Public Health & Safety

Vision

The major themes of this Element are based on the County's General Plan Update Vision, Goals, and Strategies, a document that was approved by the Board of Supervisors prior to preparation of the General Plan. Following are highlights of the County's General Plan Update Vision, Goals, and Strategies document that are related to the Public Health & Safety Element:

- *Have schools, parks, and public gathering places that provide a safe enjoyable environment and promote active, healthy lifestyles.*
- *Provide the highest level of flood protection possible for our residents.*
- *Ensure that existing and future communities are healthy places to live by promoting a physically active lifestyle with clean air to breathe and safe facilities to meet the community's needs.*
- *Ensure that existing residences and resources are protected from hazardous conditions, such as wildfires, flooding, and soil erosion, in the process of evaluating future subdivisions.*
- *Protect our air and water quality by implementing responsible and realistic policies that protect these precious resources.*
- *Provide public services, such as law enforcement, fire protection, public transportation, and civic facilities, at appropriate levels for urban and rural communities.*
- *Ensure that existing residences and resources are protected from hazardous conditions, such as wildfires, flooding, and soil erosion, in the process of evaluating future subdivisions.*

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Introduction

The Public Health & Safety Element describes the County of Yuba's (County's) goals, policies, and actions to minimize the hazards to public health and safety in and around Yuba County. 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 Public Health & Safety Element also seeks to minimize physical harm to the buildings and infrastructure in and around Yuba County and to reduce damage to local economic systems, community services, and ecosystems. The goals, policies, and actions in this Element ensure that public health and safety are considered in the County's decisions related to the provision of services, proposed plans, development projects, and public investments. This Element also informs changes to County codes and ordinances, such as the Zoning Ordinance, and the County's grading, building, and construction standards.

Some degree of risk is inevitable—the exact timing, location, and intensity of many hazardous events and disasters cannot be predicted with absolute accuracy. The goal of the Public Health & Safety Element is to reduce the risk of injury, death, property loss, and other hardships to acceptable levels.

This Element addresses issues required under state law as mandatory for the safety element of a general plan.[1] Following are the County's goals, policies, and actions addressing:

- Flooding and dam inundation,
- Fire risk,
- Water quality,[2]
- Airport operations,
- Air quality and greenhouse gases,
- Hazardous materials,
- Geologic and soils stability hazards, including seismic issues,
- Emergency preparedness, response, and evacuation,
- Noise,
- Healthy communities,
- Severe weather,
- Drought, and
- Agricultural and forestry pests and diseases

State law requires that the Public Health and Safety Element include goals, policies, and implementation actions to increase community resilience to climate change and related hazards. These items are integrated into the sections listed above as appropriate.

The General Plan establishes the overall policy framework to guide various implementation actions. One of the most pertinent implementation actions for this Element is the Multi-Jurisdictional Local-Hazard Mitigation Plan. Yuba County was a participant in the development of the Multi-Jurisdictional Local Hazard Mitigation Plan, and this plan is hereby incorporated by reference.

[1] Please refer to Government Code Section 65302 (g) (1) for more details.
[2] Water quality is addressed in this Element both relative to public health and environmental health.

Regulatory Framework

All counties and incorporated communities in California must prepare a General Plan that must address several topics, one of which is to protect the community against natural and human-caused hazards. The Public Health & Safety Element meets these requirements, which are laid out in California law, particularly Section 65302(g) of the California Government Code. State law requires that the Public Health & 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).
- 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. Working with local cities, fire and law enforcement agencies, and special districts, OES helps to support and implement emergency mitigation and preparation activities across Yuba County, 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.

The Yuba County OES has an Emergency Operations Plan (EOP), updated most recently in 2015. The EOP describes the roles and responsibilities of Yuba County's emergency management organization and lays out a framework for how the organization should function during emergency response and recovery events. Emergency management activities are coordinated from the Yuba County Emergency Operations Center, located at 915 8th Street in Marysville.

Relationship to Other General Plan Elements

Public health and safety issues and the County's policy response to these issues are embodied not only in this Element, but also in the Community Development and Natural Resources Elements. The issues addressed in this Element feed into the County's land use strategy, which is designed, in part, to avoid development in areas prone to natural hazards. The Circulation section of the Community Development Element is also closely tied to public health and safety issues. A highly connected circulation network

allows for multiple routes to a given location for emergency services personnel and evacuation in the event of a disaster. The Circulation section of the Community Development Element and implementing standards also address road width, turning radii, and other aspects of the circulation network that are related to emergency access. With approximately 40,000 traffic fatalities per year nationally, vehicular transportation is a major public health and safety issue. Since transportation corridors are a major source of noise, there is a strong relationship between the noise section of this Element and the circulation section of the Community Development Element as well.

Air quality and climate change are addressed in this Element, but most policies that would address air quality issues are in the Community Development Element. The transportation sector is the largest source of greenhouse gas emissions in Yuba County and in California, and mobile sources (vehicles) are the source of the majority of overall air pollution within the Feather River Air Quality Management District. The Community Development Element describes the development of land use patterns and transportation facilities that will reduce dependence on automobile travel and reduce the length of vehicle trips, which has major implications for improvements to air quality and greenhouse gas emissions. Achieving air quality goals requires supportive land use patterns, community design, and transportation systems and evaluating how the location of highways, railroads, industries, and other sources of air emissions affect houses, schools, and other sensitive land uses. The Natural Resources Element policies on energy efficiency also have the potential to reduce indirect air pollutant emissions. The Housing Element includes policies and programs to address housing conditions, which can have health and safety repercussions for County residents.

These are just a few examples of the many important relationships between public health and safety issues and those policy topics addressed in other General Plan Elements. The County is aware of complementary policies in other Elements and has developed an internally consistent General Plan with these important connections in mind.

Relationship to the Multi-Jurisdictional Local Hazard Mitigation Plan

Yuba County's Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) 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 Local Hazard Mitigation Plan guidance. The mitigation actions in the LHMP include both short-term and long-term strategies and involve planning, policy changes, programs, projects, and other activities. The LHMP and the Public Health & Safety Element address similar issues, but the Public Health & Safety Element provides a higher-level framework and set of policies, and the LHMP focuses on more specific mitigation actions. The LHMP, as its name implies, focuses on mitigation-related actions; the Public Health & Safety Element also includes policies related to emergency response, recovery, and preparation activities.

The LHMP 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 LHMP 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.

Relationship to the CAL FIRE Nevada-Yuba-Placer Unit Strategic Fire Plan

Yuba County is part of the Nevada-Yuba-Placer Unit of the California Department of Forestry and Fire Protection (CAL FIRE), which provides fire protection services to large sections of the unincorporated area. The unit's Strategic Fire Plan, prepared in 2020, lays out how CAL FIRE staff in the region plan to implement the State Fire Plan in the region to reduce the threat posed by wildfires. It includes strategies such as public information and outreach, fuel reduction, maintenance of fire protection roads, and coordination with local agencies. The Safety Element incorporates many of the fire protection strategies in the Strategic Fire Plan, helping to ensure a consistent approach to wildfire mitigation between CAL FIRE and local agencies in Yuba County.

Climate Change in Yuba County

Changes to the global climate system are expected to affect future occurrences of natural hazards in and around Yuba County. Many hazards that already affect Yuba County—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. This section discusses some of the anticipated effects of climate change in Yuba County. More information on these effects and the harm they may pose to the community is given below in the discussion of individual public health and safety issues. Warmer temperatures are projected to cause an increase in extreme heat events. Depending on future greenhouse gas emission levels, the countywide number of extreme heat days is expected to rise from a historical average of 4 annually to between 22 and 42 by the middle of the century, and to between 45 and 76 by the end of the century. In addition to increases in extreme heat events, all of Yuba County is also expected to see an increase in average daily high temperatures.

Both droughts and floods are expected to become more frequent as periods of very high and very low precipitation become more common. 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.

Hotter, drier weather is expected to lead to an increase in wildfires in Yuba County. Average annual acres burned by wildfires in Yuba County are projected to increase from 2,830 acres 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.

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 in the hillside regions

of Yuba County. Compared to their historical average, the average number of extreme precipitation events is projected to approximately double by the end of this century. Severe winter weather, such as heavy snowfall, ice storms, or extreme cold may become more frequent and intense due to climate change.

Climate change is associated with several threats to human and ecosystem health. Changes in temperatures and precipitation patterns may cause pests and diseases that have historically not been present in Yuba County to expand their ranges into the area. Climate change can increase the rates of infection for various diseases because many of the animals that carry them 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 Yuba County 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. 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.

Vulnerability Assessment

In 2021, Yuba County completed a Climate Change Vulnerability Assessment consistent with Government Code Section 65302(g)(4) as part of the update to the Health & Safety Element. This analysis assesses the extent to which the diverse populations and assets in Yuba County are vulnerable to different emergencies and hazardous conditions that may be created or made worse by climate change. The primary categories of populations and assets assessed include populations, buildings and infrastructure, important economic assets, natural systems, and key community services. The assessment follows the recommended process in the updated *California Adaptation Planning Guide*, which is the state's guidance for how local communities should conduct climate adaptation planning efforts, including vulnerability assessments. As defined by the *California Adaptation Planning Guide*, climate change vulnerability is considered the degree to which natural, built, and human systems are susceptible to harm from exposure or stresses associated with climate change and from the absence of adaptive capacity to adapt.

Vulnerability Assessment Results

The Climate Change Vulnerability Assessment indicates that Yuba's County's populations and assets are most vulnerable to extreme heat, flooding, severe weather, and wildfire.

While many aspects of climate change are expected to affect community health and well-being in Yuba County, countywide, populations are most vulnerable to extreme heat, flooding, severe weather, human health hazards, severe weather, wildfire, and declines in air quality. Due to financial limitations, mobility challenges, and lack of access to medical care and associated community services, the most sensitive populations are households in poverty, immigrants and refugees, outdoor workers, persons experiencing homelessness, and seniors living alone. The homes that vulnerable populations live in, especially those in fire hazard, landslide, or flood zones, are highly vulnerable to direct damage from wildfires, landslides, and severe weather and flooding as well as indirect damage from forestry pests and diseases that can weaken trees and cause them to fall on properties.

Countywide, the electricity transmission system is vulnerable to multiple hazards, including high winds and other forms of severe weather 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 and can disrupt energy service. Extreme heat can lead to power outages by causing mechanical failure of grid equipment, by causing heat damage to power lines, and by creating a high demand for electricity to power air conditioners, all of which places stress on the network and may lead to service disruptions. Severe weather conditions can also 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.

PSPS events can also create vulnerabilities for Yuba County 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.

Yuba County's local hydroelectric power plants are also threatened by drought, which can reduce the amount of water available for producing hydropower. The County's water and wastewater treatment services may be impacted by flood events, which may damage water infrastructure and interrupt service.

Yuba County'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 forestry pests and diseases, droughts, extreme heat, and wildfire create higher vulnerability for the county's natural environments, including forest, woodland, and aquatic ecosystems. Drought and extreme heat can stress trees, weakening or killing them. Weakened trees are more susceptible to forestry pests, creating a risk of further damage. Droughts may imperil aquatic ecosystems. These changes can also affect local economic activities in Yuba County, such as outdoor recreation and visiting the county's national forests.

Public Health & Safety Issues

These sections discuss the hazardous conditions and potential hazard events present in Yuba County, past examples of the hazard in and around Yuba County, the expected frequency of future events, and how climate change may affect future events. This summary of hazardous conditions is followed by goals, policies, and implementation actions to improve community resilience to these hazard events. When discussing the possibility for future hazards, the following scale is used:

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

The anticipated frequencies of hazard events are based on past records of these hazards. Climate change and other factors may change these frequencies, including making some hazard events occur more often.

Flooding and Dam Inundation

Existing Conditions

Flooding

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 due to 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 Yuba County, flood risks relate primarily to high flows of the Feather, Bear, and Yuba Rivers, as well as other creeks and drainage channels. Flooding occurs in three forms in within the county: riverine, urban, and flash flooding. Excess rainfall and snowmelt are well-known causes of flooding, particularly flash and riverine flooding. Other causes of flooding include dam or levee failure, or, in the case of urban flooding, storm drainage system overload.

Riverine flooding occurs when water from watercourses overtops the natural banks of the watercourse to flow over the adjacent lands. This excess often flows onto floodplains, the land directly adjacent to a stream course that is often inundated as the stream rises out of its natural channel.

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.

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-year flood zones, 200-year flood zones, 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. As can be seen in **Figure 1**, Flood Hazards, the 100-year and 200-year flood zones are both concentrated primarily along the western side of the county. Marysville, Linda, Olivehurst, and Plumas Lake fall within these flood zones, as do Yuba County Airport and several medical centers, fire stations, electrical substations, power plants, major roadways, and transmission lines.

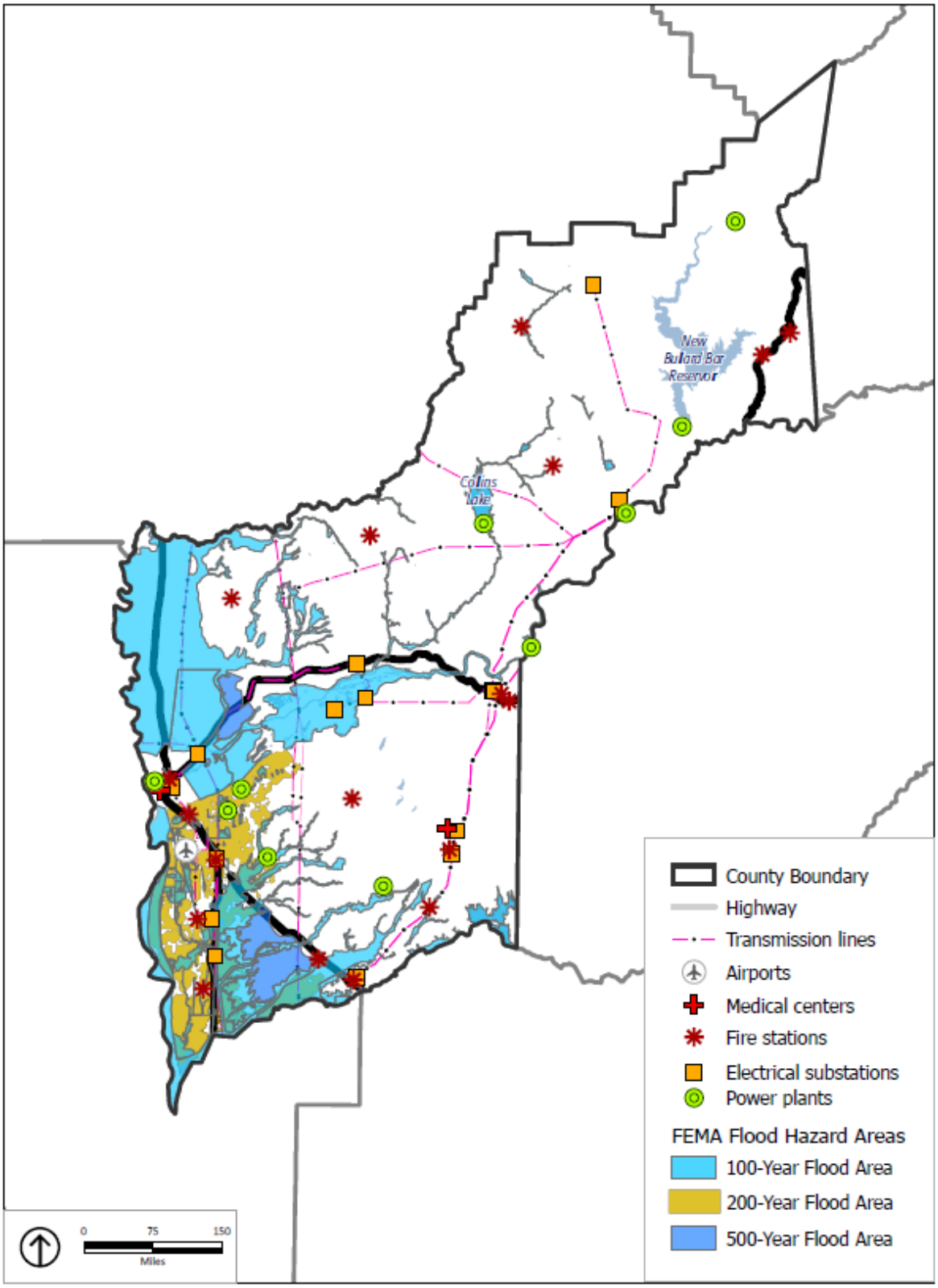


Figure 1: Flood Hazard Zones

Floodplains can change over time; the floodplain and watercourse of a stream can also be affected by anthropogenic 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 is a catastrophic type of dam damage characterized by the sudden, rapid, and uncontrolled release of impounded water. Dam failure can result from erosion of the dam face or foundation, site instability, rapidly rising flood waters, aging structure or design flaws, and earthquakes. Seismic activity may also cause inundation by the action of a seismically induced wave that overtops the dam without causing dam failure. This event is called a seiche. Landslides flowing into a reservoir are also a source of potential dam failure or overtopping.

There are five major dams that could have significant impacts on the County of Yuba in the event of dam failure: New Bullards Bar Dam, Englebright Dam (The Narrows), Virginia Ranch Dam (Merle Collins Lake), Camp Far West Dam, and Oroville Dam. Failure of these dams is generally considered a very unlikely event, although such events are not unprecedented. As discussed below, Oroville Dam's spillways were damaged by heavy rains, prompting widespread evacuations due to fear of dam failure.

The following dams are in Yuba County's jurisdictional boundaries:

- New Bullards Bar Dam, impounding the New Bullards Bar Reservoir
- Lake Francis Dam, impounding Lake Francis
- Los Verjeles Dam, impounding Lake of the Springs
- Virginia Ranch Dam, impounding Collins Lake

Areas in the county that would be affected by inundation of these dams are illustrated in **Figure 2**. Dam inundation areas are concentrated in the western end of the county and include the cities of Olivehurst, Plumas Lake, Linda, and Marysville as well as Yuba County Airport, several medical centers, fire stations, electrical substations, power plants, major roadways, and transmission lines.

Figure 3 shows the areas of the county that would be subject to inundation by dam failure of dams located outside of the county—Oroville, Themalito Afterbay, Thermalito Diversion, and Thermalito Forebay. These inundation areas are along the western boundary of the county and include the cities of Marysville, Olivehurst, and Plumas Lake as well as several medical centers, electrical substations, power plants, major roadways, and transmission lines.

The Federal Energy Regulatory Commission, as required by federal law, has reviewed and approved comprehensive emergency action plans (EAP) for each of these dams. The EAP is intended to minimize the threat to public safety and to minimize 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 United States Army Corps of Engineers 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 which might disrupt operation or dam safety.

The Yuba County Water Agency, 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 Department of Water Resources, Division of Safety of Dams, most are believed to be inactive.

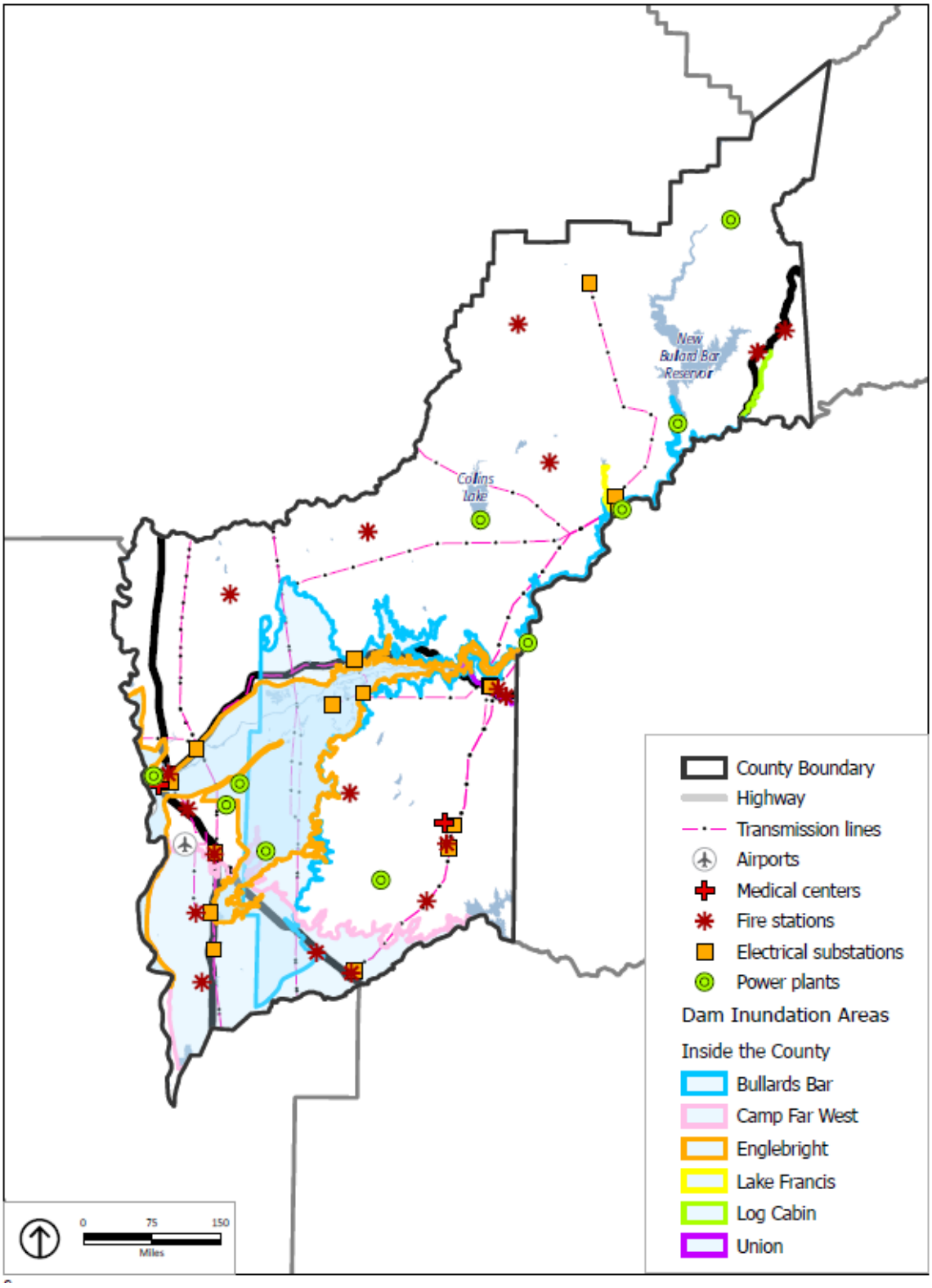


Figure 2: Dam Inundation Zones (Local Dams)

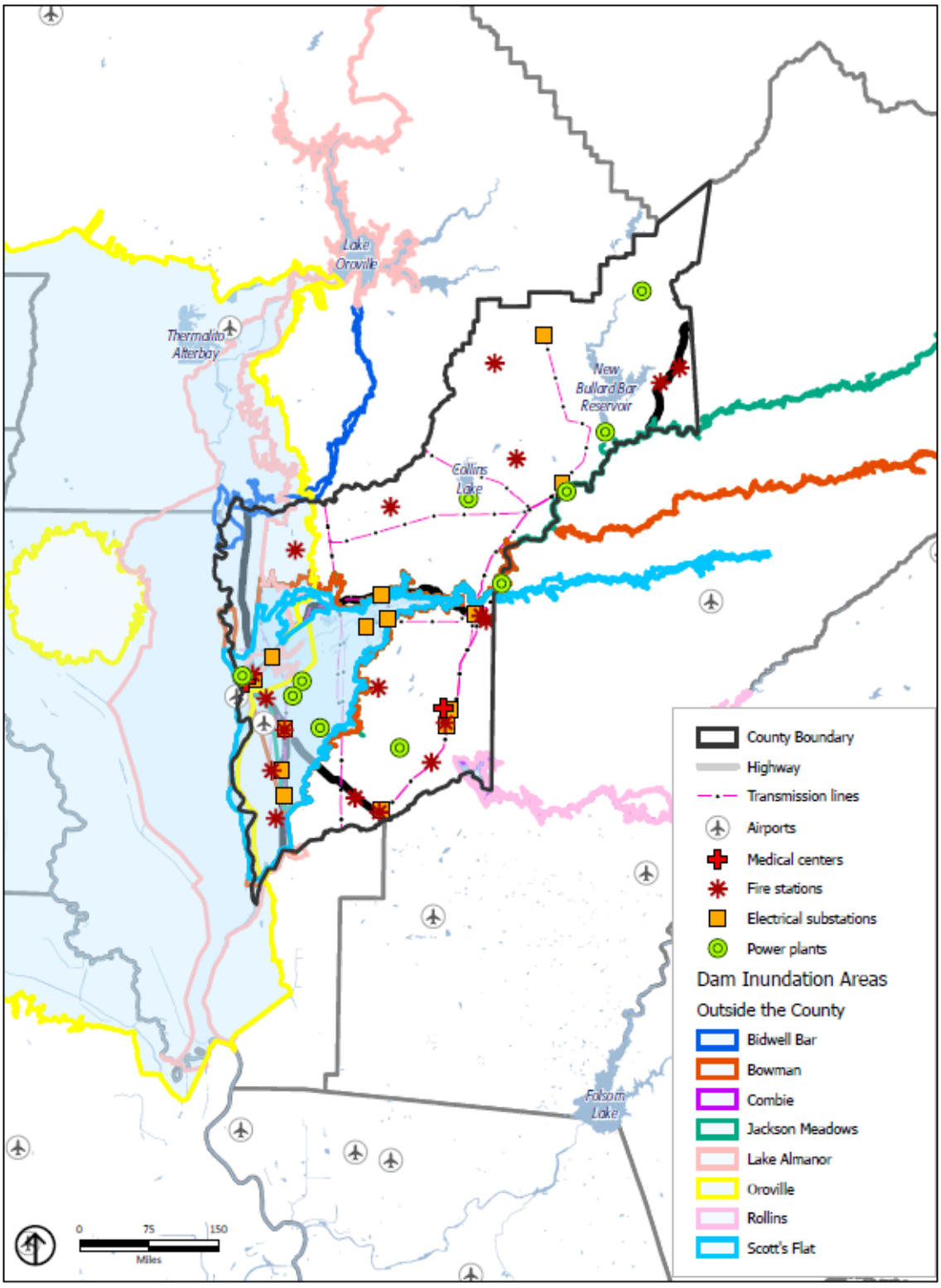


Figure 3: Dam Inundation Zones (Regional Dams)

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 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 Yuba County Water Agency to inspect the dam.

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 districts[3] and overseen by the U.S. Army Corps of Engineers, California Department of Water Resources, and the Bureau of Reclamation. Levee failure occurs when the structural integrity of the levee is comprised in some way. Over 88 miles of levees protect property adjacent to the Feather, Yuba, and Bear Rivers. In 2011, the Army Corps of Engineers Sacramento District rated a rural Yuba County levee system as unacceptable and gave a minimally acceptable rating to the urban levee system near Linda and Olivehurst.

Past Occurrences

The history of flooding in Yuba County is closely intertwined with its geographic position at the convergence of three significant river systems: the Feather River, the Yuba River, and the Bear 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 and Bear Rivers are tributaries to the Feather, draining watersheds of 1,336 and 469 square miles, respectively. As a result, Yuba County has a long history of disastrous flooding. There have been several major flood events that have impacted low-lying valley areas along the Yuba and Feather Rivers in the last 100 years, most recently in 2005/2006, January of 2008, and February of 2017. Areas that have historically been especially susceptible to flooding include the unincorporated communities of Linda and Olivehurst.

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.

A levee failure in 1950 along the Yuba River affected Hammonton, Linda, and Olivehurst and flooded approximately 43,000 acres. A levee failure along the Yuba River in 1986 inundated 7,000 acres and 3,000 homes in Linda and Olivehurst. In 1997, a levee failure along the Feather River flooded 16,000 acres and 840 homes in Arboga, Linda, and Olivehurst.

Potential Changes to Flood Risk in Future Years

Flooding/Levee Failure. Occasional – between 1 percent and 10 percent chance of occurrence in the next year or a recurrence interval of 11 to 100 years. Localized flooding is highly likely (a near 100 percent chance of occurring in a given year).

Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any recurrence interval are commonly termed 100- and 500-year floods, having 1- and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods occur at short intervals or even within the same year.

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

Low-lying areas of the county are particularly susceptible to localized flooding. The 100-year flood zone is an area that has a 1 percent chance of flooding in any given year, and the 500-year zone is an area that as a 0.2 percent chance of flooding in any given year.

The potential for levee failure in Yuba County has decreased over the last several years. Beginning in 2004, Yuba County and Reclamation District 784 formed the Three Rivers Levee Improvement Authority (TRLIA), a joint powers agency created for the sole purpose of improving the levee system in south Yuba County. TRLIA has conducted levee repairs on the Yuba River, Feather River, Bear River, and Western Pacific Interceptor Canal. Recent projects, including setback levees on the Feather and Bear Rivers, will further help to decrease the likelihood of a levee failure in South Yuba County. In 2019, the US Army Corp of Engineers conducted a routine inspection of the Reclamation District 784 levee system. The inspection noted that there were some locations where vegetation and infrastructure were located too close to the levees, and that these issues should be corrected. However, the inspection did not find any issues that would be likely to prevent the levees from performing as needed during future flood events.

Dam Failure. Unlikely – Less than 1 percent chance of occurrence in next 100 years or a recurrence interval greater than every 100 years.

Climate Change and Flooding

Floods are among the most damaging natural hazards in Yuba County, 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 Yuba County, and climate change may expand the parts of the county 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, is expected to contribute to an increased flooding risk.

Some indirect effects of climate change may also increase flooding in Yuba County. 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 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. 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.

Overall, increases in flood risk and intensity associated with climate change could be significant. Increases in damaging flood events will cause greater property damage, public health and safety concerns, displacement, and loss of life. In addition, an increase in the magnitude and severity of flood events can lead to potential contamination of potable water and contamination of the county's food crops. Displacement of residents can include both temporary and long-term displacement, increases in insurance rates, or restriction of insurance coverage in vulnerable areas.

Goals, Policies & Actions

Goal HS1. Flood Protection

Reduce flood risk for the County's people and property.

Policy HS1.1 *The County will not approve new housing development that would have a finished floor within the 100-year floodplain, as defined by the Federal Emergency Management Agency.*

Policy HS1.2 *For areas under the jurisdiction of the Central Valley Flood Protection Board, the County will not approve new developments within a flood hazard area or an area of*

moderate flood hazard without demonstrating adequate flood protection according to Government Code Sections 65865.5, 65962, and 66474.5.

Policy HS1.3 *The County may allow non-residential improvements within the 100-year floodplain so long as the proposed improvements do not:*

- *Increase flood heights or velocities;*
- *Inhibit emergency access;*
- *Create excessive costs in providing governmental services during or after flooding;*
- *Interfere with the existing waterflow capacity of the floodway;*
- *Substantially increase erosion and/or sedimentation;*
- *Contribute to the deterioration of any watercourse or the quality of water in any body of water; or*
- *Contain occupiable floor space below the base flood level elevation.*

Policy HS1.4 *Public buildings are discouraged in the 100-year flood zone, but if they are constructed, they shall be flood proofed to a point at or above the base flood level elevation.*

Policy HS1.5 *The County will continue to collaborate with the Yuba County Water Agency, local reclamation districts, levee commissions, and U.S. Army Corps of Engineers to improve, certify, and maintain the levee system that protects developed and planned development areas in Linda and Olivehurst, including the Plumas Lake Specific Plan Area. Urban areas in Yuba County should have 200-year flood protection or greater.*

Policy HS1.6 *The County will prohibit construction near levees that would adversely affect the integrity of the subject levee or would impede maintenance, inspection, or planned levee expansion.*

Policy HS1.7 *The County will 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 HS1.8 *New developments shall evaluate potential flood hazards and demonstrate compliance with state and federal flood standards prior to approval.*

Policy HS1.9 *New developments shall provide drainage improvements according to County standards.*

Policy HS1.10 *Natural waterways shall be protected from unnecessary alteration whenever flood protection structures or other forms of construction are proposed.*

Action HS1.1 General Plan and Zoning Updates

The County 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.

The County 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 County will amend the Public Health & Safety Element and Community Development Element, if necessary, 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.

Policies and actions in the General Plan related to flood protection will integrate data from the State Plan of Flood Control. For flood-related revisions to the Public Health & Safety Element, the County will consult with the Central Valley Flood Protection Board and local flood protection agencies serving the County.

Following flood-related updates to the General Plan, the County 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 County and special district approvals should incorporate amended flood policies and regulations.

Related Goals:	Goal HS1, Goal CD15, Goal NR12
Agency/Department:	Community Development and Services Agency
Funding Source:	General Fund and/or Permit fees
Time Frame:	Annually, following issuance of official updated flood hazard maps from the Federal Emergency Management Agency and the State Department of Water Resources

Action HS1.2 Flood Emergency Plan

The County will collaborate with the cities of Wheatland and Marysville to develop a flood emergency plan, consistent with the adopted Central Valley Flood Protection Plan. The flood emergency plan should also be consistent with local hazard mitigation plans and the local flood protection planning.

The County 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.

Related Goals:	Goal HS1, Goal HS9, Goal CD15, Goal NR12
Agency/Department:	Community Development and Services Agency
Funding Source:	General Fund
Time Frame:	Within 24 months of the adoption of the Central Valley Flood Protection Plan, which is required to be adopted by July 1, 2012

Action HS1.3 Continual Flood Hazard Planning Compliance

The County 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.

Related Goals:	Goal HS1
Agency/Department:	Community Development and Services Agency

Funding Source:	General Fund
Time Frame:	Ongoing, takes immediate effect upon adoption of this plan

Fire Risk

Existing Conditions

Wildfire is an ongoing concern for communities in Yuba County. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire hazard is greatest in the foothill and mountain areas of the county. Three types of fires are of concern to Yuba County: (1) wildfires, (2) wildland-urban interface fires, and (3) structural fires.

Wildfires

Wildland fire is an ongoing concern for Yuba County. Conditions for wildfire hazards arise from a combination of high temperatures, low-moisture content in the air and plant matter, accumulation of vegetation, and high winds. The geographic extent of land susceptible to wildland fire is significant. While all of California is subject to some degree of fire hazard, there are specific features that make some areas more hazardous. The California Department of Forestry and Fire Protection (CAL FIRE) is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, called fire hazard severity zones (FHSZ), influence how people construct buildings and protect property to reduce risk associated with wildland fires.

According to CAL FIRE, which is the agency responsible for fighting wildland fires in Yuba County, about 48 percent of the county is classified as "Very High" FHSZ, 15 percent is "High" FHSZ, and 7 percent is "Moderate" FHSZ. The eastern areas of the county, with their limited access, steep terrain, fire-prone vegetation, and remote location, face the greatest risk from wildland fire hazard. In other areas, large concentrations of highly flammable brush in flat open spaces are also quite susceptible to wildland fire. Also at risk are the "river bottoms," or the areas along the Yuba, Feather, and Bear Rivers within the levee system. Much of the area inside these levees are left in a natural state, allowing combustible fuels to accumulate over long periods of time. **Table 1** identifies the acreages by zoning district in the different fire hazard severity zones. See **Figure 4** for the location of Moderate, High, and Very High FHSZs within Yuba County.

Table Public Health & Safety-1
Acres in Fire Hazard Severity Zones by Zoning District

Zoning District	Very High		High		Moderate	
	Acres	Percent	Acres	Percent	Acres	Percent
AE (Exclusive Agriculture)	33,874	23%	3,386	16%	12,461	27%
AI (Agricultural/Industrial)	199	Less than 1%	0	0%	0	0%

AR (Agricultural/ Rural Residential)	24,724	17%	2,935	14%	3,709	8%
EX (Extractive)	567	Less than 1%	27	Less than 1%	7,107	16%
NMX (Neighborhood Mixed Use)	1	Less than 1%	19	Less than 1%	0	0%
PD (Planned Development)	1,222	1%	0	0%	0	0%
PF (Public Facilities)	199	Less than 1%	71	Less than 1%	1,657	4%
RC (Rural Commercial)	967	1%	163	1%	254	1%
RE (Residential Estate)	984	1%	29	Less than 1%	50	Less than 1%
RPR (Resource Preservation and Recreation)	22,577	15%	1,877	9%	12,105	27%
RR (Rural Residential)	34,480	23%	11,960	58%	8,148	18%
SE (Sports and Entertainment)	0	0%	0	0%	0	0%
TP (Timberland Preservation)	28,620	19%	172	1%	0	0%
Total	**148,414**	**100%**	**20,639**	**100%**	**45,491**	**100%**

Land in the Federal Responsibility Areas (predominately RPR and PF zoning designations) are not included.
Zoning districts not included in this table do not cover any land in the fire hazard severity zones.

A number of important developments and infrastructures are within or adjacent to High or Very High FHSZs, including the communities of Loma Rica, Smartsville, Dobbins, and Challenge-Brownsville as well as several fire stations, electrical substations, major roadways, and transmission lines. The FHSZs identify fire hazard, not fire risk. "Hazard" is based on the physical conditions that give a likelihood that an area will burn over a 30- to 50-year period without considering modifications such as fuel reduction efforts. "Risk" is the potential damage a fire can do to the area under existing conditions, including any modifications such as defensible space, irrigation and sprinklers, and ignition-resistant building construction that can reduce fire risk. Risk considers the susceptibility of what is being protected. Susceptibility to wildfires is considered in the Vulnerability Assessment included as an appendix to this Element.

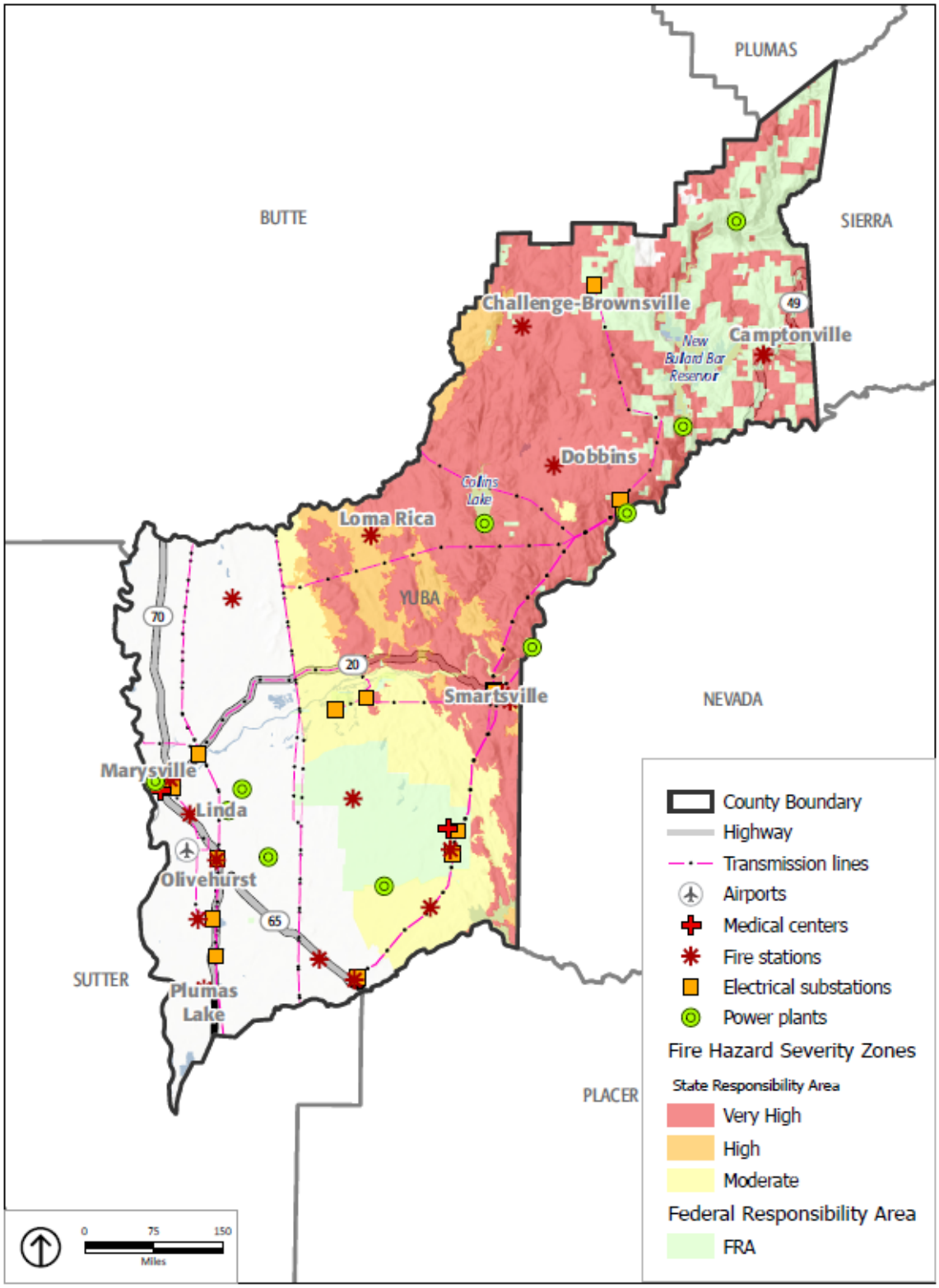


Figure 4: Wildfire Severity Zones

Wildland-Urban Interface Fires

The Wildland-Urban Interface (WUI) is an area where buildings and infrastructure (e.g., cell towers, schools, water supply facilities) mix with areas of flammable wildland vegetation, typically in low-density residential development along foothill regions. The WUI for Yuba County consists of communities at risk as well as the area around the communities that pose a fire threat.

There are two types of WUI environments. The first is the urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low density communities where homes are intermixed in wildland areas. Wildland urban intermix communities are difficult to defend because they sprawl over a large geographical area, with wild fuels interspersed throughout. These conditions makes access, structure protection, and fire control difficult as fire can freely run through the community. Consequently, WUI fires are typically the most damaging. Even relatively small acreage fires may result in significant damages, such as infrastructure damage, damage to homes and businesses, and loss of life, wildlife, and injury.

In the wildland-urban interface, efforts to prevent ignitions and limit wildfire losses hinge on hardening structures and creating defensible space through a multifaceted approach, which includes engineering, enforcement, education, emergency response, and economic incentive.

Figure 5 illustrates the location of the WUI within Yuba County. This area is primary scattered across the central portion of the county, with smaller areas scattered to the north and south as well. Loma Rica, Smartsville, Dobbins, and Challenge-Brownsville fall primarily or entirely within the WUI, as do several fire stations, electrical substations, major roadways, and transmission lines.

Fire Responsibility Areas

In and around Yuba County, different organizations all have some responsibility for wildfire protection in different areas. These responsibility areas are codified under the state law into three categories: local responsibility areas (LRA), state responsibility areas (SRA), and federal responsibility areas (FRA).

- LRAs are areas protected by local agencies, including city and county fire departments, local fire protection districts, and CAL FIRE when under contract to local governments.
- SRAs are areas where CAL FIRE has responsibility for wildfire protection. SRAs are generally unincorporated areas that are not federally owned, are undeveloped, and are covered by wildland vegetation or rangeland.
- FRAs are areas that are managed by a federal agency, including the U.S. Forest Service, the U.S. Fish and Wildlife Service, and the Bureau of Land Management.

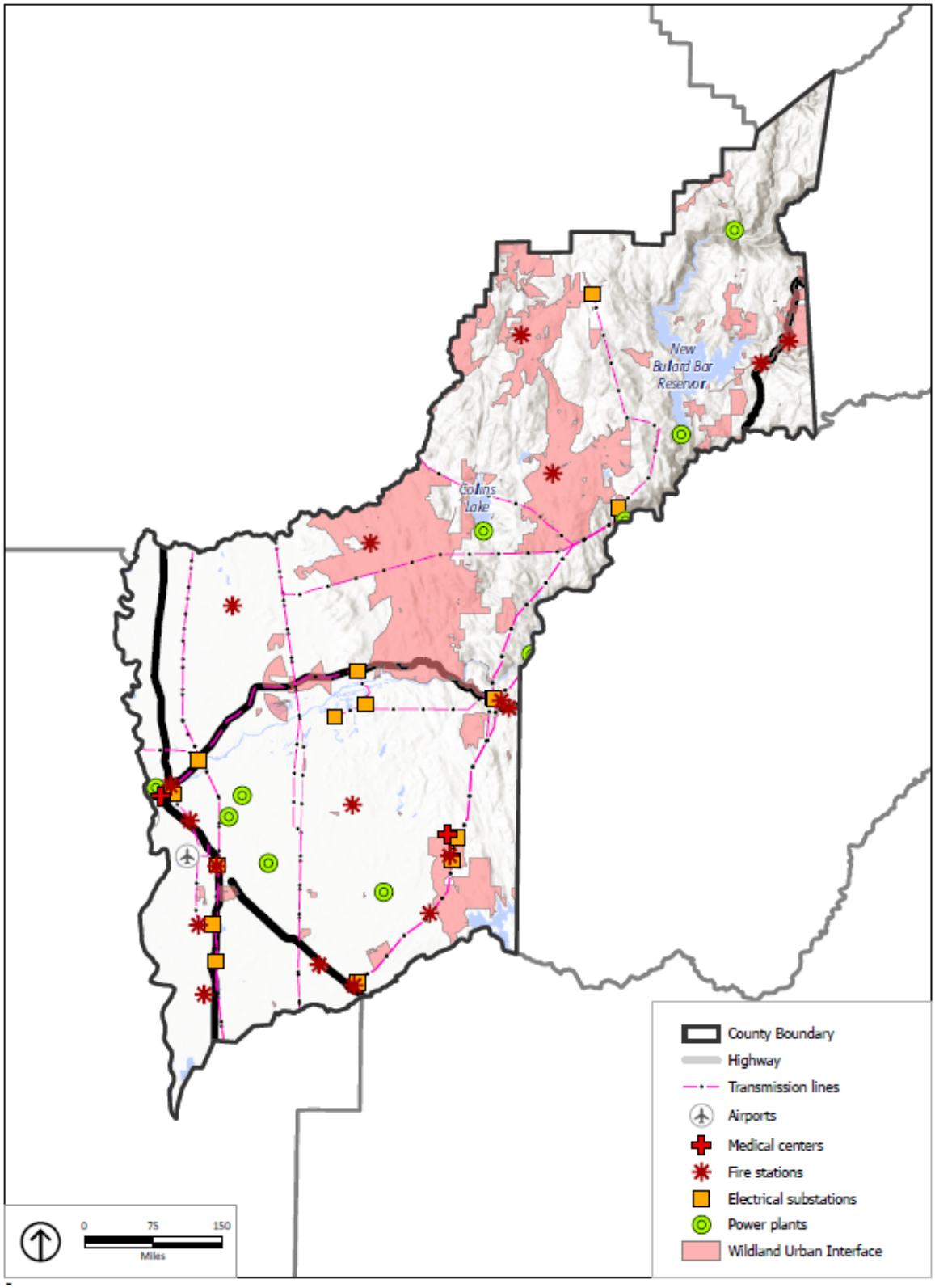


Figure 5: Wildland-Urban Interface Zones

Fire Protection

In the unincorporated county, fire protection services are provided by CAL FIRE, the US Forest Service, and several local agencies—including the Camptonville Community Services District (CSD), Dobbins-Oregon House Fire Protection District (FPD), Foothill FPD, District 10-Hallwood CSD, Linda FPD, Loma Rica/Browns Valley CSD, Olivehurst Public Utilities District (OPUD), Plumas-Brophy FPD, Smartsville FDP, the Plumas and Tahoe National Fire Service, and the Beale Air Force Base Fire Department.

Fire protection services for Beale Air Force Base (AFB) are provided internally by the U.S. Air Force. Several fire protection districts contract with CAL FIRE and other fire agencies for services. For example, District 10 Hallwood CSD contracts with the Marysville Fire Department (MFD) for fire protection services, but owns and operates its own equipment and has two on-call firefighters in addition to MFD firefighters. The Plumas-Brophy FPD entered into a joint powers agreement with the City of Wheatland to create the Wheatland Fire Authority (WFA), in which the District owns the equipment, but services are provided by WFA. The Loma Rica/Browns Valley CSD contracts with CAL FIRE for fire protection services.

The rural fire protection agencies are primarily volunteer departments. Camptonville CSD, Dobbins-Oregon House FPD, Foothill FPD, and Smartsville FPD are all volunteer departments, and the Valley fire protection agencies employ paid firefighters. The Linda FPD, OPUD, and WFA have both paid and volunteer firefighters.

Although CAL FIRE and the US Forest Service's service areas are generally limited to SRAs and FRAs, respectively, they will provide assistance to the other fire protection agencies during a major incident, particularly wildfires.

The Yuba Watershed Protection & Fire Safe Council has targeted fuel reduction along roads as a focus of activity in the foothills of Yuba County. The Council has partnered with Yuba County Public Works Department to reduce fuels along public roadways and thus prevent or slow the spread of vehicle fires into adjacent wildlands.

The Yuba County Code of Ordinances Chapter 10.05 contains requirements intended to improve structures' resistance to fire. As of January 1, 2020, all construction plans are required to be in compliance with the 2019 California Fire Code, which specifies standards on minimum building clearances, minimum road widths, and water supplies required for fire-fighting operations.

Past Occurrences

The County of Yuba has documented over 100 wildland fires since 1909. Eight of these fires were considered major, including the three most recent wildland fires, the Williams Fire in 1997, the Pendola Fire in 1999, and the Cascade Fire of 2017.

- The Williams Fire was in the community of Dobbins-Oregon House, burned over 5,743 acres, destroyed over 417 building structures and hundreds of vehicles, and caused damages totaling nearly $20 million dollars.
- The Pendola Fire burned over 11,725 acres, destroyed 123 buildings and vehicles, and caused nearly $3 million in damages.
- The Cascade Fire started in October 2017, burned 9,989 acres, destroyed 250 structures, and caused the death of four civilians. The fire was triggered by a high wind event which disrupted local electricity infrastructure.

Many of Yuba County's residential communities—Smartsville, Dobbins, Oregon House, Collins Lake, Browns Valley, Loma Rica, Rackerby, Camptonville, Log Cabin, Brownville, and Challenge—are in High or Very High FHSZs and have been subject to past fires. The Dobbins-Oregon House area has been affected by several wildfires, including the Cascade Fire (2017), Bullards Fire (2010), Yuba Fire (2009), Marysville Road Fire (2006), Pendola Fire (1999), and Willams Fire (1997).

Figure 6 illustrates the locations of past major fires within the county.

The federal government issued a disaster declaration in August 2020 for the Bear Fire, which ultimately merged with other fires to create the North Complex Fire, one of the largest and deadliest in California's history. Although it did not directly threaten Yuba County, the fire did cause significant harm in nearby counties and created extremely high levels of air pollution in Yuba County.

As development occurs in the rural foothill regions, wildfire will continue to be a significant hazard due to limited resources and remote access to areas served by rural fire agencies providing service to the foothill regions of the county.

Potential Changes to Fire Hazards in Future Years

Likely – Between 10 percent and 100 percent chance of occurrence in the next year or has a recurrence interval of 10 years or less. Although fire season has historically occurred from June to October of each year, Yuba County now faces a year-round wildfire threat. The threat of wildfire and potential losses increase as human development and population increase in the county's WUI.

Climate Change and Wildfire

Changing climate conditions are expected to increase wildfire risk in and around Yuba County. 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 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 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.[4]

Figure 7 illustrates how fire regimes within the county are projected to change between the years 2070 and 2099 under a climate change scenario where greenhouse gas emissions continue to increase through the end of the century. As shown in this map, the highest-intensity wildfires are projected in the northeast portion of the county. However, wildfires are still projected in the central and western portions of the county, even in areas around Marysville, Linda, and Olivehurst, which have not experienced significant wildfire risk in the past.

[4] 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 greenhouse gas emissions through the end of the century.

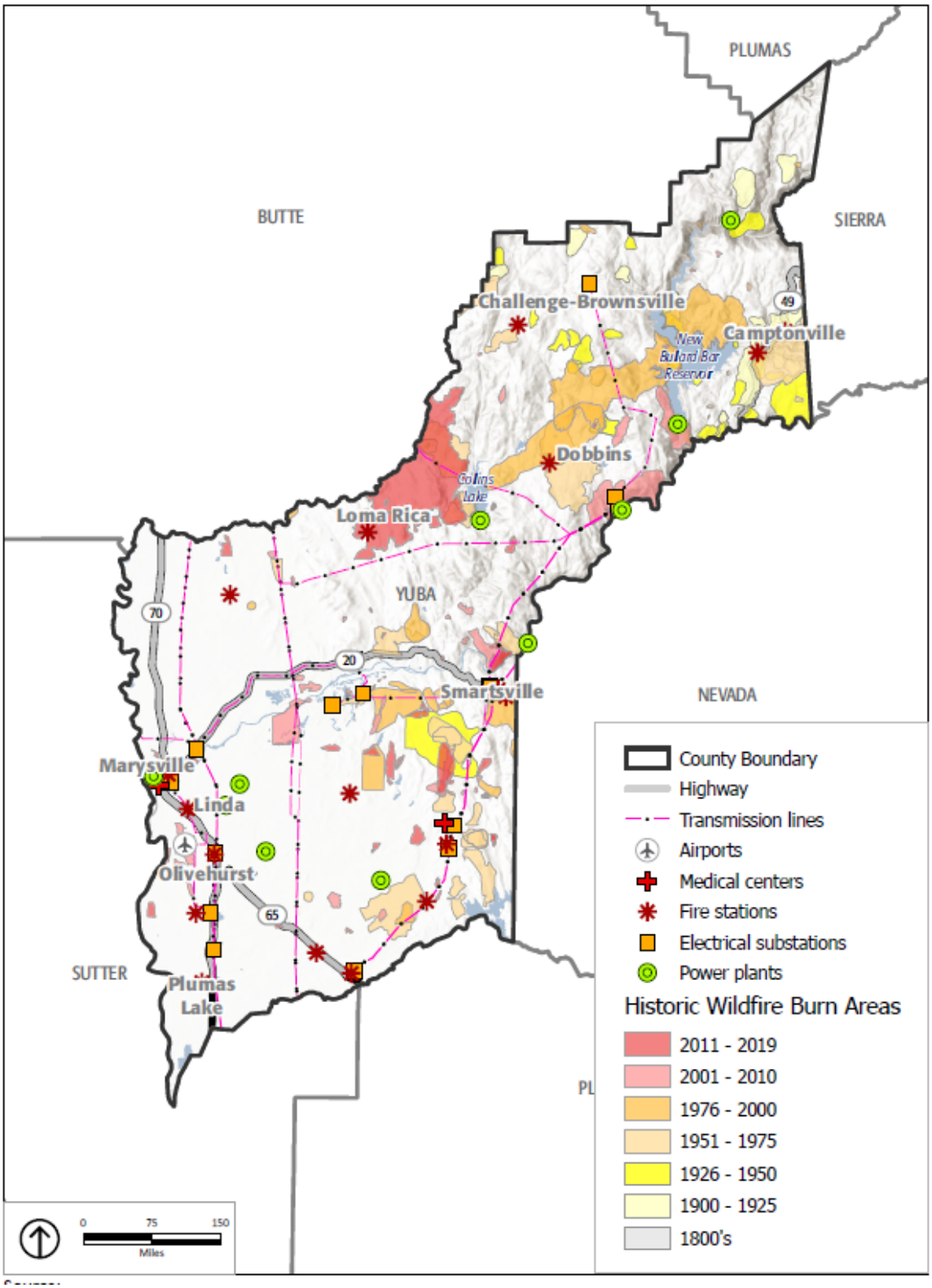


Figure 6: Past Wildfire Locations

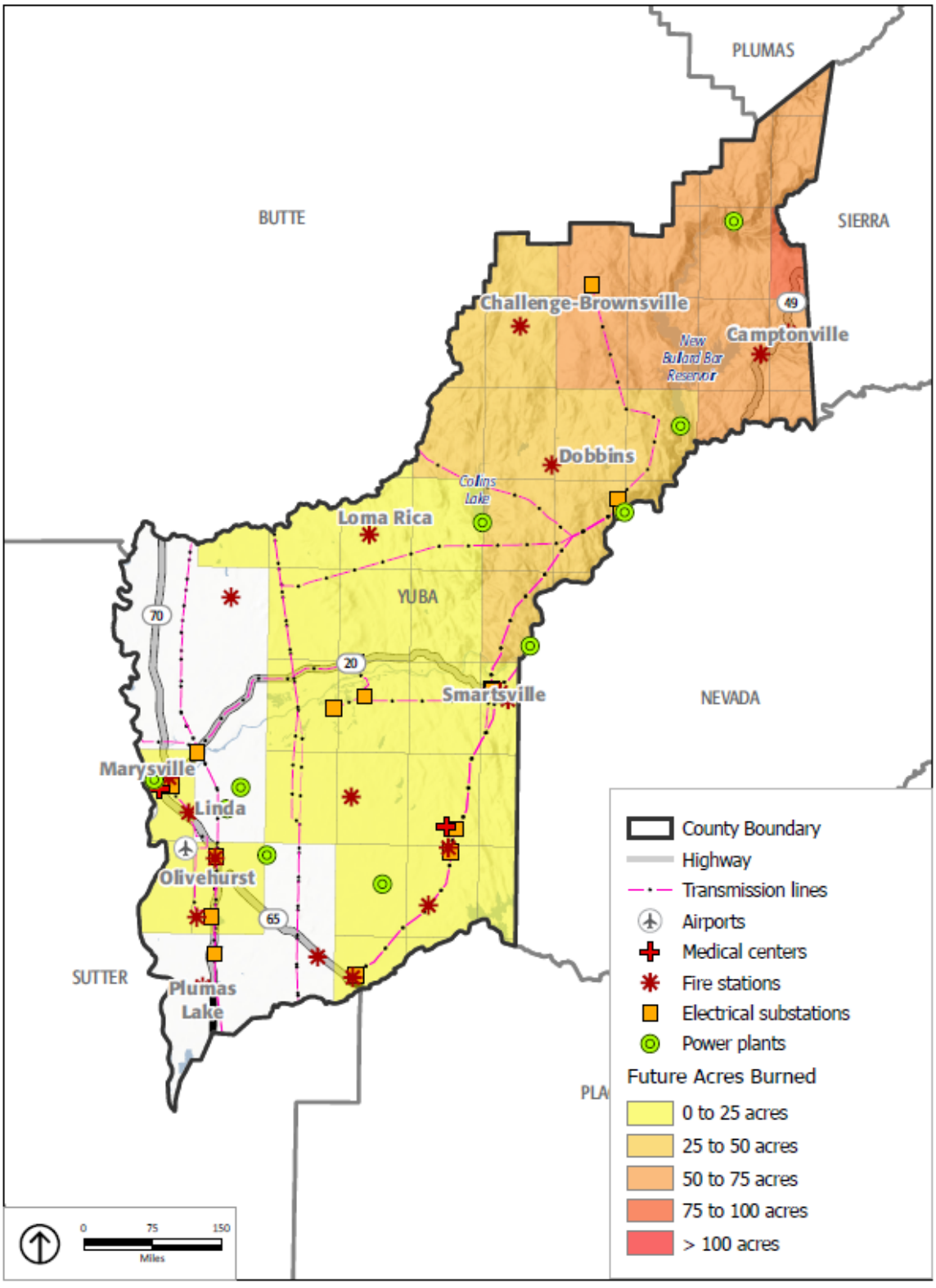


Figure 7: Future Acres Burned, 2070 to 2099

Goals, Policies, and Actions

Goal HS2. Fire Risk

Protect people and property from wildland and urban fire risk and create more fire-resilient communities.

Policy HS2.1 *Prior to approval, new developments proposed in areas of very high, high, or moderate fire hazard, as designated on maps maintained by CAL FIRE, shall demonstrate compliance with Fire Safety Regulations and local regulations for defensible space, ignition-resistant construction materials, property maintenance to reduce fuels, natural hazards disclosure requirements, emergency access and multiple access points, availability of water for fire suppression, and other relevant building and development standards.*

Policy HS2.2 *The County will communicate with appropriate local, state, and federal fire protection personnel during the development review process and will condition projects considering input from these agencies to require defensible space, fire-wise landscaping, fuel breaks, emergency access, fire flow, hydrants, sprinkler systems, fire stations, and other improvements and conditions, as appropriate.*

Policy HS2.3 *New development projects shall pay on a fair-share basis for fire stations, equipment, and other fire suppression improvements necessary to provide adequate fire protection services.*

Policy HS2.4 *All community water systems serving new development projects are required to meet or exceed County minimum standards for provision of water for fire flows.*

Policy HS2.5 *Road and building construction on slopes of more than 10 percent are strongly discouraged and will only be approved if consistent with County standards and the Yuba County Community Wildfire Protection Plan.*

Policy HS2.6 *The County will seek funding for and cooperate with efforts to protect watersheds, reforest areas, and restore ecosystems affected by wildfire.*

Policy HS2.7 *The County will use the best available science to evaluate and protect people and property from changes in fire risk attributable to climate change, insects, and disease.*

Policy HS2.8 *Communication and electricity infrastructure and any essential public facilities shall be located outside of identified hazard zones, particularly areas of elevated fire hazard severity. When this is not feasible, these facilities and sets of infrastructure should be designed to withstand the impacts of fire hazard events to avoid interruptions and continue meeting community needs during periods of fire activity.*

Policy HS2.9 *Public trails and unimproved roads shall be maintained, where feasible, to provide emergency access, including evacuation and wildfire response. These rights-of-way are not considered primary evacuation or emergency access routes, and vehicles that cannot successfully navigate these routes shall not make use of them.*

Policy HS2.10 *New developments shall provide access that will allow safe evacuation and movement of firefighting equipment during a wildfire—specifically, each new development shall not receive planning approval without having a minimum of two entry/exit points.*

Evacuation routes shall have the capacity to accommodate traffic in relation to the population served.

Policy HS2.11 *Property owners may manage fuel load on County road easements and rights-of-way adjacent to their properties with prior approval of the County and in compliance with applicable County standards.*

Policy HS2.12 *Clustered developments in Rural Community portions of the foothills and/or occurring in any of CAL FIRE's Fire Hazard Severity Zones shall take advantage, whenever possible, of natural and man-made fire breaks; provide defensible space for clusters of buildings (rather than individual buildings); locate and orient buildings and pervious areas to reduce fire risk; avoid areas of steep topography and dense vegetation; and otherwise use a site plan review process in coordination with County staff to ensure that wildfire risk is minimized.*

Policy HS2.13 *The County will encourage the retrofitting of older buildings to meet current safety standards, including those in the County's current Building Standards and Construction Code, CAL FIRE's Low Cost Retrofit List, or others as appropriate, in coordination with proposed major remodeling or additions.*

Policy HS2.14 *Developments in the Valley Growth Boundary shall be planned and constructed to resist the encroachment of uncontrolled fire.*

Policy HS2.15 *The County shall 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 HS2.16 *The County will adopt fire hazard landscaping design standards as prescribed by CAL FIRE for all of its new facilities and will make appropriate retrofits to existing facilities to reduce wildfire risks, where feasible.*

Policy HS2.17 *The County will ensure that minimum requisite firefighting services and infrastructure are ubiquitous throughout its jurisdiction, including but not limited to: high-visibility street signage and house numbers, appropriate street widths and building clearances for firefighting equipment and vehicles, high water pressure at all fire hydrants, and driving signage indicating rights-of-way with no outlets. The County shall assess existing developments to ensure that these requirements are met.*

Policy HS2.18 *The County will encourage and support work to regularly remove fuels from public and private lands in order to protect and maintain defensible spaces.*

Policy HS2.19 *The County will discourage all new residential development within a Very High fire hazard severity zone or in the wildland-urban interface areas. The County shall require all new residential developments in these areas to demonstrate that the proposed development has incorporated sufficient fire hazard mitigation features, as outlined in Policy HS2.1, before the issuance of any permits.*

Policy HS 2.20 *The County will require all new development occurring within the State Responsibility Area to prepare and submit a fire protection plan to assess and mitigate fire risks in these areas. The plan should include 1) risk analysis; 2) fire response capabilities assessment; 3) fire safety requirements (i.e., defensible space, infrastructure, and building ignition resistance); 4) mitigation measures and design considerations for nonconforming fuel modification; 5) wildfire education strategies; and 6) plan maintenance and limitations.*

Policy HS2.21 *The County will require absent owners of housing units and owners of seasonal or vacation rental housing units to modify and clear fuel loads throughout their properties pursuant to "firescaping" standards as established by CAL FIRE and that they shall conduct these clearance exercises on a regular basis.*

Policy HS2.22 *The County, pursuant to Policy HS2.15, will reduce wildfire risks to its transportation network by regularly clearing vegetation adjacent to public roadways and to private roadways when responsibility has not been delegated to private land owners, as described by Policy HS2.11.*

Policy HS2.23 *The County will maintain and keep in a state of good repair all existing fuel breaks and new fuel breaks that the County establishes in the future.*

Policy HS2.24 *The County will refer to the current CAL FIRE State Fire Plan and the Nevada-Yuba-Placer Unit Strategic Fire Plan, as needed, for guidance on long-term fire hazard reduction projects and efforts.*

Policy HS2.25 *The County will facilitate planning exercises for communities in both Very High fire hazard severity zones and State Responsibility Areas that will identify the most effective methods to evacuate people in these areas in the event of a fire hazard.*

Policy HS2.26 *The County will make available and share relevant educational and outreach materials with the public to help residents understand appropriate fire mitigation activities, such as defensible space, and emergency evacuation procedures during a fire hazard.*

Policy HS2.27 *The County will regularly assess communities in Very High fire hazard severity zones and State Responsibility Areas that may be underserved by existing emergency/first-responder facilities, and will conduct projections of where new fire emergency services needs may be emerging as a result of newly planned uses or developments.*

Policy HS2.28 *Following a large and/or destructive fire in Yuba County or the region, the County shall reassess standards and other requirements for new development and redevelopment, and revise these requirements to ensure a high level of community resilience to fire events.*

Policy HS2.29 *The County, in coordination with local water providers, shall work to ensure the long-term sustainability of water supplies to meet current and anticipated future firefighting needs.*

Action HS2.1 Fire Standards

The County will maintain a planning and entitlement review process that documents compliance with state and local standards for fire safety. The County will update zoning, development, improvement standards, and building standards, as necessary, to maintain compliance with relevant fire codes, including those maintained by CAL FIRE. County codes would be anticipated to address such topics as landscaping standards and fire-resistant plant materials, fire-resistant building materials for exterior walls and other exterior features of structures, defensible space standards for different topographic conditions, sprinklers, emergency access, water supply and pressure for firefighting, building and road construction in areas prone to fire risk and greater slopes, and other relevant topics. Additionally, the County will conduct a review of its roadways within identified Very High Fire Hazard Severity Zones as well as in State Responsibility Areas and identify which ones are not compliant with California Code of Regulations, Division 1.5, Chapter 7,

Subchapter 2, Articles 2 and 3, and/or certified local roadway standards, and undertake actions to address these roadways and bring them into compliance.

Related Goals:	Goal HS2
Agency/Department:	Community Development and Services Agency; Office of Emergency Services; Yuba Watershed Protection and Fire Safe Council
Funding Source:	Grants, development fees, and other funding sources, and if necessary, General Fund
Time Frame:	Ongoing, as necessary to maintain consistency with relevant fire codes

Action HS2.2 Yuba County Wildfire Safety Plan Implementation and Maintenance

The County will continue implementing the Yuba Foothills Community Wildfire Protection Plan and facilitate requisite update efforts. This plan focuses on reducing fuel loads, ensuring emergency access and evacuation routes, and providing incentives for property owners to improve properties in order to reduce wildfire risk and improve fire resiliency for existing developed areas.

As a part of this planned maintenance effort, the County will continue collaborating with other public agencies and nonprofits to implement fire breaks and fuel reduction projects in areas of high and very high fire risk, including removal of invasive species that increase understory fuel loads. Areas of particular focus could include County roads, ridges surrounding rural communities, and defensible space around existing structures. The County will seek funding from sources such as the Bureau of Land Management and the U.S. Department of Agriculture for fire fuel reduction projects.

The County will continue to collaborate with landowners in fire-prone areas without adequate secondary access to improve access, add water tanks, or otherwise improve fire safety conditions. The County will seek funding to provide incentives for property owners to retrofit existing structures in High and Very High fire hazard areas to reduce combustibility.

Planning for emergency access and evacuation routes will take into account records of historical fire activities affecting foothills portions of the county. Emergency access and evacuation will also take into account fire behavior modeling, including consideration of wildfire driven by winds that could limit the use of existing evacuation routes. The County will analyze and consider planning and fair-share funding of improvements needed to provide for emergency access and evacuation routes generally leading away from the head of a wildfire that has the characteristics of the worst-case predicted wildfire and secondary access allowing egress oriented in a direction of approximately 180 degrees from the previously described route.

The County would examine fair-share funding approaches and grant funding approaches for improvements needed to provide adequate emergency access and evacuation. Grant funding for fire mitigation activities is regularly available from CAL FIRE, and may also be available from other agencies and private sources in some instances.

Related Goals:	Goal HS2

Agency/Department:	Community Development and Services Agency; Office of Emergency Services; Yuba Watershed Protection and Fire Safe Council
Funding Source:	State and federal grants, other State or federal funding, and private funding from landowners of affected properties
Time Frame:	As funding is available

Water Quality

Existing Conditions

In general, surface water and groundwater quality in Yuba County is good.[5] Different watershed areas have different water quality characteristics. Major watershed areas in the county are shown in **Figure 8.**

The Yuba River has excellent water quality by most measures, although gold-mining activities have left a legacy of mercury contamination. Mercury is routinely detected in both the Feather and Yuba Rivers, but concentrations have not exceeded regulatory limits. Pesticides have been detected in the Feather River more frequently than in the Yuba River, but with the exception of the drinking water standard for carbofuran (a pesticide), there are no applicable regulatory criteria established for the pesticides that have been detected.

A series of special districts and private water companies provide domestic, commercial, and irrigation water in unincorporated Yuba County. Beale AFB provides water for its operations. For the most part, municipal providers do not serve irrigation needs, and irrigation districts do not provide municipal water. Today, agricultural users rely mostly on surface water, and urban users rely mostly on groundwater.

Yuba County Water Agency was formed as an independent special district to provide wholesale water and flood control. Linda County Water District provides domestic water service, water for fire protection, and wastewater services to residents of the community of Linda. The Olivehurst Public Utility District (OPUD) provides domestic water, wastewater, drainage services, parks, and fire protection services to people in the community of Olivehurst (which includes Plumas Lake). Both OPUD and Linda County Water District anticipate substantial growth in demand as a result of County-approved plans and projects.

Water provided by Linda County Water District and OPUD is routinely tested, as required by State regulations. The Health & Safety Code requires public water systems to periodically report on water quality. Water samples are analyzed against established pollutant limits that protect the public and environmental health. A source water assessment was completed for wells serving Olivehurst and Plumas Lake. This assessment illustrates the variety of potential sources of pollution for Yuba County water supplies, which include manufacturing and railroad operations, agricultural drainage and livestock, gas stations, sewer and septic systems, auto body shops, and airports.

[5] Yuba County Water Agency, Integrated Regional Water Management Plan, 2008.

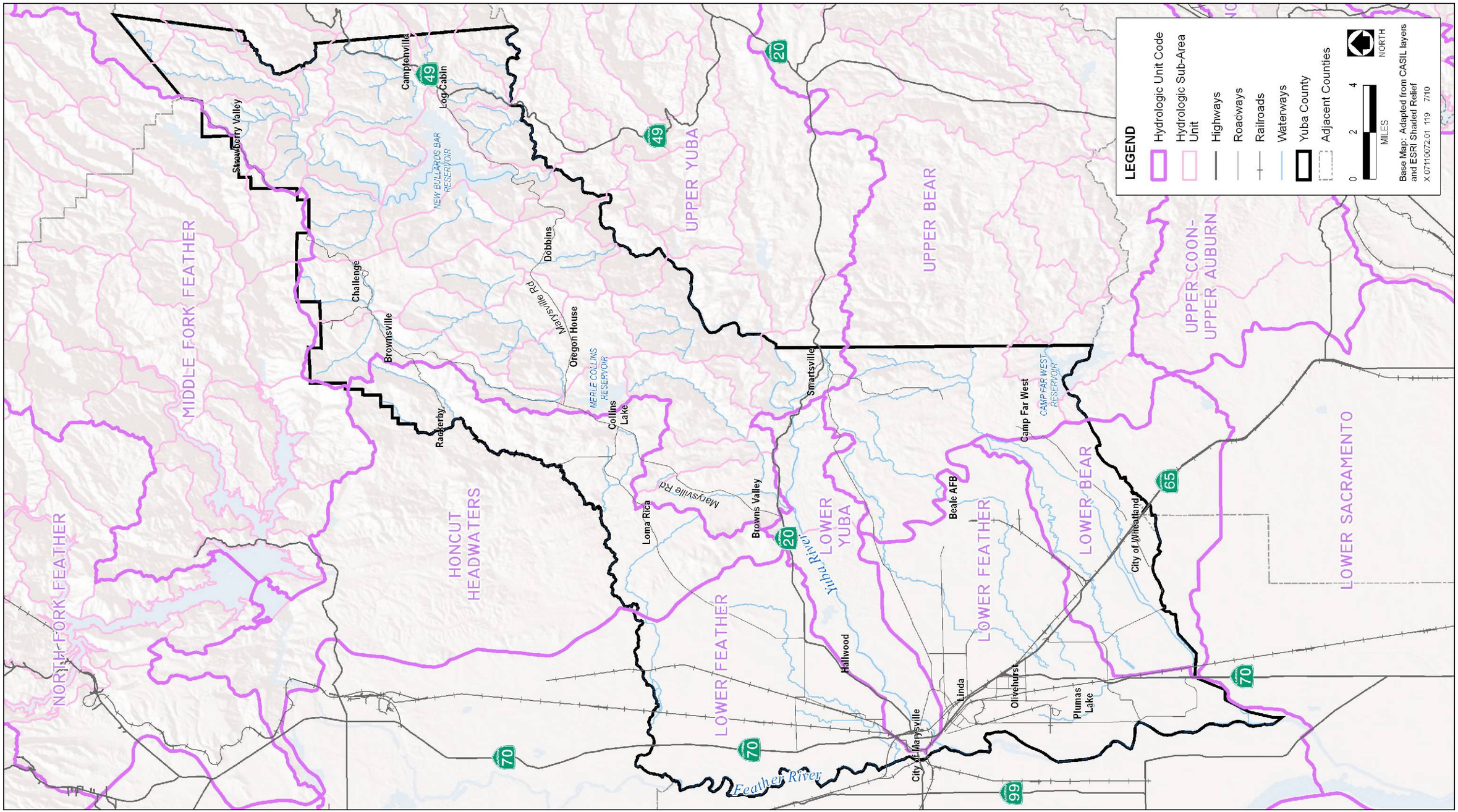


Figure 8: Yuba County Watersheds

As the County grows, there is the potential for impacts to water quality and natural habitat from surface runoff. As natural areas or agricultural land is converted to rooftops, driveways, parking lots, roads, and other impervious surfaces, rain and snowmelt no longer soak into the ground. Instead, drainage systems carry runoff that may contain sediment, oil, grease, pesticides, nutrients, bacteria, trash, and heavy metals to streams and other water bodies.[6] Increased runoff may also contribute to elevated levels of erosion. Erosion-potential areas in Yuba County are shown in **Figure 9**.

In order to reduce impacts to hydrology and water quality, many local governments are applying "low impact development" (LID) or "natural drainage systems" (NDS) concepts within the context of new development or redevelopment. These concepts reduce the rate of surface water runoff, filter pollutants out of runoff, and facilitate infiltration of water into the ground. Rather than collecting runoff in piped or channelized networks and controlling the flow downstream in large stormwater management facilities, NDS and LID take a decentralized approach to disperse flows and manage runoff closer to where it originates.

LID incorporates a set of site design strategies and decentralized source control techniques that can be used in buildings, infrastructure, or landscape design. The goal of moving stormwater away from buildings is combined with strategies to slow down, disperse, and filter stormwater runoff. NDS and LID include many different techniques for controlling runoff that can be customized for the local regulatory environment and according to specific site conditions. These systems can be less costly to construct and maintain compared to a traditional piped drainage system, while also providing water quality benefits and using stormwater as a community amenity.

Top Photo: Vegetated areas can be used in parking lots to slow stormwater and promote groundwater infiltration.

Middle Photo: Streetscapes can be constructed or redeveloped to slow down, filter, and infiltrate stormwater.

Bottom Photo: Swales are used for filtering and conveying stormwater runoff.

[6] For more information, please refer to the Governor's Office of Planning and Research Technical Advisory, "CEQA and Low Impact Development Stormwater Design: Preserving Stormwater Quality and Stream Integrity Through California Environmental Quality Act (CEQA) Review." This is available online at: http://www.opr.ca.gov/ceqa/pdfs/Technical_Advisory_LID.pdf.

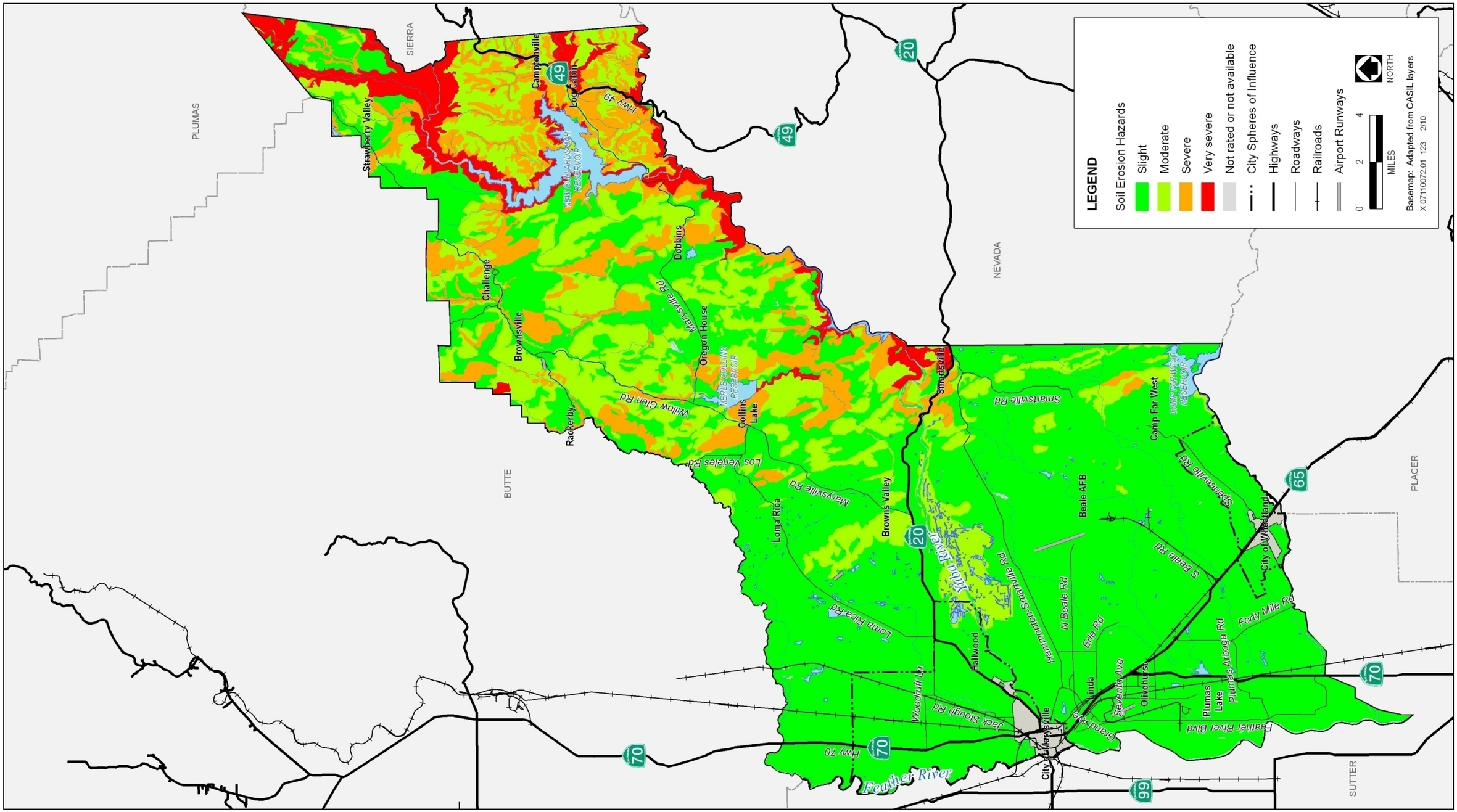


Figure 9: Erosion Potential

It is also important to look for opportunities to reduce the amount of impervious surfaces added in the context of new development, since impervious surfaces increase runoff and can contribute to water pollution. Different types of projects in different locations will have different needs for parking, loading areas, driveways, and other types of impervious surfaces. Sometimes construction standards, parking ratios, and other standards do not consider opportunities to consolidate paved areas for multiple uses, provide shared parking, or otherwise reduce impervious surfaces. Roads and parking lots are sometimes designed to handle the peak demand (such as the rush hour or shopping activities on the day after Thanksgiving) without properly considering the more typical daily demand and the consequences of overplanning for these improvements. The County's intent is for projects to demonstrate feasible means to reduce the amount of impervious surfaces added in new development.

The County implements a Storm Water Management Plan designed to control runoff and pollutant discharge into waterways (and implement federal and state law and permitting requirements for water quality). Current County code requirements address stormwater quality as well as drainage requirements for proposed developments.[7] Future code requirements will need to be revised based on evolutions in state law related to water quality as well as the goals and policies in the General Plan.

Goals, Policies, and Actions

Goal HS3. Water Quality

Preserve, protect, and improve the quality of regional water supplies.

Policy HS3.1 *The County will collaborate with relevant service providers to ensure that municipal water supply, treatment, and delivery within unincorporated areas meet or exceed maximum contaminant levels specified in Title 22 of the California Code of Regulations.*

Policy HS3.2 *County and regional water supply providers should monitor and proactively address water quality problems, with a focus on achieving and maintaining adequate water quality for "beneficial uses" of area waterways identified in the Yuba County Integrated Regional Water Management Plan. "Beneficial uses" in Yuba County include municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.*

Policy HS3.3 *The County will regulate new developments, as necessary, and collaborate with irrigation districts to address Regional Water Quality Control Board requirements intended to protect agricultural use and sustain the agricultural economy.*

Policy HS3.4 *New developments shall be designed to control surface runoff discharges and to comply with or exceed the permit requirements and the receiving water limitations administered by the Regional Water Quality Control Board, by limiting construction of new impervious surfaces, such as parking lots, travel ways, vehicle waiting areas, and vehicle loading areas to the minimum amount needed to implement the subject project. The County instead shall encourage new developments to use permeable materials, such as bricks or open cell pavers, where feasible.*

Policy HS3.5 *The County will cooperate with local, state, and federal agencies to remediate issues related to groundwater contamination and increases in total dissolved solids.*

[7] Please refer to the General Plan Update Hydrology and Water Quality Background Report for a more detailed description of applicable regulations.

Policy HS3.6 *New developments shall comply with streambed alteration standards and shall be designed to avoid harmful discharge that would substantially affect wetlands and riparian areas.*

Policy HS3.7 *Valley Neighborhoods, Employment Village areas, Commercial Mixed Use areas, and Employment areas should have coordinated drainage master planning and avoid a site-by-site approach to detention and drainage. Drainage master planning should implement an areawide approach that incorporates existing and constructed swales for conveyance and planned open space and parkland for detention.*

Policy HS3.8 *New developments in areas with moderate, severe, and very severe erosion potential shall provide technical documentation, to the satisfaction of the County, that adequate measures have been taken in site planning, design, and/or mitigation to avoid erosion and sediment loss.*

Policy HS3.9 *The County will regularly evaluate available septic system technologies and shared leach field systems to serve planned Rural Centers and allow their use if proven to be protective of water quality.*

Policy HS3.10 *New developments proposing private well and septic systems shall demonstrate compliance with the County's standards for water wells and sewage disposal systems, which are designed to protect the public and environmental health.*

Policy HS3.11 *New community wastewater disposal systems are discouraged, but if considered, projects proposing a new system shall provide bonding or other financial mechanisms that are adequate for ongoing maintenance and periodic replacement, subject to County approval.*

Policy HS3.12 *New developments shall comply with applicable state siting, design, and monitoring standards for on-site wastewater treatment (septic) systems, including standards intended to protect the beneficial use of potentially affected water bodies.*

Policy HS3.13 *Proposed residential property subdivisions that would create lots of 1 acre or less shall be served by a public water and sewer system designed in compliance with County standards. Projects that propose parcels of between 1 and 2.5 acres shall provide either a public sewer system or public water supply, as determined by the County Environmental Health Director.*

Policy HS3.14 *The County will encourage the preservation, creation, or restoration of riparian corridors, wetlands, open space buffers, and other types of open space that provide water quality benefits.*

Policy HS3.15 *New projects and plans in the Valley Growth Boundary should employ runoff collection strategies close to the point where water initially meets the ground to minimize urban runoff, where feasible.*

Policy HS3.16 *New developments are encouraged to incorporate open, vegetated swales to filter, slow down, and convey stormwater and encourage groundwater infiltration.*

Policy HS3.17 *New developments shall break up parking areas, intersperse parking with vegetated areas, and incorporate other best management practices that filter and slow down runoff and promote infiltration.*

Policy HS3.18 *The County will ensure that all land uses that handle, produce, store, or transport hazardous materials shall not negatively impact the surrounding watershed through appropriate mitigation activities to limit the risk of a hazardous materials release event.*

Policy HS3.19 *The County will cooperate with regional partners and jurisdictions to mitigate threats to regional water supplies and, when necessary, manage incidents where conditions threaten the watershed's quality. These include the cities of Marysville and Wheatland, communities in unincorporated Yuba County, the Yuba County Water Agency, and the California Department of Water Resources.*

Action HS3.1 Ongoing Monitoring and Corrective Actions

During General Plan buildout, the County may conduct water quality monitoring along key waterways and watersheds. The County may require more stringent water quality standards for developments that may affect waterways or watersheds with identified water quality problems.

The County, in collaboration with regional water supply providers, will conduct ongoing monitoring to ensure the application and effectiveness of construction and environmental policies and standards. Ongoing monitoring would be designed to identify problems that may require corrective actions. The County will collaborate with regional and state agencies on the need for corrective actions for ongoing uses that pollute the county's water supply.

Related Goals:	Goal HS3, NR12
Agency/Department:	Community Development and Services Agency
Funding Source:	State and federal grants, other State or federal funding, and private funding for projects near the county's water bodies
Time Frame:	Ongoing, with corrective actions, as needed

Action HS3.2 Improvement Standards and Design Guidelines

As discussed in the Community Development Element, the County will revise its development, subdivision, grading, and improvement standards to allow or require natural drainage systems and low impact development drainage strategies for new developments. The County will revise its improvement standards to encourage naturalized drainage swales, pervious driveways, pervious parking areas, tracked (or "Hollywood") driveways, and other stormwater management and landscaping best practices that maximize on-site infiltration and treatment of stormwater. The County's standards and guidelines will be designed to limit disturbances to natural water bodies, reduce short- and long-term water pollution, and incorporate natural drainage systems. The County will adopt design guidelines that provide certainty for new development regarding acceptable approaches to drainage and erosion control methods.

Related Goals:	Goal HS3, Goal NR12
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund, applicable fees
Time Frame:	Adopt by 2023

Airports

Existing Conditions

Yuba County has three airports, shown in **Figure 10**. The largest and most active of these facilities is Beale AFB, located approximately 10 miles east of Marysville. A Joint Land Use Study (JLUS) for Beale AFB was completed in May 2008, and an Air Installation Compatible Use Zone (AICUZ) Study was completed in 2005. The AICUZ identifies constraints from flight operations, including noise zones and accident potential zones. These documents encourage collaborative planning efforts and consultation between local governments and Beale AFB when making land use decisions to ensure compatibility and safety.

The Yuba County Airport is owned and operated by Yuba County and is in the community of Olivehurst, roughly three miles south of Marysville. The airport is a general aviation facility adjacent to residential, agricultural, and industrial lands. The airport has a clear zone and an approach/departure zone that extend north and south of the airport boundary into developed areas in the western portion of Linda and Olivehurst. Appropriate land uses are limited in these zones to ensure that airport crash hazards are minimized.

The Brownsville Aeropines Airport is in the northeastern portion of the county along La Porte Road in the community of Brownsville. The airport has a single paved runway. The clear zone and the approach/departure zone extend east and west of the runway.

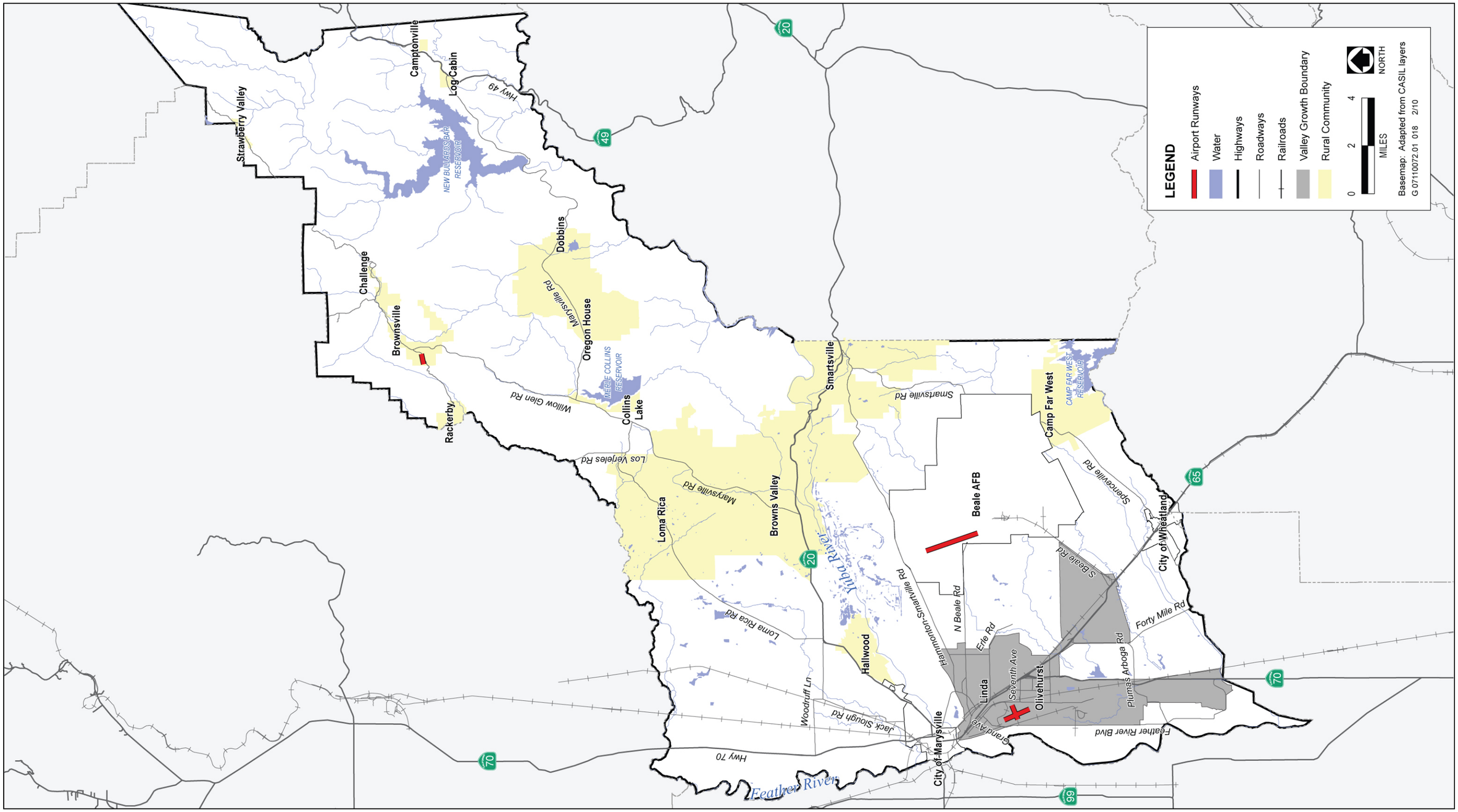


Figure 10: Yuba County Airports

Goals, Policies, and Actions

Goal HS4. Airports

Avoid land use conflicts with and reduce exposure of people and property to risks from the County's airports.

Policy HS4.1 *The County will collaborate with the Airport Land Use Commission to update local airport land use compatibility plans and will condition projects, as necessary, to ensure compliance with these plans.*

Policy HS4.2 *New developments shall be located and designed to avoid conflicts with current and potential future operations at Beale Air Force Base, including Beale's Phased Array Warning System.*

Policy HS4.3 *New construction within the Air Installation Compatibility Use Zone 65 dB CNEL noise contours for the existing and potential future missions shall use building materials and construction techniques to mitigate noise impacts.*

Action HS4.1 Airport Land Use Compatibility Planning

During General Plan buildout, the County will collaborate with the Airport Land Use Commission and local airports to update compatibility plans. The County will regulate and condition new development according to restrictions of local airport land use compatibility plans.

Related Goals:	Goal HS4, Goal HS7, Goal HS10, Goal CD3, Goal CD22
Agency/Department:	Community Development and Services Agency
Funding Source:	State and federal grants, other State or federal funding, General Fund
Time Frame:	Adopt Yuba County and Beale CLUPs by 2012 with periodic revisions during General Plan buildout

Action HS4.2 Beale Air Force Base Coordination

The County, along with the cities and other public service agencies, will coordinate with Beale Air Force Base representatives to ensure continued land use compatibility between County lands and base operations. The County will involve Beale representatives in development project review and conditions.

Related Goals:	Goal HS4, Goal CD3, Goal CD10
Agency/Department:	Community Development and Services Agency
Funding Source:	General Fund, project applicant funds
Time Frame:	Ongoing, and as needed, in response to project proposals near Beale AFB

Air Quality and Greenhouse Gases

Yuba County is in the Northern Sacramento Valley Air Basin, a multicounty area that shares some characteristics relative to air quality, topography, meteorology, and climate. Air quality is monitored and regulated in Yuba and Sutter Counties by the Feather River Air Quality Management District.

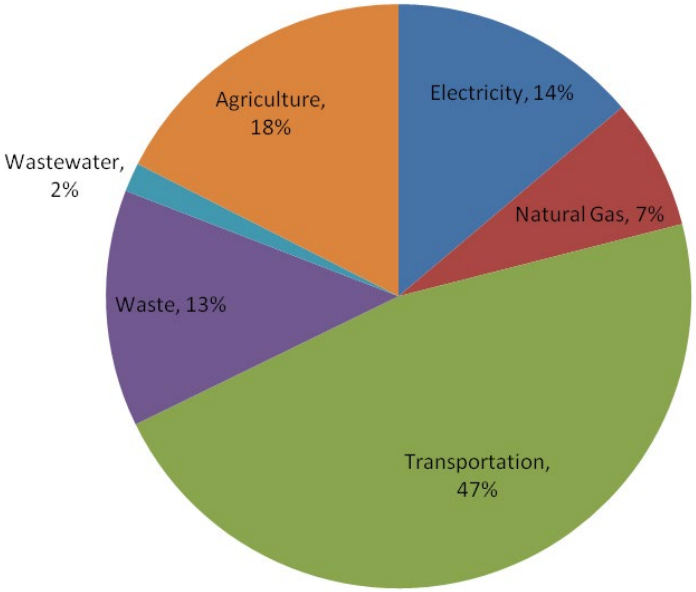
Approximately 60 to 70 percent of the air pollution in the FRAQMD area comes from mobile sources. The remaining 30 to 40 percent of the air pollution in the FRAQMD area is a result of stationary sources that include agricultural operations, open burning of vegetative wastes, wood burning for residential heating, industrial operations, and other sources.[8] In addition to ambient air quality issues related to ozone and particulate matter, toxic air contaminants (TAC) are a concern for local air quality officials. TACs include a variety of substances from many different sources, such as gasoline stations, highways and railroads, dry cleaners, industrial operations, power plants, and painting operations. The effects of TACs are mostly experienced locally (close to the source).

Evidence has shown that emissions of greenhouse gases (GHG) from locations around the world likely will contribute to global climate change, which could have drastic impacts related to flooding and other natural disasters, agriculture, habitats, water supply, and the global economy. In response to the environmental, economic, and social threats posed by climate change, California approved the Global Warming Solutions Act (AB 32) in September of 2006. AB 32 requires that statewide GHG emissions must be reduced to 1990 levels by 2020. Future planning efforts that do not consider GHG emissions reduction strategies could conflict with AB 32, impeding California's ability to comply with the statewide mandate. The primary GHGs of concern are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds.

Sources of GHG Emissions

Since transportation is the largest source of ozone in the region and of GHGs in Yuba County and California, land use and transportation planning to reduce vehicular travel is needed to achieve air quality goals.

A reduction in vehicle emissions is necessary to achieve significant GHG reduction, especially since improvements in building energy efficiency can be overwhelmed by increases in vehicle miles traveled. The effectiveness of a local GHG reduction program for a growing area like Yuba County is contingent on development patterns and transportation systems that reduce emissions from the transportation sector.



2007 Yuba County GHG Emissions Sources

[8] Feather River Air Quality Management District. State and National Area Designations. Accessed March 8, 2010. Available online at: http://www.fraqmd.org/Programs.htm.

GHG-Sensitive Planning

A variety of land use, transportation, and design approaches, when used together, can substantially reduce vehicular travel (and therefore protect air quality and reduce GHG emissions). Policies included in other Elements of the 2030 General Plan have GHG-reducing effects. Policies in the Community Development Element are designed, in part, to reduce GHG emissions. The County employs several approaches to managing travel demand, including:

- **Connectivity**. A highly connected transportation network shortens trip lengths and allows land uses to be placed closer to one another and along direct routes. A roadway network that is not well connected requires users to travel long distances to destinations that are relatively close by, increases trip lengths, and creates obstacles for walking, bicycling, and transit access.

- **Compactness**. Compact development, by its nature, can increase the efficiency of infrastructure, enable travel by modes other than by car, and reduce trip lengths. If communities can place the same amount of development in a smaller area closer together, GHG emissions would be reduced concurrently due to less travel by car and avoid unnecessary conversion of agricultural land and other open space.

- **Diversity**. Placing a variety of land use activities in proximity to each other (housing, shopping, employment, recreation, schools, etc.) provides greater choice of mobility—people can walk, bike, or take transit to meet daily needs. This strategy also makes the trips that must occur in a car shorter.

- **Facilities**. Safe and convenient bike lanes, pedestrian pathways, transit shelters, and other transportation facilities that are incorporated into a comprehensive transportation network can also encourage more travel by other means, thereby reducing air pollution and GHG emissions.

- **Reinvestment and Revitalization**. One way to avoid GHG emissions is to facilitate more efficient and economic use of the lands in already-developed portions of a community. Reinvestment in existing neighborhoods and retrofit of existing buildings is GHG efficient and can even result in a net reduction in GHG emissions.

- **Housing and Employment**. By planning for and placing jobs and housing closer to one another, communities can reduce work-related trips. The most effective local strategies seek to attract businesses and industries that are a good match for the current and anticipated labor force and to accommodate a variety of housing types that meet the needs of that labor force.

In addition to land use/transportation planning, another way to address global climate change and other air pollution is to promote energy efficiency and use of renewable (and low emission) sources of energy. Please see the Natural Resources Element for goals and policies addressing energy conservation and efficiency.

Legal Authority

Land use entitlement authority, which largely rests at the local government level in California, has a great influence on development patterns, community design, transportation facilities planning, and other factors that influence vehicle miles traveled (VMT). The number of VMT in a city or county, in turn, directly relates to the amount of GHG emissions. However, local government does not have control over vehicle emissions technology or fuel economy standards, which are factors in calculating greenhouse gas emissions from the transportation sector. Similar to development patterns, local government standards can have some influence on the solar orientation of buildings and other components related to building and public realm energy efficiency. However, energy generation, renewable energy requirements, and other components of electricity-related emissions are outside of local governments' control.

Co-benefits of Planning to Reduce Greenhouse Gas Emissions

Even if avoiding contributions to dangerous climate change is not a priority for a given jurisdiction, there are many local co-benefits of planning to reduce greenhouse gas emissions.[9] Land and transportation policies that reduce VMT and promote alternatives to automobile travel can also reduce household and business transportation costs, reduce harmful air pollution (other than GHGs), enhance mobility, reduce time spent commuting, and provide other benefits. Compact development (which reduces GHGs) can also be more efficient to serve with public infrastructure and services. Measures that promote energy efficiency reduce GHGs, but also reduce household and business utility costs. Encouraging reinvestment and revitalization of existing developed areas can reduce VMT and GHGs, but also helps to conserve important open space functions, such as agriculture, recreation, watershed protection, and others.

Approaches to GHG Reduction Standards

Local governments across the globe have taken a variety of approaches to addressing climate change. Jurisdictions have used various approaches for setting GHG targets that depend on the community context, the political dynamics at play, and the applicable regulatory setting. A mixture of incentives and regulations is normally appropriate for achieving greenhouse gas reduction targets.

Often, the simplest approach is some type of percentage reduction for community-wide emissions or government operations. California's GHG mandate required that statewide GHG emissions be reduced to 1990 levels by 2020, which is a roughly 10 percent reduction from 2006 levels and a roughly 30 percent reduction from forecast "business as usual" 2020 emissions.[10] Some agencies have adopted a GHG reduction target of between 10 and 30 percent based on these statewide estimates. However, AB 32 addresses a *statewide* emissions target that is not necessarily appropriate for application at the city or county level (unless the community's growth rate is expected to be identical to that of the state). Also, the "business as usual" scenario developed by the California Air Resources Board (ARB) is based on many complex, long-range assumptions regarding statewide growth in VMT, energy prices and demand, modeling of change in different industrial sectors, and many other factors and assumptions, many of which are correlated. The "business as usual" scenario is useful in illustrating the ambitious nature of California's GHG goals, but is only indirectly related to the actual AB 32 target (1990 emissions by 2020). A percentage reduction from the "business as usual" scenario also is difficult to objectively apply at the project level.[11] The assumptions used to build the hypothetical project could be subject to artificial inflation in order to improve the performance of the proposed project by comparison. Comparing a project's per-unit emissions against a local or regional per-unit average would improve the percentage reduction approach, but this would still have only an indirect relationship with AB 32 targets.

Greenhouse Gas–Efficient Communities

The intent of AB 32 is to accommodate population and economic growth in California, but in a way that achieves a lower *rate* of GHG emissions. Neither state legislation nor executive order suggests that California intends to limit population or employment growth as a way to reduce the state's GHG emission

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[9] Bollen, J. et al. "Co-Benefits of Climate Change Mitigation Policies: Literature Review and New Results", OECD Economics Department Working Papers, No. 693, OECD Publishing. 2009.

[10] Estimates of 2006 CO_2 equivalent are provided by the California Air Resources Board, online at: http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2009-03-13.pdf.

[11] Since the location of the project itself is a major factor in the GHG emissions, analysis of a hypothetical project on the same site would mask much of the GHG efficiency or inefficiency of the site in question. Percentage reduction approaches, depending on their implementation, could mask other fundamental characteristics of land development needed to achieve AB 32 objectives such as density, intensity, and mixing of land uses. GHG-efficient locations, such as downtowns and other centrally located, relatively dense, mixed-use areas, generally have higher land costs. Projects with GHG-efficient locations have already invested in relatively dear land, and in doing so have substantially "mitigated" their GHG impacts in the site selection process. Therefore, it would be inappropriate to require similar percentage reductions for projects with GHG-efficient locations and projects proposed at the fringe.

levels. In achieving the state's targets, some communities will experience an *increase* in mass emissions, while others may experience a *decrease*. The key point, however, is that to achieve AB 32 targets, communities will need to achieve a lower *rate* of emissions per capita and/or per employee.[12] With a reduced *rate* of emissions per capita and per employee, California can accommodate expected population growth and achieve economic development objectives while also abiding by AB 32's emissions target. Focusing on *per-unit* rather than *mass* emissions levels is sometimes called "GHG efficiency." For land development projects, the use of an efficiency approach that considers emissions per capita or per employee correlates well with the activities accommodated by development.

Using an efficiency-based approach based on achieving 1990 GHG emission levels is tied to the science of climate change. Avoiding dangerous climate change would require ambient global CO_2 concentrations to stabilize at a level between approximatley 350 and 400 parts per million. Ambient global CO_2 concentrations in 1990 were approximately 353 parts per million, and 1990 is the year to which the AB 32 legislative mandate is tied. One may calculate the GHG efficiency required to meet AB 32 goals by taking 1990 emissions and dividing by the projected population and employment.

Using this approach, the "fair share" of GHG emissions per person is currently estimated to be between 6.4 and 6.6 metric tons of CO_2 equivalent emissions.[13] Using current estimates, new development in unincorporated Yuba County should not generate greater than 6.6 net metric tons of CO_2 equivalent per person using this fair-share approach.[14] "Service population" is a term used to express the total population plus employment. The "fair share" of GHG emissions per service population needed to achieve AB 32 mandates is approximately 4.6 net metric tons CO_2 equivalent. For residents and employees accommodated in new development, emissions should not be more than 4.6 metric tons CO_2 equivalent per service population.[15] New development that generates GHG emissions at levels equal to or less than these levels could be considered part of the solution to the problems related to cumulative GHG emissions and would not hinder the state's ability to meet its goals of reduced statewide GHG emissions. These estimates consider only GHG emissions associated with land use sectors, including transportation, electricity, natural gas, solid waste, and domestic wastewater treatment and do not include manufacturing

[12] Important local components in increasing GHG efficiency relate to the location, density, and design of development and the transportation facilities serving that development. There are also important state or federal actions that will be needed to increase communities' GHG efficiency, such as uniform building codes (with energy efficiency elements), renewable energy portfolio requirements, emissions standards, and regulations on industry and energy producers.

[13] The estimate of GHG emissions efficiency required to be consistent with AB 32 may change if future population and/or employment estimates are parsed out more finely to, for example, remove industrial, agricultural, or other employment types from the denominator of the GHG efficiency calculation (1990 GHG emissions for land use related sectors divided by estimated 2020 population plus employment). Whether AB 32-consisent emissions are 6.4 or 6.6 metric tons CO_2e per capita or whether they are 4.4 or 4.6 metric tons CO_2e per service population is mostly dependent on whether or not electricity related emissions from cogeneration are included.

[14] Use of the term "net" emissions in this context simply connotes a flexible approach that would consider both on-site and off-site emissions reduction strategies. Net emissions would consider plans and projects that reduce emissions through selection of a centrally located project site, mixing land uses, thoughtful urban design, and other on-site strategies, as well as taking actions that are demonstrated to reduce existing emissions levels off-site or through added sequestration potential.

[15] The efficiency standards presented here are based only on land use related emissions sectors: transportation; electricity; natural gas; water and wastewater; and recycling and waste (but not landfill related emissions). GHG emissions produced by manufacturing and agriculture are not included since the emissions characteristics of these sectors are mostly outside of the County's entitlement authority and policy purview. For example, the County does not approve or deny specific manufacturing processes or materials used in industry (unless they have demonstrated public health, safety, or welfare effects). The efficiency targets are based on those sectors over which the County would exercise some influence through its planning and development policies and standards. This fair-share approach applies to new development over which the County would have some control, but assumes equal responsibility for existing development in becoming more GHG efficient. This would occur through infill and reinvestment, as well as federal and state actions related to emissions standards, renewable energy generation, and other regulations over activities beyond the County's authority.

emissions, emissions related to industrial process, agricultural emissions related to fertilizer application, and other sources unrelated to the County's entitlement authority.

For most cities and counties, it would not be feasible to require or fund extensive retrofitting of existing building stock and development patterns to achieve GHG reductions. Local governments normally have limited authority for and a limited interest in adopting planning or building regulations that would substantially affect existing businesses and residences. For this reason, in built-out communities where development patterns are somewhat fixed, there are substantial challenges for achieving ambitious greenhouse gas reduction targets. However, for growing areas like Yuba County, there is great opportunity to address climate change goals, while also decreasing household travel costs; improving air quality and public health; and achieving a variety of other economic, environmental, and social objectives by incorporating greenhouse gas objectives into the location and design of new projects, plans, and public investments.

The County's approach to climate change in this General Plan addresses transportation-related emissions in the framework components of the Plan, as well as electricity, agriculture, solid waste, and other sectors. This General Plan addresses air quality and climate change for both new development areas and existing developed communities. Policies with air quality benefits are also designed to provide economic, fiscal, social, and other environmental benefits. For example, policies that encourage compact, phased development also reduce up-front and ongoing infrastructure and service costs. Policies that reduce VMT can also save household travel costs. Compact development conserves farmland by accommodating population and employment growth within smaller development footprints. Infill development concepts promoted in this General Plan are designed to attract outside funding for infrastructure and other public facilities, improving the County's fiscal position. In sum, there are extensive co-benefits associated with the wide variety of air quality related policies found throughout the General Plan.

In addition to GHG emissions, another important component of climate change for local governments is adapting to the future effects of a changed climate. Changed climate conditions are expected to have serious repercussions for public health, biodiversity, water supply and flooding, agriculture and forestry, wildfire risk, public infrastructure and facilities, and other issues. Communities prone to these effects will need to identify areas most vulnerable to these impacts and develop risk reduction strategies. The State of California intends to work collaboratively to address these impacts, as noted in the 2009 California Climate Adaptation Strategy.[16] This General Plan addresses locally important aspects of climate change adaptation through water conservation strategies in the Natural Resources Element, fire and flood risk measures in the Public Health & Safety Element, evacuation and emergency response policies in the Public Health & Safety Element, preservation and restoration policies in the Natural Resources Element, and other topics addressed throughout the General Plan.

[16] Available online at: http://www.climatechange.ca.gov/adaptation/.

Goals, Policies, and Actions

Goal HS5. Greenhouse Gas Emissions & Climate Change

Provide greenhouse gas–efficient development patterns and successfully adapt to future changes in Yuba County's climate.

Policy HS5.1 *The County will guide land use change, direct investments, and apply its fees and programs to encourage more GHG-efficient development patterns, as feasible.*

Policy HS5.2 *The County's regulations, investments, and fee programs should be structured to reduce net GHG emissions for new development in the unincorporated county consistent with the level of emissions needed per capita or per service population to achieve the County's fair share of the State's emissions mandate.*

Policy HS5.3 *Since transportation is the largest sector contributing to GHG emissions both locally and statewide, the County will prioritize land use/transportation projects that manage travel demand by increasing housing/employment density, placing homes in closer proximity to destinations, increasing accessibility to transit, or otherwise decreasing vehicle miles traveled (per household, per capita, and/ or per employee).*

Policy HS5.4 *The County will use an efficiency-based threshold (net emissions per capita + employee) to evaluate proposed urban land uses, such as homes, retail, office, and other uses where the location, density, and mix of uses in the project area is important to the level of GHG generation.*

Policy HS5.5 *For proposed industrial projects, including those with new stationary sources of emissions, and other uses where location, land use mix, and density are not important indicators of GHG emissions rate, the County will require incorporation of feasible technologies or management practices and best available control technologies, in coordination with Feather River Air Quality Management District and in compliance with regulations effective at the time of project review.*

Policy HS5.6 *The County relies, in part, on infrastructure planning and funding controlled by regional, state, and other local agencies, and will work cooperatively with these agencies to provide infrastructure and public facilities needed to support GHG-efficient development patterns.*

Policy HS5.7 *The County will work collaboratively with state agencies and public/private utility providers charged with regulating building efficiency, mobile-source emissions controls, energy sources and uses, and other components of GHG emissions to create the opportunity for more GHG-efficient local development.*

Policy HS5.8 *The County will actively pursue funding for GHG-efficient transportation systems and other needed infrastructure, building and public realm energy efficiency upgrades, renewable energy production, land use-transportation modeling, and other projects to reduce local GHG emissions.*

Policy HS5.9 *The County will partner with local agricultural groups to create voluntary and incentive-based programs designed to help farmers reduce their GHG emissions.*

Policy HS5.10 *The County should collaborate with Marysville, Wheatland, and other local and state agencies to identify risks posed by climate change and implement appropriate adaptation strategies.*

Policy HS5.11 *Rural Community Plans should address strategies to diversify the local land use mix to meet more resident needs within each community, increase energy efficiency, shorten trips, and encourage nonvehicular travel, as feasible, to increase GHG efficiency.*

Action HS5.1 Greenhouse Gas Reduction Plan

The County will prepare and adopt a plan to reduce GHG emissions. This plan may be structured to address GHGs alone or may also be designed to address other important County objectives that also promote climate change adaptation and GHG reduction, such as energy conservation, renewable energy development and use, economic development, transportation and other public infrastructure, infill and mixed-use development, or other topics.

The County will choose a GHG reduction target for countywide emissions (existing and new growth) that is consistent with State and regional regulations and plans, such as those adopted to implement the California Global Warming Solutions Act of 2006 (AB 32) and California's Sustainable Communities and Climate Protection Act (SB 375).

The County's GHG Reduction Plan will be designed to be consistent with AB 32, as appropriate and applicable within the unincorporated County. The County will ensure that the GHG emissions reductions targets represent the unincorporated County's "fair share" of statewide GHG reduction, consistent with legislation and regulations with AB 32 (i.e., reduce statewide GHG emissions to 1990 levels by 2020). This does not mean that the County will attempt to literally reach its own 1990 emissions level by 2020, as this would be a misreading of legislation. As noted, the County's overall objective is to plan for new growth in a way that is as GHG-efficient as would be needed statewide to achieve AB 32 mandates.

The County's GHG Reduction Plan and target will address only the GHG emission sectors that are applicable to the County and over which the County can have influence—either through entitlement authority, public investments, incentives, or other feasible means. It would not be appropriate for the County's GHG reduction target to address GHG sources that are beyond the County's influence.

The County's GHG Reduction Plan and target can "credit" future regional, statewide, or federal regulations and would reduce GHG emissions, as applicable. For example, vehicle emissions standards and low carbon fuel standards would substantially reduce emissions associated with the 2030 General Plan, just as it would reduce mobile source emissions throughout California communities. The effect of future regulations will be taken into account through implementation of the County's GHG Reduction Plan. The GHG reduction target may need to be revised occasionally as new legislation or regulations become effective. With emerging transportation modeling tools, it may become necessary to reanalyze the County's GHG emissions to better account for the benefits of transit investment, infill and mixed-use development, roadway connectivity, and other elements of the 2030 General Plan and implementing actions.

In addition to policies and implementing actions in the General Plan, the County's GHG Reduction Plan will identify additional plans, policies, projects, actions, mitigation measures, and regulations that are necessary to reduce GHG emissions to a level consistent with the County's GHG reduction target.

The GHG Reduction Plan may include, but is not limited to:

- Regulations;
- Infrastructure investment strategies;
- Development streamlining and other incentives;
- Contributions to (and/or local use of) carbon offset programs;
- Infill and redevelopment plans and projects;
- Affordable housing projects or other higher-density housing and mixed-use projects near existing or planned future transit stops and along existing or planned pedestrian/bicycle networks;
- Bicycle and pedestrian master plans and infrastructure projects;
- Other public facilities and infrastructure projects in areas targeted for reinvestment;
- Financing programs for installation and use of renewable energy infrastructure in new and/or existing development;
- Programs to assist existing property owners in making energy efficiency upgrades;
- Travel demand management programs for new nonresidential projects; and
- Other plans and projects consistent with the 2030 General Plan that would improve per-capita and per-employee GHG efficiency in the county.

If a carbon offset program is developed locally, funding from this program should be used for revitalization, land assembly, transit improvements, pedestrian/bicycle facilities, and similar efforts in already-developed parts of the Valley Growth Boundary, where GHG-efficient land use and transportation environments will be provided.[17] The offset should be tied to a County GHG efficiency target for new land use projects. If developments are proposed that would exceed the GHG efficiency target, the County could require a GHG offset at a level necessary to achieve the County's GHG efficiency threshold for the lifetime of the subject project. The County could also participate in a regional or statewide offset program, as appropriate.

Since transportation is the largest sector contributing to GHG emissions both locally and at the statewide level, land use/transportation projects that manage travel demand are crucial to achieving the state's GHG emissions reduction target. The County will prioritize and seek grant funding to promote planning and development projects that increase housing/employment density, place homes in closer proximity with destinations, increase accessibility to transit, or otherwise decrease vehicle miles traveled (per household, per capita, per job).

The County will periodically monitor progress toward its GHG reduction target and, if necessary, consider revisions to the GHG Reduction Plan and implementing actions. As a part of ongoing monitoring, the County will follow changes in the

[17] Carbon offset programs are designed to achieve a net emissions objective by allowing additional emissions but also requiring purchase of offsetting credits. A factory or development may not be able to feasibly reduce its own carbon footprint, but would instead achieve some "net" carbon emissions objective through funding emissions reducing activities elsewhere. Funds from these credits are used for a variety of projects, such as planting trees (which absorb carbon dioxide), converting vehicle fleets to more efficient/less polluting technologies, funding for energy efficiency retrofits of existing buildings, renewable energy projects, and other activities. For a discussion of the potential for carbon offsets in the context of "indirect" GHG emissions and the California regulatory context, see Timothy P. Duane and Joanna D. Malaczynski, "Reducing Greenhouse Gas Emissions from Vehicle Miles Traveled: Integrating the California Environmental Quality Act with the California Global Warming Solutions Act," *Ecology Law Quarterly*, Vol. 36:71.

regulatory environment and technology, as well as grant and other funding programs that could be used to fund different components of the County's GHG Reduction Plan.

Related Goals:	Goal HS1, Goal HS2, Goal HS3, Goal HS5, Goal HS11, Goal CD2, Goal CD4, Goal CD5, Goal CD6, Goal CD7, Goal CD8, Goal CD10, Goal CD15, Goal NR2, Goal NR7
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund, grant funding
Time Frame:	Adopt by 2023, monitoring reports and needed revisions in coordination with Housing Element updates and updates to the Regional Transportation Plan

Action HS5.2 Assist Farmers to Reduce Greenhouse Gas Emissions

The County will meet with local agricultural groups, such as the Yuba-Sutter Farm Bureau, UC Davis Extension representatives, local organic farming groups, and other public and private groups representing farmers to discuss programs to reduce agricultural greenhouse gas (GHG) emissions. Methods to be explored may include but are not limited to reduction strategies from changes in crop management, animal wastes, energy use, crop residue burning, livestock management, soil management, solid waste management, fertilizers, and off-road equipment. The County will seek funding through carbon offsets or other sources to provide incentives that encourage farmers to participate in consensus GHG reduction programs for agriculture.

Related Goals:	Goal HS5, Goal NR3
Agency/Department:	Community Development and Services Agency and Agricultural Commissioner, in collaboration with local farming groups
Funding Source:	General fund, grant funding, carbon offset fees
Time Frame:	Ongoing, as funding is available

Goal HS6. Construction Emissions

Use construction practices and operational strategies that minimize air pollution.

Policy HS6.1 *New developments shall implement emission control measures recommended by the Feather River Air Quality Management District for construction, grading, excavation, and demolition, to the maximum extent feasible.*

Hazardous Materials

Existing Conditions

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, or as a consequence of vehicle accidents. Yuba County has sites that generate and store hazardous waste and permitted operations that produce or use hazardous materials, including oils, solvents, fertilizers, pesticides, welding gases, manufacturing/processing chemicals, and products that are flammable, toxic, reactive, or corrosive.

A release or spill of bulk hazardous materials could result in fire, explosion, toxic cloud, or direct contamination of water, people, and property. Effects may be felt at a local site or over many square miles. Health problems may be immediate, such as corrosive effects on skin and lungs, or be gradual, such as the development of cancer from carcinogen exposure. Damage to property could range from immediate destruction by explosion to permanent contamination by a persistent hazardous material.

Unexploded ordnance (ammunition for weapons) is a potential hazard at the site of the former Camp Beale in the southeastern portion of Yuba County and western Nevada County, as shown in **Figure 11**. This former Army base was historically used for bombing ranges, and there is still the potential for discovering munitions or explosives in this area.

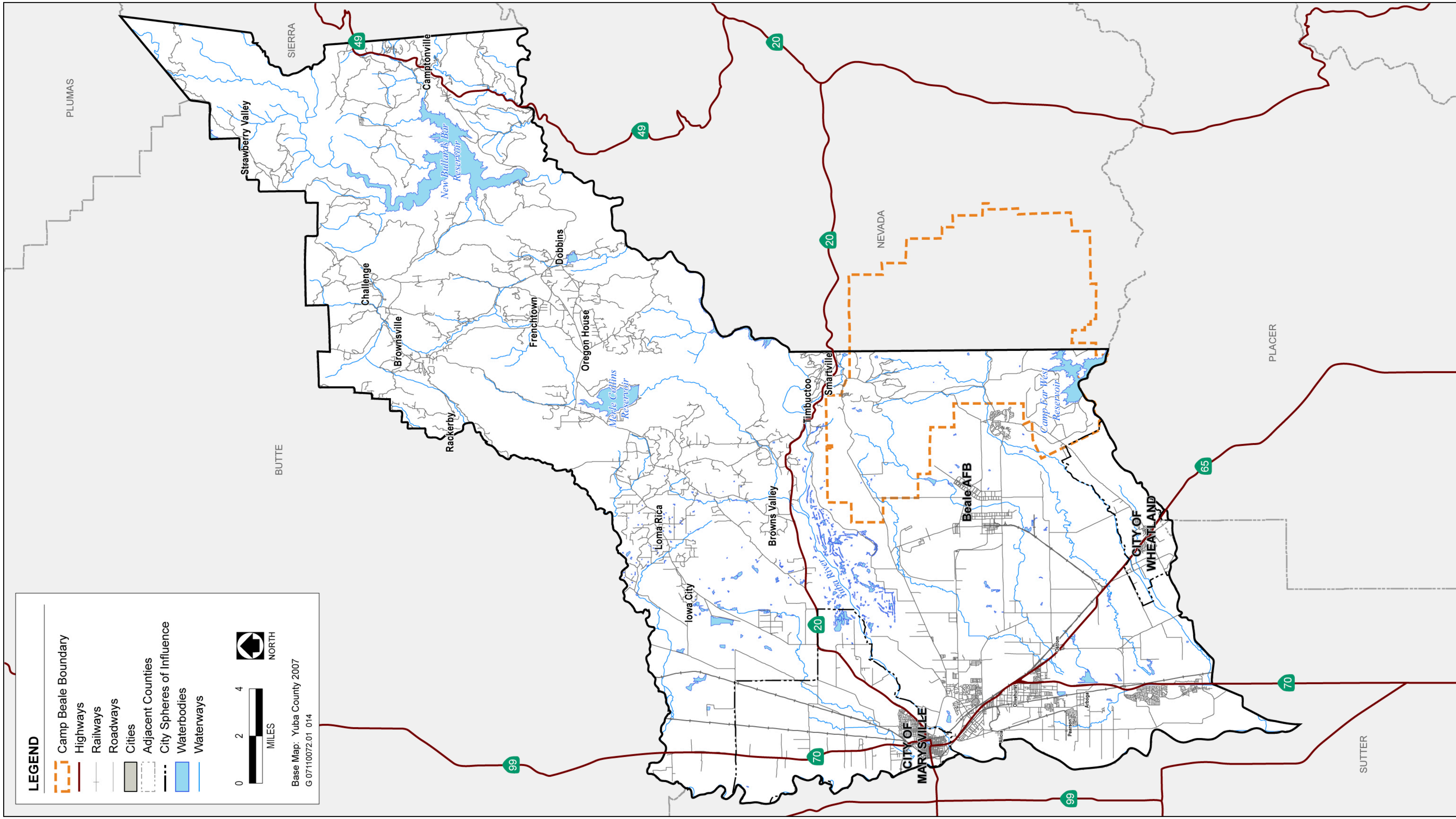

Figure 11: Camp Beale

Hazardous materials and waste within Yuba County 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.

The transport of hazardous materials/wastes and explosives through the county is regulated by the California Department of Transportation (Caltrans). The County's unincorporated areas are generally not designated as hazardous materials/waste transportation routes, but a permit may be granted on a case-by-case basis. Transportation of hazardous wastes are required to be certified by Caltrans, and manifests are required to track the hazardous waste during transport.

Past Occurrences

No major hazardous materials incidents have occurred within recent years in Yuba County.

Potential Changes to Hazardous Material Releases in Future Years

Highly Likely – It is highly likely that a hazardous materials incident will occur in Yuba County every year. However, 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 county 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 severe storms may create a greater risk of hazardous materials releases during these events.

Goals, Policies, and Actions

Goal HS7. Hazardous Materials

Protect the community from the harmful effects of hazardous materials.

Policy HS7.1 *The County will assess risks associated with public investments and other County-initiated actions, and new private developments shall assess and mitigate hazardous materials risks and ensure safe handling, storage, and movement in compliance with local, state, and federal safety standards.*

Policy HS7.2 *Hazardous materials waste sites and areas of contamination shall be remediated in conformance with applicable federal and state standards prior to new development that could be substantially and adversely affected by the presence of such contamination.*

Policy HS7.3 *The County will collaborate with appropriate federal, state, and regional agencies in an effort to identify and remediate soils and groundwater contaminated with toxic materials and to identify and eliminate sources contributing to such contamination.*

Policy HS7.4 *New residential developments proposed in areas adjacent to ongoing agriculture shall provide buffers or other design features adequate to protect residents from harmful effects of agricultural chemical use.*

Policy HS7.5 *The County will support compliance with state law regarding the location of school sites and sources of hazardous air emissions to ensure against endangerment of public health.*

Policy HS7.6 *The County's entitlement review procedures should be regularly updated, as necessary, to ensure the public safety in the former Camp Beale area.*

Policy HS7.7 *The County will coordinate with the Army Corps of Engineers regarding cleanup of the former Camp Beale Army Base.*

Policy HS7.8 *New developments and public investments involving earth disturbance in the former Camp Beale Army Base area shall incorporate permit requirements in coordination with the State Department of Toxic Substances Control to reduce risk associated with munitions or explosives.*

Policy HS7.9 *The County will encourage the use of landscaping and green infrastructure to help remediate contaminated sites to process and clean soils of hazardous materials.*

Action HS7.1 Revise County Standards for Camp Beale Area

Following adoption of the General Plan, the County will revise its standards to address the potential for residual buried munitions in the former Camp Beale area. The intent of these revisions would be to ensure that public safety is considered in County approvals for any type of earth disturbance, such as grading, installation of foundations, trenching for underground utilities, installation of septic systems, and other actions. The County would revise its ordinances to clarify the process for entitlements in areas identified as having a high probability to contain munitions or other hazardous materials associated with the former Army base.

Related Goals:	Goal HS7
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund
Time Frame:	Adopt by 2025

Action HS7.2 Plan Review for Hazardous Materials

The County will use its plan review process to review development proposals that aim to handle, produce, store, or transport hazardous materials in Yuba County and require that the applicant incorporate appropriate site remediation or mitigation activities through environmental design or ongoing site management programs to reduce the risk of a hazardous materials release event.

Related Goals:	N/A
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund
Time Frame:	Ongoing, takes immediate effect upon adoption of this Element.

Seismic and Geologic Hazards

Existing Conditions

Seismic and geologic hazards are caused by the movement of different parts of the Earth's crust, or surface. Seismic hazards are the hazards associated with earthquakes in a particular area. Geological hazards are other hazards involving land movements that are not necessarily 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, and subsidence (sinking of the ground surface). Factors which affect the severity of damage from an earthquake include the location of the earthquake epicenter, its magnitude, the time of day, and local construction materials and practices.

Yuba County is in an area of relatively low seismic activity and 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. Faults include the Prairie Creek Fault Zone, the Spenceville Fault, and the Swain Ravine Fault. No Alquist-Priolo Earthquake Fault Zones[18] are located in the county. Regional faults are illustrated in **Figure 12**.

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. 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 County.

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 county within or directly adjacent to the floodplains of the Bear, Feather, and Yuba Rivers are areas of the greatest peak ground acceleration. These areas will experience the strongest shaking during an earthquake event, which could result in severe liquefaction events.

Geological Hazards

An area's susceptibility to geologic hazards depends on its local geologic composition. Geologic hazards can be caused or exacerbated by unstable soils and certain ground formations that render some areas unsuitable for intensive human activity. Lands around major fault zones, for example, are exposed to greater geologic hazards as a result of repeated fault movement, which creates looser ground material that is more likely to move. Common geological hazards include erosion, soil shrinkage and expansion, landslides, soil liquefaction, and volcanic activity.

[18] 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

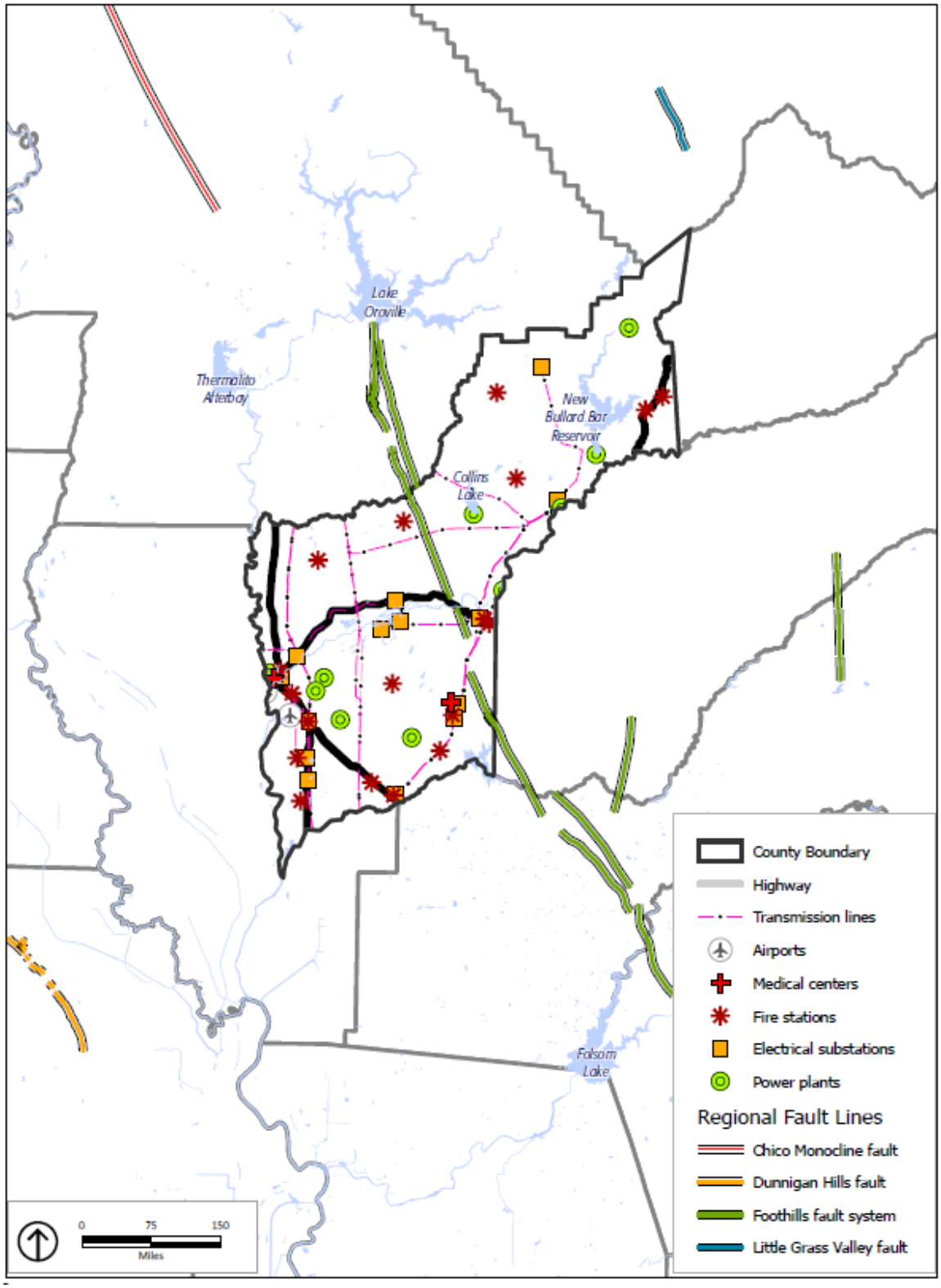

Figure 12: Regional Fault Lines

Yuba County is susceptible to hazards related to erosion, or the geological process in which earthen materials such as rock or soil are worn away by natural forces such wind or water. A number of soils within Yuba County are considered to have high potential for erosion. Highly erosive soils can damage roads, bridges, buildings, and other structures. In general, the areas with the highest erosion hazards are located along the Yuba River between Smartsville and the northeast boundary of the county. Areas with elevated erosion hazard are primarily located in the eastern half of the county.

Expansive or shrink-swell soils contain significant amounts of clay minerals that swell when wet and shrink when dry, which can result in damage to foundations, buildings, infrastructure, and other structures. Soils having high shrink-swell potential are more common in the floodplains of the Feather River in the western end of the county, with some soils with moderate shrink-swell potential in valleys in the eastern portion of the county.

Landslides can include a variety of ground movements, including rockfalls, slope failures, mudflows, and debris flows. Landslide susceptibility is a function of various combinations of factors, including rainfall, rock and soil types, slope, aspect, vegetation, seismic conditions, and human activities, such as construction. In Yuba County, landslides would likely be limited to foothills and mountain areas where slopes are greater. **Figure 13** illustrates areas in Yuba County that are most susceptible to landslides. These areas are concentrated primarily in the eastern half of the county and include the cities of Dobbins, Camptonville, and Challenge-Brownsville as well as several fire stations, electrical substations, power plants, and transmission lines.

Soil liquefaction occurs when loosely spaced, water-logged sediments at or near the ground surface lose their strength in response strong ground shaking. The soils most susceptible to liquefaction are clean, uniformly graded, loose, saturated, fine-grained soils. Earthquakes can transform this granular soil material into a fluidlike substance similar to quicksand. Liquefaction potential varies across the county. Foothill and mountain areas have a low potential for liquefaction, except in areas of unconsolidated sediments (generally adjacent to stream channels). 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 Holocene 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 Yuba County, approximately 90 miles north of Marysville. Large sections of Yuba County could be affected by a volcanic eruption. However, the damage due to a volcanic event would likely not be severe.

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.

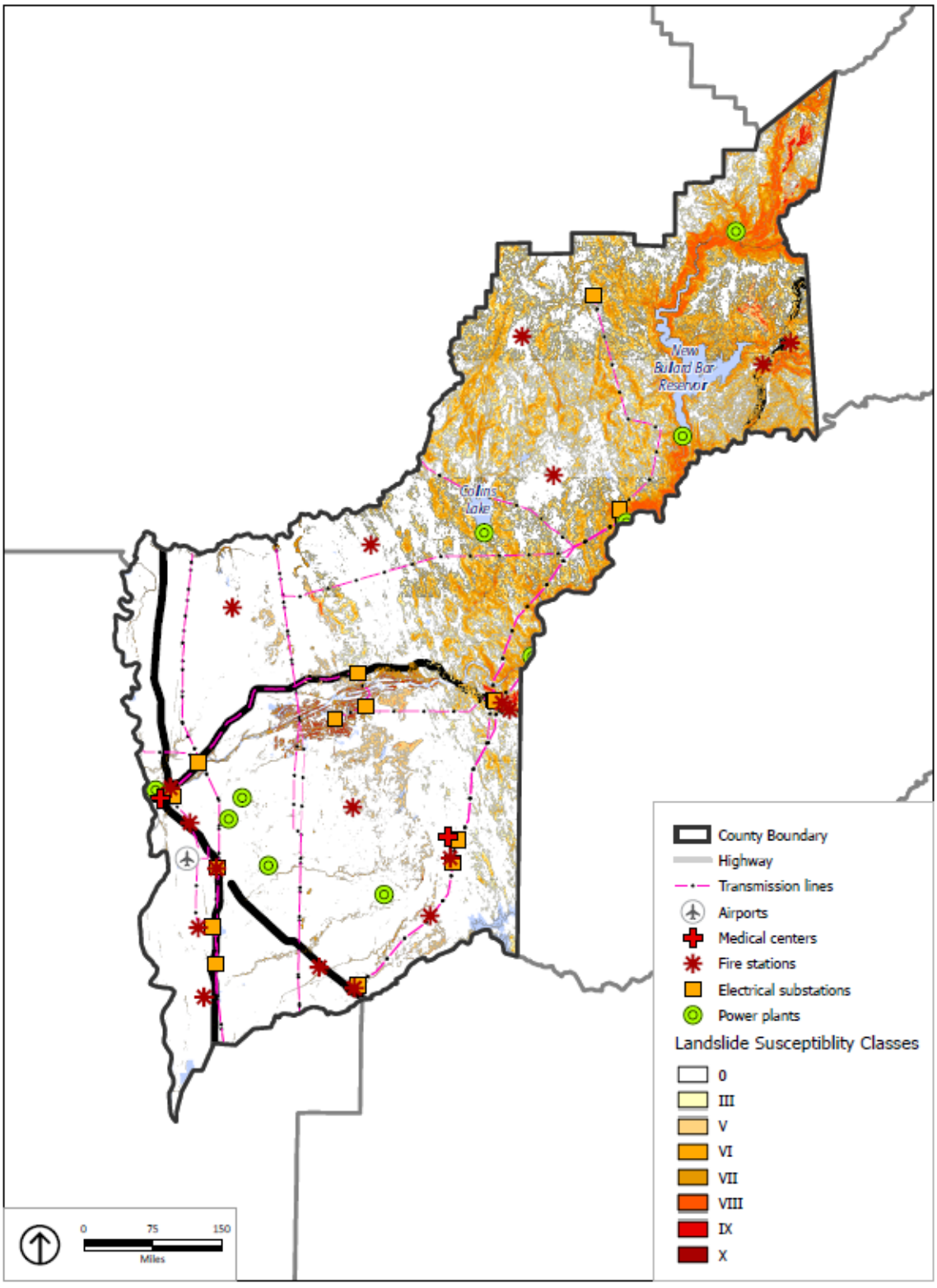

Figure 13: Landslide Susceptibility

No asbestos is mined in Yuba County, but small areas of potentially asbestos-bearing ultramafic rock are in foothills and mountain portions of the county.

Past Occurrences

Major earthquakes are rare in Yuba County, but minor earthquakes do occur. The US Geological Survey has recorded approximately 500 earthquakes in the environs of Yuba County since 1975, or an average of approximately 11 earthquakes per year. The majority of these earthquakes were minor, with an average magnitude of 3.

Landslides are generally infrequent in Yuba County. However, a major landslide during a storm event in the winter of 2005–06 caused severe damage to higher-elevation county roads and special district facilities, especially along Marysville Road and around New Bullards Bar Reservoir.

The Lassen region, the volcanic region closest to Yuba County, has been volcanically active for more than three million years. Its most recent eruptive activity occurred at Lassen in Peak in 1914 to 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

Seismic Risk

Unlikely – The threat of earthquakes exists in Yuba County. However, the probability that a strong earthquake will occur within the county is lower than in areas near the San Andreas Fault and the eastern Sierra Nevada. When earthquakes do occur, they may cause no substantive damage and may not even be felt by most people.

If serious shaking does occur, newer construction is in general more earthquake resistant than older construction due to improvements in building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Earthquake losses would vary across Yuba County depending on the source and magnitude of the event.

Geologic Hazard Risk

Occasional – Geologic risks such as landslides are generally considered to be rare occurrences in Yuba County.

Volcanic Activity Risk

Unlikely – Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years. 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 Park 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 Seismic and Geologic Hazards

While climate change is unlikely to increase earthquake frequency or strength, it may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. Heavy rainfall or snowfall could cause an increase in the number of landslides or make landslides larger than normal. The combination of 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.

Goals, Policies, and Actions

Goal HS8. Geology and Soils

Reduce risk to people and property from geologic hazards and soil limitations.

Policy HS8.1 *Development projects shall implement applicable state and local building code requirements, including structural and seismic safety measures, in order to reduce risks associated with seismic events and unstable or expansive soils.*

Policy HS8.2 *New developments that could be adversely affected by geological and/or soil conditions shall include project features that minimize these risks.*

Policy HS8.3 *A grading permit from the County is required for movement of dirt, soil, rock, debris or other material on over one acre of land and construction of retaining walls, bridges, and fill operations exceeding four feet, unless the activity is listed in the County Code as exempt from grading requirements.*

Policy HS8.4 *Grading permits generally require submittal of grading plans and drainage study for review and approval by the Community Development and Services Agency, and where requested, a revegetation and winterization plan, and geotechnical investigation report.*

Policy HS8.5 *An erosion and sediment control plan meeting County standards for preventing to increased discharge of sediment is required for:*

- *Projects that propose to grade more than ten thousand (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 two thousand five hundred (2,500) square feet will be inadequately protected from erosion during any portion of the rainy season;*
- *Projects that involve grading will occur within fifty (50) feet of any watercourse; or*
- *Where the County determines that the grading will or may pose a significant erosion, or sediment discharge hazard for any reason.*

Policy HS8.6 *Project applicants may be required to show evidence of coverage, or application for coverage, under an NPDES general construction permit and a Storm Water Pollution Prevention Plan (SWPPP) with a State issued W.D.I.D. number, if applicable. Grading activities shall be located and designed to avoid contributing to the violation of provisions of any applicable NPDES stormwater discharge permit.*

Policy HS8.7 *Grading activities shall be designed, per County standards, to avoid obstructing or impeding the natural flow of stormwaters, causing accelerated erosion, or aggravating any existing flooding condition.*

Policy HS8.8 *For engineered grading, the peak off-site storm water discharge from the project site shall not exceed pre-construction conditions unless the applicant demonstrates that downstream storm water conveyance systems have sufficient capacity to handle the increased flow rate without exceeding established design standards, subject to County approval.*

Policy HS8.9 *Grading activity and land disturbance shall be conducted such that the smallest practicable area of erodible land is exposed at any one time.*

Policy HS8.10 *Grading activities shall preserve natural features, including vegetation, terrain, watercourses and similar resources, wherever feasible.*

Policy HS8.11 *Grading activities within four hundred (400) feet of a landside levee toe shall require a registered geotechnical engineer to submit a stamped report demonstrating that the proposed action will not have an adverse impact on the integrity of the levee system. Agricultural practices are generally exempt from setback requirements except for the storage of agricultural waste.*

Policy HS8.12 *Proponents of new developments shall notify owners of adjacent and abutting utilities prior to approval of a grading permit. The subject utility must either approve the permit, or, if 30 days pass after notifying the utility, or if the Agency Director waives the need for utility approval, the permit may also be approved.*

Policy HS8.13 *Grading permittees shall be responsible for the prevention of damage to any adjacent public utilities or services and adjacent properties. No person(s) shall excavate or fill close to the property line without supporting and protecting such property from damage which may result. It shall be the responsibility of the permittee to control discharge of sediment and hazardous materials to any watercourse, drainage system, or adjacent property.*

Policy HS8.14 *New developments that would involve earth disturbance of areas with slopes exceeding 5 percent shall prepare and implement an erosion control plan, subject to County approval.*

Policy HS8.15 *The County shall enforce and implement the seismic safety requirements of the 2019 California Building Code to reduce risks to structures and lives from seismic shaking hazards.*

Policy HS8.16 *The County will require that developers submitting proposals in hilly terrain with a slope of more than 15 percent shall perform a geotechnical analysis investigating the potential for deep-seated landslide hazards.*

Policy HS8.17 *The County 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.*

Action HS8.1 Grading Permits, Erosion Control Plans, Drainage Studies, and Geotechnical Evaluations

The County 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.

The County will require a geotechnical evaluation prior to construction of buildings meant for public occupancy in areas with potential risk related to geologic conditions or soil limitations, as identified on maps maintained by the County. 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 County. The County will also incorporate geotechnical evaluations and recommendations into its own public investments, as appropriate.

Related Goals:	Goal HS8, Goal HS3
Agency/Department:	Community Development and Services Agency
Funding Source:	Project applicant funding
Time Frame:	Ongoing, as projects are proposed

Public Safety and Emergency Management

Emergency Preparedness

In Yuba County, a number of different agencies and special districts provide emergency response services. The Yuba County Office of Emergency Services (OES) was established to coordinate emergency management between the various public safety and service providers, including local cities, special districts, and fire and law enforcement agencies. OES prepares emergency and contingency plans, ranging from evacuation plans to emergency operations plans that help specify the roles and responsibilities of first responders and emergency management personnel for an incident. Moreover, OES plans and organizes training and exercises involving Yuba County and local, federal, and regional agencies.

The local fire departments within Yuba County and CAL FIRE are prepared to handle everyday emergencies, such as all types of fire, medical, or hazardous situations. However, during a disaster, the number and scope of incidents may exceed the fire department's and CAL FIRE's ability to provide effective emergency services. For this reason, Yuba County provides the public with access to a community emergency response team (CERT) training program. The CERT program educates individuals about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations.

With advanced warning, evacuation can be effective in reducing injury and loss of life during a catastrophic event. **Figure 14** shows potential primary evacuation routes in Yuba County. **Figure 15** 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.

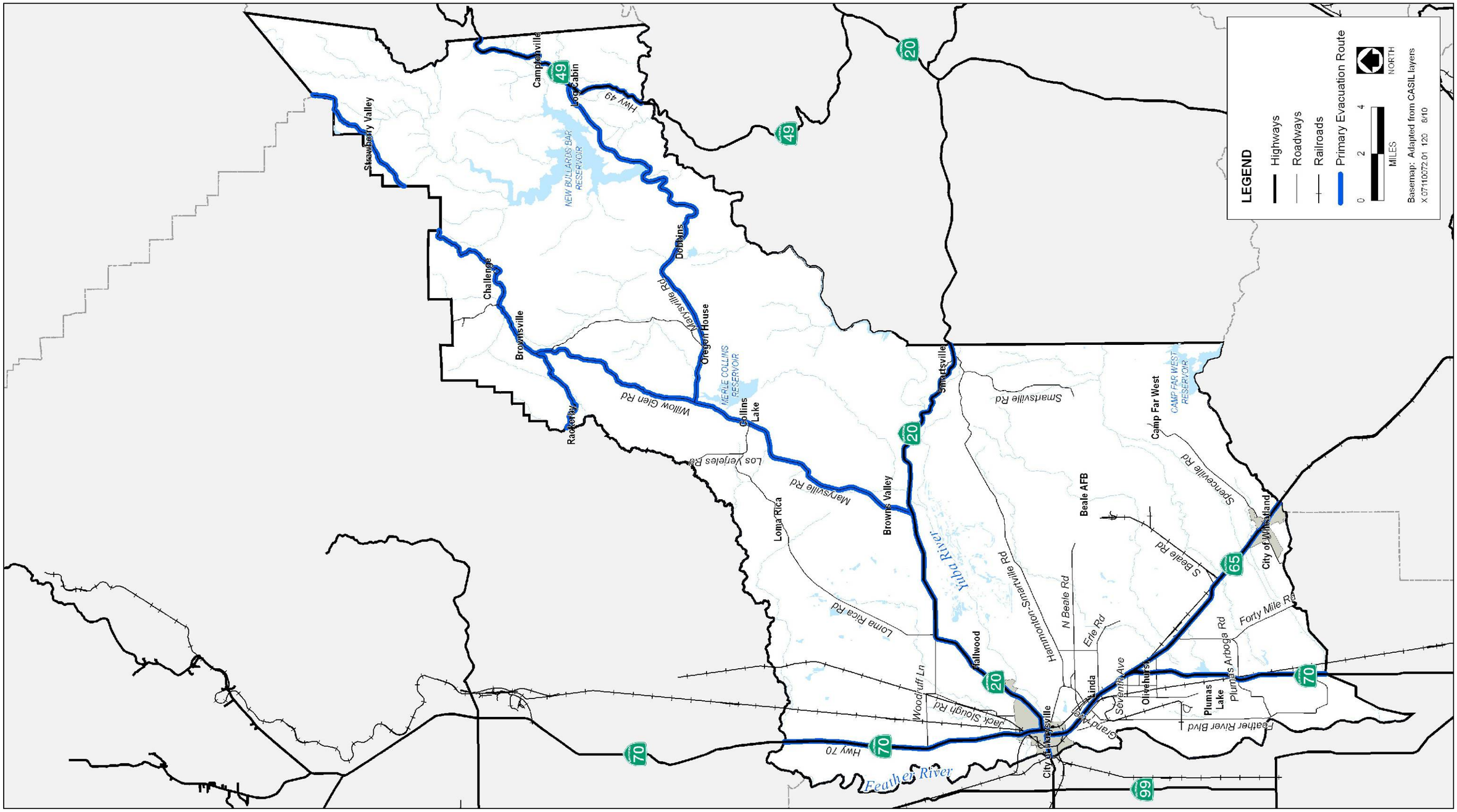

Figure 14: Primary Evacuation Routes

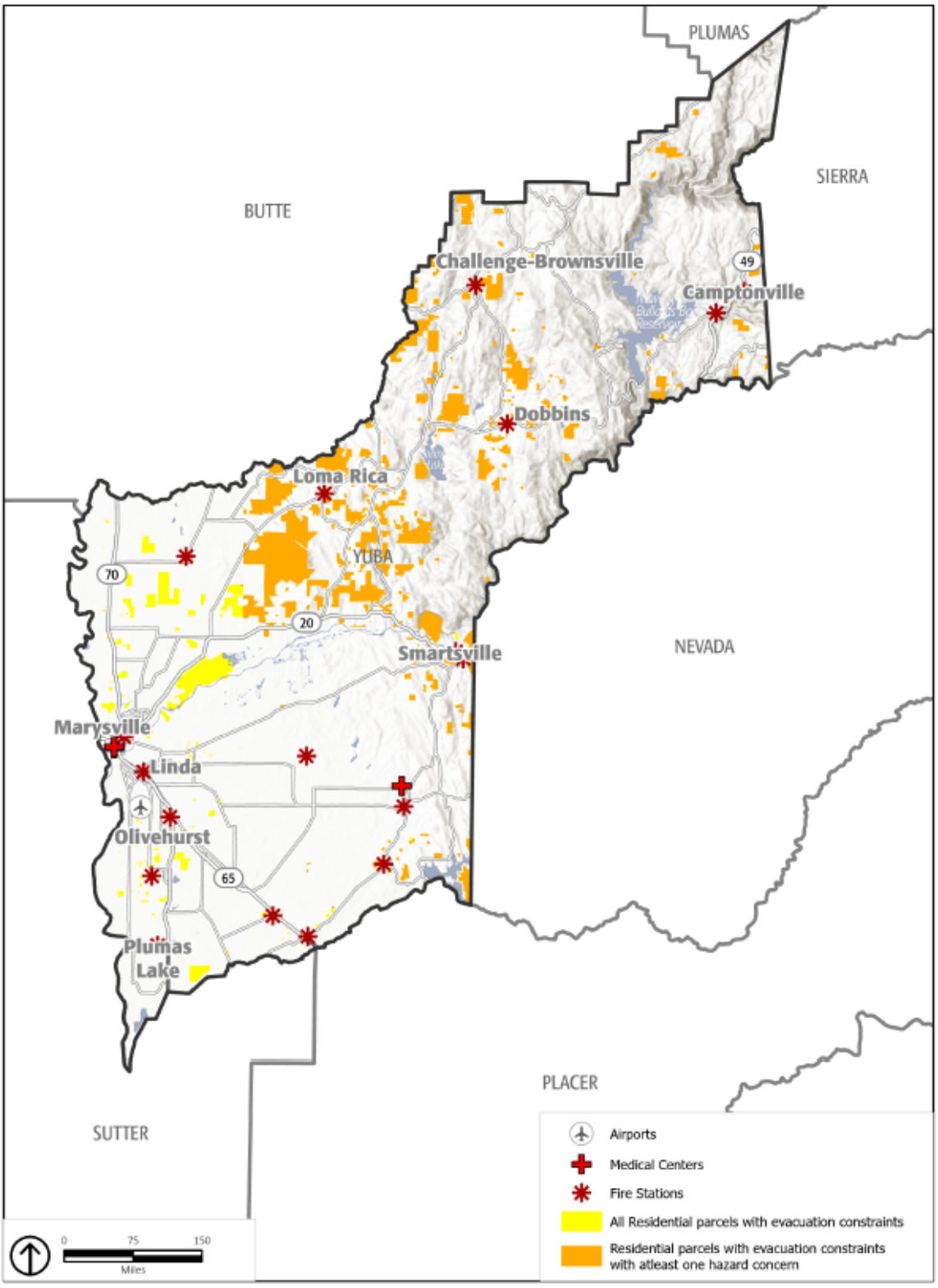

Figure 15: Evacuation-Constrained Areas

The main transportation corridors that serve as evacuation routes for the county are State Highways 20, 70, and 65 in the lower half of the county, and Marysville Road, a two-lane road traversing the northern half of the county from east to west. Marysville Road begins at State Highway 20 in the west and terminates in the east at State Highway 49. State Highway 49 can serve as an evacuation route for the eastern end of Yuba County. The northernmost portion of the county is served by the La Porte-Quincy Road.

Public Safety Power Shutoffs

Electricity utilities throughout California, including the Pacific Gas & Electric Company (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. These activities, called Public Safety Power Shutoffs (PSPSs), result in a loss of power for customers served by the affected power lines. A PSPS 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. Several PSPS events also occurred in 2020. While smaller, these events still affected thousands of PG&E customers across Yuba County.

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. 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.

Goals, Policies, and Actions

Goal HS9. Public Safety and Emergency Management

Minimize the loss of life and damage to property from natural and human-caused hazards by ensuring adequate emergency routes and response.

Policy HS9.1 *The County will review development projects, plans, and public investment decisions to ensure consistency with the current Multi-Jurisdictional Local Mitigation Plan.*

Policy HS9.2 *The County will provide public access to emergency response procedures in such locations as the Government Center, the County library, and public schools, as well as on the Yuba County website and through social media, and will otherwise promote awareness of emergency response and evacuation plans.*

Policy HS9.3 *The County will coordinate with Caltrans to maintain Highways 20, 70, 49, and 65 in the lower half of the county, and the County will maintain Marysville Road, Frenchtown Road, and La Porte–Quincy Road in the upper half of the county as primary emergency access and evacuation routes and improve other roads as necessary, such as Plumas Arboga Road, to create additional evacuation routes (Public Health & Safety-Figure 14).*

Policy HS9.4 *The County's development and improvement standards will require a circulation system with multiple access points and evacuation egresses.*

Policy HS9.5 *The County will adopt an updated emergency evacuation route network that accounts for each route's feasibility under differing hazard conditions (e.g., flood, fire, seismic hazards) and that integrates locally with Marysville's and Wheatland's evacuation*

networks and regionally with the networks of Butte, Nevada, Placer, Sierra, and Sutter counties.

Policy HS9.6 *The County will harden evacuation networks leading to resilience hubs or other emergency shelters and ensure that they are easily accessible through multiple routes and that they remain free and clear of conditions such as unstable utility poles, old or dead trees with loose branches, etc.) that threaten their operational status during a hazard event.*

Policy HS9.7 *The County will review its facilities and collaborate with property owners of private community assets (meeting houses, lodges, faith-based buildings, etc.) in order to evaluate which of these facilities could become cooling centers, resilience hubs, or emergency shelters that provide safe places for residents of Yuba County during hazard events or emergency conditions (fire, extreme heat, flooding hazards, etc.). These places shall remain operational both during and after the hazard event as needed.*

Policy HS9.8 *The County will regularly update its Emergency Operations Plan and identify which of its facilities shall become alternative sites for continuity of governance during and after a hazard event. These sites shall have redundancies for power and communications.*

Policy Hs9.9 *The County will encourage the development of locally owned and operated power suppliers and sources of energy to support the creation of power microgrids that are resilient to regional impacts on large power suppliers or events requiring mass public safety power shutoffs.*

Policy Hs9.10 *The County will keep residents and stakeholders as up to date as possible on any emerging or current hazard events through communication media such as texts, phone calls, email, social media announcements, television broadcasts, and press releases.*

Policy HS9.11 *The County will provide all public information materials available in English and Spanish and provide prompt translations upon request.*

Policy HS9.12 *The County will collaborate with utilities (e.g., power, gas, water) to prepare for Public Safety Power Shutoff events and other potential infrastructure disruptions in order to increase regional resilience.*

Policy H9.13 *The County will work with the cities of Marysville and Wheatland, unincorporated communities in Yuba County, surrounding counties, and the Sacramento Area Council of Governments on future hazard mitigation and emergency management planning efforts where feasible.*

Policy H9.14 *The County shall ensure that plans are in place to quickly evacuate vulnerable populations (e.g., unhoused people, seniors in assisted living facilities, people with disabilities, etc.).*

Policy H9.15 *The County shall work with local emergency service providers to better assess emergency service needs under current and anticipated future conditions, including changes to emergency service needs as a result of climate change.*

Policy H9.16 *The County 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.*

Action HS9.1 Emergency Access and Evacuation Routes

The County 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 County 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 in order to ensure adequate emergency access and evacuation egress, even in the event of a flood. As noted in Action HS1.2, the County will collaborate with Wheatland and Marysville on development of a flood emergency plan.

Related Goals:	Goal HS9
Agency/Department:	County Office of Emergency Services
Funding Source:	Grant funding
Time Frame:	Ongoing, as funding is available

Action HS9.2 Emergency Shelters and Resilience Hubs

The County will seek funding to implement Policy HS9.7 to create a network of regional resilience hubs to provide shelter to Yuba County 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 (seniors, renters, low-income households, unhoused people or families, etc.). For unhoused groups specifically, the County 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 County's future network of resilience hubs. When hazard conditions mandate the opening of the resilience hubs, the County 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

Related Goals:	Goal HS9
Agency/Department:	County Office of Emergency Services
Funding Source:	Grant funding
Time Frame:	Ongoing, as funding is available

Noise and Vibration

Existing Conditions

Unregulated noise can cause stress and strain on the general well-being of the county's residents. With proper planning, mitigation, and cooperation, unwanted noise can be managed to preserve the overall well-being of the people within the county.

Sound pressure levels are expressed in decibels (dB). The dBA scale is used to correlate noise measurement with human sensitivity. Community noise is commonly described in terms of the "ambient," or all-encompassing noise level in a given environment. The Equivalent Noise Level (L_{eq}) and Community Noise Equivalent Level (CNEL) are common community noise descriptors.

- **L_{eq}** (Equivalent Noise Level): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels.

- **CNEL** is an average of 24-hour L_{eq} with a 10 dBA 'penalty' for noise events that occur during noise-sensitive hours of the day (10:00 p.m. to 7:00 a.m.). An additional 5 dBA 'penalty' is added to noise events that occur between 7:00 p.m. to 10:00 p.m.

The county's major transportation corridors are a primary existing source of noise. This includes State Highways 20, 65, and 70; major County roads; and two railroad lines operated by Union Pacific Railroad. The county also includes several ongoing stationary noise sources, including quarries and mining operations, manufacturing operations, agricultural operations, the Marysville Raceway Park, Ostrom Road Landfill, Sleep Train Amphitheater, a concrete plant, Beale Air Force Base, and the county's airports. In addition to the noise contours surrounding the county's major noise sources, ambient noise levels throughout the county were evaluated in a community noise survey conducted to support this General Plan. Specific information on ambient noise levels and noise contour maps can be found in the General Plan Update Noise Background Report, under separate cover.

Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or intermittent, such as explosions.

As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency. Vibration amplitudes are usually expressed in peak particle velocity (PPV) or RMS, as in root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as VdB, which serves to compress the range of numbers required to describe vibration.

The background vibration-velocity level in typical residential areas is approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels.

Noise policies will be used to guide decisions concerning land use and the location of roads, industrial developments, agricultural operations, and other common sources of noise. Noise sensitive land uses will be planned with existing and future estimate noise levels in mind. For the purposes of this Element, noise- and vibration-sensitive uses include: residences; schools; hospitals; rest homes; long-term medical or mental care facilities; and similar uses.

Noise policies seek to avoid the planning mistakes of the past. For example, the County will ensure a network of connected, smaller-volume roadways that disperse traffic and therefore lower noise along such roadways. Buffers should separate noise-sensitive uses from large-volume roadways and railroads. Noise-generating industrial and commercial uses should be designed to avoid impacts on noise-sensitive receptors. In general, the County will plan intelligently in order to reduce substantial noise conflicts and avoid the need for sound walls and other reactive fixes that create unnecessary barriers, prohibit community connectivity and cohesiveness, and reduce the opportunities for casual surveillance.

Goal HS10. Noise and Vibration

Ensure that noise does not substantially reduce the local quality of life.

Policy HS10.1 *New developments that generate traffic or are affected by traffic noise shall provide design and mitigation, if necessary, to ensure acceptable daytime and nighttime land use/noise environment at outdoor activity areas of affected properties, as defined in Table Public Health & Safety-1.*

Policy HS10.2 *If existing noise levels exceed the acceptable levels listed in Table Public Health & Safety-1, new developments are required to incorporate mitigation to reduce noise exposure in outdoor activity areas to the maximum extent feasible and include mitigation designed to achieve acceptable interior noise levels, as defined in Table Public Health & Safety-1.*

Policy HS10.3 *New developments that would generate or be affected by non-transportation noise shall be located, designed, and, if necessary, mitigated below maximum levels specified in Table Public Health & Safety-2, as measured at outdoor activity areas of affected noise-sensitive land uses.*

Table Public Health & Safety-2
Maximum Allowable Noise Exposure from Transportation Noise Sources at Noise-Sensitive Land Uses

Land Use	Interior Spaces		Outdoor Activity Areas (dBA Ldn) 55 60 65 70 75 80
	dBA Ldn	dBA Leq	
Residences	45	-	
Hotels, Motels	45	-	
Schools, Libraries, Museums, Places of Worship, Hospitals, Nursing Homes	45	45	
Theaters, Auditoriums, Concert Halls, Amphitheaters	35	-	
Outdoor Spectator Sports	-	-	
Playgrounds, Parks	-	-	
Golf Courses Riding Stables, Water Recreation, Cemeteries	-	-	
Office Buildings, Retail, and Commercial Services	45	-	
Industrial, Manufacturing, Utilities, Agriculture	-	-	

Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise requirements.

Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

Normally Unacceptable – New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.

Clearly Unacceptable – New construction or development clearly should not be undertaken.

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = energy-equivalent noise level. This table does not apply to existing transportation noise sources affecting existing land uses. Outdoor activity areas are the portion of a property where activities are normally expected. This would include portions of backyards, decks, balconies, pools, sports or game courts, and patios, but would not include front yards, spaces next to parking, roads, driveways, or vehicular loading areas. Hospitals and nursing homes use the L_{dn} interior standard, whereas schools, libraries, museums, and places of worship use a L_{eq} interior standard. Office buildings have an interior standard, but retail and commercial service uses do not have an interior standard.

Source: Governor's Office of Planning and Research 2003 General Plan Guidelines.

Table Public Health & Safety-3
Maximum Allowable Noise Exposure from Non-transportation Noise Sources at Noise-Sensitive Land Uses

NOISE LEVEL DESCRIPTOR	DAYTIME (7 A.M.–10 P.M.)	NIGHTTIME (10 P.M.–7 A.M.)
Hourly L_{eq}	60 dBA	45 dBA
L_{max}	75 dBA	65 dBA

Notes: dBA = A-weighted decibel; L_{eq} = energy-equivalent noise level; L_{max} = maximum noise level.
Each of the noise levels specified shall be lowered by 5 dBA for simple tone noises, noises consisting primarily of speech, music, or for recurring impulsive noises. These noise-level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). Noise-sensitive land uses include schools, hospitals, rest homes, long-term care facilities, mental care facilities, residences, and other similar land uses.

Table Public Health & Safety-4
Performance Standards for Non-transportation Noise Sources

CUMULATIVE DURATION OF A NOISE EVENT[1] (MINUTES)	MAXIMUM EXTERIOR NOISE LEVEL STANDARDS[2]	
	DAYTIME dBA L_{MAX}[2,4]	NIGHTTIME dBA L_{MAX}[3,4]
30–60	50	45
15–30	55	50
5–15	60	55
1–5	65	60
0–1	70	65

Notes: dBA = A-weighted decibel; L_{max} = maximum noise level.

1 Cumulative duration refers to time within any 1-hour period.

2 Daytime = hours between 7:00 a.m. and 10:00 p.m.

3 Nighttime = hours between 10:00p.m. and 7:00 a.m.

4 Each of the noise level standards specified may be reduced by 5 dBA for tonal noise (i.e., a signal which has a particular and unusual pitch) or for noises consisting primarily of speech of for recurring impulsive noises (i.e., sounds of short duration, usually less than one second, with an abrupt onset and rapid decay such as the discharge of firearms).

Policy HS10.4 *If existing noise levels exceed the maximum allowable levels listed in Table Public Health & Safety-3, projects are required to incorporate mitigation to reduce noise exposure in outdoor activity areas to the maximum extent feasible and include mitigation to achieve acceptable interior noise levels, as defined in Table Public Health & Safety-2.*

Policy HS10.5 *The maximum noise level shall not exceed the performance standards shown in Table Public Health & Safety-4, as measured at outdoor activity areas of any affected noise-sensitive land use except:*

- *If the ambient noise level exceeds the standard in Table Public Health & Safety-4, the standard becomes the ambient level plus 5 dBA.*

- *Reduce the applicable standards in Table Public Health & Safety-4 by 5 decibels if they exceed the existing ambient level by 10 or more dBA.*

Policy HS10.6 *New developments shall provide all feasible noise mitigation to reduce construction and other short-term noise and vibration impacts as a condition of approval.*

Policy HS10.7 *New developments shall ensure that construction equipment is properly maintained and equipped with noise control components, such as mufflers, in accordance with manufacturers' specifications.*

Policy HS10.8 *Noise attenuation barriers are strongly discouraged, except to attenuate noise for existing developed uses, and may be used in the context of new developments only when no other approach to noise mitigation is feasible.*

Policy HS10.9 *New developments shall disperse vehicular traffic onto a network of fully connected smaller roadways and minimize funneling of local traffic onto large-volume, high-speed roadways near existing or planned noise-sensitive land uses to the maximum extent feasible.*

Policy HS10.10 *Proposed noise-generating industrial and other land uses shall be located away from noise-sensitive land uses, shall enclose noise sources, or shall use other site planning or mitigation techniques to ensure acceptable noise levels, to the greatest extent feasible.*

Policy HS10.11 *Lands within the 65 CNEL noise contour of Beale Air Force Base, Yuba County Airport, and Brownsville Airport shall be maintained in agricultural, open space, commercial, industrial, or other uses permitted by the subject airport's adopted Comprehensive Land Use Plan (CLUP) and consistent with the recommendations of the Beale Joint Land Use Study, including noise contours associated with future hypothetical missions, as appropriate.*

Policy HS10.12 *The County supports the construction of rail crossings designed to reduce or eliminate the use of rail horn blasts in areas with existing and planned noise-sensitive land uses.*

Policy HS10.13 *New developments that propose vibration-sensitive uses within 100 feet of a railroad or heavy industrial facility shall analyze and mitigate potential vibration impacts, to the greatest extent feasible.*

Policy HS10.14 *Public events, such as school sporting events, festivals, and other similar community and temporary events are exempt from the noise standards outlined in this Element.*

Policy HS10.15 *New developments that would generate substantial long-term vibration shall provide analysis and mitigation, as feasible, to achieve velocity levels, as experienced at habitable structures of vibration-sensitive land uses, of less than 78 vibration decibels.*

Policy HS10.16 *Mining, forestry, and agricultural noise will not be considered a nuisance when generated in areas designated by the General Plan for these uses.*

Action HS10.1 Airport Land Use Planning

The County will coordinate development requests in areas addressed by Airport Comprehensive Land Use Plans (CLUPs) according to the land use restrictions embodied in those plans and will initiate amendments to the General Plan and revisions to zoning, if necessary, following updates to local CLUPs.

Related Goals:	Goal HS10
Agency/Department:	Community Development and Services Agency

Funding Source:	Project applicant funding
Time Frame:	Ongoing, as projects are proposed within zones addressed by local CLUPs

Action HS10.2 Noise Generating Projects

Where development projects or roadway improvement projects could potentially create noise impacts, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design. Such analysis shall be the financial responsibility of the applicant and be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics. Mitigation strategies shall emphasize site planning and design over other types of mitigation.

Related Goals:	Goal HS10
Agency/Department:	Community Development and Services Agency
Funding Source:	Project applicant funding
Time Frame:	Ongoing, as projects are proposed

Action HS10.3 Revise County Noise Standards

The County will maintain noise control regulations consistent with the stated policies of this plan and within the capacity of the County to equitably enforce. The County's building, zoning, and subdivision, and public peace and safety codes will be revised to incorporate these policies. The County's code updates will provide construction noise guidance and will define special public events that are exempt from noise policies and standards.

Related Goals:	Goal HS10
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund
Time Frame:	Adopt by 2013, update as needed

Healthy Communities

As noted previously, most issues related to the development of healthy communities are addressed in other sections of this Element, the Community Development Element, and the Natural Resources Element. For example, the County has provided for convenient and safe pedestrian and bicycle access in the Community Development Element. Separation between sensitive and potentially polluting uses (such as agriculture, heavy industry, high-volume roadways, and railroads) is addressed in the Community Development Element and elsewhere in the Public Health & Safety Element. Water quality, air quality, and climate change are also addressed elsewhere in the Public Health & Safety Element. Recreational open space is covered in the Natural Resources Element. Other public health issues are integrated throughout this General Plan.

The Yuba County Health Committee has been discussing several issues and programs that are important to citizen health and welfare. Topics discussed before this committee include:

- Access to healthy food;
- School wellness programs;
- Access to transit;

- Safe walking and bicycling routes to school;
- Recreational programming;
- Agricultural education; and
- Drug abuse prevention.

Many of these topics are related to the General Plan. In particular, ensuring access to recreational open space (Natural Resources Element), encouraging transit access (Community Development Element), and providing for bicycle and pedestrian travel (Community Development Element) are important points of emphasis for the 2030 General Plan. Water quality and air quality (addressed in this Element) are very important components of healthy communities. This section addresses the County's policy on healthy communities not addressed in other portions of the General Plan.

Healthy community principles can address a wide range of factors, including access to health care, healthy food, recreation, education, and other factors. The County is committed to pursuing healthy community objectives in the context of its decision making and programs and in collaboration with many local and regional partners. Future collaboration is anticipated between County departments and health care providers, school districts, nonprofit foundations, and other public and private groups.

Goal HS11. Healthy Communities

Improve the overall health of Yuba County's residents.

Policy HS11.1 *The County will encourage access to grocery stores in Yuba County's neighborhoods, particularly in areas that are underserved or lack sufficient access to grocery stores.*

Policy HS11.2 *The County should coordinate with school districts and other local agencies to incorporate local agricultural products into government food programs, including the County jail, as feasible.*

Policy HS11.3 *The County should collaborate with area health providers and other stakeholders to provide targeted education regarding the importance of nutrition and exercise in a healthy lifestyle.*

Policy HS11.4 *County health statistics should be periodically monitored and used to guide the activities and focus of the County Health and Human Services Department.*

Policy HS11.5 *The County's standards will promote the establishment of community gardens, farm stands, and farmer's markets.*

Policy HS11.6 *The County will identify sources of zoonotic and vector-borne diseases in Yuba County and prepare for their impacts on the livelihoods of their residents.*

Action HS11.1 Prepare for Epidemics/Pandemics

The County will keep apprised of public health threats and diseases that could develop into large-scale sicknesses or otherwise impact the livelihoods of the county's residents. Of particular concern, the County will monitor zoonoses—diseases that develop or begin in animals and transit to humans directly or via a vector—that could turn into human-based infections (e.g., Zika, Swine Flu, novel coronavirus). The County will communicate public health information in a timely manner to constituents using online dashboards and GIS analysis to track where outbreaks are occurring. The County will use stay-at-home orders to limit disease spread when deemed appropriate by the Board of Supervisors or to comply with directives from the Governor's Office of Emergency Services. The County will

collaborate with the California Department of Food and Agriculture and the California Department of Fish and Wildlife to monitor new livestock-based diseases that could lead to losses for farm operators based in Yuba County. The County Department of Health and Human Services will provide or facilitate access to low-cost healthcare services for vulnerable populations to protect themselves against new disease spread and will share public heath guidance from the US Centers for Disease Control and Prevention. The County Agricultural Commissioner will work with the appropriate state agencies to enact measures on farms that will limit the potential for zoonotic diseases to develop and spread to humans.

Related Goals:	N/A
Agency/Department:	Agricultural Commissioner and Sealer of Weights and Measures; Board of Supervisors; Emergency Services; Health and Human Services; Sutter-Yuba Mosquito and Vector Control
Funding Source:	General fund
Time Frame:	Ongoing, takes effect upon adoption of this plan.

Severe Weather

Existing Conditions

Severe Storms

Severe storms usually occur in Yuba County as localized storms that bring heavy rain, hail, lightning, and strong winds. These storms are most likely to occur during the late fall, winter, and spring.

Yuba County 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. As the population of Yuba County grows, the lack of adequate drainage systems continues to be an important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

During the rainy season, Yuba County 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.

Winter Hazards

Severe winter weather includes heavy snowfall, ice storms, extreme cold, and similar events. Winter weather and freezing conditions can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. In Yuba County, monthly average low temperatures in the coldest months (November through April) range from the upper 30s to mid 40s. The lowest recorded daily extreme was 9°F on January 20, 1907. In a typical year, countywide minimum temperatures do not fall below 32°F, although temperatures may fall below freezing in the higher elevations.

The severity of winter weather varies by location in Yuba County, with the mountainous portions of the county experiencing cooler temperatures and higher levels of winter snow. The majority of the county is usually below the winter snow. The snow line is generally 2,000 to 5,000 feet, though moderate amounts of snow are reported nearly every winter at elevations as low as 1,000 feet. The Dobbins 1 S weather station (elevation 1,640 feet) reported an average of 3.4 inches of snow between 1970 and 2005.

Blizzards and ice storms can cause extensive damage to buildings and other structures, vehicles, and power lines. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets to impacts of severe weather in the county. Ice may form on roadways, creating dangerous driving conditions and a higher risk of vehicle crashes.

Winter storms can also result in avalanches, when some or all the snow on the side of a hill falls or slides down the slope. They are usually caused when enough snow falls on a slope to unbalance it or by warmer weather causing some snow to melt, making it easier for the rest of the snow to move down the hill. There is enough force and speed in a large avalanche to damage or destroy vehicles, trees, and buildings in their paths. Even smaller avalanches can injure or kill a person.

People who are exposed to extreme cold may suffer from conditions such as trench foot, frostbite, or hypothermia. The ability of the County to continue to operate during periods of winter storm and freeze is paramount. Vulnerable populations to winter weather and freeze include:

- Families in poverty
- Immigrants and refugees
- Outdoor workers
- Persons experiencing homelessness
- Seniors living alone

In addition to vulnerable populations, outdoor pets and livestock are at risk to freeze from cold.

The agricultural industry is especially vulnerable to extreme cold. Freezing temperatures can cause significant loss of crops. Historically, extreme temperatures have caused large losses to agricultural crops and have resulted in several U.S. Department of Agricultural disaster declarations.

Other impacts of winter snowstorms include damage to infrastructure, frozen pipes, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also of concern is the impact to populations with special needs, such as the elderly and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow.

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. For Yuba County as a whole, this currently denotes a day where the maximum temperature exceeds 101.2 degrees Fahrenheit. However, climatic differences across the county mean that different extreme heat thresholds exist in different parts of the county. The extreme heat threshold is approximately 97 degrees Fahrenheit at the eastern end of the county, 100.4 degrees Fahrenheit in the center of the county, and 104.8 degrees Fahrenheit at the western end of the county.

An event with five extreme days in a row is called a heat wave.

Health impacts are the primary concern associated with extreme heat and health impacts may be quite severe. People exposed to extreme heat can suffer a number of heat-related illnesses, including heat cramps, heat exhaustion, heat stroke, and death. Senior citizens, young children, persons with chronic health issues, and those on certain medications or drugs are particularly susceptible to heat effects. Nursing homes and elder care facilities are also 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 air conditioning is not affordable. Individuals who work outdoors or are experiencing homelessness are vulnerable to heat because they may not be able to take shelter or cease work during high temperatures. Immigrant and refugee populations, as well as those who are members of linguistically isolated communities, may have elevated vulnerability to heat, to the extent that they are more likely than members of the general population to have low incomes or work outdoors, and may face structural barriers when seeking medical care or other social services.

Very high temperatures can harm plants and animals—wild ecosystems as well as farm crops and livestock. 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.

Indirectly, extreme heat puts more stress on power lines and lowers their power transmission efficiency. High heat also increases the demand for electricity (usually to run air conditioning units). In combination with the additional stress on power lines, this may lead to brownouts and blackouts.

Past Occurrences

Within Yuba County, documented instances of extreme weather occurred in 1969, 1982, and 1983. These events, including sever wind and severe storms/thunderstorms, caused property and crop damage in the county as well as injuries and fatalities. Over 36 high wind events have occurred between 1950 and 2014.

Most tornadoes in Yuba County have been relatively weak and caused little damage. In recent years Yuba County has seen three tornadoes, two in 2012 and one in 2018. A tornado in 2012 caused significant damage to several buildings, while the others resulted in minor or no damage.

Winter weather is an annual occurrence in Yuba County. However, between 1950 and 2012, only two freeze events were severe enough to be declared disasters in Yuba County. As of 2014, the most prevalent severe weather event in Yuba County was winter storms, with up to 123 winter storm events since 1950. In 1995 the entire state experienced unusual storms. Higher elevations within Yuba County experienced heavy snows that caused broken tree limbs, fallen telephone lines, and a heavy accumulation of debris.

The winter storms of 2005–06 were particularly severe and caused significant flooding and damages throughout the county. Within Yuba County, this storm series washed out gravel roads and shoulders, necessitated debris removal in multiple locations, caused power outages, and damaged levees and

stormwater infrastructure. Another round of severe winter storms occurred in the late winter and early spring of 2017.

In Yuba County, there has been an average of four extreme heat days per year. There have been two major high heat events in Yuba County since 1961, the most recent of which was in 1992. These events caused injury and crop damage, but did not result in any fatalities.

Potential Changes to Severe Weather

Highly Likely – There have been many instances of severe storms and winter hazards within Yuba County, and instances of these events are expected to continue in the future. Cold weather is an annual occurrence in Yuba County. Though freeze and snow events happen in Yuba County each year, local elevation determines, in part, the extent to which a given area is affected by freezing and snow. Extreme heat tends to occur on an annual basis in Yuba County and is expected to continue occurring annually.

Climate Change and Severe Weather

Within California, climate change is anticipated to result in changes in precipitation patterns, with rainfall shifting to become less frequent but more intense. This change may make severe storms and the associated risk of flooding, an increasingly relevant hazard to Yuba County.

Overall, Yuba County is expected to see an increase in the average daily high temperatures in the coming years. Historical average maximum temperatures in Yuba County have typically been around 73°F. By the end of this century, annual average maximum temperatures are projected to increase to approximately 82°F. These increases in ambient temperature increase the likelihood that an above-average high temperature will cross the extreme heat threshold. According to the RCP 8.5 model, which anticipates greenhouse gas emissions increases until 2100, Yuba County will experience an average of 62 extreme heat days by the end of the 21st century, a dramatic increase over the average of 4 extreme heat days experienced per year under historical conditions. As temperatures increase, Yuba County community members are expected to face increased risk of dehydration, heat stroke, heat exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. Such conditions can result in long-term injury or death.

Extreme heat is expected to impact agriculture and forestry within Yuba County. Excessive heat and prolonged dry or 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. Outdoor workers face particularly high levels of exposure to the elements and are thus more susceptible to extreme heat conditions and the potential illnesses associated with very high temperatures.

Climate change can also indirectly exacerbate risk of agriculture and forestry pests and diseases. Many crop plants, trees, and livestock may be harmed and weakened by extreme heat and warmer average temperatures. Weaker plants and animals may not be able to fend off infestation or infections as well as a stronger plant or animal, causing pests and diseases to affect crops more severely. Additionally, pests and diseases can inhibit plant and animal growth, cause damage and lower market value, or cause death. Extreme heat can damage several different crops in Yuba County, including field and orchard crops such as walnuts, plums, peaches, kiwis, and almonds.

Figure 16 illustrates how temperature increases are expected to affect various parts of Yuba County between the years 2070 and 2099, under a climate change scenario where greenhouse gas emissions continue to increase through the end of the century. Maximum temperature increases are projected to be most severe, exceeding 25 degrees Fahrenheit, in the western half of the county.

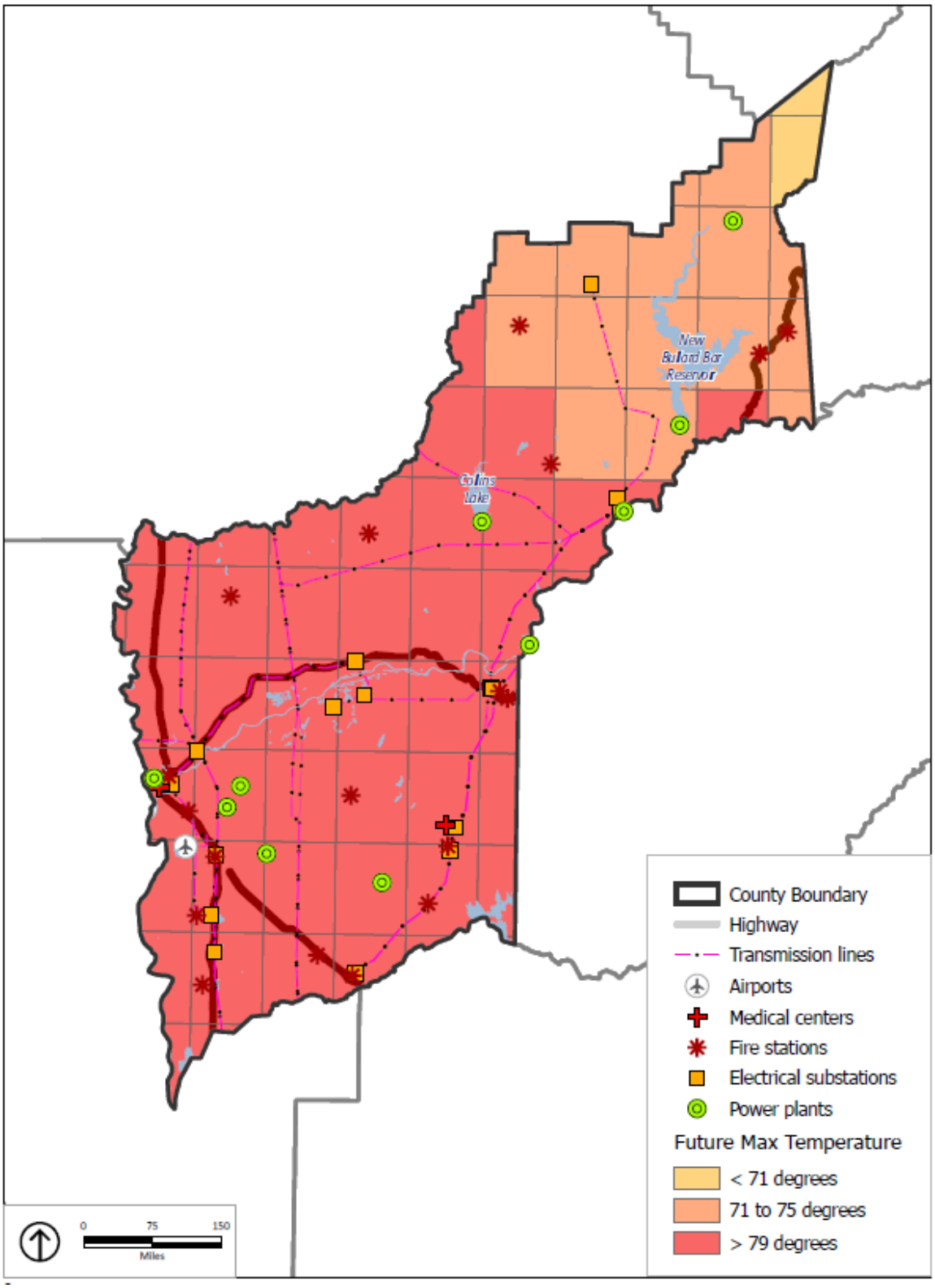

Figure 16: Future Maximum Temperature, 2070 to 2099

Goals, Policies, and Implementation Actions

Goal HS12. Severe Weather

Protect against the impacts of severe weather in Yuba County.

Policy HS12.1 *The County will monitor prevailing weather conditions and issue prompt warnings to residents to take shelter when the occurrence of severe weather events are deemed imminent.*

Policy HS12.2 *The County will diligently work to mitigate the threats of extreme wind through aggressive tree trimming and undergrounding of utilities when possible.*

Policy HS12.3 *The County will monitor winter weather and yearly El Niño conditions to determine if a severe winter storm is likely and will work to clear drainage channels of debris that could prevent effective drainage.*

Policy HS12.4 *The County will ensure hydration stations and cooling centers are available for all residents during extreme heat events.*

Policy HS12.5 *The County will ensure that information on extreme heat and the dangers it poses to at-risk populations is shared with all county residents.*

Policy HS12.6 *The County will help connect farmers and agricultural workers with resources (property insurance, temporary unemployment benefits, housing assistance, etc.) should severe weather, like extreme heat, extreme wind, or freezing temperatures, damage any crops or kill any livestock on farms in Yuba County.*

Action HS12.1 Develop Severe Weather Readiness Plan

The County will prepare, adopt, and maintain an action plan to address the full scope of severe weather hazards that most frequently impact Yuba County (i.e., severe winter storms, extreme wind, and extreme heat). The plan should discuss how the County will rapidly address emerging severe weather events to protect the lives and property of its residents and should address policies HS12.1 to HS12.6 in the Safety Element.

Related Goals:	N/A
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund
Time Frame:	Adopt by 2025, update as needed

Drought

Existing Conditions

A drought is a long period when precipitation levels are well below normal. This means that less water is available for people (especially if the local water supply depends on surface water) and natural systems. Droughts in California are triggered by a lack of large winter storms and water shortages exacerbated by high temperatures, which increase the evaporative loss of water from soils, rivers, canals, and reservoirs.

Water supplies in Yuba County are provided by several different providers that, in turn, rely on both surface and groundwater sources. The eastern portion of the county is in the Sierra Nevada foothills and mountain region. These areas rely primarily on surface water supplies due to the underlying granite bedrock that does not allow for many pockets of dependable groundwater, with the exception of limited areas with fractures in the bedrock. The portions of the county in the Sacramento Valley, west of the foothills, rely on both surface and groundwater sources. Municipal water purveyors, including California Water Service, Linda County Water District, the City of Wheatland, Olivehurst Public Utilities District, and Beale Air Force Base, use groundwater exclusively. Urban users rely primarily on groundwater, and most agricultural users rely on a combination of surface and groundwater supplies. Yuba County Water Agency provides its members with surface water sources from the Yuba River.

Communities in Yuba may experience water shortages during drought conditions, which could lead to mandatory water use restrictions. Farmers may need to cut back on irrigation activities, and ranchers may need to reduce their number of livestock. 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, such as wetlands and riparian habitats, can be more easily harmed. 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, harming plants and animals. Additionally, many fish species 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. Drought 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. Drought conditions can also cause soil to compact and reduce its ability to absorb water, making the affected area more susceptible to flooding and erosion.

Drought impacts are wide-reaching and may be economic, environmental, or social. The most significant impacts associated with drought in Yuba County are related to water-intensive activities such as hydropower production, agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. Additionally, during a drought, allocations go down and water costs increase, which also reduces water availability. Voluntary conservation measures are a normal and ongoing part of system operations and are actively implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems.

Past Occurrences

Yuba County has experienced multiple droughts that resulted in a disaster declaration. A federal state of emergency was declared in 1977 over drought conditions. More recently, between the years 2012 and 2016, Northern California as a whole experienced one of the worst droughts in the state's recent history, leading to a state disaster declaration in 2014. 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. Another state disaster declaration related to droughts was issued in April 2021.

Potential Changes to Drought in Future Years

Likely – Drought is different from many 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; however, drought manifests differently in different sectors. Adequate water is a critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the county continues to grow, so will demand for water, increasing the probability of water shortages.

Historically, drought and water supply have not been significant issues in Yuba County due to the extensive surface and groundwater supplies in the region; however, future demands of the county and the region, including the demands of the agricultural industry, make this hazard an ongoing concern.

Climate Change and Drought

Scientists expect that climate change will lead to more frequent and more intense droughts statewide. The state's current data indicate that there will be more years with extreme heat and 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 mountains. Typically, this snow melts slowly over the year, helping to provide a regular supply of water during dry months. However, due to climate change, less precipitation is expected to fall as snow, leading to a smaller snowpack. Additionally, 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 lead to particularly low water levels in late summer and early autumn, which are often the hottest parts of the year.

Goals, Policies, and Implementation Actions

Goal HS13. Drought

Ensure a reliable water supply to protect against drought events.

Policy HS13.1 *The County will work with local water providers to increase storage capacity and reduce losses, including evaporative losses, from water infrastructure.*

Policy HS13.2 *The County will continue work with local water providers to promote water efficiency retrofits in existing buildings and landscaping projects.*

Policy HS 13.3 *The County will support efforts to secure additional water resources as needed to help meet community demand.*

Policy HS 13.4 *The County will review and revise indoor and outdoor water efficiency standards for new developments and significant retrofits.*

Policy HS 13.5 *The County will consider the impact of proposed development projects on local water resources, and shall not approve projects that risk exceeding the capacity of available water supplies. The County will require water efficiency improvements beyond minimum standards as necessary for discretionary projects.*

Policy HS 13.6 *The County will work with local agricultural operators and agricultural groups to promote water-saving strategies and techniques to protect agricultural operators against drought conditions.*

Action HS13.1 Conduct Updated Long-Term Water Supply Assessments

The County will work with the Yuba Water Agency and other water suppliers in Yuba County to better understand how changing conditions, including climate change, are expected to affect the long-term sustainability of local groundwater and surface water supplies. If there are concerns that water demand may exceed projected supplies, the County and its partners will work to pre-emptively increase water

efficiency in Yuba County through individual action, building retrofits, and changes to water efficiency standards in new developments as appropriate.

Related Goals:	N/A
Agency/Department:	Community Development and Services Agency
Funding Source:	General fund
Time Frame:	Assess by 2025, update as needed

Agriculture and Forestry Hazards

Existing Conditions

Timberlands

Yuba County is home to a number of forested areas, including Plumas National Forest. However, many forests in and around Yuba County are considered unhealthy, according to the North Yuba Forest Partnership.[19] These forests are overstocked with small trees and brush and at risk of high-severity wildfire due to fire suppression and historical timber harvesting practices exacerbated by climate change. As a result, communities and infrastructure within the watershed are at significant risk.

Forests once characterized by large, widely spaced trees and beneficial, low-to-moderate-severity fires are now dominated by nonfire-resilient stands of vegetation ranging from dense thickets of small trees and brush to overstocked forests with significant ladder fuels. These conditions greatly increase the likelihood of destructive wildfire causing significant damage to communities and watershed health.

In addition to threats associated with wildfire, forested areas are also susceptible to severe weather, high heat, drought, pests, and disease.

Figure 17 identifies the locations of tree mortalities in recent years. Spots of tree mortality have occurred near the eastern border of the county.

[19] North Yuba Forest Partnership. "Current Landscape," https://www.yubawater.org/317/North-Yuba-Forest-Partnership.

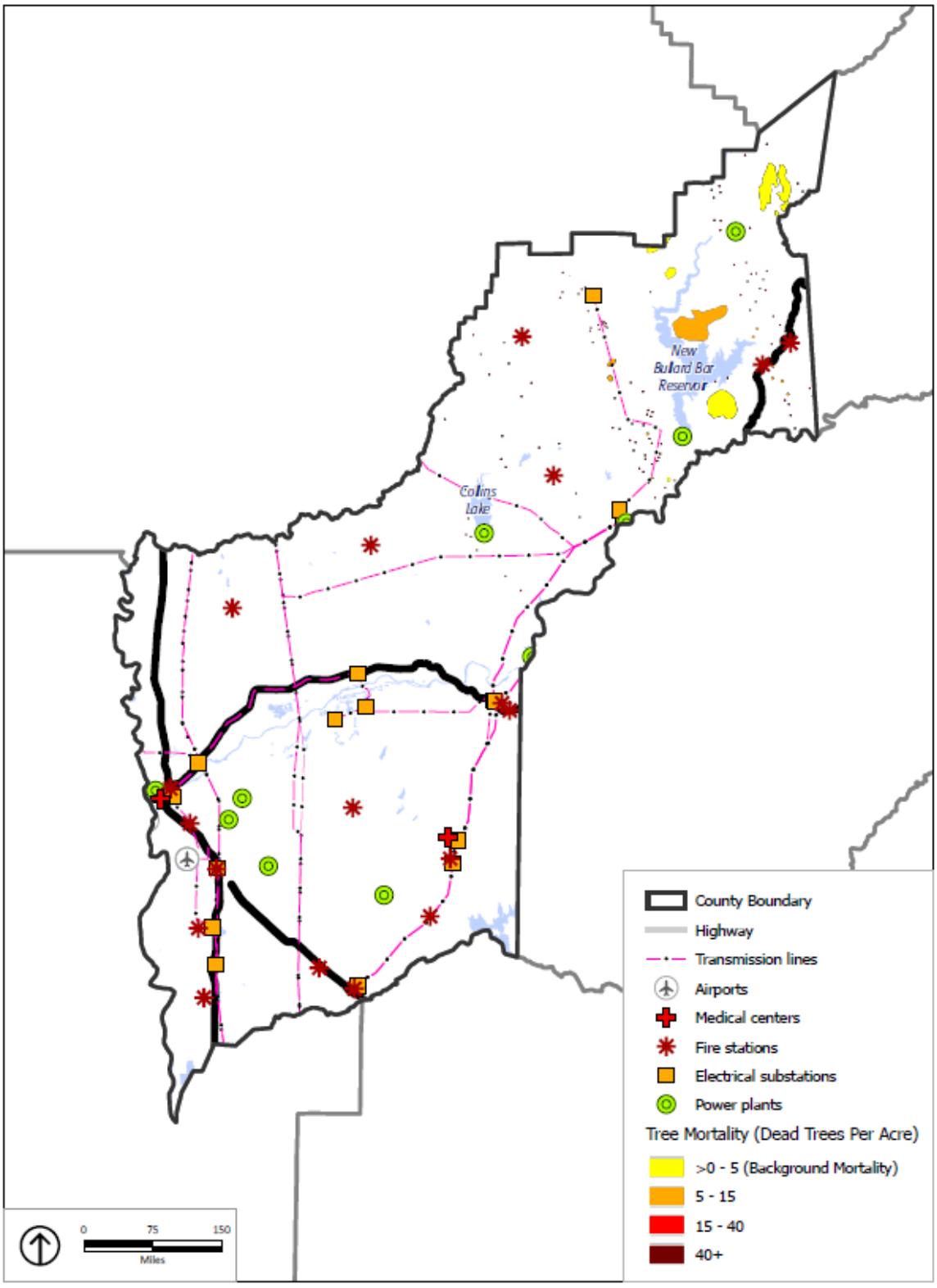

Figure 17: Tree Mortality

Agricultural Lands

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.

Yuba County is threatened by a number of insect pests that, under the right circumstances, can cause severe economic and environmental harm to the agricultural industry. 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 Forestry Hazards in Future Years

Highly Likely – As long as severe weather events continue to be an ongoing concern to Yuba County, the potential for agricultural and forestry losses remains. The primary causes of agricultural losses are severe weather events, such as drought, freeze, and insect infestations. These factors can also contribute to significant forestry loss, as can wildfire events.

Climate Change and Agriculture and Forestry 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. Areas of tree death are expected to spread, and pest infestation severity is projected to increase as a result of climate change.

Yuba County's timberlands are highly susceptible to agriculture and forestry pests and diseases, in particular to the bark beetle and associated species. Damage associated with these insect species is expected to lower the value of the county's timberlands. Drought and extreme heat events can weaken or kill large numbers of trees, further reducing the long-term supply of harvest-ready trees. These events can also make forests more susceptible to pests and wildfires, which can cause more widespread tree loses.

Climate change can also indirectly create a greater risk of agriculture and forestry 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.

Goals, Policies, and Implementation Actions

Goal HS14. Agriculture and Forestry Hazards

Protect the long-term viability of agricultural and forestry activities in Yuba County.

Policy HS14.1 *The County will work with the UC Cooperative Extension and local agricultural groups to support and participate in ongoing agricultural education programs to help inform the agricultural community about climate-related pests and hazard conditions.*

Policy HS 14.2 *The County will support efforts by local farmers and ranchers to raise crops and livestock that are better adapted to warmer temperatures, greater precipitation variability, and changes in pest regimes.*

Policy HS 14.3 *The County will review and revise land use plans to accommodate changes in the types of agricultural activities suitable for Yuba County and to allow agricultural activities to move into more viable areas as conditions change.*

Policy HS 14.4 *The County will work with community-based organizations to ensure that all agricultural workers have adequate protection from extreme conditions, and that healthy and safe working conditions are maintained.*

Policy HS 14.5 *The County will protect and restore natural lands adjacent to agricultural areas to provide sufficient habitat for native pollinators and other species.*

Policy HS 14.6 *The County will work with regional, state, and federal partners to ensure the long-term health of Yuba County forest ecosystems through appropriate management techniques and efforts to ensure sustainable timber harvests.*

Action HS13.1 Revise the County's Pest Exclusion, Detection, Eradication, and Management Activities to Account for Changing Conditions.

The County will reassess and revise its efforts to control agricultural and forestry pests, in response to changing climate conditions that are expected to increase pest activities. This effort will help make sure that the County has a better understanding of anticipated pest conditions, which will allow for a flexible and proactive pest control strategy. These activities will help limit new pests from establishing in Yuba County and control existing pests that may become more widespread or active as a result of climate change activities.

Related Goals:	N/A
Agency/Department:	Agricultural Commissioner
Funding Source:	General fund
Time Frame:	Revise strategies by 2023, update as needed

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