freight shipping, faces increased congestion when severe storms occur.

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Severe Weather

Climate related hazards are expected to cause an increase in intense rainfall, which is usually associated with strong storm systems. This means that Marysville could see more intense storms in the coming years and decades. Such an increase may not affect all forms of severe weather and may not always be apparent. Thunderstorms, high winds, hail, and lightning are all severe weather events that are expected to continue in Marysville, with varying frequency and degrees of severity.

POLICIES

GOAL CS-7: **Ensure a resilient community able to adapt to climate-related hazards.**

POLICY CS-58 The City shall collaborate with other cities, unincorporated communities, and special districts in Yuba County as well as with Capital Region Climate Readiness Collaborative to develop and implement regional climate change adaptation and resilience initiatives.

POLICY CS-59 The City will use the reported data and findings of applicable local, regional, or state documents or plans pertaining to climate-related hazards that could impact the City of Marysville, including the California Climate Change Assessment, the California Adaptation Planning Guide, and the Safeguarding California Plan.

POLICY CS-60 The City shall develop a network of equitably located resilience hubs throughout Marysville, outside of any areas of elevated hazard risk to the greatest extent possible, that can serve as shelters and resource centers during and after hazard events (e.g., flood inundation, fire hazards, extreme heat days). Such facilities should be in easily accessible locations and available to all community members, as needed. Resilience hubs consist of well-used, existing community-serving facilities that are upgraded to provide local communities with shelter and water.

POLICY CS-61 The City will prepare for a reduced, long-term water supply resulting from more frequent and severe drought events, including working with regional water providers to implement extensive water conservation measures and ensure sustainable water supplies for the City.

POLICY CS-62 The City will renovate existing City-owned assets and design future facilities to incorporate renewable energy generation systems, battery storage systems, and energy-efficient design and features, as feasible.

POLICY CS-63 The City shall coordinate with water agencies and irrigation districts to explore ways to improve and increase storage capacity and generation efficiency.

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- POLICY CS-64** The City shall coordinate with local governments and Yuba-Sutter Transit to increase shading and heat-mitigating materials on pedestrian walkways and transit stops.
- POLICY CS-65** The City shall encourage new developments and existing property owners to incorporate sustainable, energy-efficient, and environmentally regenerative features into their facilities, landscapes, and structures to reduce energy demands and improve on-site resilience. Support financing efforts to increase community access to these features.
- POLICY CS-66** The City shall promote and expand the use of drought-tolerant green infrastructure, including street trees and landscaped areas, as part of cooling strategies in public and private spaces.
- POLICY CS-67** The City shall use natural resources and infrastructure to absorb the impacts of climate-related hazards and associated natural hazards, as feasible.
- POLICY CS-68** The City shall encourage the use of high-reflectivity pavement in new or significantly retrofitted large-scale paving projects, such as parking lots.
- POLICY CS-69** The City shall work with healthcare providers to support free or reduced-cost vaccinations for vector-borne diseases that are widely available for Marysville residents.
- POLICY CS-70** The City shall work with partner agencies and non-profit groups to ensure that unhoused persons or groups in the City of Marysville have access to temporary and/or emergency housing, food, and other essential living materials to keep them safe during anticipated hazard events.
- POLICY CS-71** The City shall work with partner agencies and non-profit groups to ensure that lower-income households have access to low-cost programs (e.g., subsidies for National Flood Insurance Program participation, air-conditioning, low-cost healthcare) to protect their homes and wellbeing from climate-related hazards.
- POLICY CS-72** The City shall look for opportunities to ensure that workers in outdoor industries have the training and resources to be adequately protected from environmental hazards, including extreme heat, poor air quality, and diseases.

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Table S-1: IMPLEMENTATION MEASURES

Implementation Measure		Applicable Policy	Responsible Department	Time Frame	Funding Source
CS-1	<p>The City will update and maintain standards designed to avoid geologic hazards, mitigate for soils-related constraints, reduce impacts to hydrological and drainage conditions, and minimize erosion resulting from site grading and preparation, construction, and ongoing operations. Projects will be conditioned to include measures to avoid geologic- and soils-related impacts, as necessary.</p> <p>The City will require a geotechnical evaluation prior to construction of buildings intended for public occupancy in areas with potential risk related to geologic conditions or soil limitations, as identified on maps maintained by the City. The geotechnical evaluation shall evaluate all relevant risks, which may include but are not limited to liquefaction, erosion, landslide, expansive soils, subsidence, and seismic activity. Recommendations from the geotechnical evaluation shall be incorporated into the subject project or plan in order to reduce risk to levels acceptable to the City. The City will also incorporate geotechnical evaluations and recommendations into its own public investments, as appropriate.</p>	CS-1 CS-7 CS-8	Public Works Department	Ongoing	Project applicant funding
CS-2	<p>The City will monitor maps issued by the State Department of Water Resources and the Federal Emergency Management Agency and will amend the General Plan, as necessary, to ensure compliance with state and federal standards for development in flood hazard areas.</p> <p>The City will communicate with staff from the Central Valley Flood Protection Board to ensure that local policies and standards are consistent with state law and regulations. The City will amend the Community Safety Element, if necessary,</p>	CS-12 CS-13	Community Development Department	Ongoing, following issuance of official updated flood hazard maps from the Federal Emergency Management Agency and the State Department of Water Resources	General Fund / Permit Fees

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Implementation Measure	Applicable Policy	Responsible Department	Time Frame	Funding Source
<p>to ensure adequate flood protection is provided in areas anticipated for urban development or to provide demonstration of adequate progress toward the requisite level of flood protection.</p> <p>Policies and implementation measures in the General Plan related to flood protection will integrate data from the State Plan of Flood Control. For flood-related revisions to the Community Safety Element, the City will consult with the Central Valley Flood Protection Board and local flood protection agencies serving the City.</p> <p>Following flood-related updates to the General Plan, the City will, if necessary, amend applicable development standards, including the Zoning Ordinance, Subdivision Ordinance, improvement standards, and other codes to ensure consistency with flood protection policies. Subdivision approvals, development agreements, permits, and other City and special district approvals should incorporate amended flood policies and regulations.</p>				
<p>CS-3 The City will update its policies and standards, if necessary, to remain consistent with state and federal standards for floodplains, levee design criteria, and urban development in areas subject to flooding during General Plan buildout.</p>	<p>CS-17 CS-18 CS-23</p>	<p>Community Development Department</p>	<p>Ongoing</p>	<p>General Fund</p>
<p>CS-4 Pursuant to the Central Valley Flood Protection Plan (CVFPP) conduct the following:</p> <p>a) Review existing City flood related planning documents as well as General Plan elements (e.g., Land Use, Open Space, Safety) and policies for consistency with the CVFPP. Initiate amendments to existing documents as appropriate.</p>	<p>CS-20</p>	<p>Community Development Department / Public Works Department / Engineering Department</p>	<p>Ongoing</p>	<p>General Fund</p>

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Implementation Measure		Applicable Policy	Responsible Department	Time Frame	Funding Source
	<p>b) Consider whether adoption of a local plan of flood protection under CA Water Code Sections 8201 et seq. is appropriate for Marysville.</p> <p>c) Work cooperatively with Yuba County and other appropriate agencies to identify those areas in Marysville that are subject to flooding and provide input on the preparation of flood emergency plans and flood mitigation programs, as provided for by CA Water Code Sections 9621 through 9623.</p>				
CS-5	Continue to implement the City’s most currently adopted Fire Codes to ensure that development is constructed in a structurally safe manner. To the extent feasible, conduct periodic fire safety inspections to ensure compliance with adopted codes.	CS-26 CS-30	Fire Department	Ongoing	General Fund / Fines
CS-6	Require continued operation of programs for fuel breaks, brush management, controlled burning, revegetation, and fire roads, as feasible.	CS-29	Fire Department	Ongoing	General Fund
CS-7	Coordinate with Cal Water regarding the regular maintenance on the City’s water pipelines, replacing any outdated or malfunctioning sections of pipe, and regularly clean and flush out fire hydrant terminals.	CS-32	Fire Department	Ongoing	General Fund / Development Impact Fees
CS-8	Identify and map areas with older housing stock (especially housing stock built before 1990), open spaces or natural areas with accumulated fuel loads, utility rights-of-way, and other areas that are susceptible to conflagration.	CS-32	Community Development Department	Ongoing	General Fund / Hazard Mitigation Grant Program

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Implementation Measure		Applicable Policy	Responsible Department	Time Frame	Funding Source
CS-9	The City shall work with the Cal Water to maintain adequate water supply and identify areas lacking adequate water service for firefighting, including capacity for peak load under a reasonable worst-case wildland fire scenario, to be determined by CAL FIRE. The City shall identify areas lacking adequate water service, where future development may occur.	CS-33	Fire Department	Ongoing	General Fund
CS-10	Maintain automatic aid agreements with other fire protection/suppression agencies in Yuba County.	CS-36	Fire Department	Ongoing	General Fund
CS-11	Require existing and new commercial and industrial uses involving the use, handling, transport, or disposal of hazardous materials in the city to disclose their activities in accordance with Yuba County guidelines and the requirements of California law.	CS-37	Fire Department	Entitlement process and through routine inspections	General Fund
CS-12	Designate the Marysville Fire Department as the keeper of a database of all properties in Marysville engaging with hazardous materials and include such information as their address, their owner's contact information, and a list of all the hazardous materials on site.	CS-44	Fire Department	Ongoing	General Fund
CS-13	The City will seek funding to maintain and update its emergency evacuation route network to ensure that it can withstand a variety of differing hazard conditions. It will also implement Action Items listed in the Multi-Hazard Mitigation Plan and future revisions to this General Plan, including the actions intended to avoid flooding over emergency access routes. The City will consider, as a part of future revisions to the Multi-Hazard Mitigation Plan, whether new growth accommodated under the General Plan will require improvements to circulation or drainage to ensure adequate emergency access and evacuation egress, even in the event of a flood.	CS-49	Public Works Department / Finance Department / Fire Department / Police Department	Ongoing	Grant Funding

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	Implementation Measure	Applicable Policy	Responsible Department	Time Frame	Funding Source
CS-14	The City will seek funding and coordinate with the County to create a network of local resilience hubs to provide shelter to residents against the effects of hazard events. These resilience hubs will have special services and amenities available to vulnerable groups who may be particularly threatened by hazards (e.g., seniors, renters, low-income households, unhoused people or families). For unhoused groups specifically, the City will work with Sutter-Yuba Homeless Consortium Continuum-of-Care (SYHCCOC) to merge the existing cold-weather shelter program, currently available only in adjacent Sutter County, with the City’s future network of resilience hubs. When hazard conditions mandate the opening of the resilience hubs, the City will ensure that personnel either from SYHCCOC or the Yuba County Department of Health and Human Services are available to address the special needs of unhoused people.	CS-50	Police Department	Ongoing	Grant Funding
CS-15	The City shall work with local schools and community centers to create resilience hubs that can serve as gathering places during emergencies and interruptions in services, and contain access to water, electricity, and other necessary services.	CS-50	Police Department	Ongoing	General Fund
CS-16	The City shall develop and maintain agreements with other local, state, and federal agencies to ensure coordinated disaster response.	CS-52 CS-53	Community Development Department / Fire Department / Police Department	Ongoing	General Fund
CS-17	The City shall support hiring multi-lingual staff and offer language training to existing staff to improve communication and assistance with non-English-speaking residents.	CS-54	City Administration	Ongoing	General Fund

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Implementation Measure		Applicable Policy	Responsible Department	Time Frame	Funding Source
CS-18	The City shall integrate the results and adaptive policies of the Climate Vulnerability Assessment into other City planning documents where feasible, including this General Plan Safety Element, the Local Hazard Mitigation Plan, Zoning Ordinance, fire code, building code, and other applicable codes.	CS-59	Public Works Department / Community Development Department	Ongoing	General Fund
CS-20	Mandate drought-responsive design features and measures such as retrofitting all existing City-owned buildings with water-efficient fixtures (e.g., faucets, toilets, sprinklers) as well as prohibiting landscape irrigation during the middle of the day.	CS-60 CS-61 CS-62	Public Works Department	Ongoing	Development Impact Fees
CS-21	The City shall annually review the climate adaptation and resiliency strategies and shall update them as needed to ensure compliance with state laws and community needs.	CS-61 CS-62 CS-63	Community Development Department	Annually	General Fund
CS-22	The City shall update the Vulnerability Assessment every eight years, consistent with the requirement to update the Housing Element, to incorporate new technology, programs, and policies to improve adaptation to climate-related hazards.	CS-61 CS-62 CS-63	Community Development Department	Ongoing	General Fund
CS-23	Where feasible, the City shall encourage the use of existing natural features and ecosystem processes, or the restoration of, when considering alternatives and adaptation projects through the conservation, preservation, or sustainable management of open space. This includes, but is not limited to, the conservation, preservation, or sustainable management of any form of aquatic or terrestrial vegetated open space, such as parks, rain gardens, and urban tree canopies. It also includes systems and practices that use or mimic natural processes, such as permeable pavements, bioswales, and other engineered systems, such as levees that are combined with restored natural	CS-64 CS-66 CS-67	Community Development Department	Ongoing	General Fund / Development Fees

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Implementation Measure		Applicable Policy	Responsible Department	Time Frame	Funding Source
	systems, to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people and wildlife.				
CS-24	Pursue funding to prepare an urban forest master plan for the city that includes quantified goals and tracking methods, prioritizing vulnerable communities.	CS-66	Public Works Department	By 2025	General Fund / Grant Funding
CS-25	Provide new affordable and safe housing stock to vulnerable populations by encouraging, and expediting when possible, housing developments with projects focused on special populations. Enforce and regularly update the City's Housing Element and its implementation programs.	CS-70	Community Development Department	Ongoing	General Fund / Metropolitan Planning Organization (MPO), State, and Federal Housing Development Grant

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APPENDIX A: VULNERABILITY ASSESSMENT RESULTS

The tables below show the results of the vulnerability assessment prepared for the City of Marysville, in accordance with the requirements of Senate Bill 379. For each population or asset that may be vulnerable to each climate-related hazard, the population or asset is scored on a scale of 1 to 5:

V1: Minimal vulnerability

V2: Low vulnerability

V3: Moderate vulnerability

V4: High vulnerability

V5: Severe vulnerability

The vulnerability scores reflect both the severity of climate-related impacts and the ability of populations and assets to resist and recover from these effects. Refer to the “Climate Change Vulnerability” section of the Safety Element for additional details on the vulnerability assessment method.

Hazard									
	Agricultural and Ecosystem Pests	Air Quality	Drought	Extreme Heat	Flooding	Human Health Hazards	Landslides	Severe Weather	Wildfire
Populations									
Children	-	V4	-	V5	V3	V3	-	V3	V3
Cost-burdened households	-	V3	V3	V4	V3	V3	-	V2	V2
Households in poverty	-	V4	V4	V5	V5	V5	-	V5	V3
Immigrants and refugees	-	V5	-	V4	V4	V5	-	V4	V3
Linguistically isolated populations	-	V4	-	V4	V3	V3	-	V3	V3
Low-income households	-	V4	V3	V5	V4	V3	-	V3	V3
Outdoor workers	V4	V5	V4	V5	V4	V5	-	V5	V4
Persons experiencing homelessness	-	V5	-	V5	V5	V5	-	V5	V5
Persons in mobile homes	-	V3	-	-	-	-	-	-	-

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Hazard									
	Agricultural and Ecosystem Pests	Air Quality	Drought	Extreme Heat	Flooding	Human Health Hazards	Landslides	Severe Weather	Wildfire
Persons in overcrowded housing	-	V3	-	V3	V3	V3	-	-	-
Persons with chronic illnesses	-	V4	-	V4	V3	V4	-	V4	V4
Persons with disabilities	-	V3	-	V3	V4	V3	-	V4	V3
Households that lack internet access	-	V3	-	V3	V4	V3	-	V3	V2
Households that lack access to a private vehicle	-	V3	-	V3	V5	-	-	V4	V3
Renters	-	V3	V3	V3	V3	V2	-	V3	V2
Seniors	-	V4	-	V4	V3	V4	-	V3	V4
Seniors living alone	-	V5	-	V5	V4	V5	-	V4	V4
Undocumented persons	-	V5	-	V5	V4	V5	-	V5	V3
Infrastructure									
Access roads	-	-	-	V3	V4	-	-	V4	-
Biking routes and pedestrian paths	-	-	-	V2	V3	-	V3	V3	V3
Bridges	-	-	-	V3	V5	-	-	V4	-
Communication facilities	-	-	-	V3	V5	-	-	V4	V3
Electrical substations and transmission lines	-	-	-	V4	V4	-	V1	V4	V4
Electric vehicle charging stations	-	-	-	V3	V3	-	-	V4	V3
Evacuation routes	-	-	-	-	V5	-	V4	V2	V4
Flood control infrastructure (levees)	-	-	-	-	V5	-	-	V4	-
Hazardous materials sites	-	-	-	-	V3	-	V2	-	-
Major roads and highways	-	-	-	V3	V3	-	V3	V2	V3
Natural gas pipelines	-	-	-	V3	V3	-	V3	-	V3
Parks and open space	V4	-	V4	V3	V2	-	V2	V2	V3
Railways	-	-	-	V5	V4	-	V3	V3	V3

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Hazard									
	Agricultural and Ecosystem Pests	Air Quality	Drought	Extreme Heat	Flooding	Human Health Hazards	Landslides	Severe Weather	Wildfire
Solid waste facilities and closed landfills	-	-	-	-	V3	-	-	V2	-
Transit stops	-	-	-	-	V3	-	-	V4	V1
Water and wastewater infrastructure	-	-	V2	-	V3	-	V3	V3	V3
County Library	-	-	-	V3	V3	-	-	V3	V1
Community centers	-	-	-	V3	V4	-	-	V3	V1
Emergency shelters/cooling centers	-	-	-	V3	V4	-	-	V3	V2
Government buildings	-	-	-	V3	V3	-	-	V3	V2
Homes and residential structures	-	-	-	V3	V4	-	-	V4	V4
Medical and care facilities	-	-	-	V1	V3	-	-	V2	-
Public safety buildings	-	-	-	V1	V2	-	-	V2	V2
Schools	-	-	-	V3	V4	-	-	V2	-
Yuba County Courthouse	-	-	-	V3	V3	-	-	V2	V1
Yuba County Government Center	-	-	-	V3	V3	-	-	V2	V1
Important Economic Assets									
Cropland	V5	-	V4	V3	V3	V4	-	V4	V4
Historic Sites	-	-	-	V2	V4	-	-	V3	-
Major employers	-	-	-	V2	V4	V2	-	-	V1
Restaurants and hotels	-	-	-	V3	V4	-	-	V4	V3
Building and construction	-	-	-	V2	V3	-	-	V3	V2
Pastures/grazing lands	-	-	-	V3	-	-	-	V4	V4
Local businesses	-	-	-	V3	-	V4	-	V4	V3
Water recreation sites	-	V4	V5	V3	V3	-	V2	V4	V3
Yuba College	-	-	-	V3	V3	V4	-	V2	V3

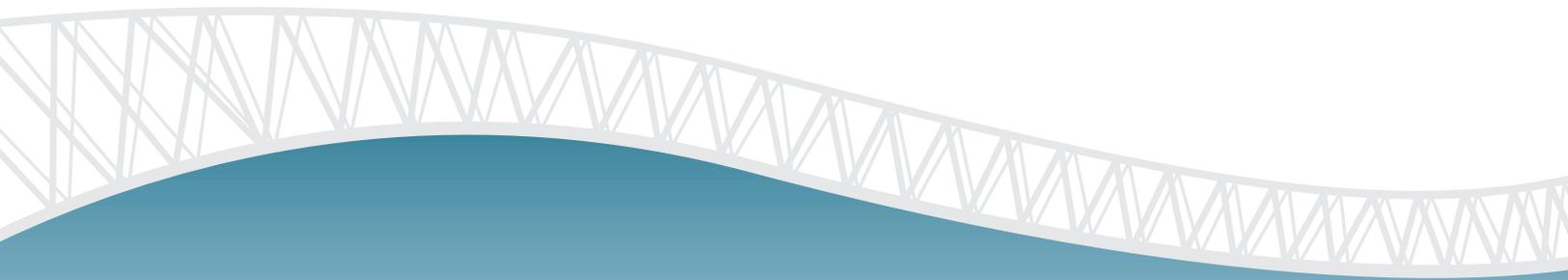
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Hazard									
	Agricultural and Ecosystem Pests	Air Quality	Drought	Extreme Heat	Flooding	Human Health Hazards	Landslides	Severe Weather	Wildfire
Ecosystems and Natural Resources									
Annual grassland	V4	-	V4	V2	V2	-	V2	V2	V4
Aquatic habitat	V4	-	V5	V5	V3	-	V5	V4	V4
Forested area	-	-	V4	V4	V2	-	V3	V2	V4
Wetlands, bogs, and vernal pools	V4	-	V5	V5	V3	-	V3	V3	V4
Woodland	V5	-	V3	V4	V2	-	V3	V3	V4
Key Community Services									
Communication services	-	-	-	V3	V3	-	-	V4	V3
Emergency medical response	-	V3	-	V4	V3	V4	V2	V3	-
Energy delivery	-	V1	V4	V5	V4	-	V1	V5	V4
Government administration & community services	-	-	-	V1	V2	V2	-	V2	V2
Public safety response	-	V3	V2	V2	V3	V4	V3	V3	V4
Public transit access	-	V3	-	V4	V4	V2	V3	V4	V3
Solid waste removal	-	-	-	V3	V3	V2	V2	V3	V3
Water and wastewater	-	-	-	V3	V5	-	V2	V2	V4

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526 C Street | Marysville, California 95901 | Tel: (530) 749-3901 | marysville.ca.us

