

# **TEHAMA COUNTY SAFETY, SECONDARY ACCESS, COMMUNITY PLANNING & EVACUATION ROUTING STUDY**



**PREPARED FOR THE TEHAMA COUNTY TRANSPORTATION COMMISSION**



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## EXECUTIVE SUMMARY

The Tehama County Safety, Secondary Access, Community Planning and Evacuation Routing Study, herein referred to as the Evacuation and Routing Study, is a comprehensive analysis conducted to identify locations and communities within Tehama County that are at a high risk of experiencing wildfires, flooding, or hazardous materials exposure. Throughout the County, evacuation improvements have been identified by utilizing strategies aimed at ascertaining communities with insufficient ingress and egress evacuation routes, addressing local community fire evacuation concerns, and enhancing evacuation operations with improved communication tactics. Tehama County worked in collaboration with the California Department of Forestry and Fire Protection (CAL FIRE), the California Governor's Office of Emergency Services (Cal OES), and the Tehama County Sheriff's Office, with assistance from transportation planners, engineers, and evacuation consultants including Green DOT Transportation Solutions, Deer Creek Resources, and Headway Transportation to design and implement this study. To ensure the development of a comprehensive report, consistent community workshops and meetings were scheduled throughout the study and key local evacuation issues were addressed and well documented.

By integrating a holistic approach which considers historical data, geographical factors, wildfire risks, and community feedback, this study comprehensively identifies critical areas in need of improved roadway infrastructure and strategic enhancements. Leveraging insights from CAL FIRE data and community input, the study strategically addresses bottlenecks, historical fire risk, and flood-prone regions to propose vital modifications that bolster evacuation efficiency and mitigate potential disasters. This study is structured around the primary objective of assessing existing conditions, evaluating hazards, and addressing vulnerability, all while formulating robust action policies, evacuation improvement projects, and effective public engagement strategies. The initial phase of this study entails a thorough analysis of historical fire patterns, resource assessments, and evacuation requirements, with a specific focus on safeguarding vulnerable communities. The goal of this study is to enhance Tehama County's resilience and preparedness, ensuring the safety and well-being of its residents during emergency situations. The report is structured into four primary sections:

- 1. EXISTING CONDITIONS AND HAZARD EVALUATION:** This section assesses the relative risk of wildfires across Tehama County, providing insights into areas more susceptible to wildfire incidents. It includes an overview of existing conditions maps, fire severity zones, wildland-urban interface data, historic fire footprints, existing flood conditions and history, CAL FIRE subdivision review vulnerability assessments, and examples/best practices.
- 2. ANALYSIS AND RECOMMENDATIONS:** This section delves into action policies and introduces a web-based mapping and resource center. It identifies potential challenges and barriers to effective communication during evacuation preparation and execution. It also provides recommendations to improve communication methods for enhanced public safety.
- 3. PRIORITIZED PROJECT LIST:** prioritized project list based on policies and recommendations gleaned from the study overall.
- 4. COMMUNITY AND STAKEHOLDER ENGAGEMENT:** This section details public outreach efforts, stakeholder questionnaires, and summarizes the outreach activities to engage communities and stakeholders effectively.

This comprehensive study serves as an invaluable resource for Tehama County's emergency preparedness and response. It offers an in-depth assessment of wildfire risk, evacuation requirements, and communication strategy improvements tailored to each vulnerable community while providing a list of essential projects in each community.

## INTRODUCTION

The Tehama County Emergency Evacuation and Routing Study serves as a comprehensive guide to enhance the County's overall preparedness capabilities in the event of an emergency. Its primary focus revolves around the development and upkeep of evacuation strategies, infrastructure enhancements, and community engagement endeavors necessary to enable efficient responses to a wide range of hazards that Tehama County may confront.

To enhance community safety during emergencies, this study conducts a thorough evaluation of evacuation routes spanning the entirety of the County. Emergency evacuations, being unforeseeable and inevitable events, underscore the significance of readiness to efficiently relocate individuals and resources to secure locations. These events, arising from both natural and human causes such as wildfires, floods, lightning storms, seismic activity, utility failures, vehicular accidents, and human error, can lead to situations demanding immediate evacuations.

The historical context of fire suppression practices, prolonged drought conditions, and more frequent extreme weather patterns, has compounded the severity of emergency situations. These new environmental challenges, attributable to human-induced climate change, have necessitated a reevaluation of emergency response strategies. Recent incidents like the Lahaina Fire in Maui and the Camp Fire in Paradise have underscored the urgent need for improved evacuation planning. These devastating fires, characterized by their catastrophic nature, revealed the critical importance of preparedness as people struggled to escape impending danger due to limited evacuation measures.

Within this study, a comprehensive analysis is conducted to identify evacuation bottlenecks and assess access routes. The goal is to ensure that residents can swiftly and effectively exit hazardous situations, allowing crucial time for emergency services to arrive and provide assistance. This introduction encapsulates the pivotal findings and recommendations that have emerged from this study, laying the groundwork for a safer and more resilient Tehama County in the face of future emergencies.

Tehama County faces a range of hazards, with wildfires and floods being of primary concern due to the County's geography and climatic conditions. Comprehensive research has pinpointed high-risk areas, enabling prioritization of roadway, bridge, and hazard mitigation projects. The study delves into the existing roadway system, revealing limitations in capacity, redundancy, and suitability for rapid evacuations. Communities with few and unsuitable ingress egress (enter and exit) evacuation points have been identified and positioned for additional roadway enhancements and infrastructure projects. Project recommendations emphasize the need for new roadways, roadway improvements, extensive communication systems, and hazard mitigation projects to optimize evacuation routes. Extensive community engagement, particularly with high-risk communities, has yielded invaluable insights into local knowledge, potential solutions, and challenges linked to emergency evacuations and routing. Collaborative efforts with the local communities have aided in identifying suitable shelter locations and the creation of effective evacuation routes.

The Tehama County Emergency Evacuation and Routing Study not only identifies critical vulnerabilities but also presents actionable solutions that will significantly bolster the County's preparedness for all hazards. By investing in infrastructure improvements, continuing community engagement efforts, and enhancing communication and coordination, Tehama County can achieve its organizational priorities and provide a safer environment for its residents. This study serves as a foundation for the County's ongoing commitment to resilience and preparedness, ensuring a more robust response to future emergencies.

The data analysis focused on the risks of floods in historic flood zones, wildfires in both wildland and urban areas, historic frequency of burns and fire incidents, and identified ignition hotspots, and evaluated this data in reference

to the existing conditions and identified flaws of the roadway network and evacuation system. These comprehensive assessments of hazards and vulnerabilities along roadways using Geographic Information Systems (GIS) identified high-risk evacuation locations to propose future evacuation projects to be developed. This study also emphasizes community and stakeholder engagement through public outreach and stakeholder questionnaires. Evacuation notifications and low-tech solutions like alarm systems were recommended by the community and are included in the project recommendation list as a Countywide improvement. The end of this report summarizes the findings and provides a list of projects at different levels of priority for implementation.

## 2.1 BACKGROUND

Tehama County, located in the northern part of California, is a region known for its diverse geography and historical significance. Situated between the Sierra Nevada Mountains to the east and the Coast Range Mountains to the west, Tehama County offers a variety of landscapes, including agricultural plains, rolling hills, meandering rivers, and wooded areas. This diverse topography influences the County's unique character and presents certain challenges. The County seat, Red Bluff, serves as the central administrative and cultural hub. Tehama County encompasses several other towns, hamlets, and rural areas, each with its own distinct identity. Agriculture plays a significant role in Tehama County's economy, with the region known for the cultivation of crops such as almonds, walnuts, rice, and various fruits. These agricultural activities contribute not only to the local economy but also to California's broader agricultural industry. The Tehama District Fairgrounds, host to the annual Tehama District Fair, reflects the County's strong agricultural tradition. Outdoor recreational opportunities are abundant in Tehama County, with the Sacramento River offering fishing, boating, and water-related activities. Nearby natural areas like Lassen Volcanic National Park and the Sacramento River Bend Outstanding Natural Area provide opportunities for hiking, camping, and nature exploration. The County's vast open spaces and rugged terrain make it a popular destination for outdoor enthusiasts, while its proximity to natural wonders like Mount Shasta and the Cascade Range enhances its appeal. Tehama County places a strong emphasis on community well-being, with local government agencies, law enforcement, and community organizations working collaboratively to ensure the safety and prosperity of its residents. Overall, Tehama County is a region characterized by its diverse landscapes, agricultural productivity, and commitment to community welfare. Its natural beauty and dedicated community efforts make it a unique part of California.

Tehama County, like many areas in California, faces significant flood and fire hazard risks due to its diverse geography and climatic conditions. Tehama County is no stranger to the threat of wildfires. The region's hot, dry summers, coupled with periodic drought conditions, create an environment ripe for wildfires. The combination of arid vegetation and windy conditions during certain seasons increases the likelihood of wildfires spreading rapidly. The County features areas where urban development meets or intermingles with wildland areas. These wildland-urban interfaces pose heightened wildfire risks as they increase the potential for human-caused fires and make evacuation procedures more complex. Tehama County has witnessed several historical wildfire events. These incidents provide valuable data and underscore the persistent risk, particularly in areas with a history of fire outbreaks. The County's landscape includes dense vegetation, which can serve as fuel for wildfires. Dry grasslands, forests, and brush areas are all susceptible to ignition.

Tehama County is crisscrossed by numerous rivers, including the Sacramento River and its tributaries. While these waterways are essential for agriculture and local ecosystems, they also pose flood risks, particularly during periods of heavy rainfall or snowmelt. The County is protected by a network of levees and flood control infrastructure. The integrity of these levees is crucial for preventing river flooding, and any breach or failure can result in significant flooding. Intense rain events can trigger flash floods in areas with poor drainage systems. The combination of steep terrain and heavy rainfall can lead to swift and dangerous floodwaters. The county's development patterns,

including communities and infrastructure situated in floodplains, can increase the vulnerability to flood events. Changes in climate patterns, such as prolonged droughts followed by heavy precipitation, can exacerbate flood risks. Drier soil during droughts may not absorb water effectively, increasing the likelihood of runoff and flooding when rains return. Flatland areas with poor drainage can flood due to their inherent characteristics and specific environmental conditions. Flatland areas, as the name suggests, have minimal variations in elevation. In such regions, water does not naturally flow away or drain easily because there are no slopes or gradients to guide it elsewhere. As a result, when rainfall or snowmelt occurs, the water tends to accumulate on the flat surface.

In urban or developed flatland areas, there are often impervious surfaces like roads, parking lots, and buildings. These surfaces do not absorb water. Instead, they facilitate rapid runoff. As water flows over these surfaces, it can quickly accumulate in low-lying areas, leading to localized flooding. Flatland areas may lack adequate drainage systems, including stormwater drains, ditches, and culverts. Without these infrastructure elements, there is no efficient way for excess water to be channeled away from the flatlands. Consequently, water collects on the surface. Even in undeveloped flatland areas, the soil may become saturated during prolonged periods of rainfall or snowmelt. Once the soil is saturated, it loses its capacity to absorb additional water. Excess water then pools on the surface, causing flooding. Flatland areas are often adjacent to bodies of water, such as rivers or lakes. These water bodies may experience overflow during heavy precipitation or snowmelt events, and the water can spill over into the nearby flatlands, causing flooding.

Early warning systems and emergency preparedness are critical to protecting people and property when flooding events occur in these regions. To address these risks, Tehama County has created the Tehama County Evacuation and Routing Study, to enhance safety during wildfire and flood evacuations. These efforts involve collaboration with state agencies like CAL FIRE and Cal OES, local law enforcement, and community stakeholders. The County continually works on improving its communication strategies and enhancing its evacuation operations to protect residents and assets during emergencies. These challenges underscore the need for a comprehensive approach to disaster preparedness and mitigation in Tehama County, encompassing risk assessment, infrastructure improvements, and community engagement.

## EXISTING CONDITIONS AND HAZARD ANALYSIS

The climate in Tehama County is typical of that of the Central Valley, with warm, dry summers and mild, wet winters. This is conducive to ranching, farming, timber production, and widespread recreation that are all important to the economy and quality of life in the County. It is also conducive to weather occurrences such as wildfires and flooding, which are evident throughout the County's history. As the climate continues to change with periods of extensive drought and elevated heat in the summer as well as increased precipitation in the winter, it is of utmost importance to assess how communities will be affected by these natural disasters. Available data and analysis from CAL FIRE and Cal OES act as the starting framework for assessing the most vulnerable communities in the County.

### 3.1 HISTORIC FIRE PERIMETERS

California has a long-standing history of extreme wildfires, the most destructive and lethal of which primarily occurring in the last five years. The largest fire in California history, the August Complex Fire, burned over 1 million acres including portions of Tehama County. The second largest wildfire in California history was the Dixie Fire of 2021. Although much of its footprint was east of Tehama County, the landscape and topography of Tehama County in the foothills area is very similar to the Dixie Fire area and should be noted regarding fuel load and topography. Additionally, south of Tehama in Butte County, the Camp Fire of 2018 completely devastated and flattened the Town of Paradise. This incident was the deadliest wildfire in California history and among the most lethal fires in U.S. history, causing 85 deaths.

In the Tehama County and Tehama-Glenn region, CAL FIRE has recorded 34 fires that have burned 100 acres or more in the last 10 years. Of the 13 wildfires that burned over 1,000 acres, 12 of them have occurred in the last five years – most notably the August Complex Fire and Dixie Fire.

The history of fire in Tehama County dating from 1950 to 2022 is depicted in Figure 1. The western region of the County and the Rancho Tehama community have experienced the most recent fire perimeter. The communities of Mill Creek and Mineral have had recent, close encounters as well. The eastern foothill region has encountered varied fire footprints over the last 50 years. The communities that surround I-5 and those just to the west of the major highway, have encountered a scattered frequency of fires throughout the last 50 years. It is important to acknowledge historic fire footprints because areas that have burned in the recent past might have reduced fuel loads conversely, areas that haven't burned, have greater fuel loads making them potentially hazardous.

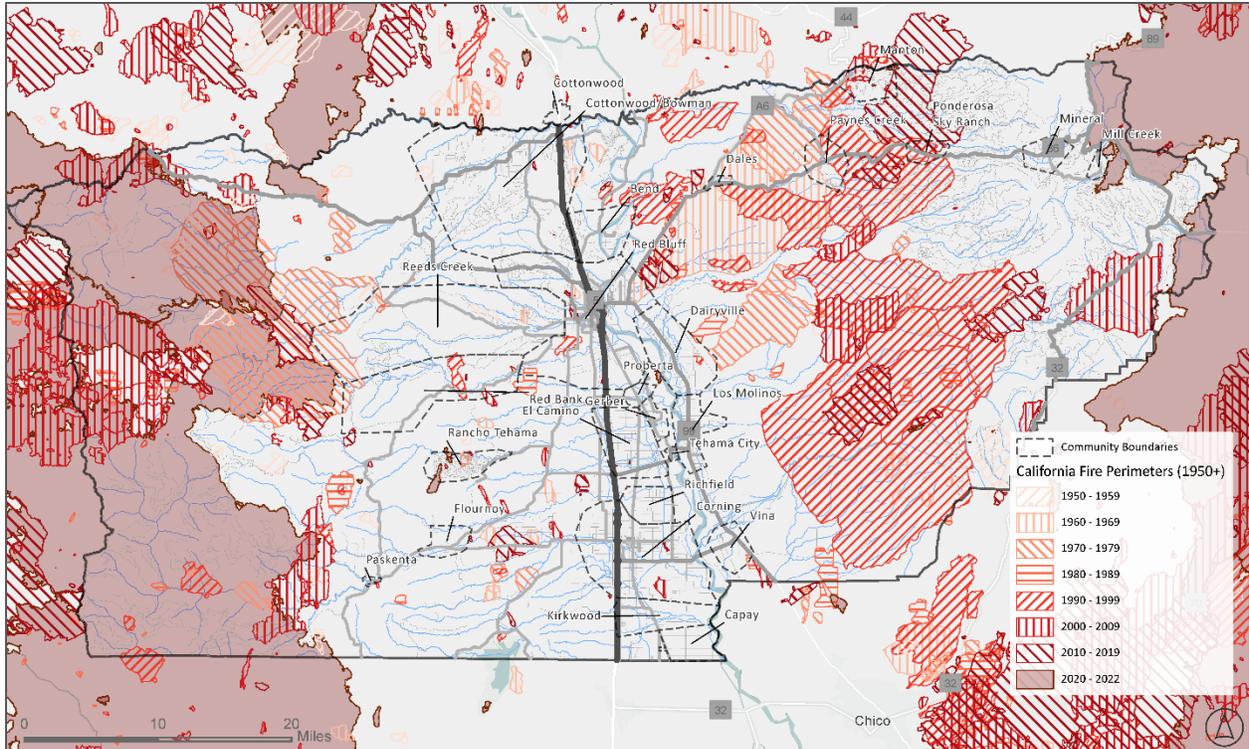


Figure 1 - Historic Fire Perimeters

## 3.2 FIRE AND RESOURCE ASSESSMENT

### FEDERAL, STATE, AND LOCAL RESPONSIBILITY AREAS

The responsibility of wildland fire protection falls into three distinct areas within the State of California: Federal Responsibility Area (FRA), State Responsibility Area (SRA), and Local Responsibility Area (LRA). These distinctions for Tehama County are depicted in Figure 2.

An FRA is an area where the federal agencies have primary financial responsibility for wildland fire protection and prevention. These areas include lands that are under federal ownership.

An SRA is where the state has primary financial responsibility for wildland fire protection and prevention. The Board of Forestry and Fire Protection have detailed procedures to define an SRA. Generally, the lands under this classification are state and privately-owned forest, watershed, and rangelands. There are a few reasons that land will be removed from an SRA including when they become incorporated by a city, change ownership to the federal government, or become more densely populated. All the SRA is classified into Fire Hazard Severity Zones (FHSZs).

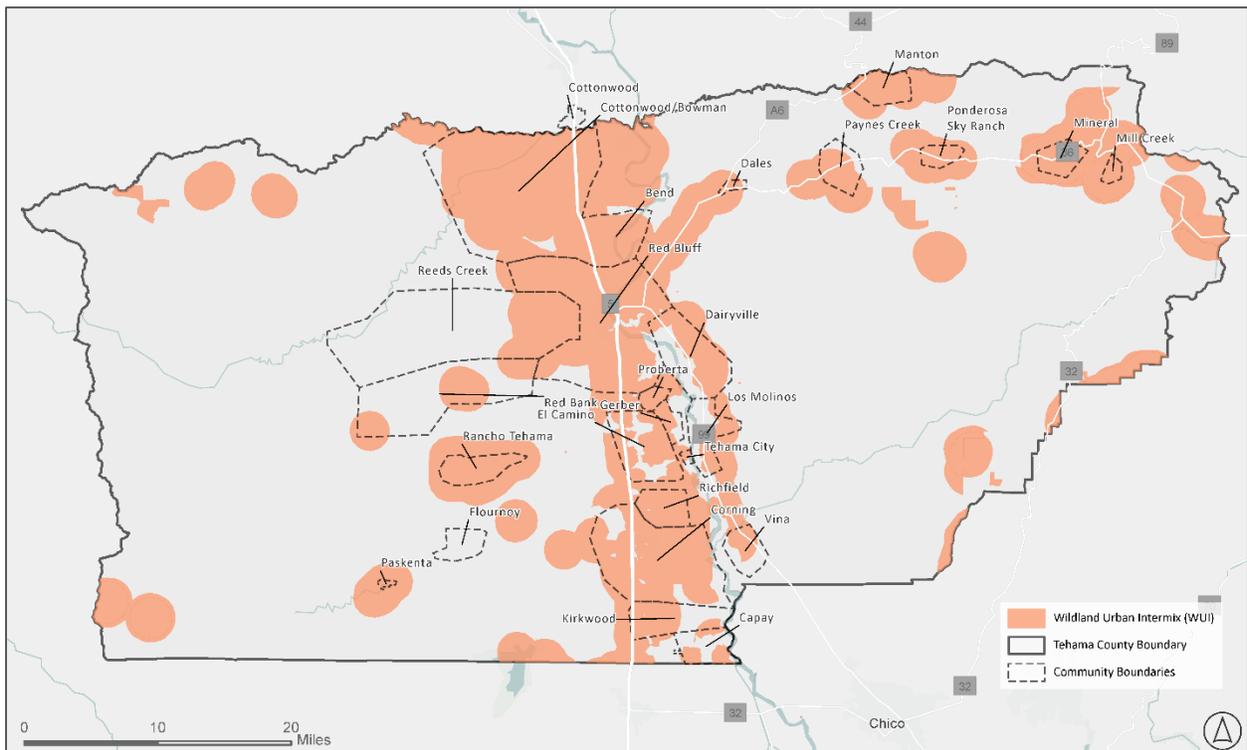
An LRA is an area where the local government is responsible for wildfire protection which is typically provided by city fire departments, fire protection districts, and/or counties. The Tehama County Fire Department (TCFD) and CAL FIRE have been in a cooperative agreement to manage and provide all-risk fire and emergency medical services to unincorporated areas of the County since 1927. In an LRA, FHSZs are determined through an extension of the SRA FHSZ model.

### WILDLAND URBAN INTERFACE

The Wildland Urban Interface (WUI) is a term for an area where unoccupied land meets or intermingles with structures and other human-developed land. When a wildfire results in “disastrous property losses”, it is considered to be a WUI fire. WUI is often broken down into two (2) types based on housing density and defined by CAL FIRE as below:

- Interface - High-density development adjacent to undeveloped wildland vegetation.
- Intermix - Lower-density housing mingled with undeveloped wildland vegetation.

Understanding the WUI in Tehama County is a priority since these are areas which may have increased potential of wildfire ignition that harms residents and property. WUI locations within Tehama County are depicted in Figure 2. Generally, there is Wildland Urban Intermixing located where there are communities in Tehama County.



**Figure 2 - Wildland Urban Interface (WUI)**

## FIRE HAZARD SEVERITY ZONES

Areas that are at risk for interface fire loss are referred to by law as Fire Hazard Severity Zones (FHSZs). CAL FIRE is mandated to evaluate the “hazard” of an area, which are the physical conditions prior to mitigation that create a likelihood and expected fire behavior. A hazard score is assigned based on many factors that influence fire likelihood and behavior, including fire history, natural vegetation, terrain, typical fire weather, etc. This Study utilizes the FHSZ data from CAL FIRE that was adopted in 2007 and 2008, however, it is important to note that they are in the process of updating these zones to better reflect more recent extreme weather events and conditions from the changing climate.

The FHSZs for the State Responsibility Area in Tehama County are depicted in Figure 3. Note that the regions that are not classified in an FHSZ are either in a Federal or Local Responsibility Area, it does not necessarily indicate a

lack of hazard. Hazard severity is Very High in the westernmost and eastern foothill portion of the County and along SR-36 in mountainous, wooded, evergreen forest areas. The hazard severity is moderate in the region directly west of I-5 and south of SR-36, however, the communities located within this region areas lie in high and very high FHSZs. The hazard severity is also moderate directly east of SR-99 but transitions to High and Very High moving eastward.

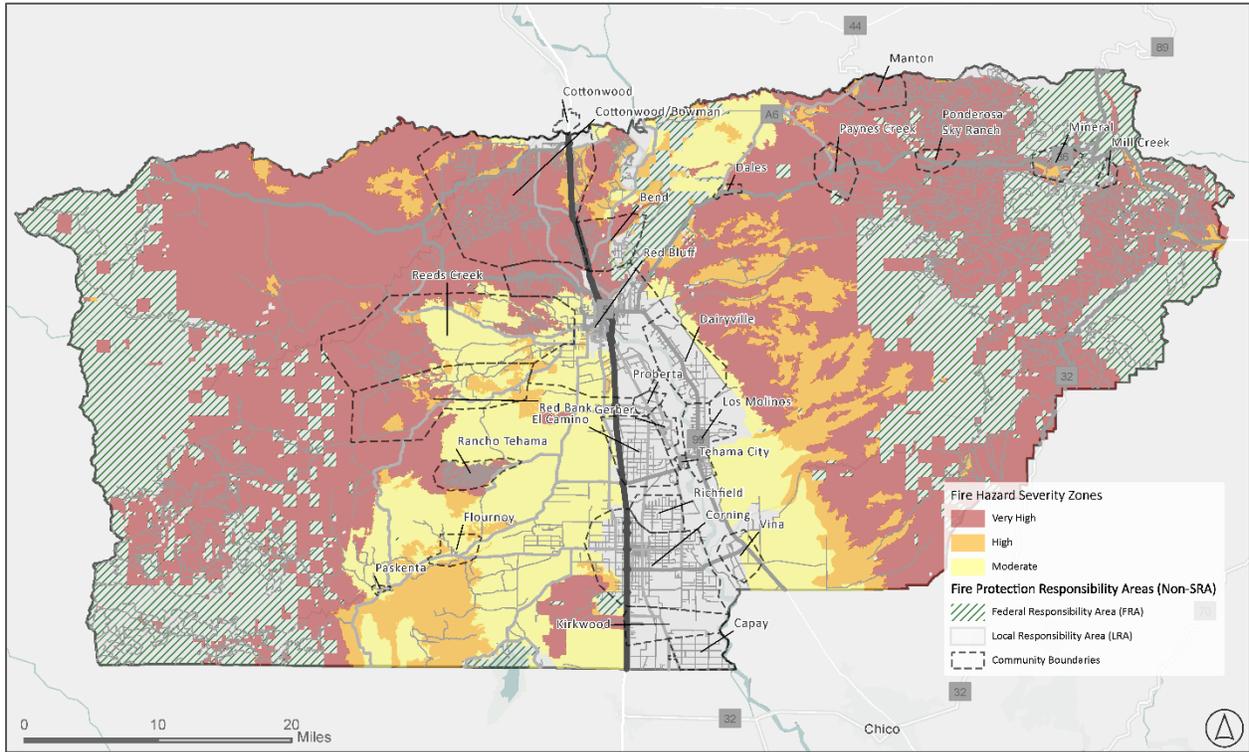


Figure 3 - Fire Hazard Severity Zones

### RELEVANT FIRE HAZARD SEVERITY ZONE REGULATIONS

The classification as a State or Local Responsibility Area as well as the Fire Hazard Severity Zone (FHSZ) classification has a direct effect on the requirements for landowners and development in these regions. Regulations include but are not limited to those mentioned in this section.

The WUI Building Codes (California Building Code (CBC) Chapter 7A) aim to reduce the risk of building ignition from embers fanned by wind-blown fires. They apply to all buildings in the SRA regardless of fire hazard severity; in the LRA, they only apply to the design and construction of new buildings in High and Very High FHSZs. Additionally, Government Code Section 51182 requires defensible space clearing and other building safety practices for wildland fires. As of June 2021, AB28 requires any property that is in a High or Very High FHSZ to have a compliant Defensible Space Inspection prior to being sold.

### 3.3 CAL FIRE SUBDIVISION REVIEW VULNERABILITY ASSESSMENT

The following section provides an overview of CAL FIRE’s Vulnerability Assessment for subdivisions located in the State Responsibility Area (SRA) or a Local Responsibility Area (LRA) Very High Fire Hazard Severity Zone. The CAL FIRE report was created to address wildfire prevention focusing on safety improvements and risk mitigation.

While some of the following subdivisions have the same names as the above communities in the community profiles section, note that these following subdivision areas are names of subdivisions and are distinct from the community profile areas in the section above. For consistency, these subdivisions have been grouped by which community they fall into.

Subdivisions were identified pursuant to Section 51178 of the Government Code. The areas were selected as having significant fire risk with more than 30 dwelling units without a secondary means of egress route. The Board of Forestry and Fire Protection (the Board) collaborated with the State Fire Marshal to identify subdivisions based on this criterion.

- By most recent Census data available / internet search. Where number of housing units available, population = 2.63 people per household
- Median Household Income \$35,000-\$50,000; \$50,000-\$75,000; \$75,000-\$100,000
- Percent Population greater than 65 years: >25%; 20%-25%; <20%
- Potential Recommendations (CAL FIRE Report):

**THE CAL FIRE/CAL OES SUBDIVISION REPORT CREATED THE FOLLOWING LIST OF RECOMMENDED STRATEGIES. IMPORTANTLY, THESE STRATEGIES WERE INCORPORATED INTO THIS STUDY’S RECOMMENDATIONS AND PROJECTS WHEN APPROPRIATE.**

1. Create secondary access to the subdivision.
2. Make improvements to the existing secondary access to the subdivision.
3. Install reflective addressing signs for structures and roads in conformance with 14 CCR § 1274.01, 1274.02, 1274.03, and 1274.04 and the California Fire code, California Code of Regulations, title 24, part 9.
4. Install reflective evacuation route street signs directing residents from their local roads to the nearest collector road(s) and/or arterial highway(s) (see California Highway Design manual for definitions), based on the standards for emergency management signing in the California Manual on Uniform Traffic Control Devices.
5. Where additional routes may exist, but with a gate that does not conform to the requirements in 14 CCR § 1273.09, recommend that gates (including private gates) remain unlocked during red flag warnings or high fire danger conditions.
6. When side street parking near Right of Ways the road to a smaller width than the standards in 14 CCR § 1273.01, during red flag warnings or conditions of high fire danger, limit street parking so a wider pathway is available to support rapid evacuation.

7. Conduct community-wide evacuation drills.
8. Install reflective markers to indicate road edges or other areas of danger that might not be evident during periods of low visibility.

**FOR DETAILED CAL FIRE / CAL OES REPORTS FOR EACH OF THE SUBDIVISIONS, PLEASE REFER TO APPENDIX A**

### 3.4 FLOOD CONDITIONS & HISTORY

Many of the communities in Tehama County have low wildfire risk but have much higher chances of getting stranded in dangerous situations while trying to escape flood conditions. While many historic floods are not on record, all community areas near streams, creeks, and rivers, are potential flooding sites in this study. The years 1986 and 1997 are marked as regionally significant flooding years in flood hazard areas for all of Tehama County. The significant flooding years are described in table 1.

Table 1 - Notable Flood Years

Year	Fatalities	Evacuation Numbers	Damage to Homes	Damage to Businesses
1986	13	50,000	14,000	1,100
1997	N/A	120,000	30,000	2,000

Flooding in California may be caused by the following factors, or a combination of the following factors: excessive snowmelt, excessive rainfall, excessive runoff, levee failure, and poor planning of built infrastructure in the flood plain. Climate change in California is resulting in more frequent extreme weather events producing major floods, greater atmospheric rivers, and inability for the Sierra Nevada Mountain Range to store water. Floods pose a serious risk for evacuation. Flooding can block roadways, submerge cars, inundate the built environment, and inhibit emergency services. Flood zones categorized by 100-year, 500-year and 1000-year floods have become more frequent events and the built environment within these flood zones have faced tremendous challenges as a result. The history of flooding is extensive, however there is minimal data on where flood events occur geographically in the flood plain.

Historically, 1986, 1997, and 2017, are marked as regional flooding years in flood hazard areas for Tehama County. The time from December 1861 until January 1862, was known as the Great Flood for the Sacramento and San Joaquin Valleys. This extreme event resulted in 300 miles of inundation in the area. In 1909, the California Flood caused the Sacramento River to flood Fort Ross in the Feather River Basin area. In 1986, floods killed 13 people in California and forced the evacuation of 50,000 Californians from their homes. Flooding around the Sacramento River, streams, and creeks in Tehama County can potentially cause future evacuation issues.

The following maps were developed with data provided by the Department of Water Resources:

- Figure 4** depicts flood information in Tehama County and illustrates the Special Flood Hazard Areas with a 1% chance of annual flood risk. These high-risk areas are categorized as AE (high risk regulatory floodway), A (high risk without base flood elevation), and AO (high risk regulatory floodway), which will be used to evaluate evacuation routes for this study.
- Figure 5** depicts historic floods from 1983, 1986, 1995 and 1997. The overlapping floods show the extent of the changing patterns over the years. Historic floods have affected several of the County’s priority evacuation communities including Lake California, Red Bluff, Proberta, Las Flores, Gerber, Los Molinos, El Camino, Richfield, Vina, and Kirkwood.

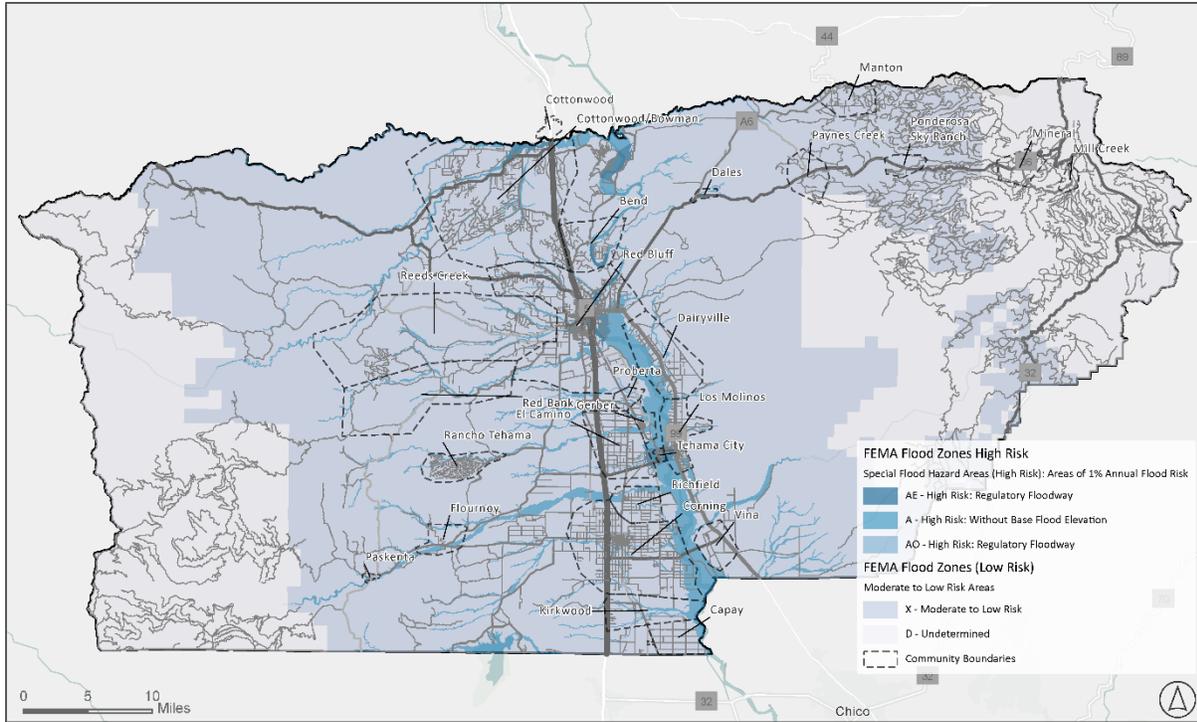


Figure 4 - Flood Hazard Zones

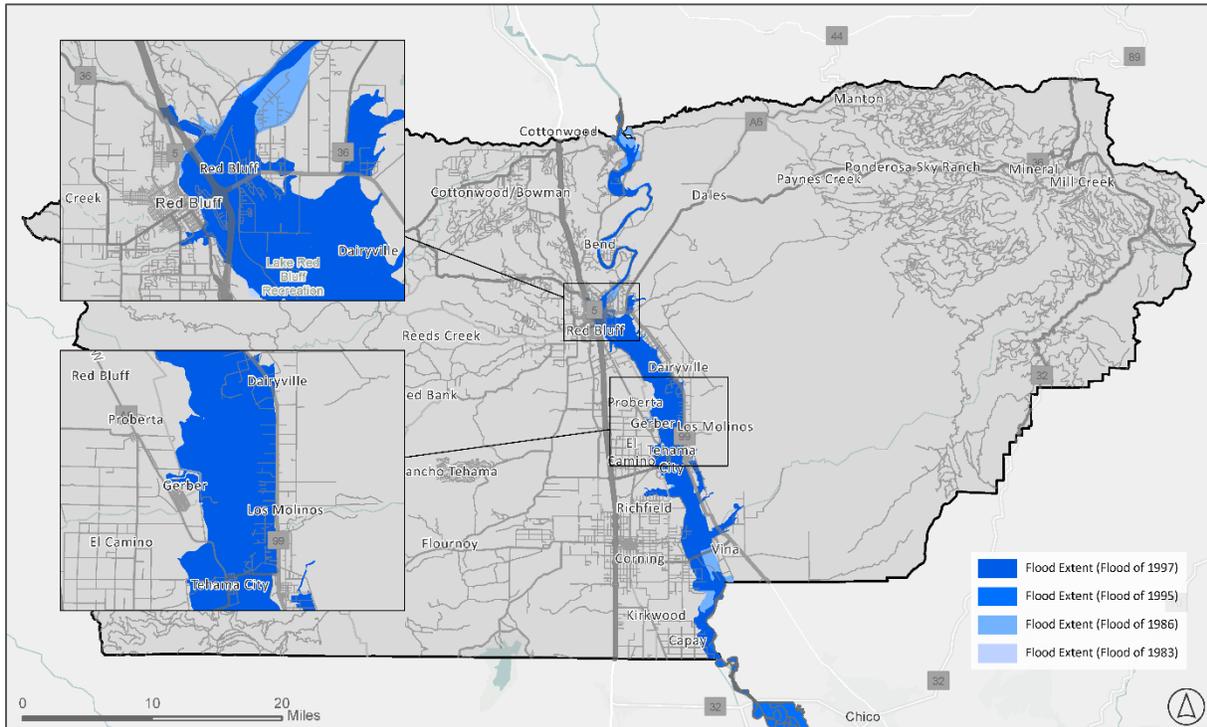


Figure 5 - Historic Floods

### 3.5 DOCUMENT REVIEW / PLAN ANALYSIS

Tehama County has several plans and studies documenting various aspects of transportation planning, emergency response, hazard identification and mitigation. The following documents were reviewed by the project team and incorporated and ensured consistencies when appropriate into the final study:

- Tehama County Active Transportation Plan
- Tehama County Emergency Operations Plan
- Tehama County General Plan Update 2009-2029
- Tehama County Hazard Mitigation Plan
- Tehama County Regional Transportation Plan
- Tehama Wildlife Area Vegetation Management Plan (Resource Conservation District of Tehama County)
- 2020 Tehama East/West Community Wildfire Protection Plans (CWPP)
- Community Specific Evacuation Plans including:
  - Lake California Multi-Hazard Emergency Evacuation Plan
  - Rancho Tehama Multi-Hazard Emergency Evacuation Plan
  - Manton Multi-Hazard Emergency Evacuation Plan
- Coordinated Public Transit - Human Services Transportation Plan
- Transit Asset Management Plan
- Public-facing websites and other documentation on emergency preparedness and evacuation

#### EXISTING DOCUMENT REVIEW

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##### **TEHAMA COUNTY ACTIVE TRANSPORTATION PLAN (ATP) – ADOPTED JUNE 2019**

1. Discusses the benefits of and process for planning for multimodal improvements. The ATP lists recommended multimodal projects. Some multimodal improvements, such as multi-use paths and bicycle lanes, may facilitate an evacuation by providing extra lanes during an evacuation for emergency responders. Needs identified in this evacuation project may help to set the priority of ATP projects.

##### **TEHAMA COUNTY REGIONAL TRANSPORTATION PLAN (RTP) – ADOPTED MARCH 2020**

2. The plan makes general reference to evacuation, and states objectives to comply with any regional emergency preparedness and disaster evacuation plans. The plan also states that “The best preventative measures with respect to this document for an emergency evacuation is the continued implementation of projects in the RTP that upgrade roadways, airport facilities, and public transit.” The RTP lists the roadway, bridge, transit, and multimodal planned projects. Needs identified in this

evacuation project may help to set the priority of RTP projects. The plan also contains traffic volumes, Vehicles Miles Traveled (VMT) and descriptions of major routes that will be helpful in analyzing and prioritizing roadway needs.

#### **TEHAMA COUNTY EMERGENCY OPERATIONS PLAN 2017**

3. This plan discusses emergency preparedness, communication structures, information sharing and recovery. The plan discusses the prevalent threats to the area and the Standardized Emergency Management System (SEMS). A current update for the Plan is in the development stage.

#### **TEHAMA COUNTY GENERAL PLAN UPDATE 2009-2029**

4. This plan outlines land use planning and economic goals for the region. The report discusses high-level transportation and circulation priorities and discusses the need to identify evacuation routes.

#### **TEHAMA COUNTY HAZARD MITIGATION PLAN**

5. This plan is general in terms of evacuation, and not specific to communities or routes. The plan discusses the Tehama Alert Systems and mentions the Emergency Action Plan (but does not include it). The document describes that a dam failure may result in limited warning for an evacuation and describes major transportation routes and bridges.

#### **TEHAMA WILDLIFE AREA VEGETATION AND FUELS MANAGEMENT PLAN – RESOURCE CONSERVATION DISTRICT OF TEHAMA COUNTY (RCD)**

6. The Tehama Wildlife Area Vegetation and Fuels Management Plan aims to manage vegetation and control wildfires within the Tehama Wildlife Area (TWA). The plan focuses on protecting watershed resources from wildfire impacts, managing vegetation to mimic natural ecological functions, and providing habitat for wildlife. It includes strategies for prescribed burning and other management practices to control large wildland fires and improve wildlife habitat.

#### **2020 TEHAMA EAST/WEST COMMUNITY WILDFIRE PROTECTION PLANS (CWPP)**

7. The Tehama East Tehama West CWPP is a comprehensive Community Wildfire Protection Plan (CWPP) focusing on the Tehama East and Tehama West regions. It outlines strategies and actions for reducing the risks and impacts of wildfires in these areas, emphasizing collaboration among local stakeholders, fire management agencies, and community members. The plans provide a detailed framework for wildfire prevention, preparedness, and response, tailored to the specific environmental and community needs.

#### **COMMUNITY SPECIFIC MULTI-HAZARD EVACUATION PLANS**

8. Community-specific evacuation plans emphasize emergency response systems and the prioritization of resident safety in urgent situations. The following multi-hazard evacuation plans are integral in guiding residents to safety during a range of emergency situations:
9. Lake California Multi-Hazard Emergency Evacuation Plan: Tailored for the Lake California area, this plan addresses efficient evacuation strategies and routes for both natural disasters and human-made threats.
10. Rancho Tehama Multi-Hazard Emergency Evacuation Plan: Focused on the Rancho Tehama

community, this plan delineates detailed evacuation procedures, including protocols and coordination with local emergency services for an organized response.

11. Manton Multi-Hazard Emergency Evacuation Plan: This plan is designed for the Manton area and provides a comprehensive approach to evacuations during crises. It emphasizes effective communication strategies and clear evacuation routes to ensure residents are well-informed and guided during such events.

#### **COORDINATED PUBLIC TRANSIT - HUMAN SERVICES TRANSPORTATION PLAN**

12. This study documents transit in Tehama County, particularly for disadvantaged groups. The study identifies current demographics and transit resources, unmet needs, and prioritizes strategies for improvement. This report discusses the importance of reliable transportation for emergency evacuations.

#### **TRANSIT ASSET MANAGEMENT PLAN**

13. This report lists the inventory (assets) and investment priorities for future fleet replacement or other important assets the County utilizes.

DRAFT

## 3.6 EXAMPLES / BEST PRACTICES

Evacuation plans for other California counties and agencies were reviewed for best practices and useful content that could be applied to Tehama County and incorporated when appropriate.

### TOWN OF PARADISE, CA

14. Headway prepared the transportation components of the *Town of Paradise Transportation Master Plan 2022* (TMP). This plan was completed following the catastrophic 2018 Camp Fire which devastated most of the Town and severely impacted the infrastructure. The plan prioritized building back a resilient transportation network and emergency response/ evacuation planning. The Evacuation Planning component included:

- Recommendations for evacuation and emergency plans including Traffic Control Plans, public-facing maps and informational guides, and Contra-flow procedures.
- Permanent and/or temporary improvements to key evacuation route intersections, particularly ones identified as known or potential pinch points.
- Multi-agency Task Force coordination among 22 partner agencies to address region-wide evacuation needs. The purpose was to develop agreements and a plan among agencies for emergency traffic control at intersections and along road agreements outside the Town of Paradise for the full length needed for evacuation.
- A practical evacuation guide for the primary evacuation routes with maps indicating responsible agency and a plan for key intersections and segments, the number of travel lanes, a contraflow plan and potential cross-over points, intersection controls movement restrictions and median closures. The plan was prepared for the *entire length of the route, beyond the Town limits*, acknowledging that evacuation planning must extend to practical limits to ensure that residents are out of harm's way.

### SAN BERNARDINO COUNTY, CA

15. The Emergency Operations Plan includes several sections:

- A chart showing each agency, the roles, and responsibilities.
- A matrix of departments and the primary and secondary emergency response roles.

16. The Hazard Mitigation Plan includes:

- Reference to the "Ready SB: Smart Phone App which identifies evacuation routes and shelters.

### CITY OF VENTURA, VENTURA COUNTY, CA

17. Ventura County published a series of maps for different areas indicating the evacuation roadways and directions routes to use in an evacuation.

## COMMUNITY EVACUATION NEEDS ASSESSMENT

This chapter outlines existing characteristics and metrics as the starting framework for assessing communities in Tehama County and are combined and supplemented with the subdivision review analysis completed by CAL FIRE and Cal OES, which evaluated subdivision housing developments in the State, County by County, providing general recommendations for procedures and infrastructure to increase the safety for emergency evacuation processes in these communities.

### 4.1 FIRE BEHAVIOR MODELING AND VULNERABILITY ASSESSMENT

This section provides an assessment of the roadway network and related elements within Tehama County. The purpose is to determine the primary needs of each vulnerable community to develop recommendations that facilitate the safe and efficient evacuation of residents, visitors, animals, and resources.

Multiple factors were considered and analyzed to determine the specific needs of each community within Tehama County, including the following key factors:

- Demographics (population, vulnerable population, etc.)
- Roadway Network (number of access points, distance to I-5, pavement conditions)
- Risk Priority (number of structures, Fire Hazard Priority, shortest distance to recent fire perimeter)
- Macro Fire Behavior Modeling and LiDAR flight data analysis
- Public Outreach
- Other evacuation considerations (availability of shelters, assembly points, safe refuge areas, signage)

#### COUNTYWIDE EVACUATION ASSESSMENT METHODOLOGY

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##### EVACUATION ROUTES

Primary and secondary evacuation routes are roadways most likely to be used in an evacuation; however, given the unpredictable nature of natural events, any roadway could become an evacuation route. The primary and secondary routes are shown on Figures 1a-1c, and a list is provided in Appendix A. Primary evacuation routes in Tehama County are Interstate 5 (I-5) and roadways classified as Arterials. Roadways classified as Collectors are secondary evacuation routes.

##### DEMOGRAPHICS

Demographic data was included as available and shows the estimated dwelling units or population used to assess the number of access points per population. Median household income and percent of elderly were included as indicators of the potential for vulnerable populations that may need assistance to evacuate.

##### SUBDIVISIONS/COMMUNITIES WITH ONE EGRESS POINT

Secondary access is critical should the primary evacuation route be unusable. Subdivisions and communities that lack secondary egress are indicated to show where secondary access should be pursued.

---

## PAVEMENT CONDITIONS

Roadways with low Pavement Condition Index (PCI) may slow evacuating traffic and could specifically be a hinderance on higher classification evacuation routes. Pavement Condition Indexes are shown in Figure 3.

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## FIRE RISK PRIORITY

Fire risk priority is included as a metric to identify and prioritize roadway improvements. Fire hazard risk analysis was completed using fire behavior GIS modeling and LiDAR remote sensing data capture. Results were field validated. Hazard assessment maps for each community are shown starting on **page 41** of this report.

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## UNUSABLE ROADS

Through public outreach, participants were asked to list any roadways that had become unusable during a previous natural event. While this is not a scientific assessment and does not capture all possible roadways, the list should be further evaluated to determine what risk factors could be reduced.

---

## FLEET MODEL ANALYSIS

High-level evacuation analysis was performed to identify roadways that may have higher capacities and/or higher congestion levels during an evacuation. Fast Local Emergency Evacuation Times Model (FLEET) is an on-line analysis tool available to the public via website in which the user can create various “scenarios” for evacuation and run travel time estimates. The FLEET website describes the program as:

“The Fast Local Emergency Evacuation Times Model (FLEET) simulation provides quick and accurate estimates of evacuation clearance times for user-defined areas anywhere in the United States. FLEET is best used in short notice evacuations such as those for wildfires, flash floods, or human-caused disasters. With FLEET, communities can quickly assess evacuation plans and accurately estimate evacuation clearance times even when trained, dedicated emergency management teams are not available.”

Some of the various elements that can be used to test different evacuation scenarios are:

- Evacuation area whether it be town wide or only within certain zones.
  - Seasonal factors to adjust population estimates.
  - Response times to evacuation and starting hours.
  - Destination/endpoint and the percentage of evacuating traffic to each community.
  - Roadway modifications such as closed routes and contraflow.
- 

## POTENTIAL PINCH POINTS

Potential pinch points on evacuation routes were identified, which are primarily located at interchanges along I-5, or the intersections of major routes in urbanized areas.

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## IDENTIFIED SHELTERS, ASSEMBLY POINTS, SAFE REFUGE AREAS

Shelters are typically established by the Sherriff’s Office or Red Cross for short-term accommodation for evacuated residents. Assembly points are temporary areas for evacuees to gather until conditions subside and evacuation

routes are accessible, or for evacuees who otherwise cannot evacuate the community on their own and need assistance to be moved to a shelter. Assembly points are designated on public transportation routes when possible. These points are often used by residents without a personal vehicle who are transported by public transportation, and transit fees are typically waived. Shelters and assembly points are typically designated at facilities with ample space, parking, and accommodations/services such as schools, parks, and big-box retailers, and are generally located well away from active danger.

A **SAFE REFUGE AREA** is a term for a location where several people (and potentially vehicles and animals) can temporarily assemble / shelter if an evacuation is not possible or safe. Types of areas may include large clearings such as big parking lots, school grounds, parks, wetlands, pastures, big stores, and gyms. It is noted that safe refuge areas may vary depending on the nature of the event.

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## BRIDGE LOCATIONS

Bridge locations are identified as potential risks, particularly along evacuation routes or along single access point routes. The locations of highway and local bridges are shown in Figure 4.

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## BIKEWAYS AND TRAILS

One option for improving evacuation routes is to provide a multiuse path that can serve as alternate emergency access during an evacuation event and connect to broader multimodal networks for everyday use. Therefore, it is logical to identify the existing multimodal network (bike paths and trailways) to evaluate opportunities for multiuse path evacuation improvements that could provide connectivity to regional multimodal networks.

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## OTHER CONSIDERATIONS

Other factors such as distance from I-5, number of structures, and shortest distance to fire perimeter are included to supplement the evaluation or to identify or prioritize improvements.

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## FIRE RISK ASSESMENT MODELING

The fire behavior modeling utilizes a combination of multiple inputs to calculate where the most vulnerable locations within the County are located and helps determine the most effective areas to focus on fire prevention and planning. The model includes multiple inputs, such as fire response time, development era of buildings, anticipated fire intensity, and current vegetation characteristics. The landscape fire behavior input is an aggregate of other inputs such as fuel types and weather patterns common to red flag fire events. The inputs are discussed in more detail throughout this section.

Each input is given a score on varying scales depending on importance. For example, the higher the housing density, the higher that location scores. Similarly, if there is a history of fire ignitions in a certain area, that location and areas in proximity receive a higher score as well. The inputs are then totaled based on location and a final risk score is given to each location (a 30-meter pixel) throughout the County. It is important to note that there are areas of the County that are non-burnable (see Figure 6) and are therefore excluded from the model. The process of scoring is iterative and stakeholders as well as local experts help determine the appropriate weight of each input to value the final score appropriately. Once reviewed and agreed upon, the entire County is scored from high to low hazard to help determine the most strategic locations for fire planning and prevention. Figure 7 depicts the final iteration of the Tehama County Wildfire Hazard Assessment.

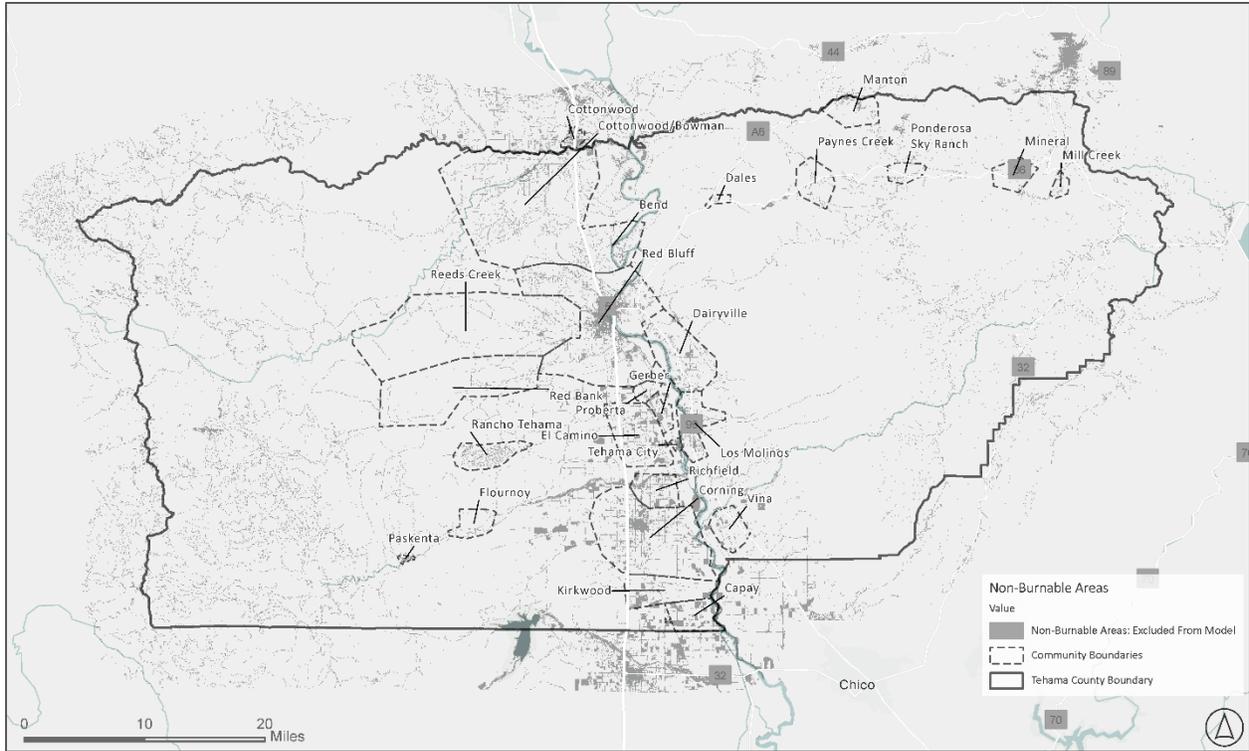


Figure 6 - Non-burnable Areas

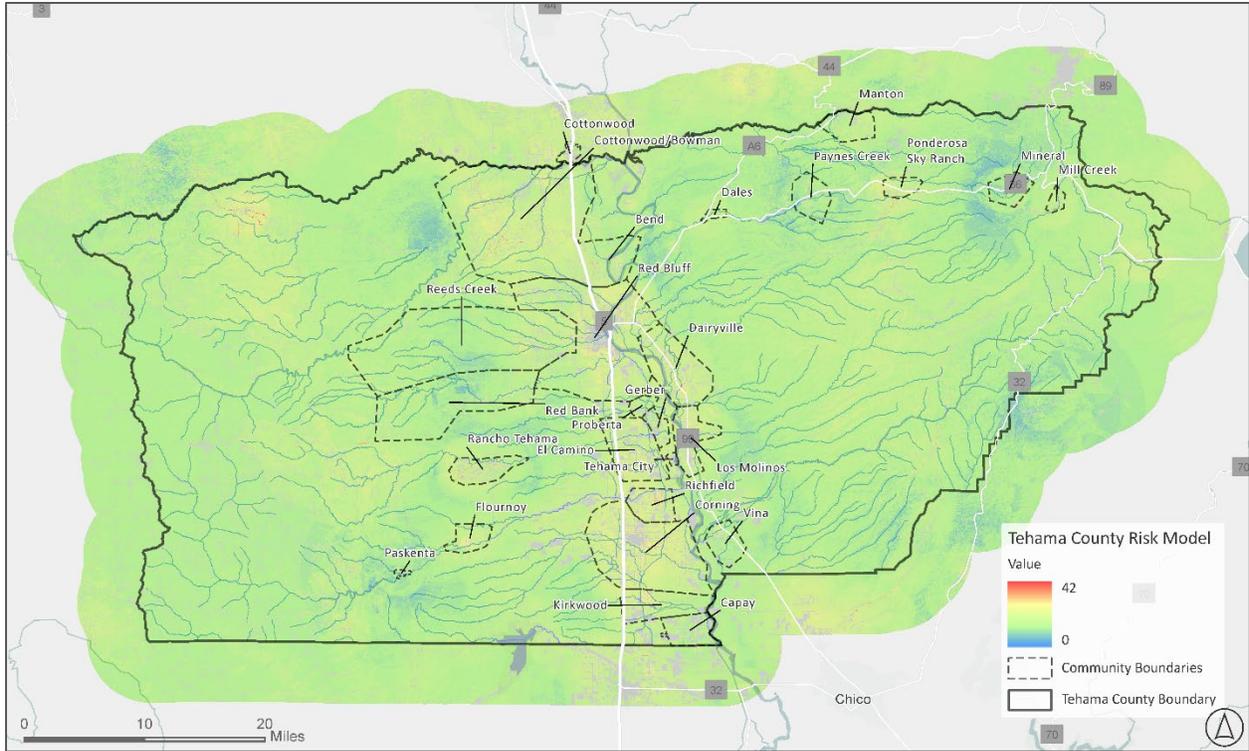
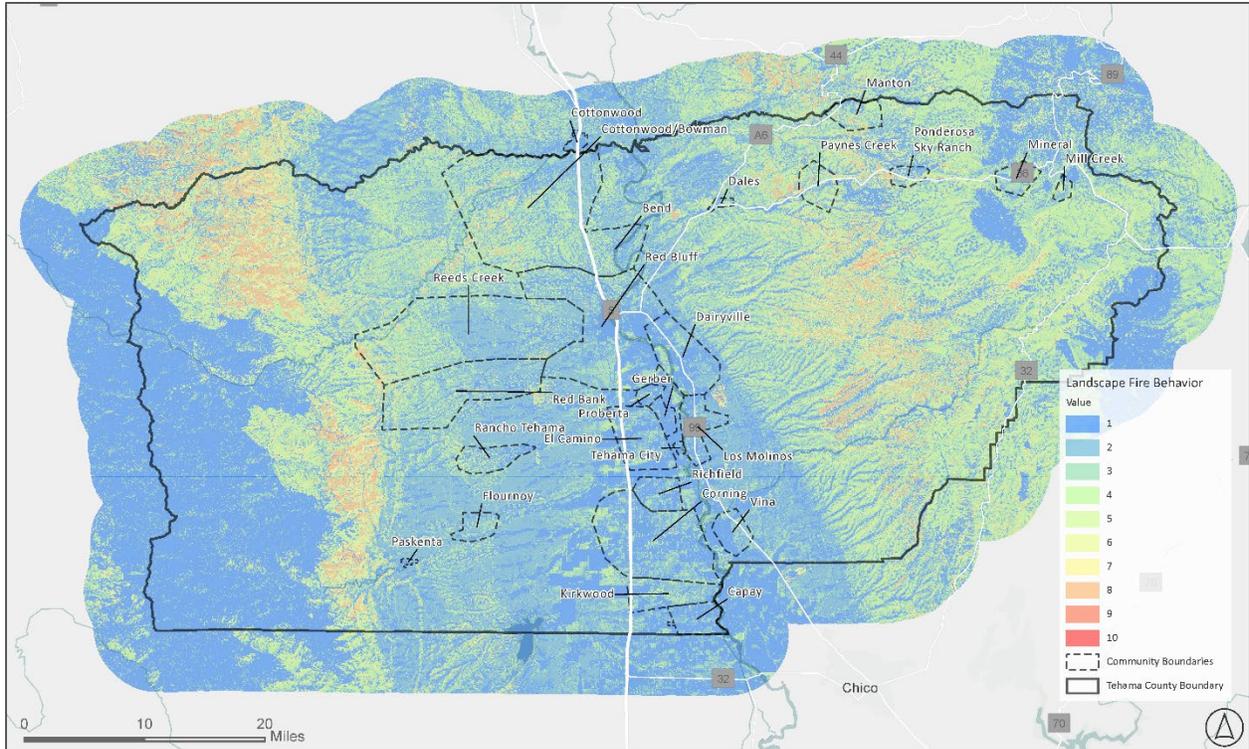


Figure 7 - Overall Wildfire Risk Model Output

LANDSCAPE FIRE BEHAVIOR

The Landscape Fire Behavior layer is a FlamMap output which accounts for elevation, slope, topographic aspect, vegetative fuel model, canopy cover, canopy height, canopy base height, and canopy bulk density. The output used for this layer is "Heat per Unit Area" weighted from 0-10.

Figure 8 depicts the landscape fire behavior in the County. The westernmost and central regions of the County primarily received weighted scores between one (1) and five (5). The eastern foothill region as well as a portion of the western region had a higher proportion of weighted scores in the five (5) to ten (10) range.



**Figure 8 - Landscape Fire Behavior**

**BUILDING DENSITY**

The Building Density layer uses a point density operation on building centroids. The output yields buildings per square mile and is weighted from 0-10.

Figure 9 depicts the building density in the County. There are high densities of buildings in the communities surrounding I-5 such as Red Bluff, Cottonwood/Bowman, and Corning. The building density of Reeds Creek and Red Bank is higher near their eastern boundary but starts to dissipate moving westward. The eastern-most and western-most regions of the County have very little building density except for the existing communities in those regions which have relatively moderate building densities.

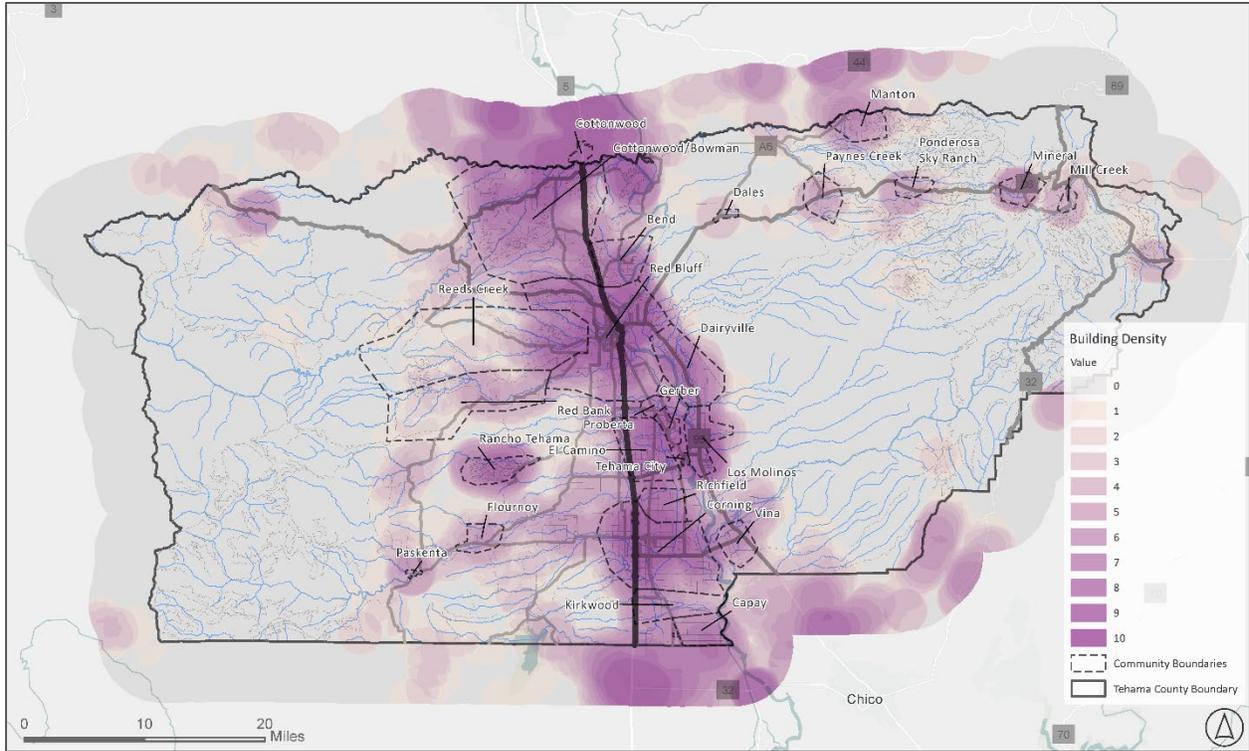


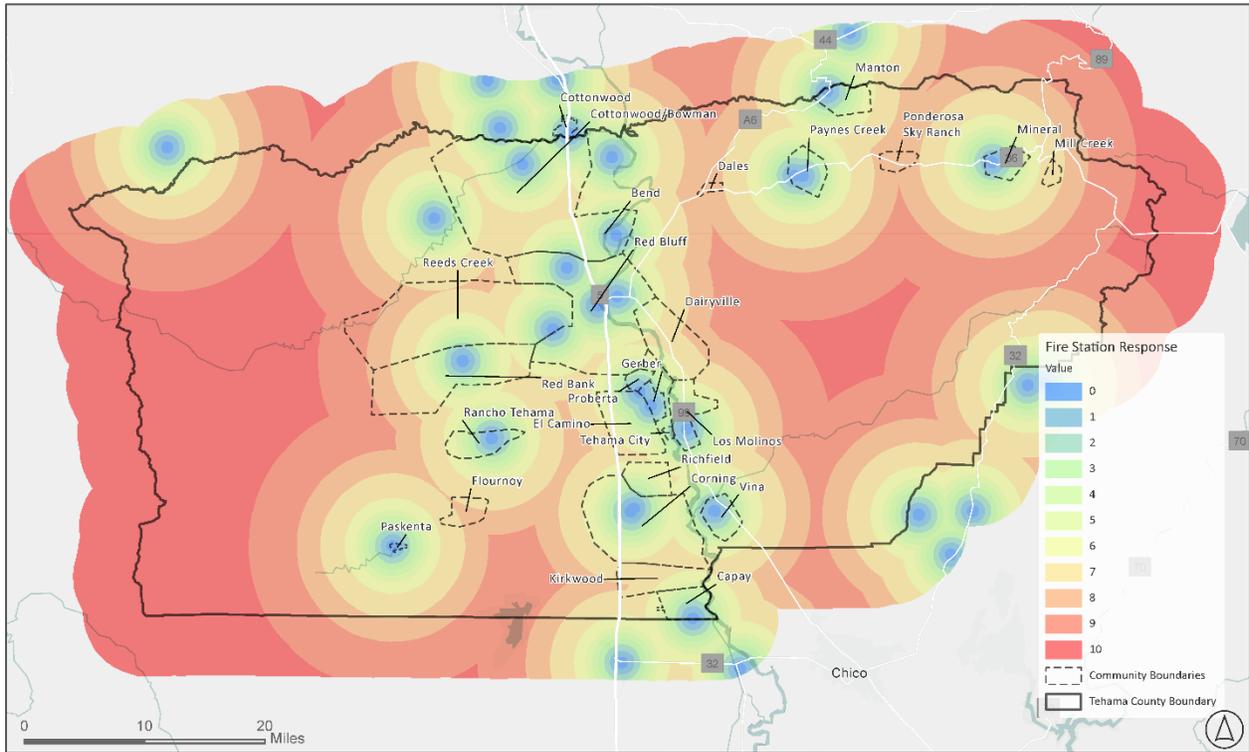
Figure 9 - Building Density

### FIRE STATION RESPONSE

The Fire Station Response layer accounts for risk associated with the length of time to respond to a fire. The Fire Station Response layer uses distance from fire stations to score as follows:

- <0.5 miles = 1
- 0.5-1 miles = 2
- 1-1.5 miles = 3
- 1.5-2 miles = 4
- 2-2.5 miles = 5
- 2.5-3 miles = 6
- 3-4 miles = 7
- 4-6 miles = 8
- 6-8 miles = 9
- >12 miles = 10

Figure 10 depicts the distances from fire stations in the County. Most of the communities in Tehama County lie within three (3) miles of a fire station. However, some portions of communities are farther away; the Reeds Creek, Ponderosa Sky Ranch, and Mill Creek communities lie mostly between three (3) and seven (7) miles away from fire stations.

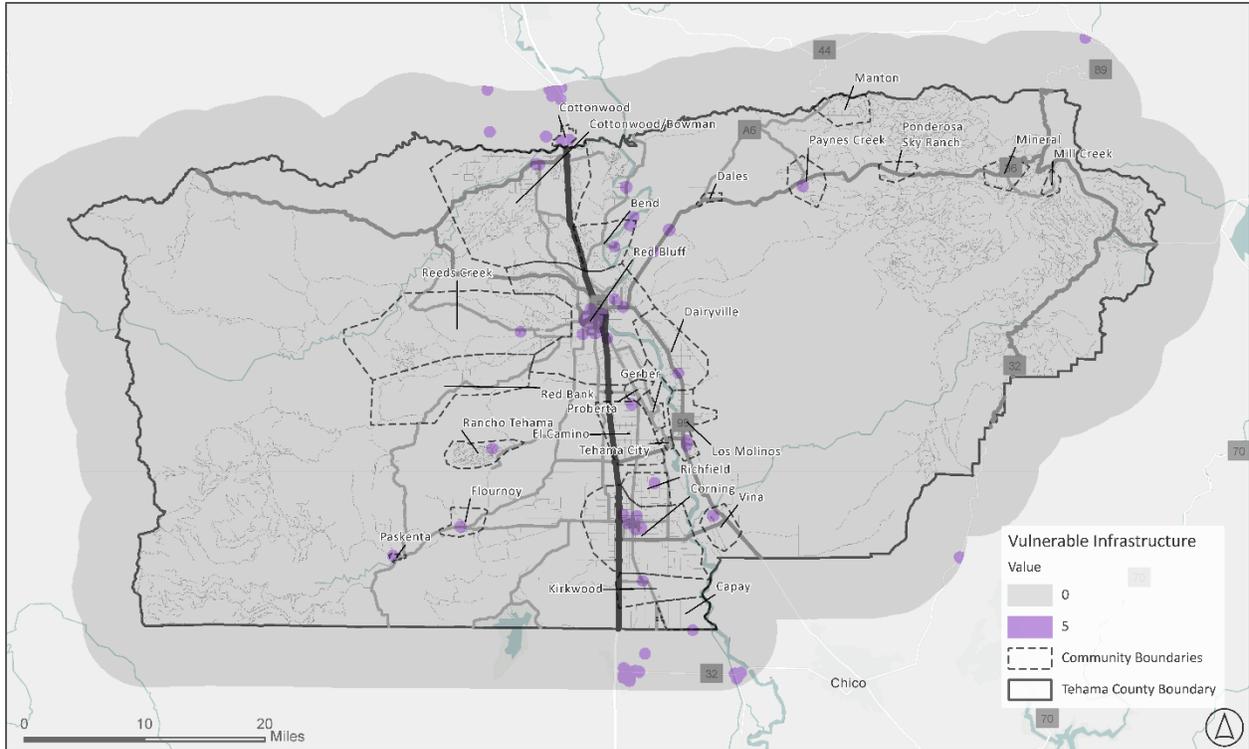


**Figure 10 - Fire Station Proximity**

## VULNERABLE INFRASTRUCTURE

The Vulnerable Infrastructure layer uses the location of schools, nursing homes, hospitals, summer camps, lodges, trailheads, and childcare centers (Department of Homeland Security records). The layer applies a score of five (5) to an area within 0.5 miles of these locations.

Figure 11 depicts vulnerable infrastructure in the County. Most communities in Tehama County have at least one area within 0.5 miles of vulnerable infrastructure; these areas are especially prevalent in Red Bluff and Corning.

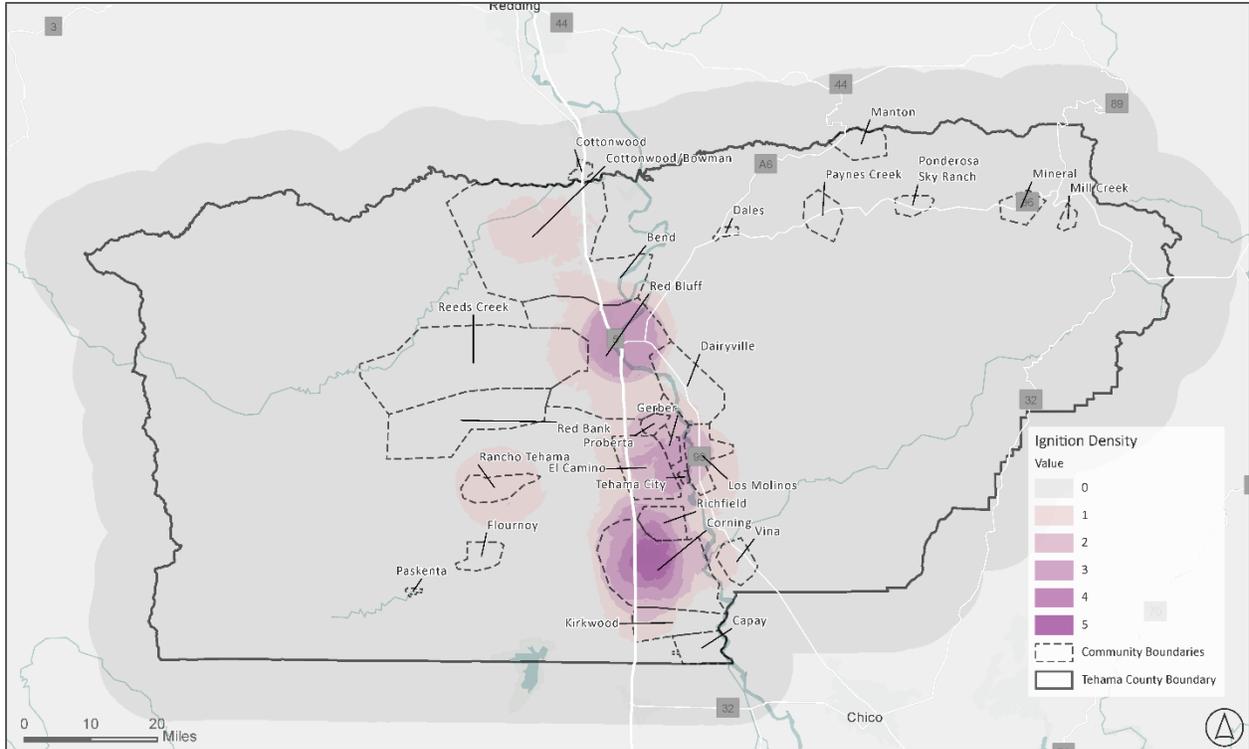


**Figure 11 - Vulnerable Infrastructure**

## IGNITION DENSITY

The Ignition Density layer uses a point density operation on series 100 (fire) incidents recorded by CAL FIRE between 06/01/2021 and 06/01/2023. The output yields ignitions per square mile and is weighted from 0-5.

Figure 12 depicts the ignition density in the County. There are high ignition densities in a few communities including Red Bluff, Corning, as well as El Camino, Gerber, Los Molinos and City of Tehama. Ignition Density is relatively moderate in communities like Rancho Tehama, Cottonwood, Bowman Road and in the areas surrounding the communities with high ignition density. There is little ignition density outside of the aforementioned areas.



**Figure 12 - Ignition Density**

### KEY TRANSPORTATION ROUTES

The Key Transportation Routes layer classifies roads throughout the County based on their importance during an evacuation, and excludes low traffic, and local roads I-5 was excluded as this route is heavily maintained. Areas within 200 feet of these classified roads were scored as follows:

Local Collectors = 1

Collectors = 2

Arterial = 3

State Highways = 4

Figure 13 depicts the key transportation routes in the County. The majority of communities have routes classified by this model as local collectors and arterials. Routes classified as arterials are present in the western region of the County near I-5, however, they are relatively absent from the eastern region of the County. Routes classified as state highways run from the northwest region to the south-central region as well as from the northeast to the south-east and south-central regions.

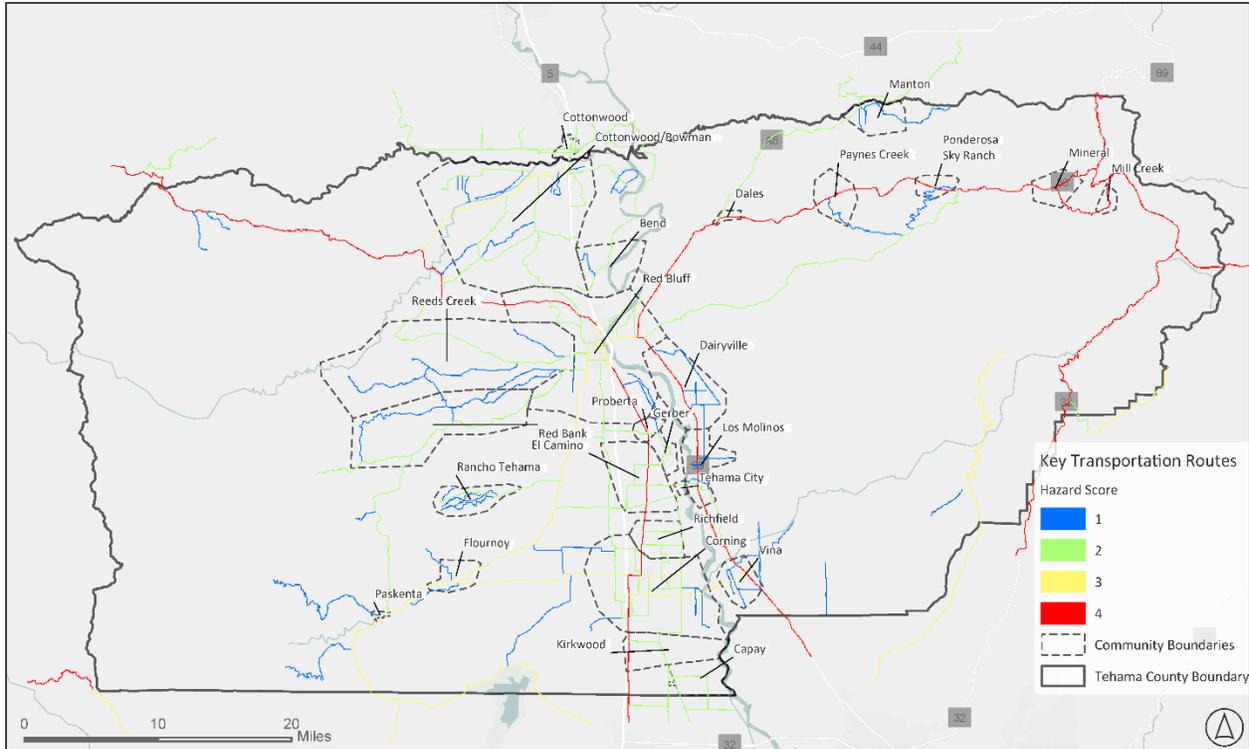


Figure 13 - Key Transportation Routes

## KEY ROADSIDE HAZARDS

The Key Roadside Hazards layer uses the roads identified in the Key Transportation Routes layer to score areas within 200ft of roadsides. These areas were intersected with areas that had higher than 10,000KJ/m<sup>2</sup> (heat units) [roughly the upper 1/3rd of all pixels from the Landscape Fire Behavior layer as ranked by heat value].

Figure 14 depicts the key roadside hazards in the County. In the Northeast region, there are roadside hazards prevalent in Manton as well as the southern portion of Paynes Creek. In the Northwest region, there are roadside hazards present in most of the communities; they are especially prevalent in Cottonwood, Bowman Road and the western portions of Reeds Creek and Red Bank. The Southeast region has relatively few areas with roadside hazards, the majority of which are in Bend. In the Southwest region, roadside hazards are extremely prevalent in Rancho Tehama as well as consolidated in two areas west of any community boundary.

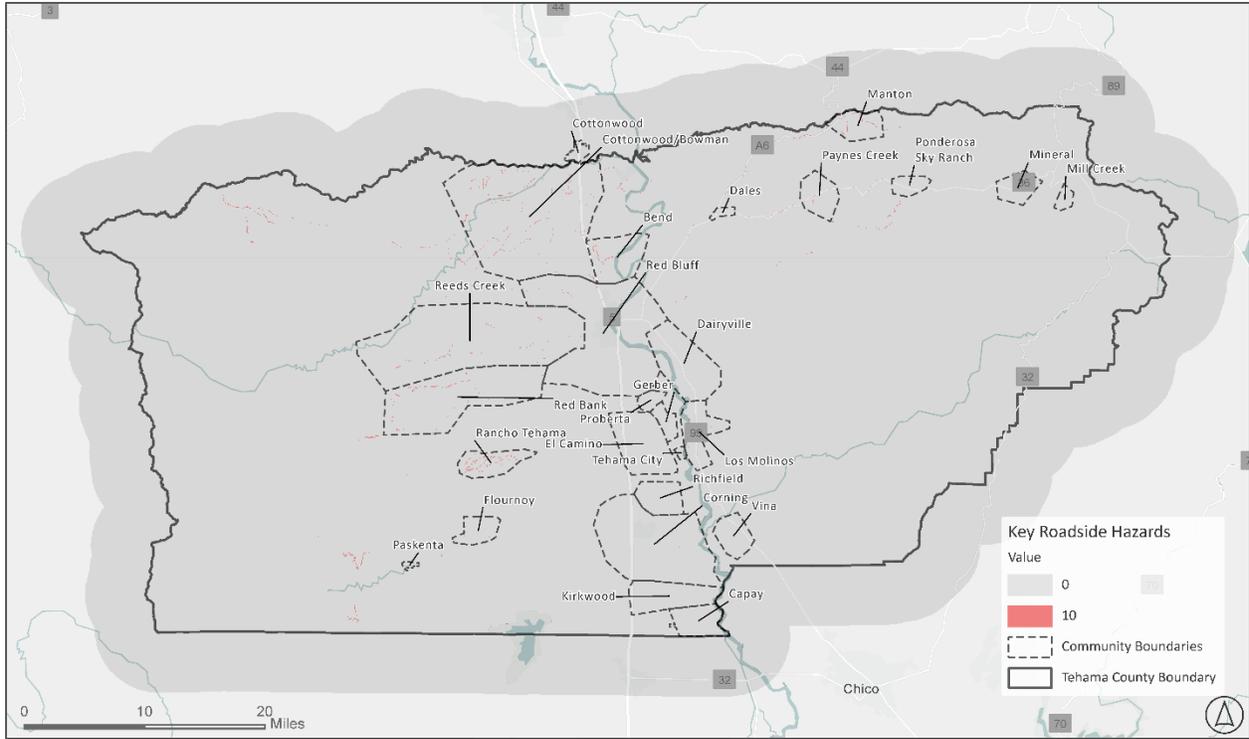


Figure 14 - Overall Roadside Hazards

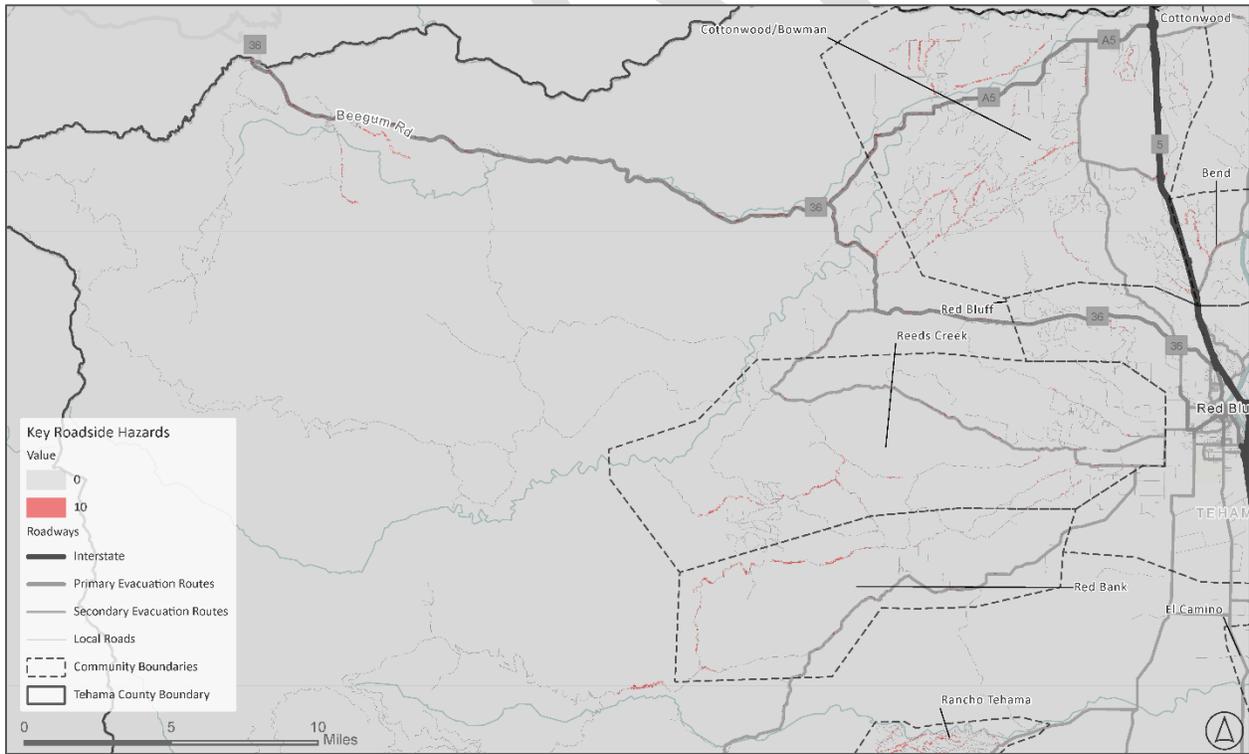


Figure 15 - Roadside Hazards NW Tehama County

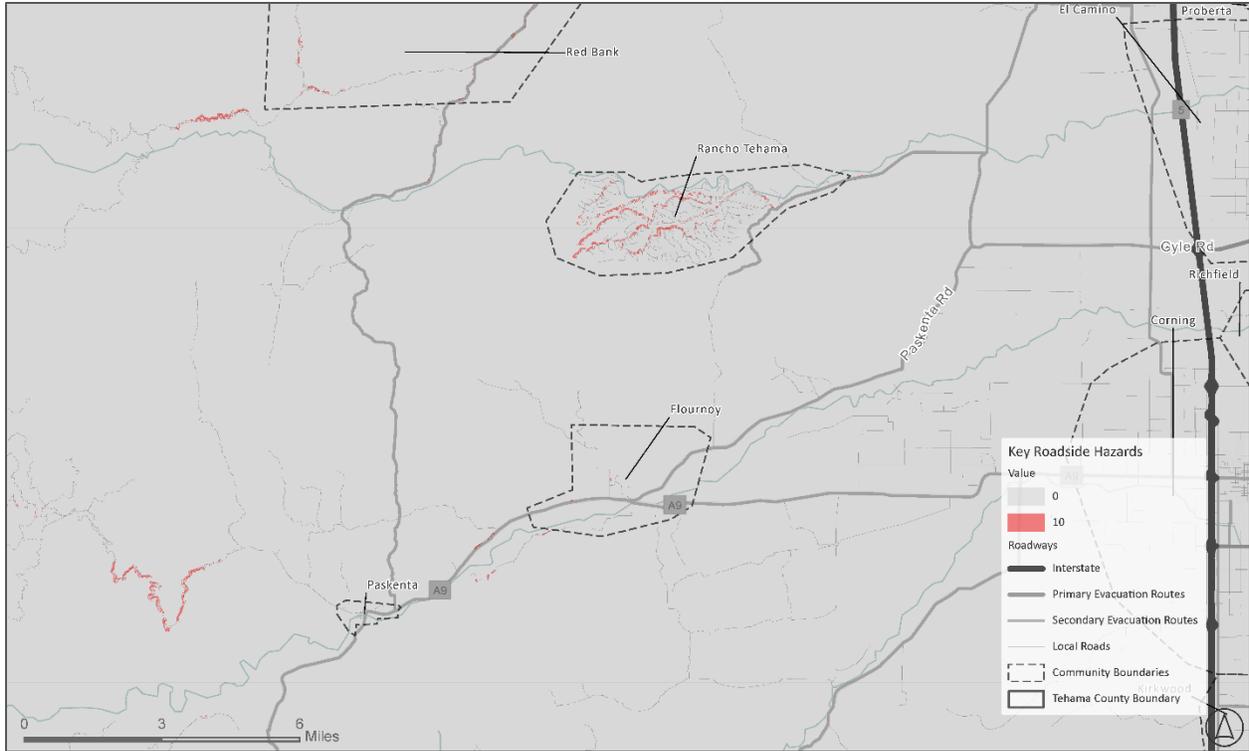


Figure 16 - Roadside Hazards SW Tehama County

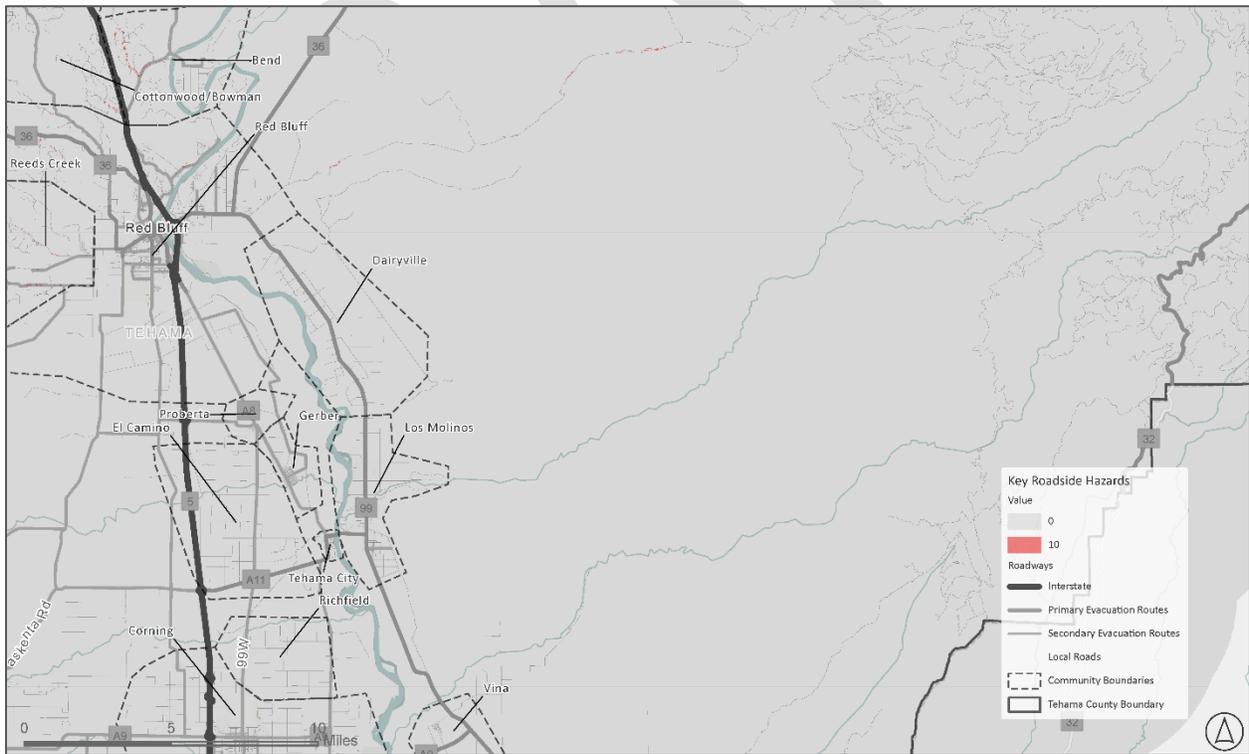


Figure 17 - Roadside Hazards SE Tehama County

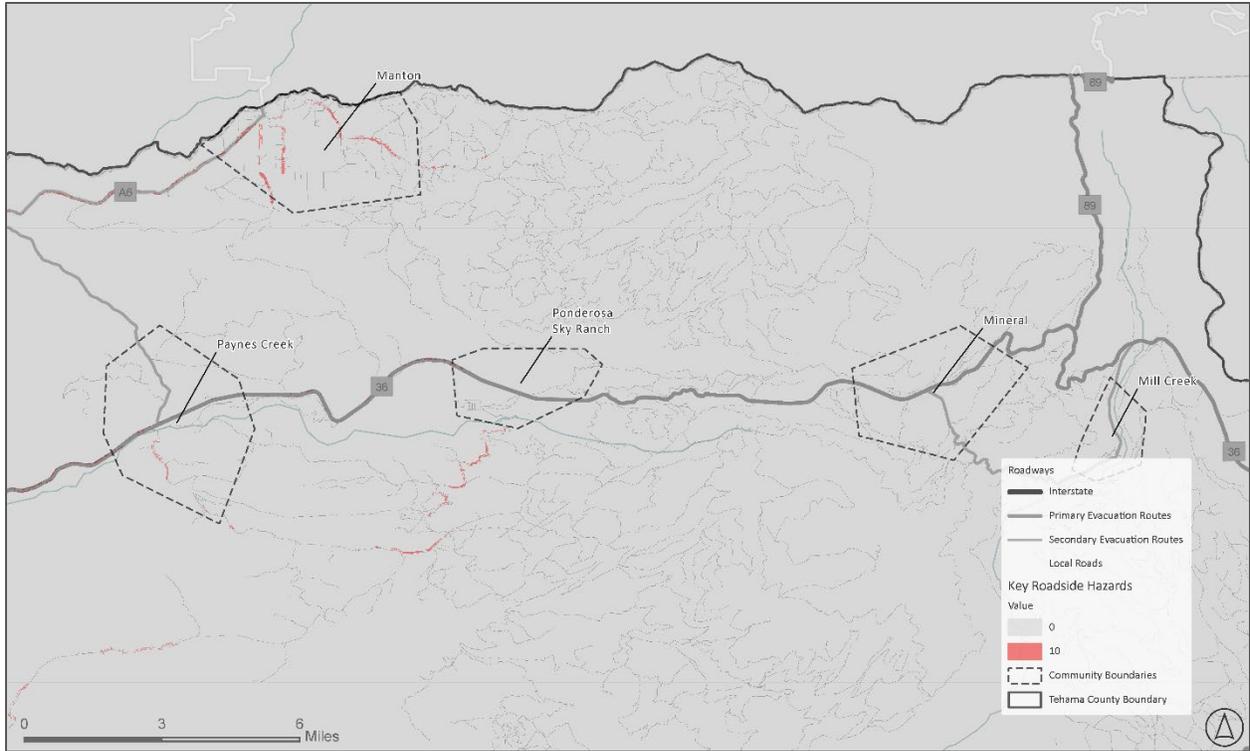


Figure 18 - Roadside Hazards NE Tehama County

## COMMUNITY AREA PROFILES

### 5.1 COMMUNITY SELECTION METHODOLOGY

This Study has identified certain communities in Tehama County as priority areas due to their heightened vulnerability to fire, flooding, and earthquake hazards compared to the rest of the County. These "vulnerable communities" are characterized by limited access or egress routes, which may impede swift and efficient evacuations. The selection of these vulnerable communities was informed by a comprehensive geographic analysis detailed in section 3.1 and section 3.2 of this report.

Ensuring multiple safe entry and exit points is crucial in emergencies, both for the evacuation of residents and the timely arrival of emergency personnel. The subsequent community profiles provide a comprehensive overview of these vulnerable areas, including their risk factors, demographics, and exit routes. In response to these vulnerabilities, a series of strategies and solutions, ranging from infrastructure projects to technological communication advancements, have been devised to enhance communication, signage, traffic management, roadway expansion, pavement conditions, and the establishment of ingress and egress routes for evacuations and emergency vehicle access.

The vulnerable community maps and associated project lists serve as a tool to delineate potential opportunities for creating additional egress routes and emergency access pathways for each vulnerable community in the event of an emergency evacuation. In cases where secondary access paths must be established on land not owned by the County, meticulous coordination with landowners is imperative. This collaborative effort may involve agencies such as CAL FIRE, CAL OES, the United States Forest Service (USFS), Caltrans, community members, and private landowners. It is important to note that the secondary access route recommendations listed below are for review, and their implementation has yet to be determined. These secondary access projects will necessitate further coordination and feasibility studies to assess their practicality and suitability for enhancing these potential improvements.

For the Study's recommended priority project list, please see Section 6, which details a series of prioritized projects identified through comprehensive analysis, including policy findings, roadway network and access evaluations, community input, best practices from similar geographic areas, and modeling analyses. These projects are sorted by community and include a variety of interventions aimed at enhancing evacuation safety and infrastructure resilience. Here are key highlights from the project list in Section 6:

- **Countywide Emergency Siren System:** A short-term project with a \$2,000,000 budget aims to install solar-powered sirens across Tehama County to alert residents, especially those without internet access, about evacuations and emergencies.
- **Countywide Emergency Evacuation Wayfinding and Routing System:** This short-term project involves placing reflective evacuation signs to direct residents to nearest roads and alternate routes during emergencies, with a budget of \$250,000.
- **Genasys Countywide Notification System:** A rollout of the Genasys Protect notification framework to inform the community about evacuation procedures and resources through various mediums.
- **Lake California Secondary Emergency Access – Fire Lane Access:** Identified as needing an additional secondary access route for emergency evacuations, this long-term project focuses on Lake California, with cost estimates pending further evaluation.

- **Manton and Mineral Area Projects:** Include roadside thinning and mastication, roadway and intersection improvements, with specific projects like the Wilson Hill Roadside Thinning in Manton and State Route 36/Battle Creek Road Safety Access Project in Mineral, highlighting the focus on maintaining and improving evacuation routes.
- **Evergreen Road Widening Project:** This medium-term roadway improvement project in Cottonwood aims to widen Evergreen Road and expand clear zones to support both evacuees and emergency vehicles, with a cost estimate of \$500,000.
- **Luce Griswold Road Paving:** Also in Cottonwood, this medium-term project intends to pave Luce Griswold Road, the only secondary access road currently unpaved, with an estimated cost of \$80,000.
- **Bowman Road Right of Way Thin:** Multiple short-term projects on Bowman Road involve thinning in the right of way as directed by a forester to target gray pine and ladder fuels while pruning larger oaks.

Each project is categorized by type, timeframe, community, estimated cost, location, and a brief description of the intervention. Prioritized projects represent a strategic approach to enhancing Tehama County's evacuation readiness and infrastructure resilience, reflecting a blend of short-term, medium-term, and long-term initiatives across different communities within the county. The comprehensive list underscores the commitment to improving safety and accessibility for all residents, particularly in response to the risk of natural disasters such as wildfires.

## 5.2 HAZARD MAPS AND CHARACTERISTICS

### WILDFIRE HAZARD MODELING RESULTS

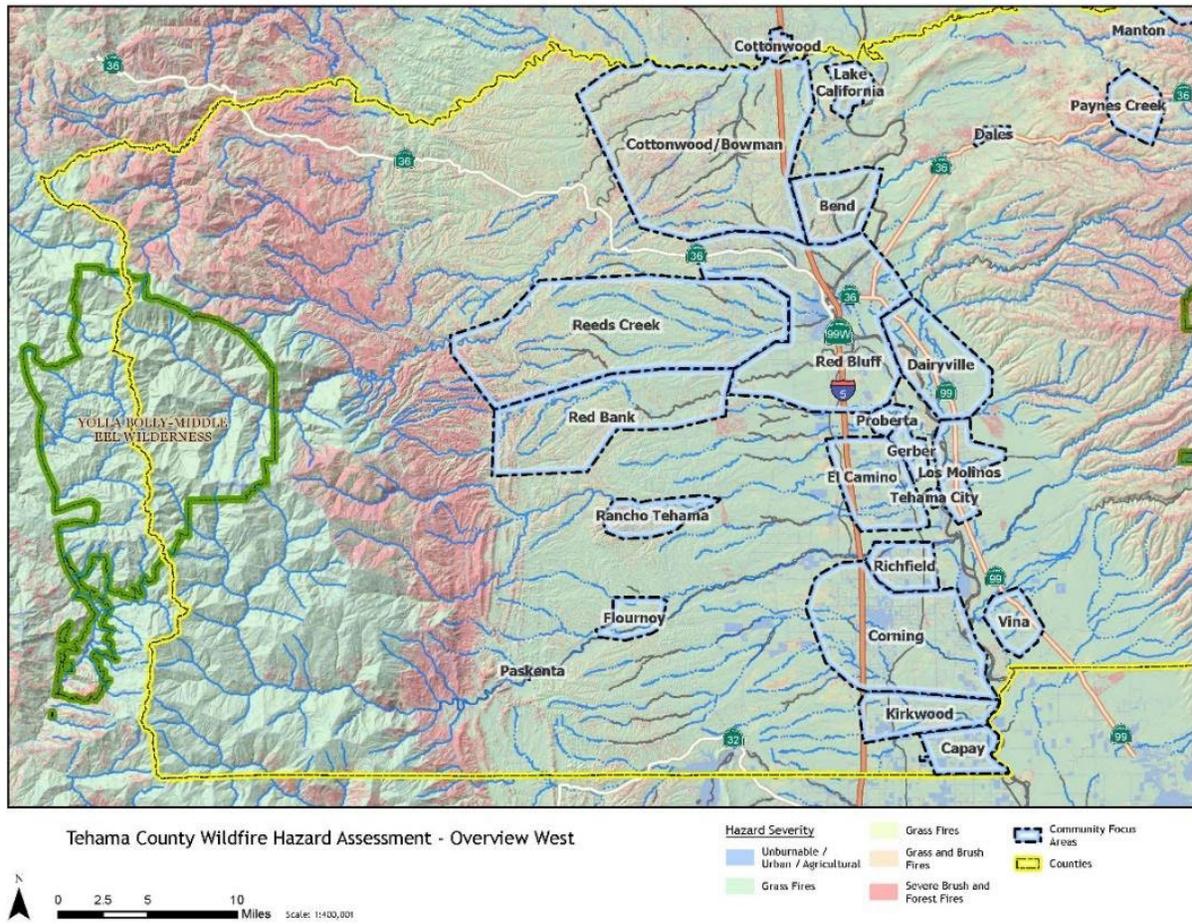
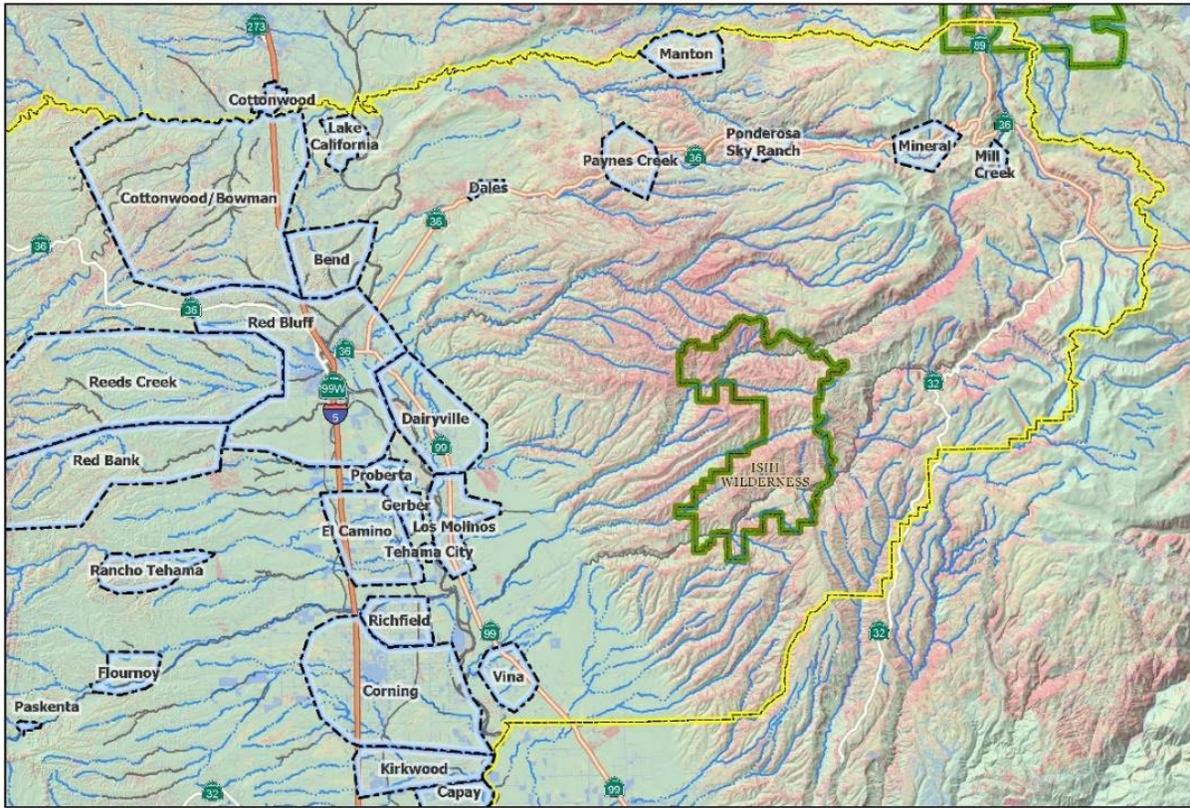


Figure 19 - Tehama County Community Areas (WEST)



Tehama County Wildfire Hazard Assessment - Overview East



Figure 20 - Tehama County Community Areas (EAST)

## FLOOD HAZARDS

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Flood risk in Tehama County presents a significant hazard due to the region's topography and climate. The County has a history of flooding, leading to costly damage and challenging emergency management. Despite ongoing efforts to reduce flood risk, the reality remains that flooding is a potential threat. Key points about flooding hazards in Tehama County include:

- Floodplain Management – Floodplains in Tehama County are designated based on flood frequency and the extent of coverage. Dams, levees, channels, and other protective structures are in place to provide some level of flood protection, but there is always a residual risk of flooding.
- Precautions and Emergency Response – Residents are advised to take several precautionary steps during flood warnings, including turning off utilities, moving valuables to higher floors, and stocking cars with emergency supplies. In case of imminent flooding, it's important to avoid flooded roads and refrain from attempting to walk through floodwaters.
- Post-Flood Recovery – After a flood, checking for structural damage before entering buildings, avoiding the use of open flames, watching for downed electrical wires, and initiating clean-up measures are crucial steps.
- Long History of Flooding – The region has experienced numerous state and federally declared flood disasters, underscoring the ongoing threat of flooding. Even in drought conditions, sudden rains can lead to flooding due to parched soil and inadequate drainage systems.
- Risk Awareness and Mitigation – Residents are encouraged to be aware of their flood risks and take proactive steps to mitigate potential damage. This includes understanding floodplain dynamics, complying with local building and safety regulations, and preparing for emergencies through planning and maintaining necessary supplies.

Overall, flood risk management in Tehama County involves a combination of structural measures, community planning, individual preparedness, and effective response and recovery strategies. The following maps show flood risk and dam breach inundation data provided by the California Department of Water Resources.

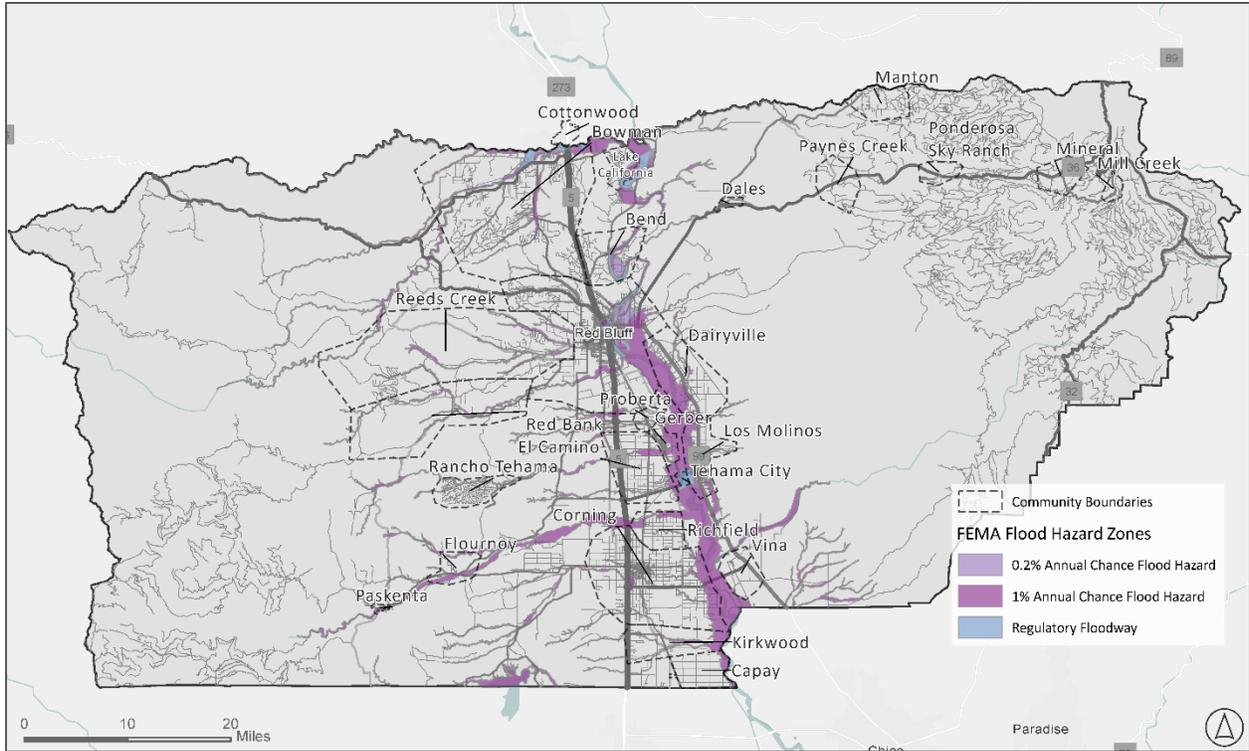


Figure 21 - 100- and 500-year flood plain model for Tehama County

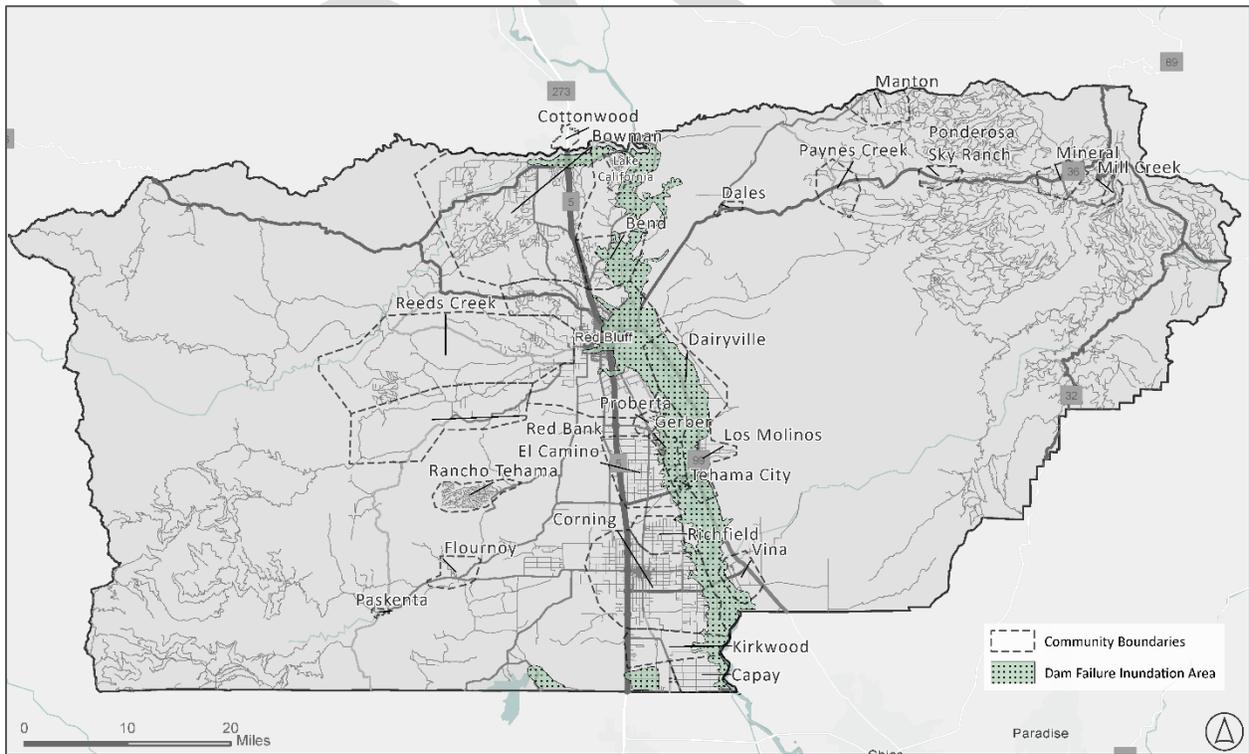


Figure 22 - Dam Failure Inundation Area

## HAZARDOUS MATERIALS ANALYSIS

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Prioritizing community safety and well-being concerning the risks posed by hazardous materials is key to the County's evacuation planning. Focusing on the areas along railways and I-5, strategic evacuation planning aims to mitigate potential hazards effectively and safeguard residents and the environment through a multi-faceted approach:

- Risk Assessment – In-depth assessments and GIS mapping identify hazardous material risks near railways and I-5.
- Emergency Response – A comprehensive emergency plan, in collaboration with local emergency services, addresses hazardous materials incidents.
- Community Engagement – Awareness programs and drills educate the public about hazardous materials safety and emergency response procedures.
- Transportation Safety Collaboration – Partnerships with transport agencies ensure adherence to safe transportation practices and regular safety audits for hazardous materials.
- Infrastructure and Technology Investment – Enhancing transport infrastructure and deploying advanced monitoring systems for hazardous material transport.
- Local Capacity Building – Training for first responders and development or reinforcement of local hazardous materials response teams.
- Continuous Strategy Review – Regular updates to risk assessments, emergency plans, and response strategies, reflecting new data and technological progress.
- Policy and Legislation Advocacy – Advocating for strict legislation to improve hazardous material transport safety.

These strategies represent a commitment to proactive risk management, ensuring the protection of the community, infrastructure, and natural environment from the challenges associated with hazardous material transportation. The following maps show areas of hazardous material risk using a standard 0.5 mile buffer:

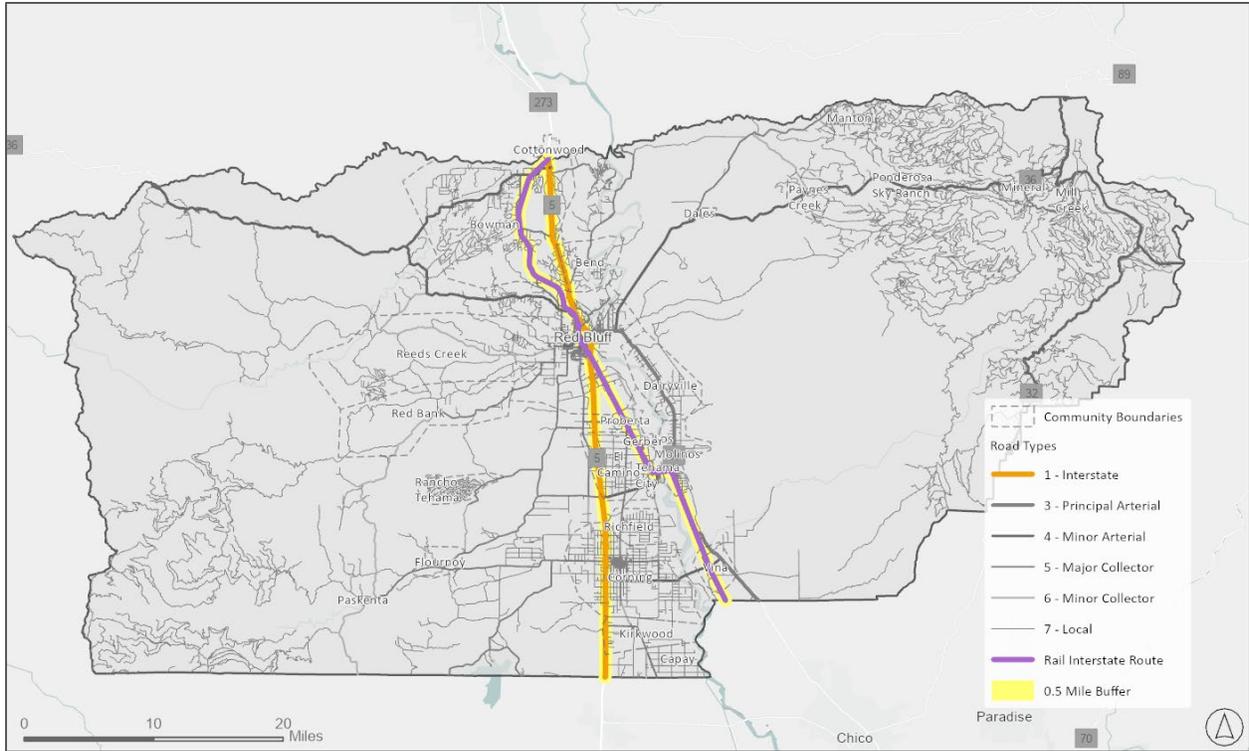


Figure 23 - Hazardous Materials Risk Zones

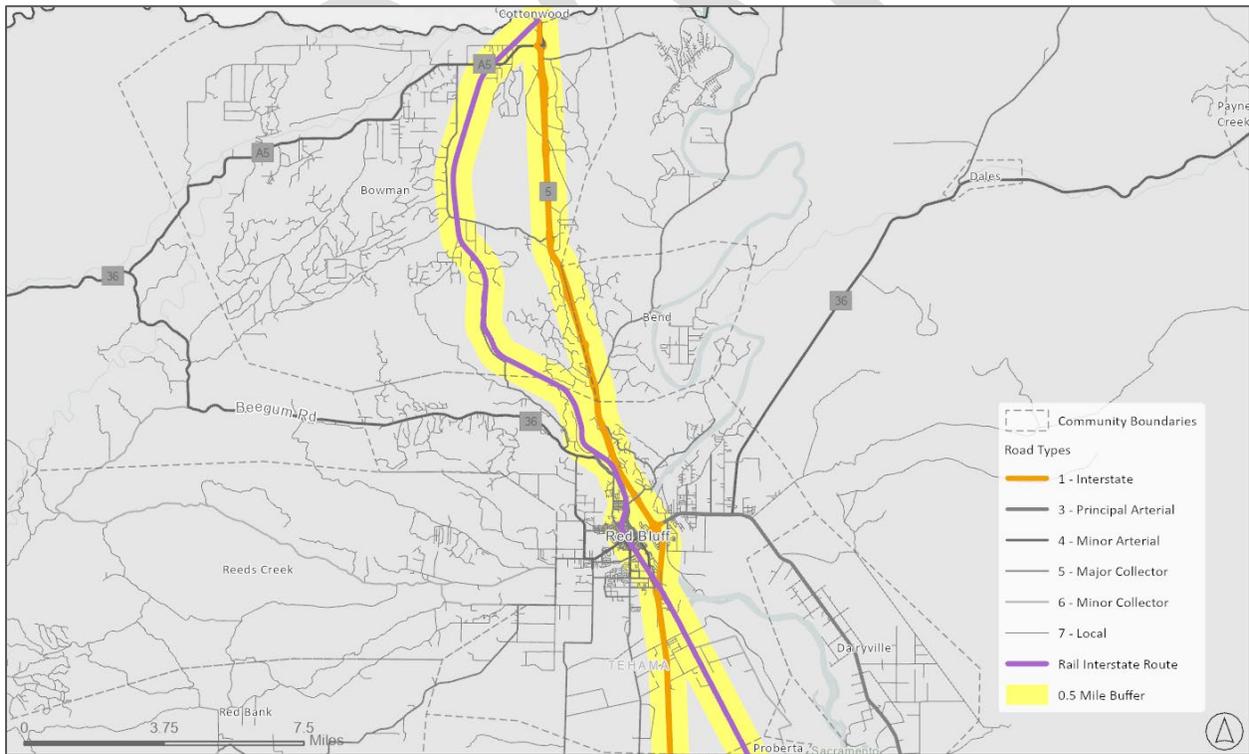


Figure 24 - Hazardous Materials Risk Zone (north)

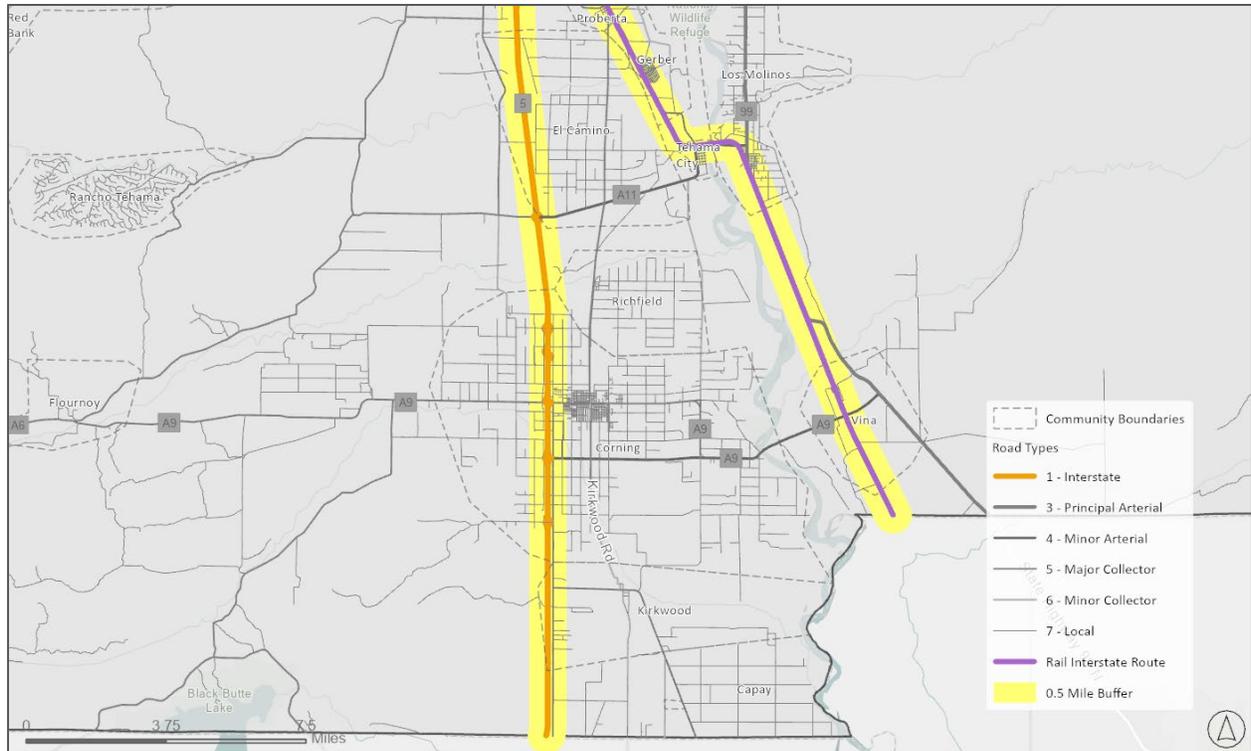


Figure 25 - Hazardous Materials Risk Zone (south)

## COMMUNITY-SPECIFIC EXISTING HAZARDS ANALYSIS

### EL CAMINO

El Camino is a small agricultural community located approximately four (4) miles east of I-5 and four (4) miles west of the Sacramento River. El Camino is in a Low Fire Hazard Severity Zone and has five (5) ingress-egress points. El Camino is served by Tehama County Fire Station 9. The area primarily consists of Oak Woodland vegetation. The evacuation area for El Camino is 21.45 square miles. The population of El Camino is 1,649 people with roughly 601 households. The average household size is 2.74 and the median age in the town is 40.4. The average household income is \$46,135 and the average price of a home is \$408,681. Most people in the community commute approximately 15-19 minutes to work. 2.6% of people carpool to work, 1.9% walk, 0.5% take public transit and little to no people bike.

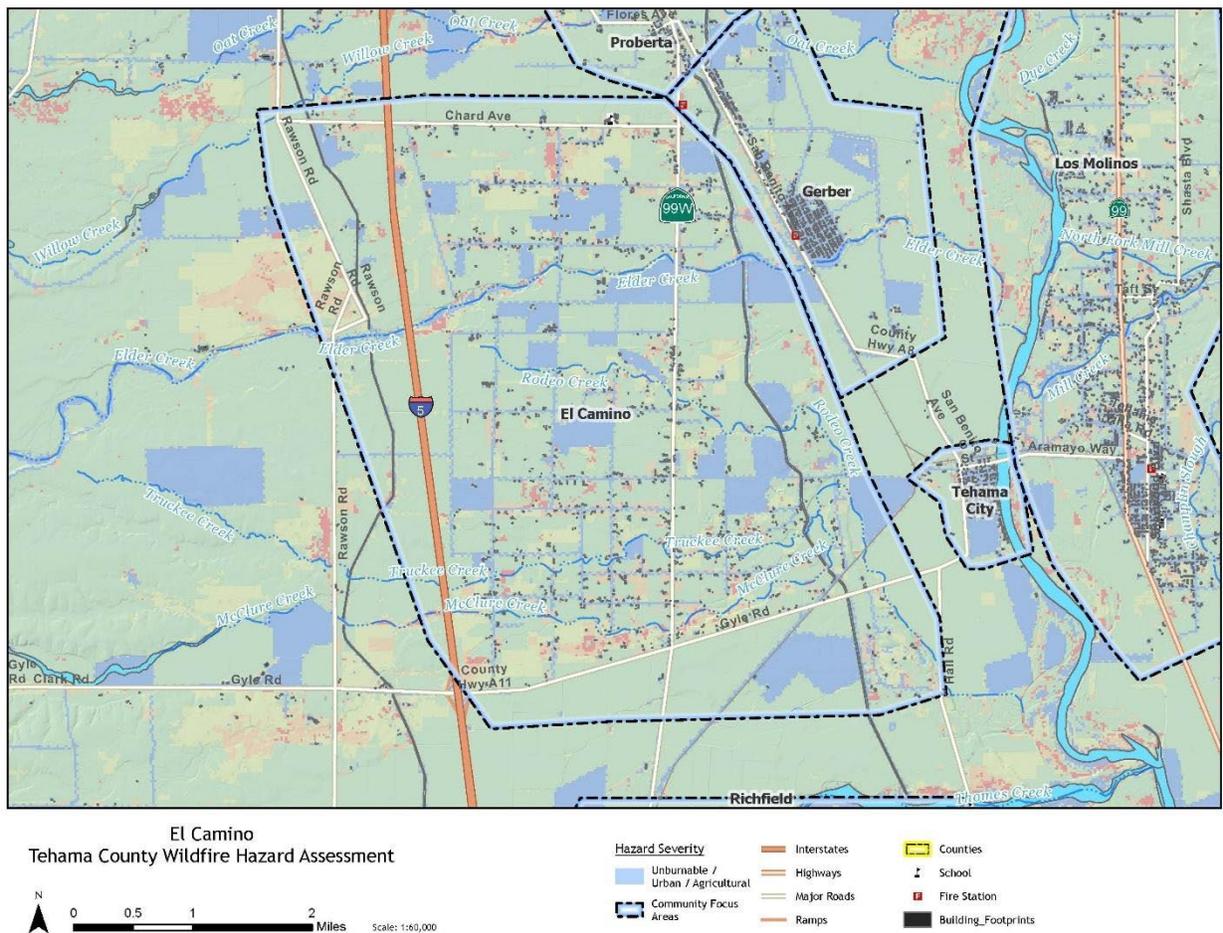


Figure 26 - El Camino Wildfire Hazard Assessment

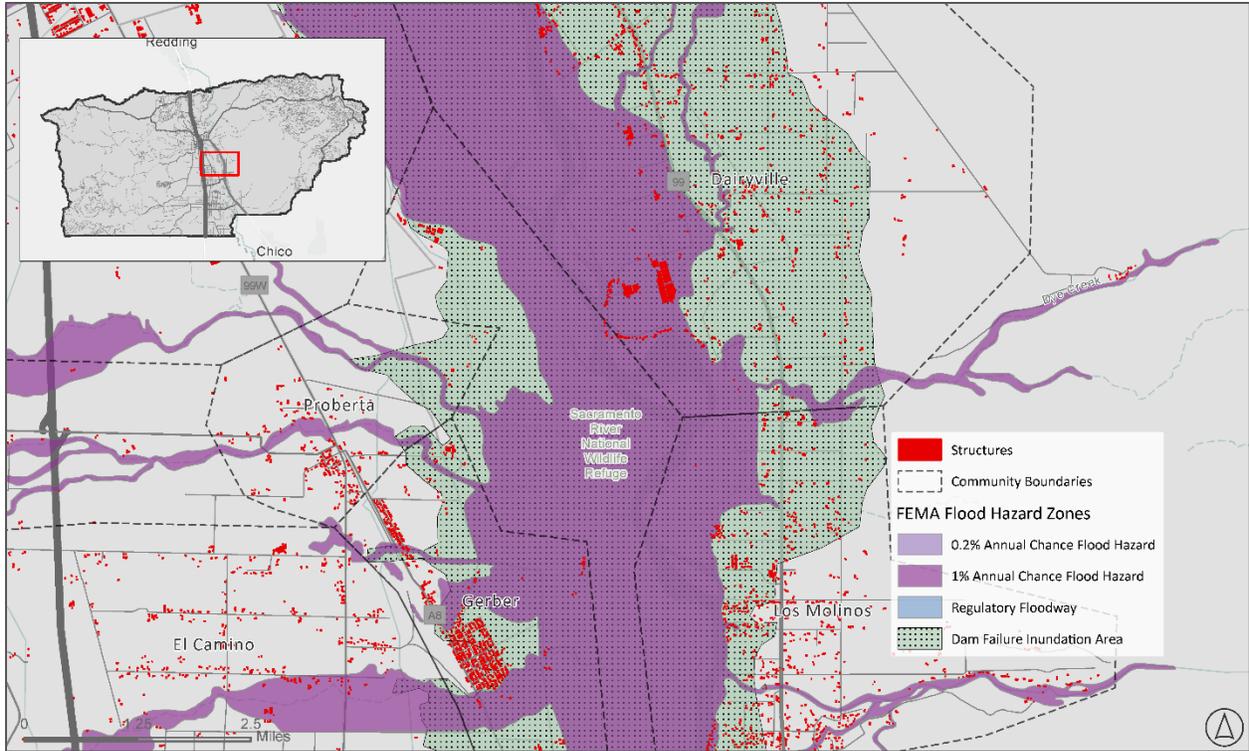


Figure 27 - El Camino Flood Hazard Assessment



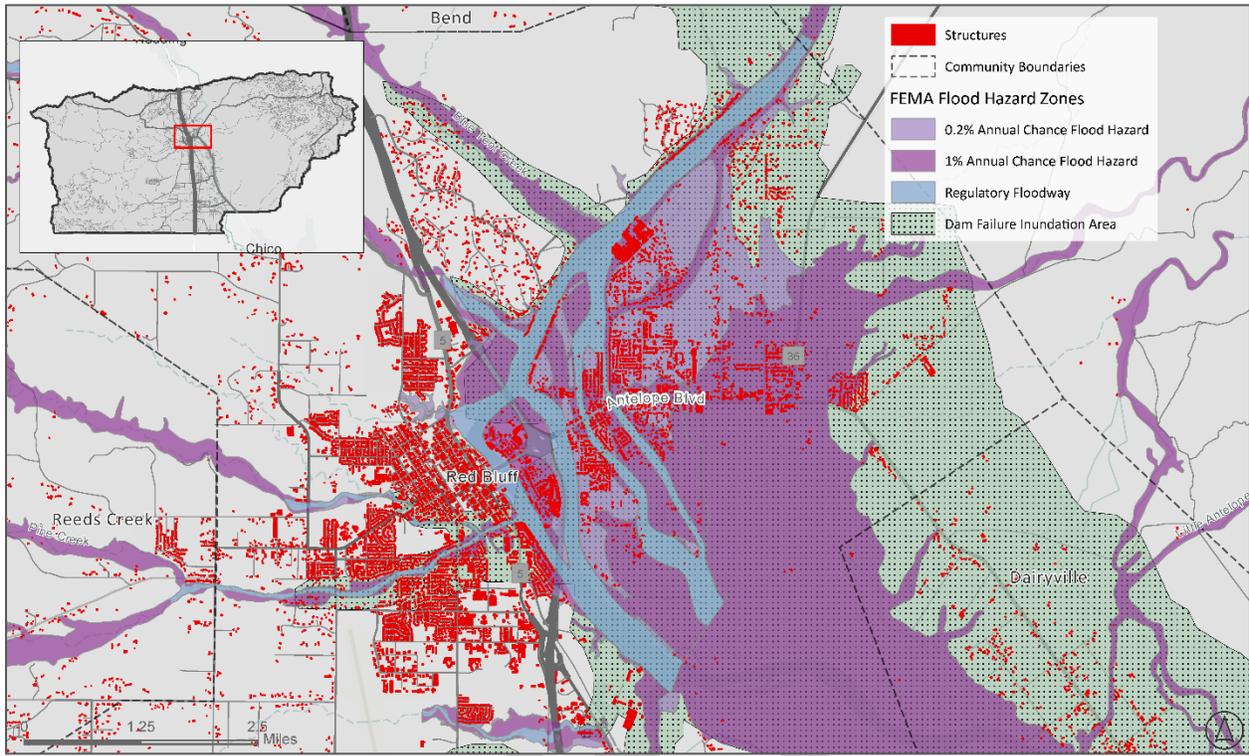


Figure 29 - Dairyville Flood Hazard Assessment (north)

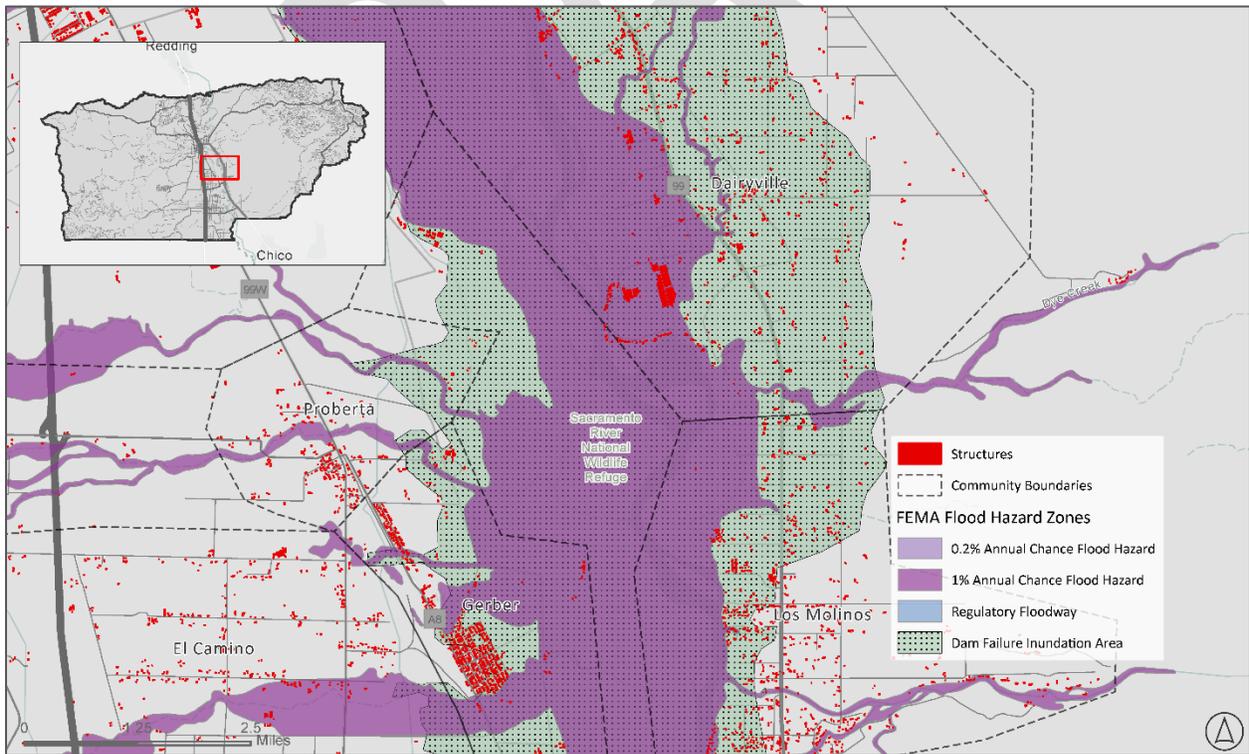


Figure 30 - Dairyville Flood Hazard Assessment (south)

GERBER

Gerber is a small town that sits on the north bank of Elder Creek, approximately two (2) miles west of the Sacramento River, encompassing the Las Flores community. The community is located between I-5 and SR 99. The main road is San Benito Avenue which provides a connection to the City of Tehama, Los Molinos and the I-5, which is approximately five (5) miles west. Gerber is surrounded by agricultural land and has the possibility of flooding due to its proximity to the Sacramento River. Gerber is in a Low Fire Hazard Severity Zone and has three (3) ingress-egress points. The evacuation area for Gerber is 2.37 square miles. The population of Gerber is 1,271 with roughly 435 households. The average household size is 2.92 and the median age in the town is 35.3. The average household income is \$52,441 and the average price of a home is \$211,875. Most people in the community commute approximately 20-24 minutes to work. 25.7% of people carpool to work, 3% walk to work and little to no people bike or take public transit.

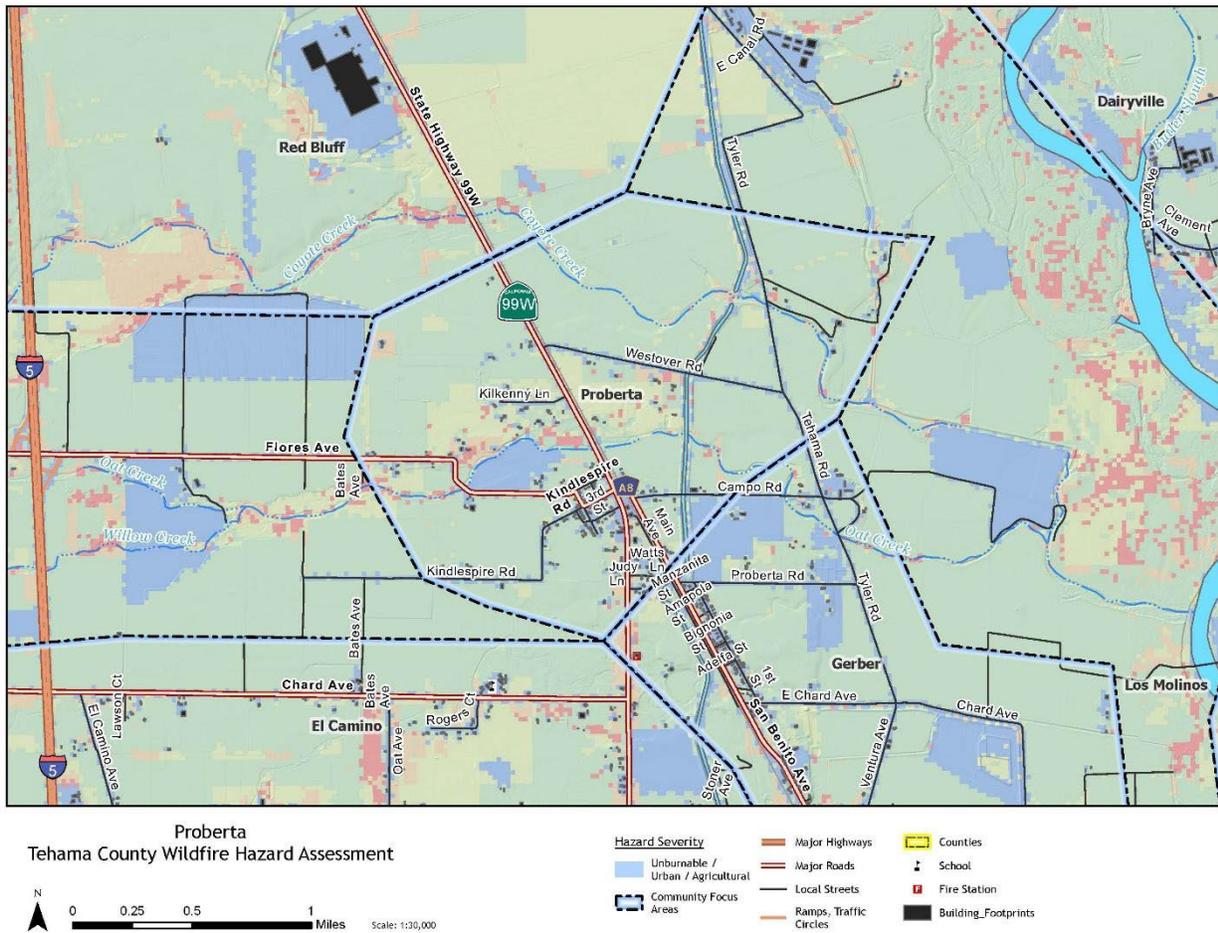


Figure 31 - Gerber Wildfire Hazard Assessment

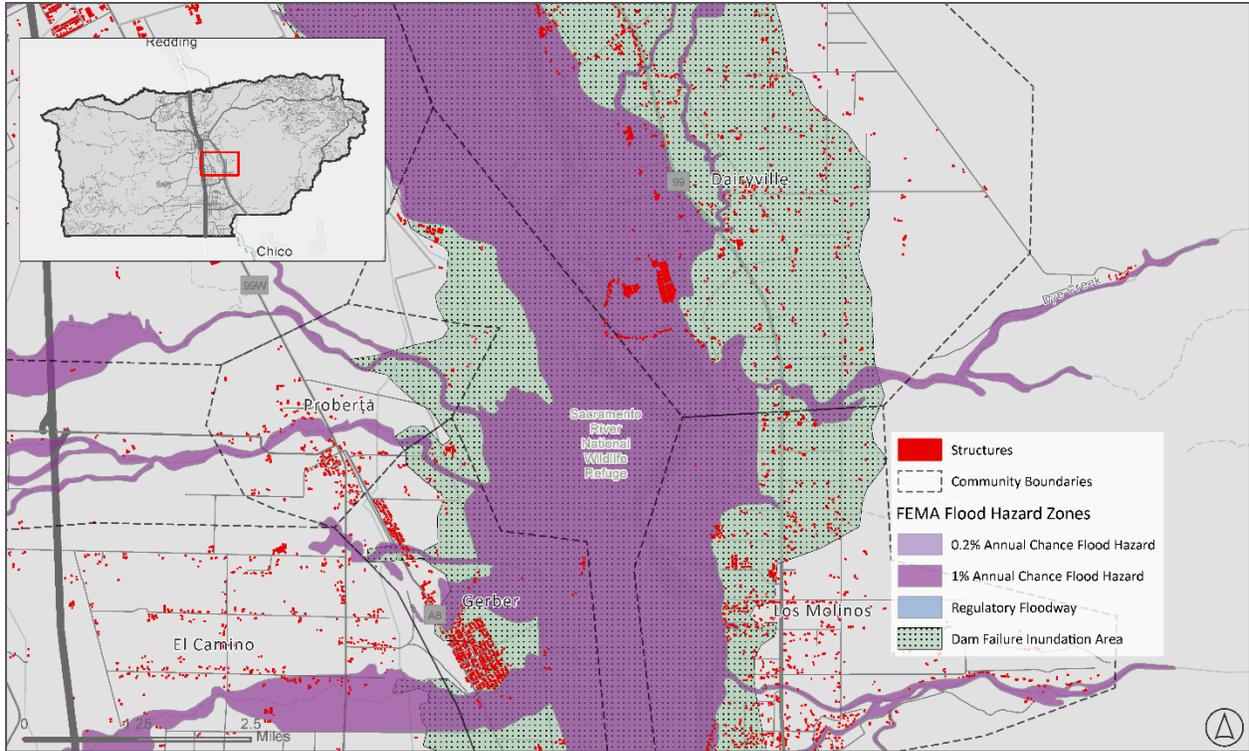


Figure 32 - Gerber Flood Hazard Assessment

## LOS MOLINOS

Los Molinos is located east of the Sacramento River and on the southwest foothills of the Lassen National Forest. The community is bisected by SR-99 and is approximately seven (7) miles from I-5. Mill Creek also flows through the community, forming a confluence to the Sacramento River. Los Molinos primarily consists of and is surrounded by large agricultural lots. The zoning in Los Molinos consists of mixed-use residential and agricultural land. Los Molinos is in a Low Fire Hazard Severity Zone and has three (3) ingress-egress points. The evacuation area for this area is 12.75 square miles. Aramayo Way in Los Molinos provides the City of Tehama with a vital connection to SR-99. Los Molinos is served by Tehama County Fire Station 10.

According to the United States Census, Los Molinos has a total population of 3,292 people with 1,322 housing units. The median age of Los Molinos residents is 45.8 and an average household size of 2.48. The average household income is \$57,699 and the average price of a home is \$274,879. Most people in the community commute approximately 20-24 minutes to work. 16.9% of people carpool to work, 0% of people bike, 2.1% walk, and 0.8% take public transit.

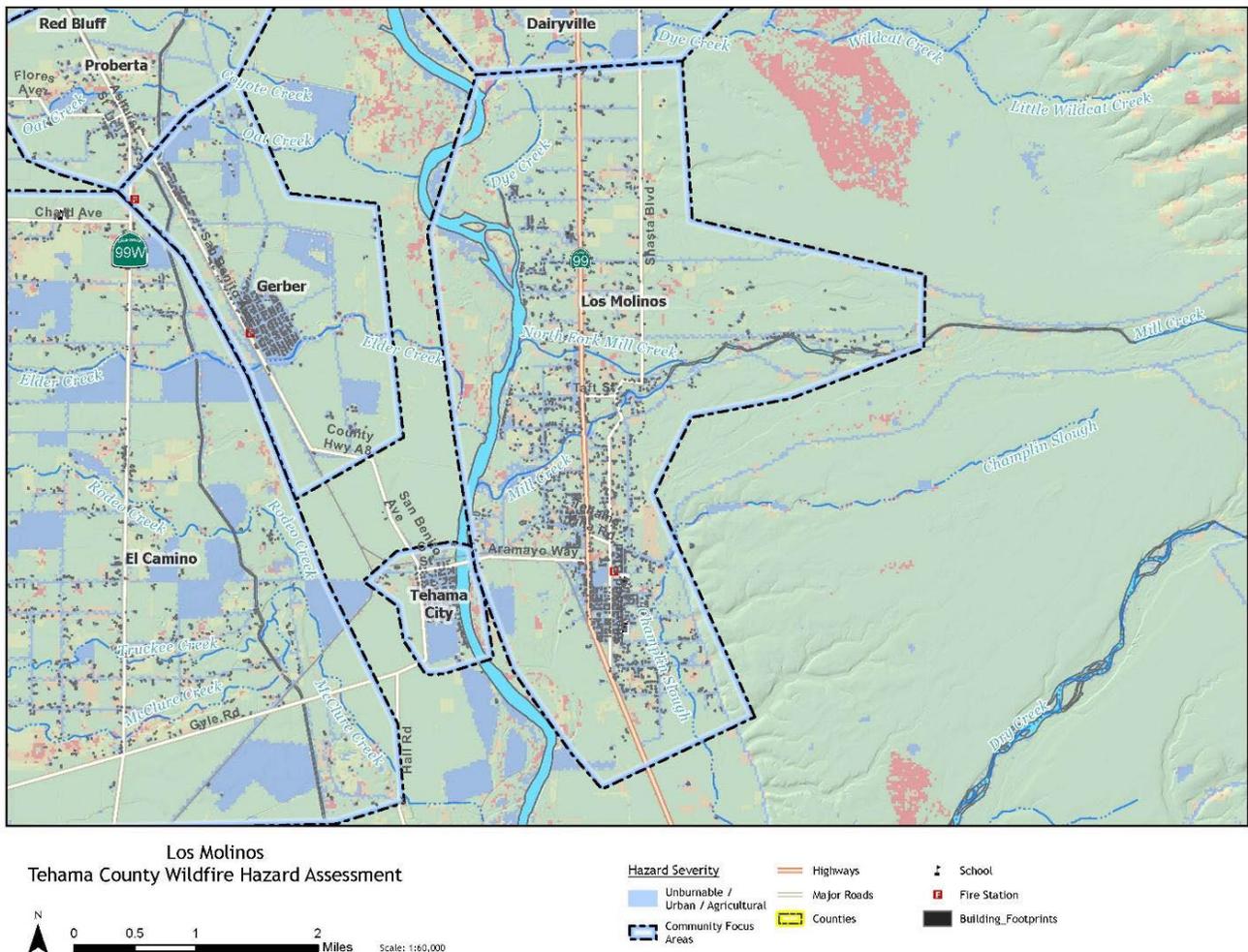


Figure 33 - Los Molinos Wildfire Hazard Assessment

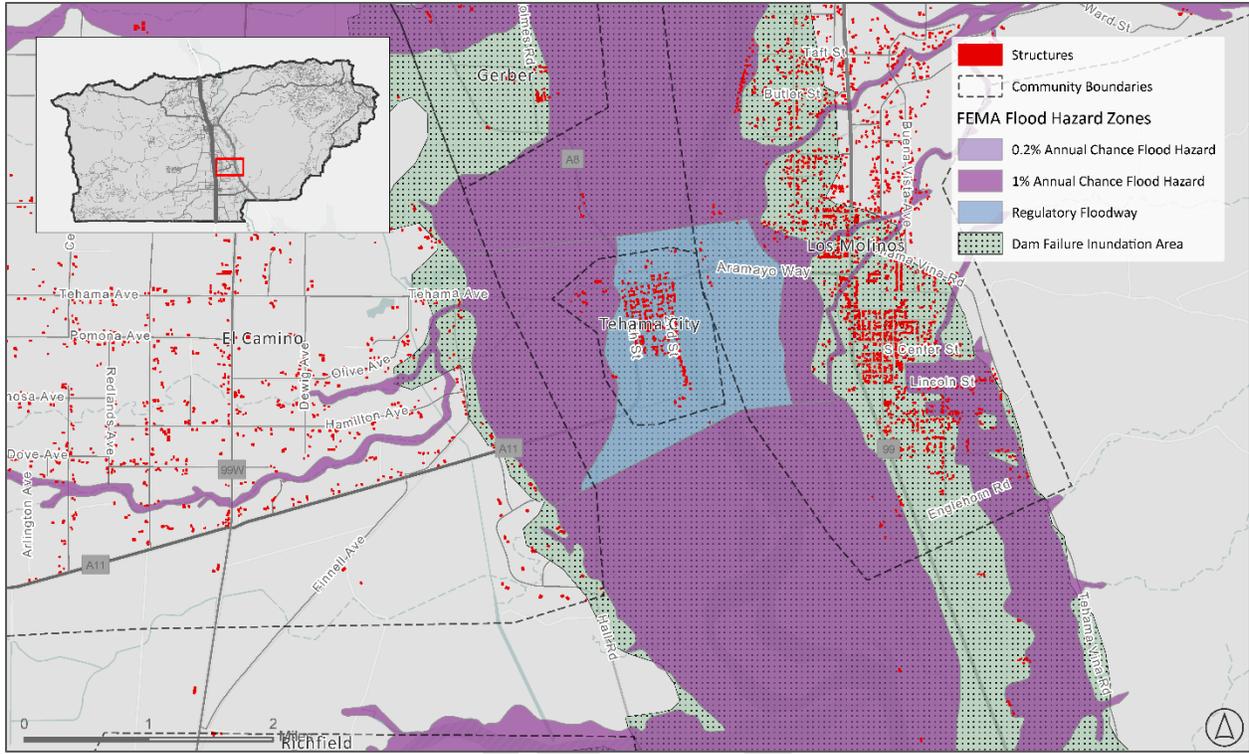


Figure 34 - Los Molinos Flood Hazard Assessment

PROBERTA

Proberta is southeast of Red Bluff and north of Corning, located between I-5 and SR 99. The community primarily consists of large agricultural areas with a dense housing area at the core and sparsely dispersed homes in the surrounding area. Proberta is located west of the Sacramento River and approximately two (2) miles east of I-5. The Town of Proberta is in a Low Fire Hazard Severity Zone and has four (4) ingress-egress points. The evacuation area for Proberta is 2.85 square miles. The population of Proberta is 80 people with approximately 30 households. The average household size is 2.67 and the median age is 42.2 years old. The average household income is \$67,177 and the average price of a home is \$383,333. Most people in the community commute approximately 20-24 minutes to work. 34.6 % drive alone to work, little to no people carpool, bike, walk or take public transit.

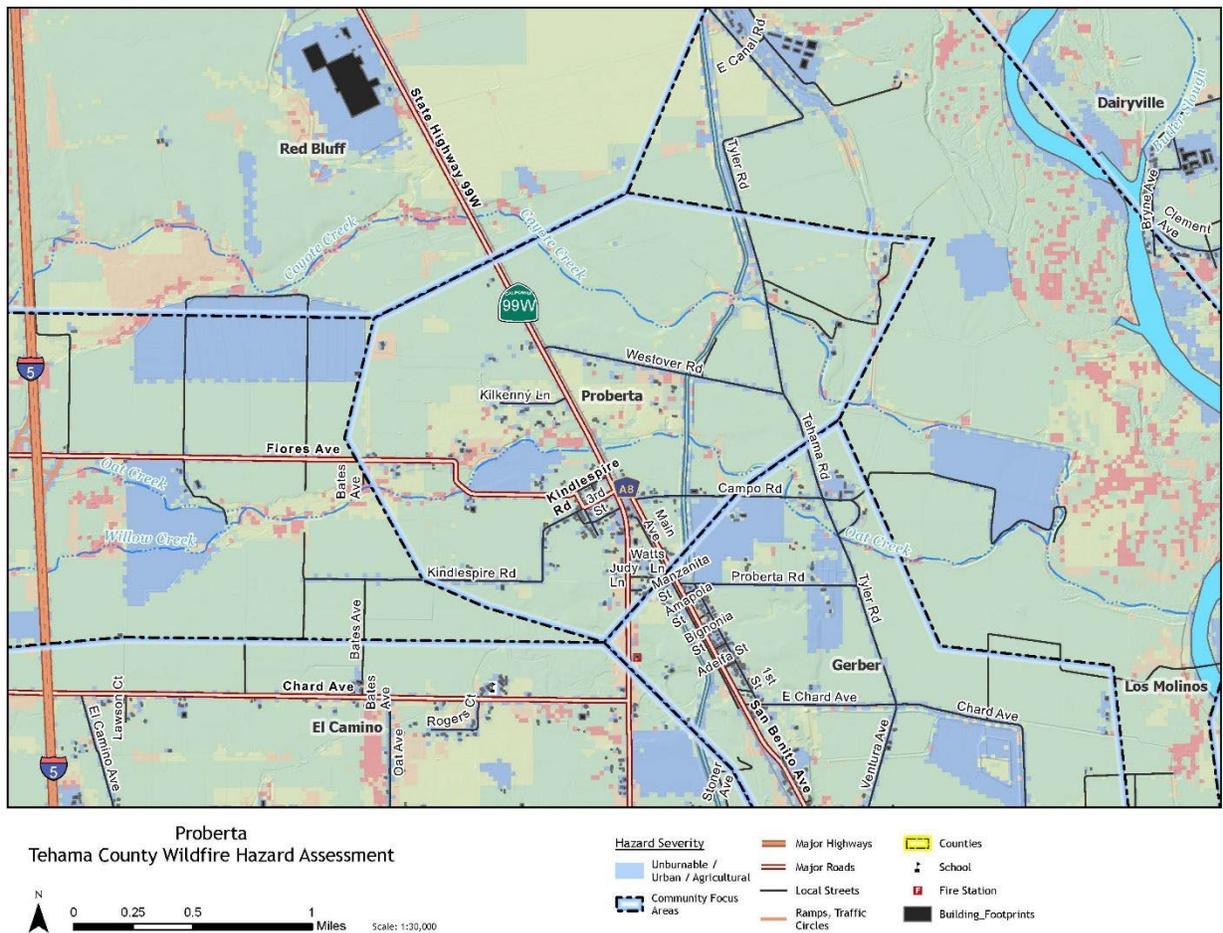


Figure 35 - Proberta Wildfire Hazard Assessment

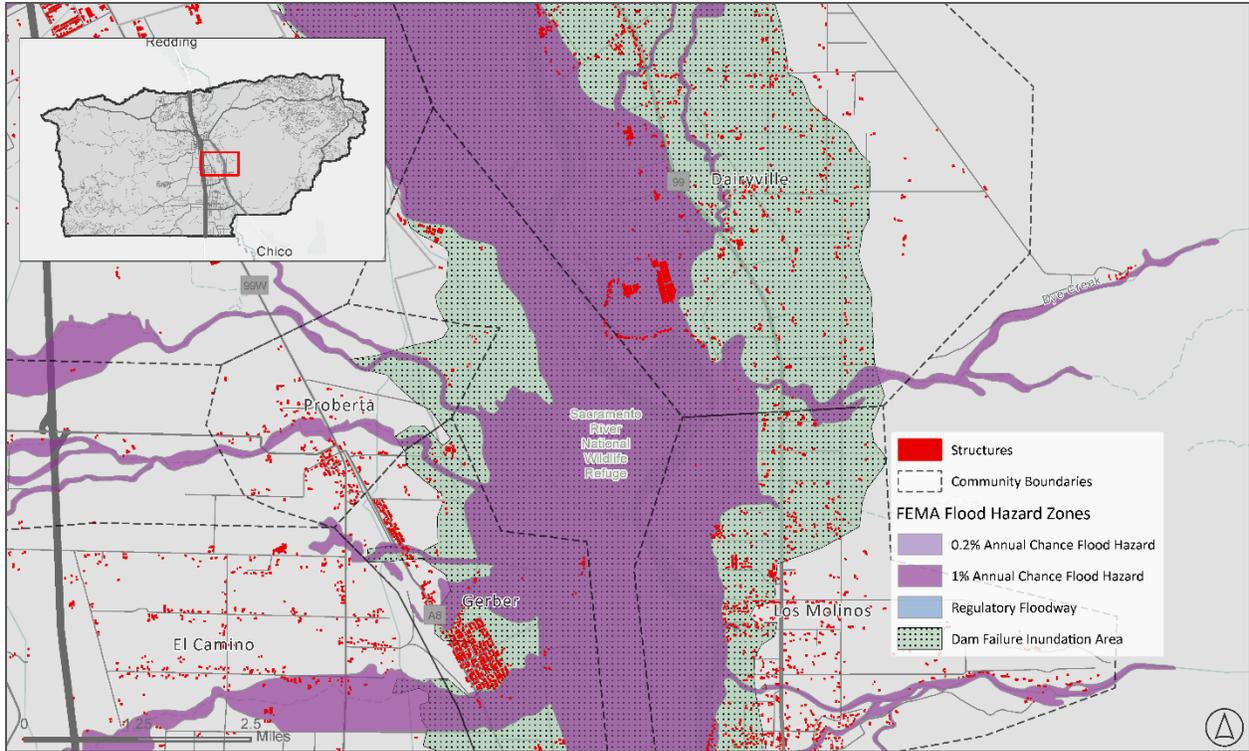


Figure 36 - Proberta Flood Hazard Assessment

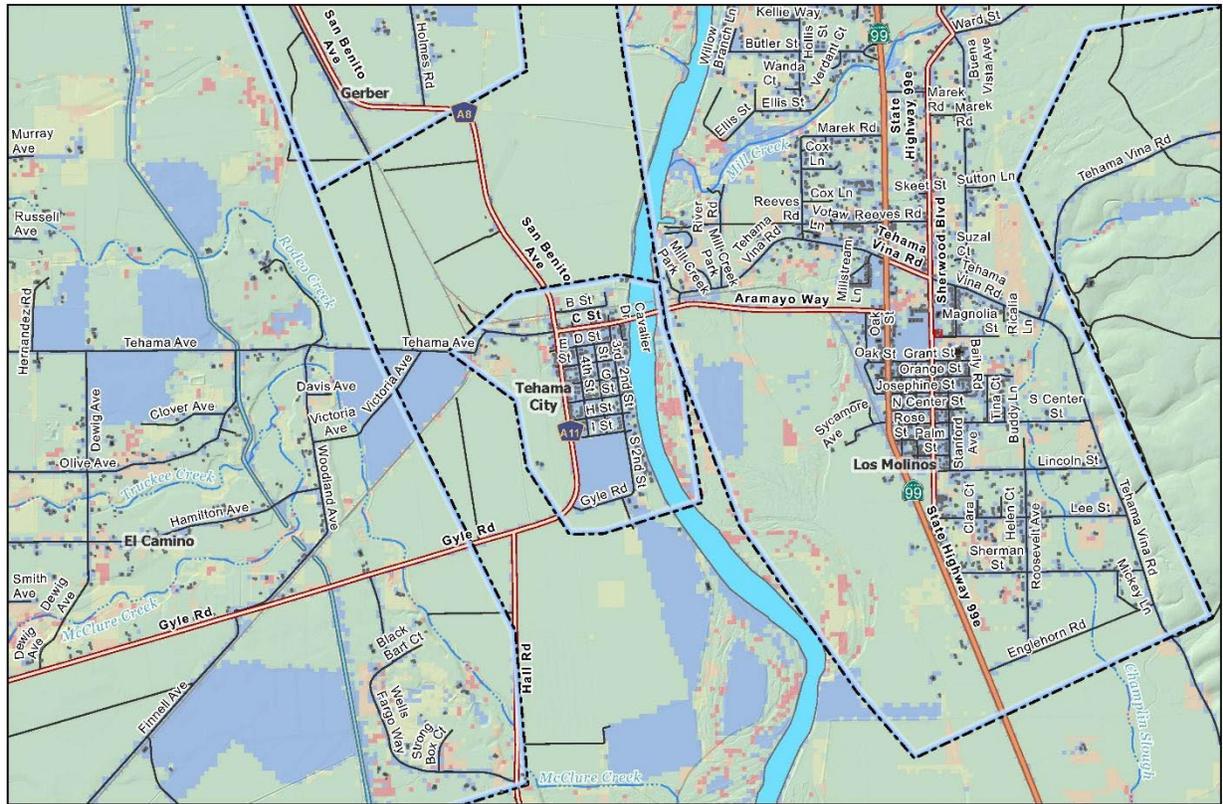
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## CITY OF TEHAMA

The City of Tehama is a small town located west of the Sacramento River and Los Molinos. Many houses here are pile dwellings, which are homes required to be raised on stilts to avoid flood damage. Flooding is a primary concern, however, due to building requirements and mitigation measures, this area is more resilient than most. The City of Tehama is in a Low Fire Hazard Severity Zone. The main street in Tehama is C Street and it serves as a connector street to SR-99 and I-5. The evacuation area for the City of Tehama is 0.75 square miles. The population is 402 people with around 168 households. The average household size is 2.39 and the median age in the town is 42.7 years old. The average household income is \$45,057 and the average price of a home is \$360,000. Generally, people in the community commute approximately 10-14 minutes to work, 8.7% carpool to work, 3.9% take public transit, 1% walk, and 0% of people bike.

Key evacuation route considerations for the City of Tehama:

- Proximity to I-5
- Medium number of access points per population
- Medium number of structures
- Low fire risk
- C Street was identified in the evacuation modeling as potentially having congestion in an evacuation
- Tehama Avenue was identified in public outreach as a road that had previously been unusable due to a natural event.
- C Street / 5<sup>th</sup> Avenue was identified as a potential pinch point where evacuation routes converge



Tehama City  
Tehama County Wildfire Hazard Assessment



Figure 37 -City of Tehama Wildfire Hazard Assessment

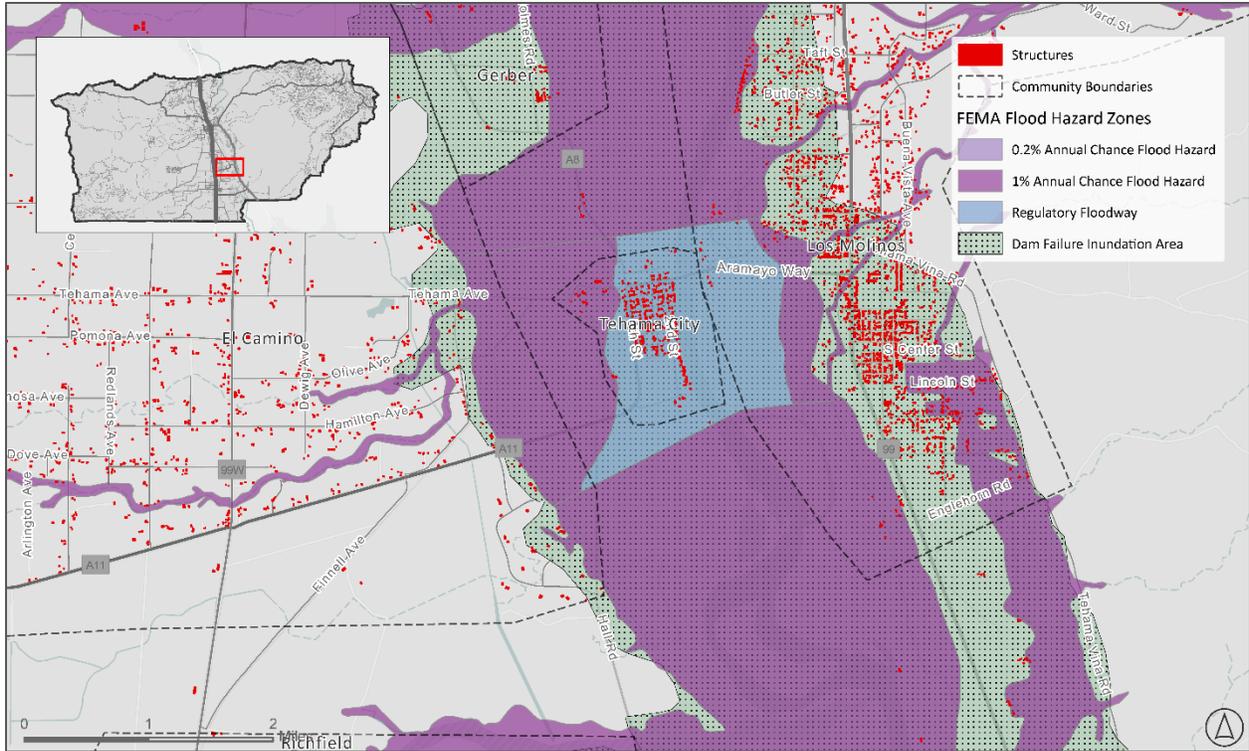


Figure 38 - City of Tehama Flood Hazard Assessment

DRAFT

CAPAY

Capay is a small rural agricultural community that is bisected by the County boundary line of Glenn and Tehama County. The community is located west of the Sacramento River, approximately eight (8) miles east of I-5 and north of SR-32. Homes and businesses are dispersed in this area with many agricultural fields scattered throughout. Capay is in a Low Fire Hazard Severity Zone and has four (4) ingress-egress points. The evacuation area for Capay is 11 square miles. The population of Capay is 482 people with roughly 382 households. The average household size is 2.32 and the median age in the town is 41.3. The average household income is \$83,344 and the average price of a home is \$400,000. Most people in the community commute approximately 30-34 minutes to work. 5.7% of people carpool to work, 2.1% walk and little to no people bike or take public transit.

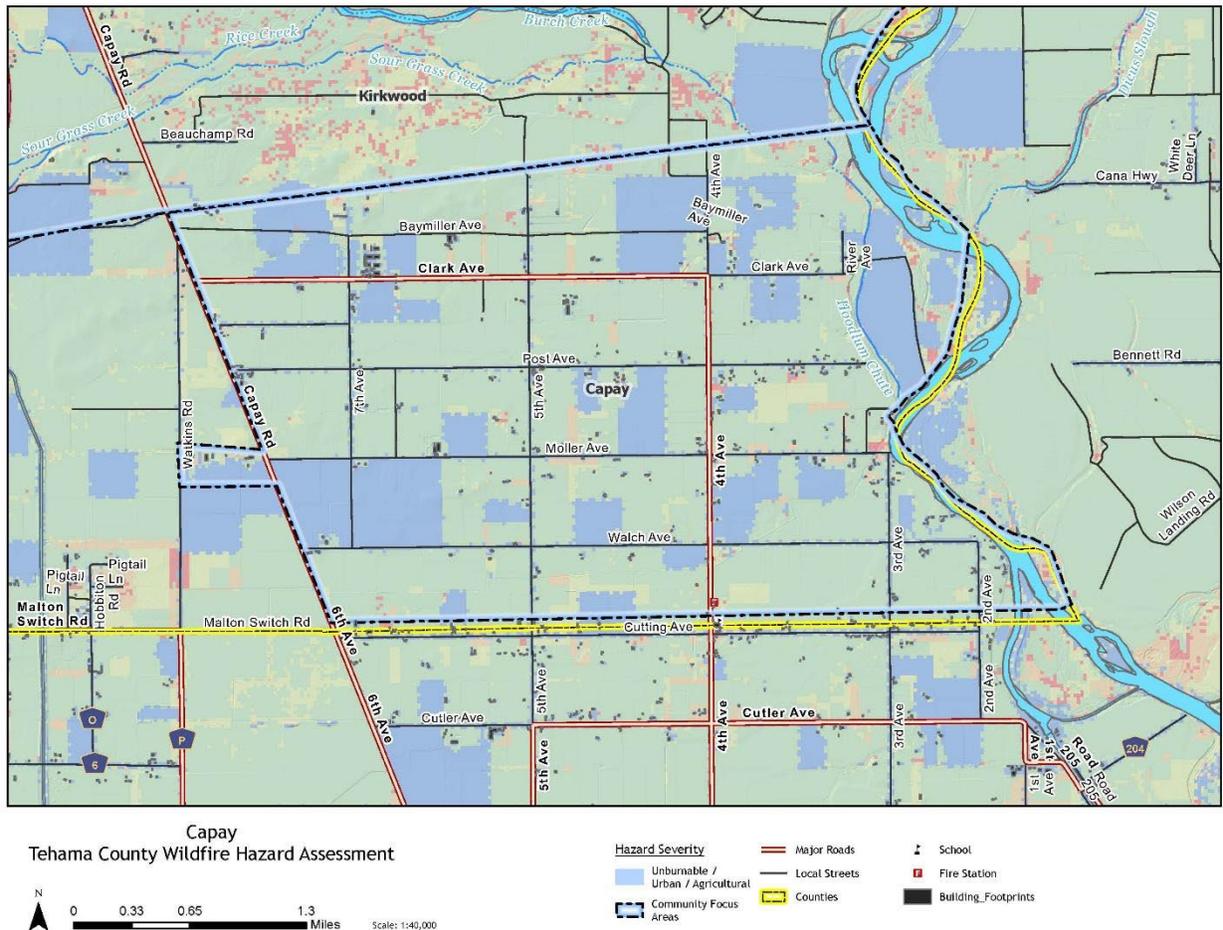


Figure 39 - Capay Wildfire Hazard Assessment

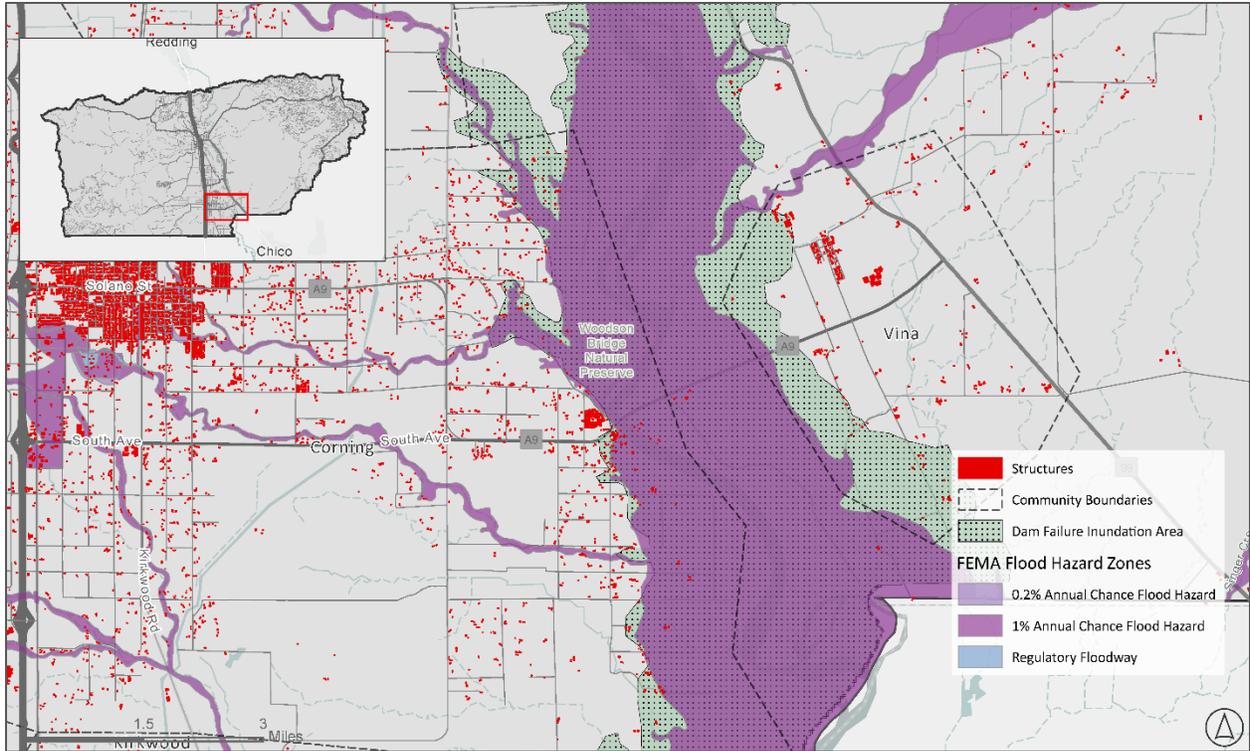


Figure 40 - Kirkwood Flood Hazard Assessment

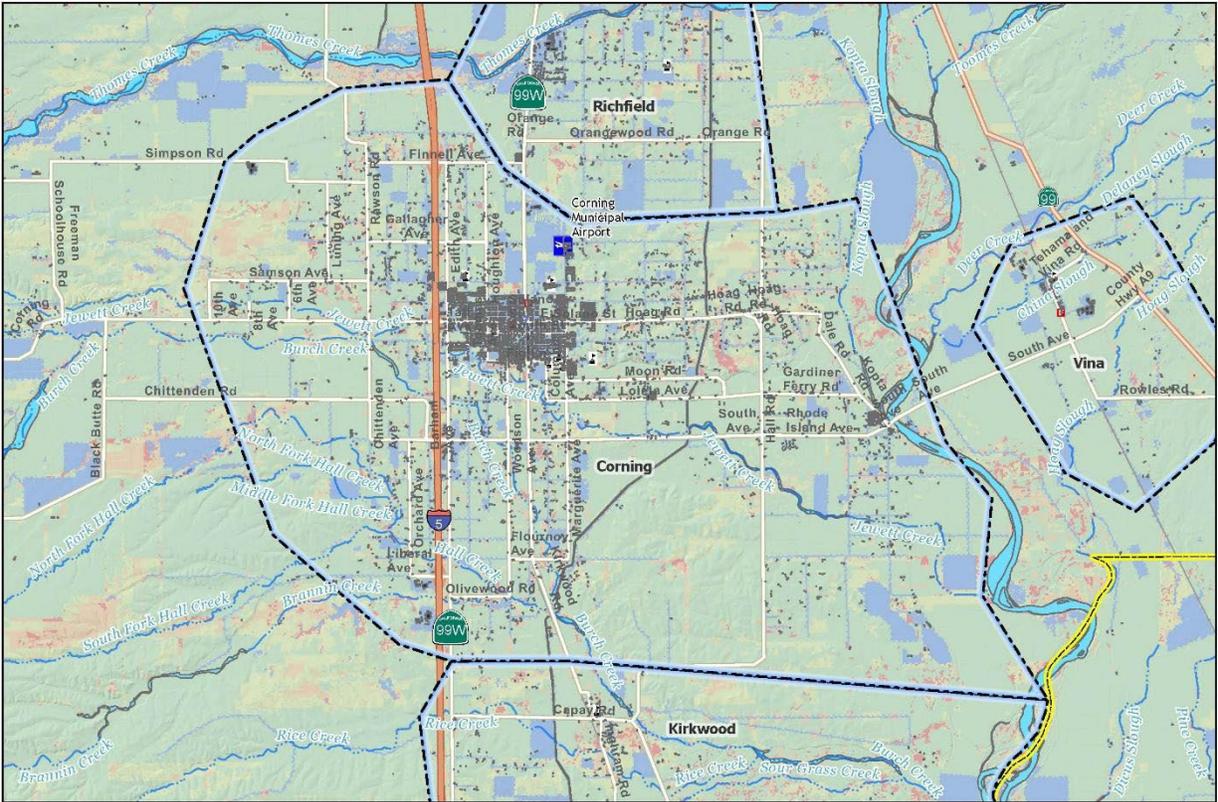
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## CORNING

The City of Corning is bisected by I-5 and west of the Sacramento River. There is an I-5 entrance and exit ramp directly in Corning that provide access to Solano Street and Corning Road. Corning primarily consists of agricultural fields that produce olives, plums, walnuts, and almonds. The City also contains the Paskenta Tribe of Nomlaki Indians Rancheria. Corning is in a Low Fire Hazard Severity Zone and has four (4) ingress-egress points. Corning had a small fire in 2007. The evacuation area for Corning is 54.97 square miles. The population of Corning is 13,447 people with around 4,712 households. The average household size is 2.85 and the median age in the town is 33.8 years old. Corning is one of the more populous locations in Tehama County. The average household income is \$58,379 and the average price of a home is \$273,940. Most people in the community commute approximately 5-9 minutes to work. 13.3% of people carpool to work, 1.3% walk, 0.8% take public transit and little to no people bike.

Key evacuation route considerations for Corning:

- High number of residents and number of access points per population
- High number of structures
- Low Fire Hazard Priority
- Several roadways identified in Fleet as potential pinch points in an evacuation (Solano Street and South Avenue)
- Potential Pinch Points
- Corning Road / West Side Highway
- Corning Road / Houghton Avenue
- E Solano Street / Kirkwood Road



Corning  
Tehama County Wildfire Hazard Assessment



- |                                   |             |                 |                     |
|-----------------------------------|-------------|-----------------|---------------------|
| <b>Hazard Severity</b>            | Interstates | Counties        | Airport             |
| Unburnable / Urban / Agricultural | Highways    | School          | Building Footprints |
| Community Focus Areas             | Major Roads | Fire Station    |                     |
|                                   | Ramps       | Law Enforcement |                     |

Figure 41 - Corning Wildfire Hazard Assessment

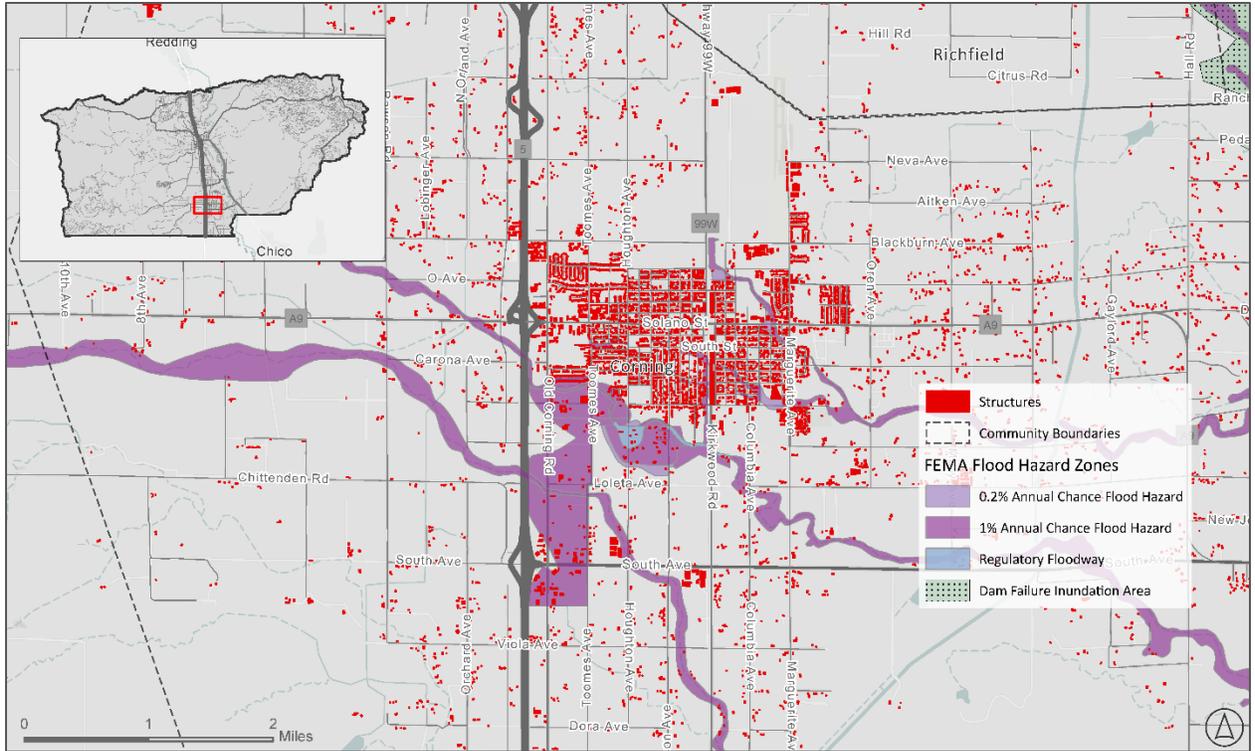


Figure 42 - Corning Flood Hazard Assessment

## RICHFIELD

Richfield is a small community located alongside SR-99. It is about five (5) miles away from I-5 and has two (2) ingress-egress points. It is located on the southern bank of Thomes Creek, which is a confluence of the Sacramento River. The area surrounding Richfield is primarily agricultural fields. There is a risk of flooding due to its proximity to the Sacramento River and Thomes Creek. Richfield is in a Low Fire Hazard Severity Zone. The evacuation area for Richfield is 9.7 square miles. The population of Richfield is 916 people with around 321 households. The average household size is 2.85 and the median age in the town is 39.5 years old. The average household income is \$79,264 and the average price of a home is \$314,286. Most people in the community commute approximately 30-34 minutes to work. 9.8% of people carpool to work, 1.1% of people walk, and little to no people bike or take public transit.

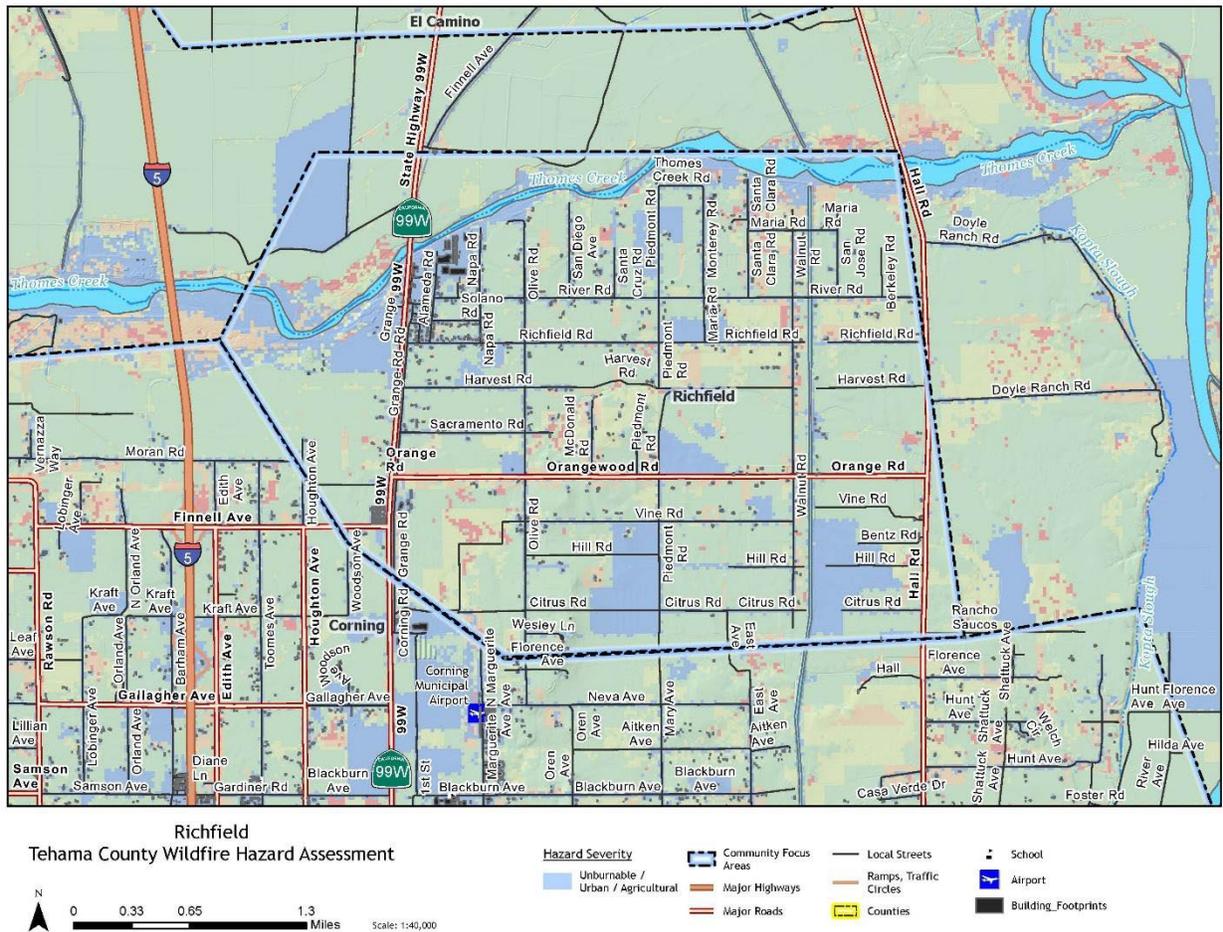


Figure 43 - Richfield Wildfire Hazard Assessment

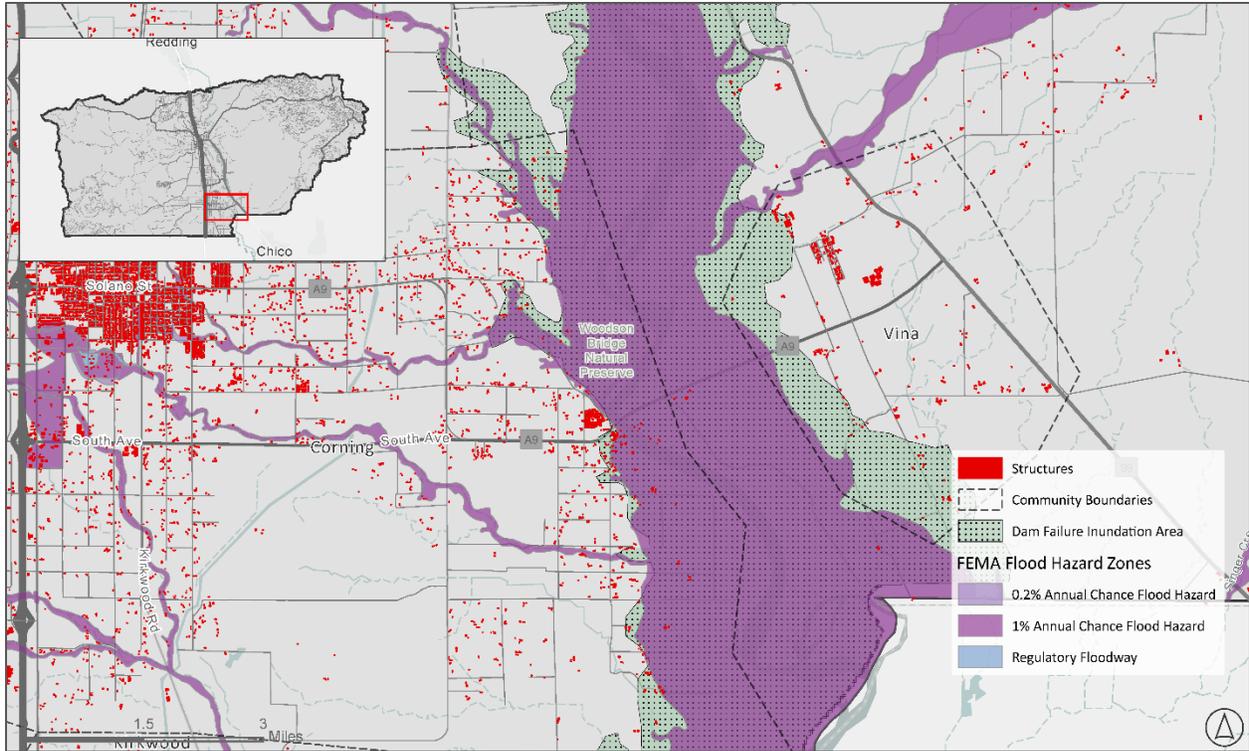


Figure 44 - Richfield Flood Hazard Assessment

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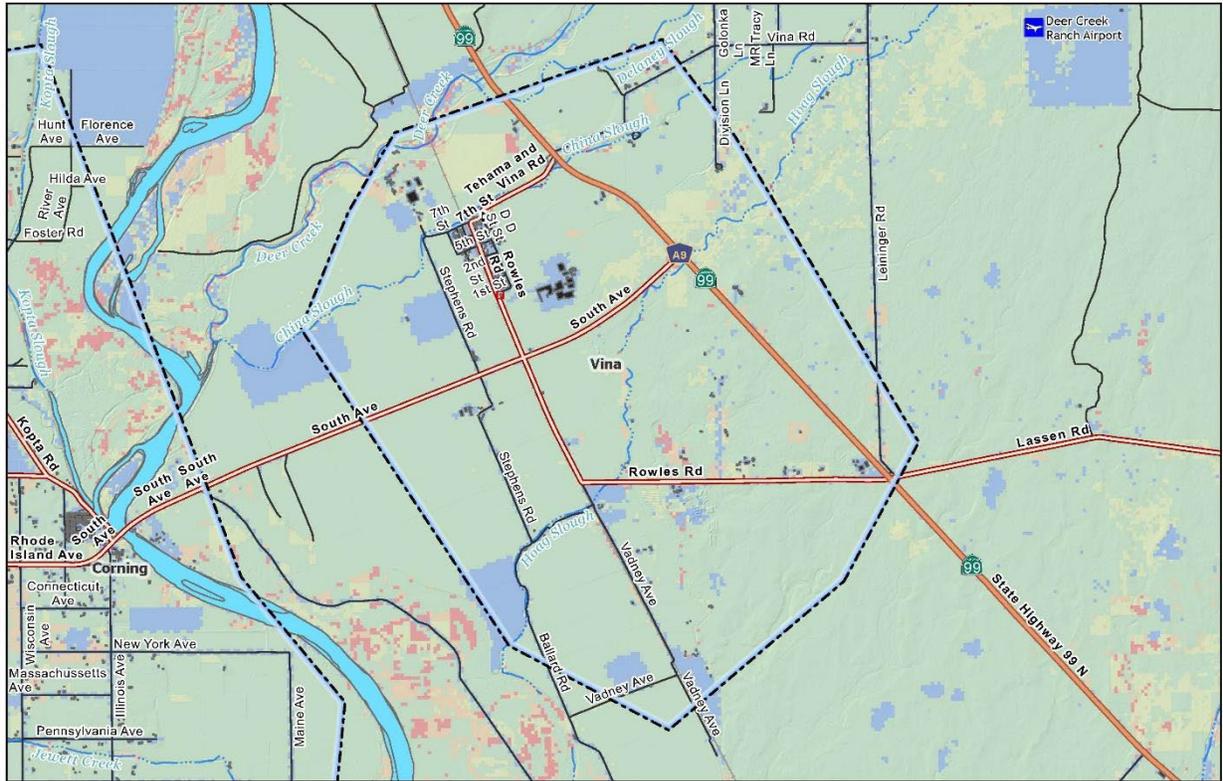
## VINA

Vina is a small community located in Tehama County, south of Red Bluff. Vina lies to the east of the Sacramento River, with SR-99 to the west, and it is located approximately eight miles from the I-5 freeway. This region is predominantly characterized by dense agricultural activities, encompassing extensive fields and vineyards. Although Vina is not immediately adjacent to major water bodies, it is situated in the vicinity of the Sacramento River, which has experienced localized flooding because of heavy rainfall and storm events in the past. Vina is also a low-lying flat area that has flooded and is likely to flood in the future. Such flooding incidents may necessitate evacuations to safeguard the well-being of residents.

In terms of fire risk assessment, Vina is designated as being in a Low Fire Hazard Severity Zone. The community has three accessible ingress and egress points, contributing to enhanced mobility and safety. Additionally, Vina is near the CAL FIRE Vina Helitack Base, which is located on SR-99. The presence of Tehama County Fire Station 16 in proximity augments firefighting capabilities. The Nature Fire incident in 2003 serves as a reminder of the importance of preparedness in the face of potential fire hazards.

The demarcated evacuation area for Vina spans 8.38 square miles. The community's population comprises approximately 311 individuals, distributed across roughly 106 households. The average household size is 2.86, and the median age within the community stands at 45.1 years. The average household income is reported as \$80,261, with the typical home price averaging \$436,667. As for commuting patterns, most residents report an average travel time of 20-24 minutes to reach their workplaces. Carpooling is a prevalent mode of commuting, with 28.6% of residents choosing this option, while 8.7% opt to walk. Biking and public transit are relatively less utilized for commuting purposes.

Vina strategically aligns along SR-99, offering multiple points of access and relatively lower fire risk. Nonetheless, the potential for flooding due to the proximity of the Sacramento River remains a significant consideration, particularly considering the increasing frequency of extreme flooding events linked to climate change. A commitment to preparedness, awareness of evacuation plans, and effective communication with local authorities is integral to ensuring the safety and well-being of Vina's residents.



Vina  
Tehama County Wildfire Hazard Assessment



- |                                   |               |                        |                     |
|-----------------------------------|---------------|------------------------|---------------------|
| <b>Hazard Severity</b>            | Highways      | Ramps, Traffic Circles | Fire Station        |
| Unburnable / Urban / Agricultural | Major Roads   | Counties               | Airport             |
| Community Focus Areas             | Local Streets | School                 | Building Footprints |

Figure 45 - Vina Wildfire Hazard Assessment

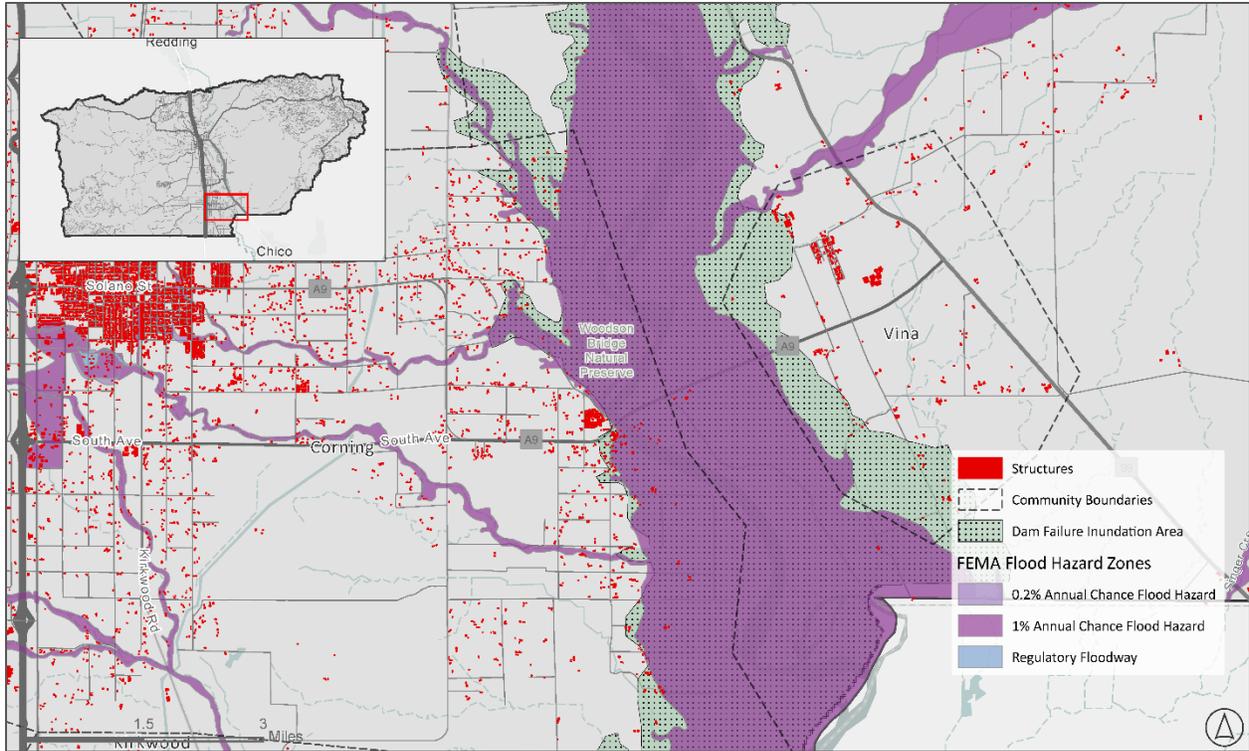


Figure 46 - Vina Flood Hazard Assessment

## KIRKWOOD

Kirkwood is a small town south of Corning and east of I-5. The main roads in Kirkwood are Kirkwood Road, Capay Road, and Inghram Road. Kirkwood is primarily an agricultural town with sparsely dispersed rural homes. Kirkwood is in a Low Fire Hazard Severity Zone and has four (4) ingress-egress points. In 2007, Kirkwood experienced the Conner Fire. The evacuation area for Kirkwood is 16.05 square miles. The population of Kirkwood is 407 people with around 128 households. The average household size is 3.18 and the median age in the town is 39.5. The average household income is \$61,129 and the average price of a home is \$425,862. Most people in the community drive around 30-34 minutes to work. 3.9% of people carpool to work, 1% walk and little to no people bike or take public transit.

This community is located between I-5 and SR 99. In general, communities in this area have low populations, low fire risk, and multiple access points.

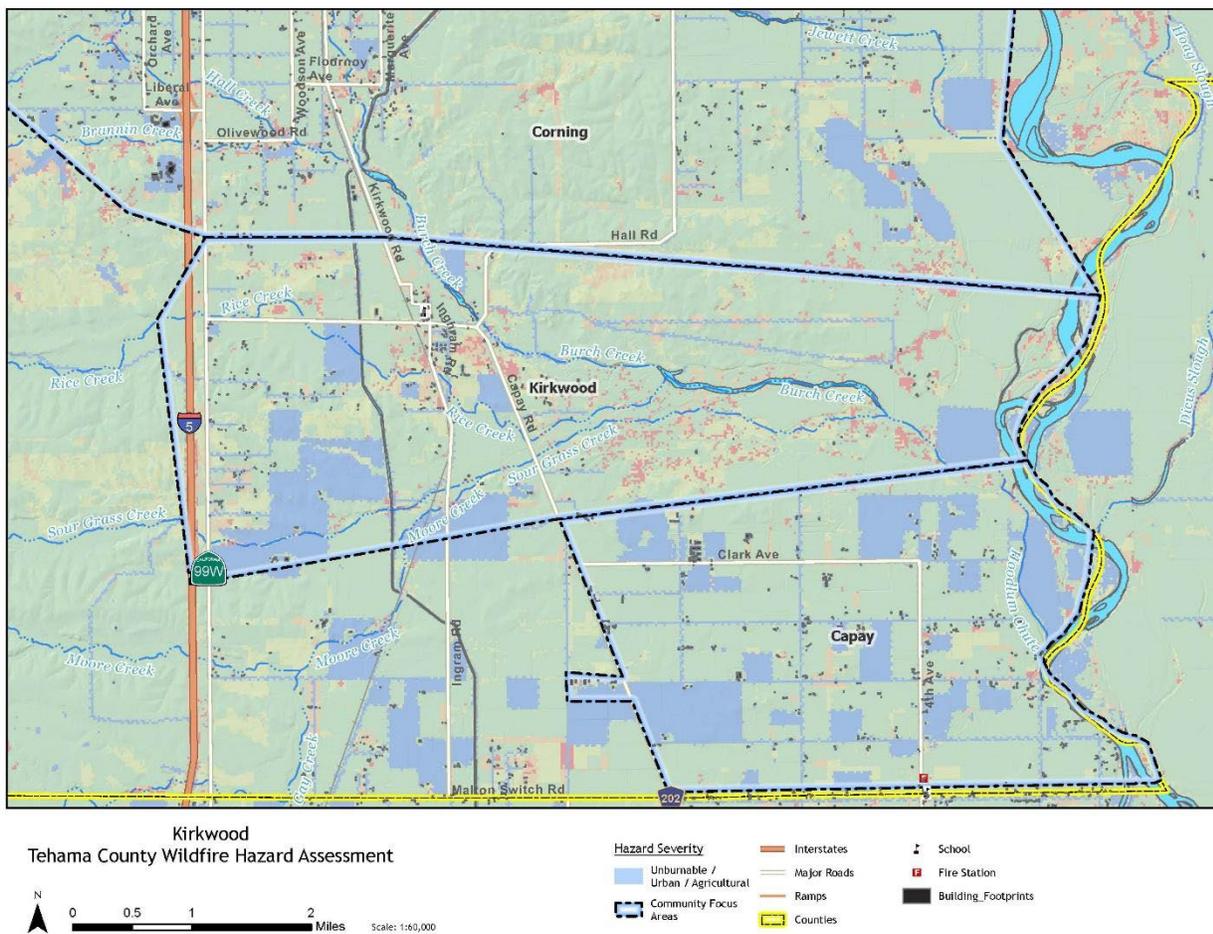


Figure 47 - Kirkwood Wildfire Hazard Assessment

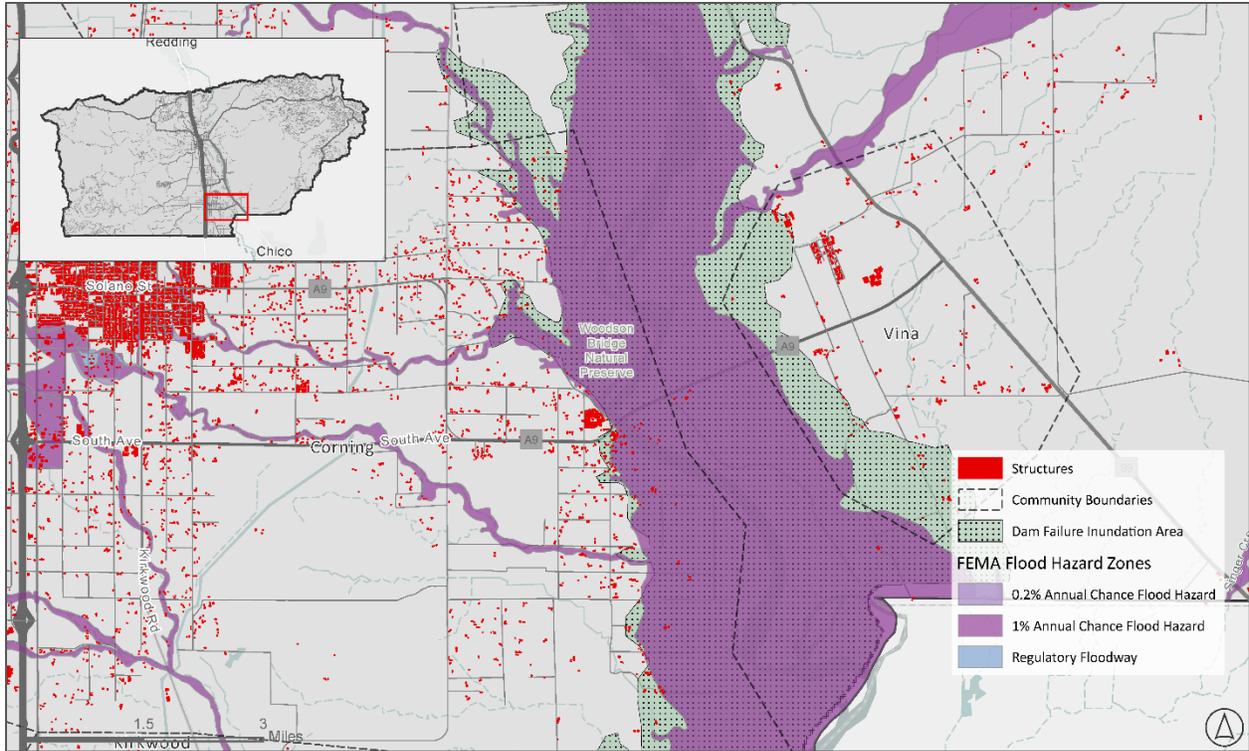


Figure 48 - Kirkwood Flood Hazard Assessment

## FLOURNOY

The town of Flournoy is west of the City of Corning and is approximately 17 miles west of I-5. The town is bisected by Thomes Creek and is primarily served by Corning Road and Paskenta Road. Flournoy is in the foothills of the Mendocino National Forest and is primarily an Oak Woodland Forest. Flournoy is a High Fire Hazard Severity Zone and has three (3) ingress-egress points. This area experienced the Paskenta Fire in 2016. The evacuation area for Flournoy is 6.73 square miles. The population of Flournoy is 125 people with around 49 households. The average household size is 2.14 and the median age in the town is 47.5. The average household income is \$38,628 and the average price of a home is \$325,000. Most people in the community commute approximately 15-19 minutes to work. 4.0% of people carpool to work, 4.0% walk to work and little to no people bike or take public transit.

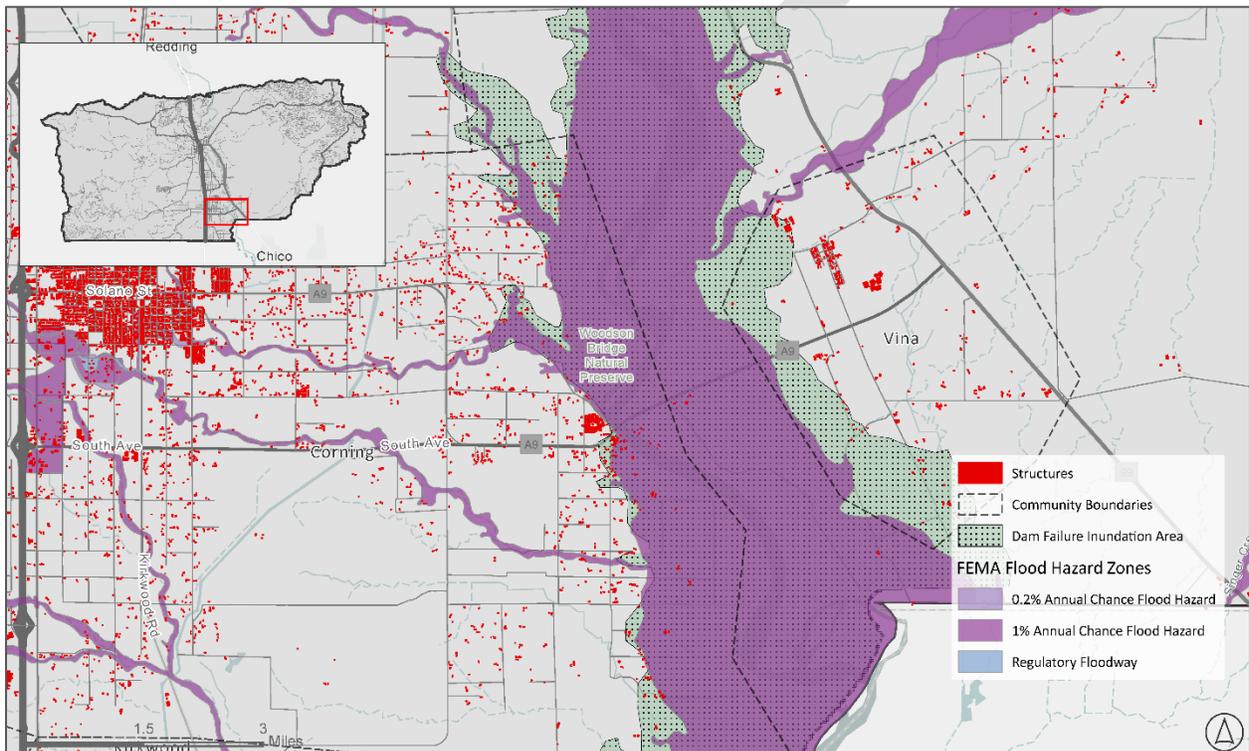
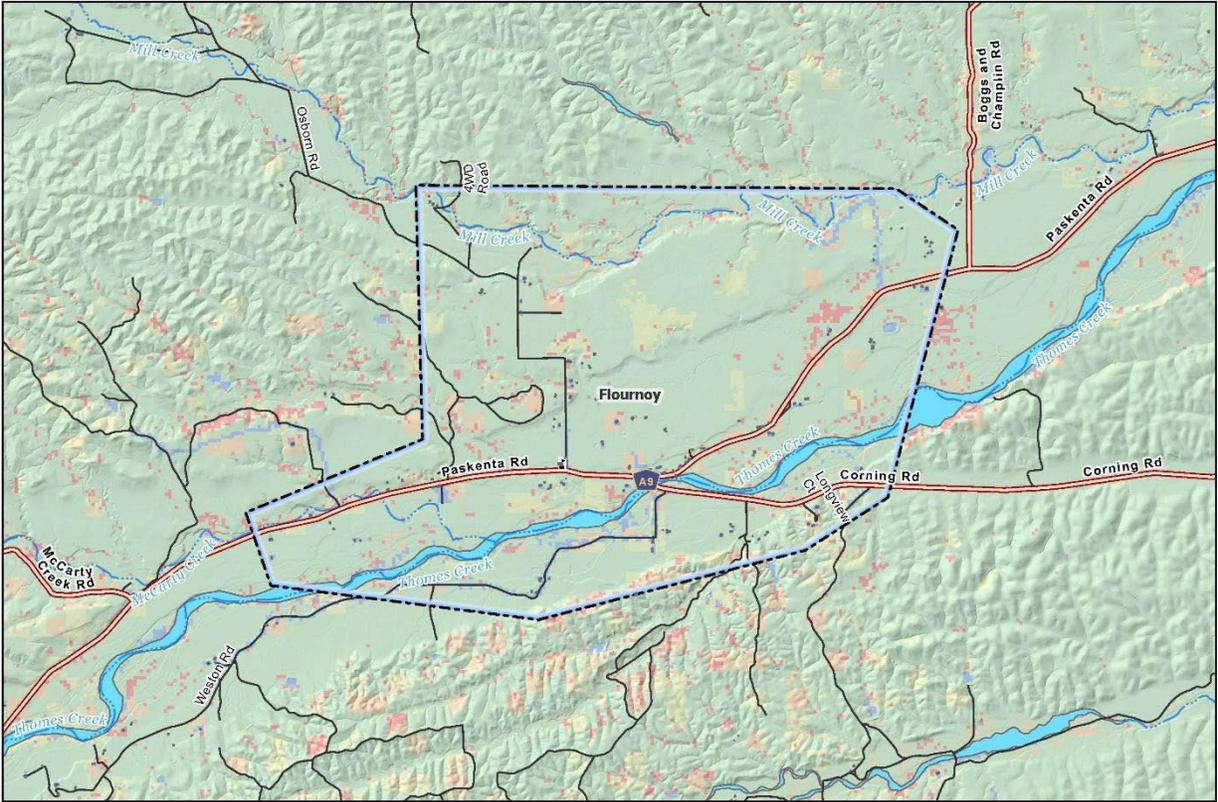


Figure 49 - Flournoy Flood Hazard Assessment



Flournoy  
Tehama County Wildfire Hazard Assessment



- |                                   |                       |                     |
|-----------------------------------|-----------------------|---------------------|
| <b>Hazard Severity</b>            | Community Focus Areas | Counties            |
| Unburnable / Urban / Agricultural | Major Roads           | School              |
|                                   | Local Streets         | Building Footprints |

Figure 50 - Flournoy Wildfire Hazard Assessment

## PASKENTA

The town of Paskenta is bisected by Thomes and Digger Creeks and is primarily served by SR-55 and SR-122. Paskenta is 19 miles away from I-5 and is in the foothills of the Mendocino National Forest. The town contains the CAL FIRE Paskenta Station, and the Paskenta Station of the Mendocino National Forest. Paskenta is in a High Fire Hazard Severity Zone and has four (4) ingress-egress points. Historically, Paskenta experienced the Whiskey Fire in 2008 and the Paskenta Fire in 2016. The evacuation area for Paskenta is 0.59 square miles. The population of Paskenta is 97 people with approximately 36 households. The average household size is 2.28 and the median age is 47.5 years old. The average household income is \$38,857 and the average price of a home is \$375,000. Most people in the community commute approximately 30-34 minutes to work. 5.3% of people carpool to work and little to no people bike, walk or take public transit.

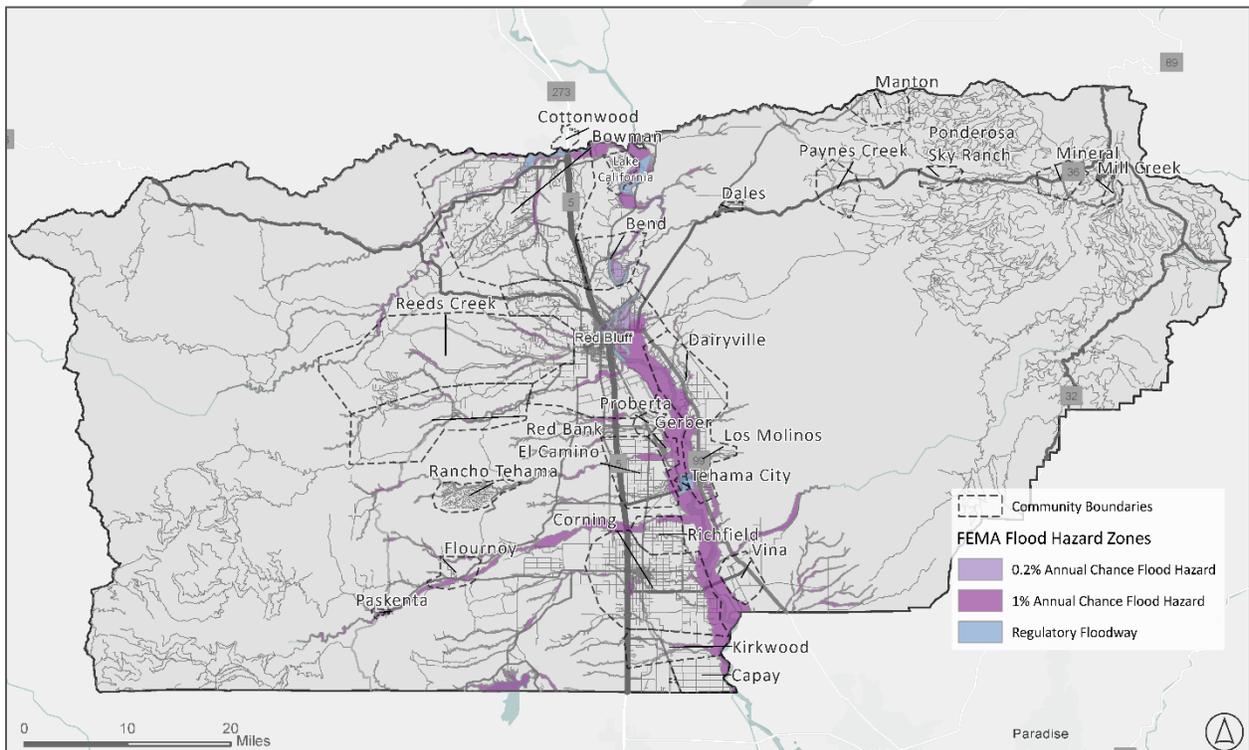


Figure 51 - Paskenta Flood Hazard Assessment

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## RANCHO TEHAMA

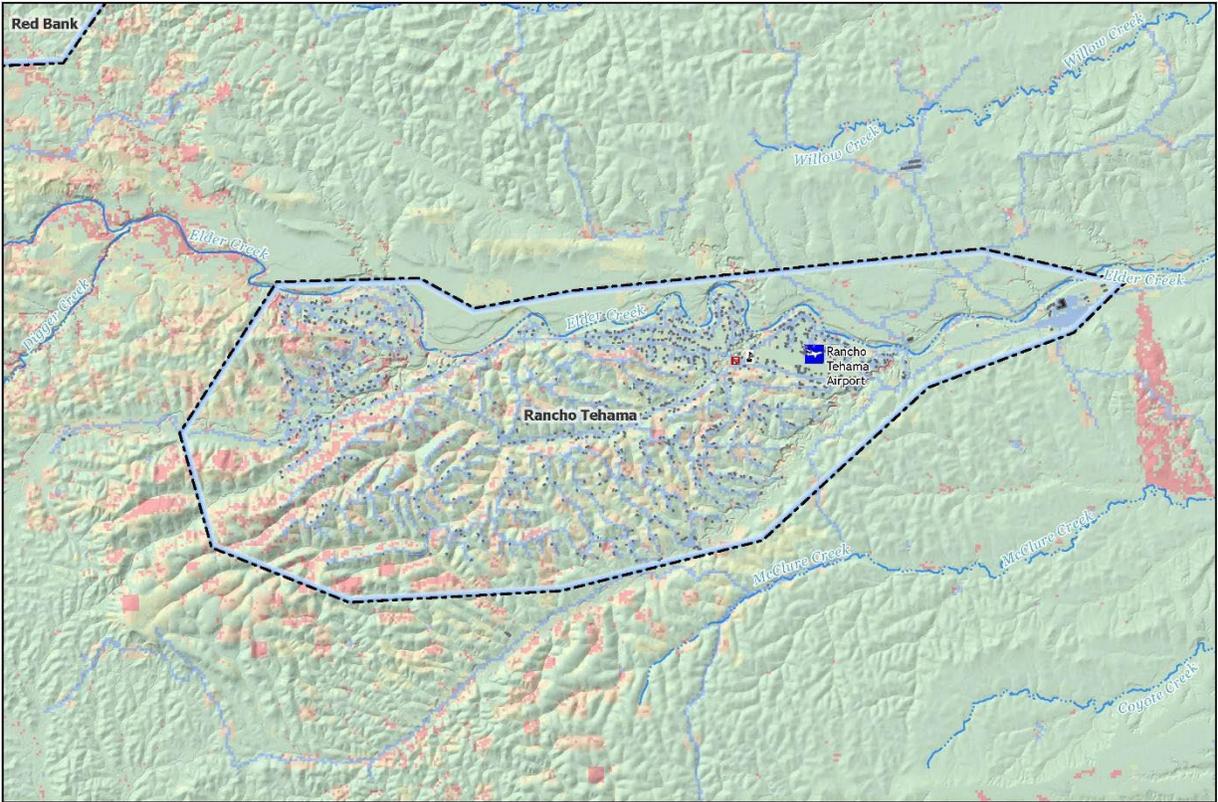
Rancho Tehama is a private, unincorporated rural community approximately 16 miles west of I-5 and southwest of Red Bluff. Rancho Tehama is north of Black Butte Recreation Area, east of the Mendocino National Forest and west of the Sacramento River. Rancho Tehama consists of seasonal Elder Creek, Oak and Pine tree vegetation. It is a private subdivision with views of Mt. Shasta, Lassen and diverse wildlife. It contains an airstrip that can serve as a potential area for emergency personnel staging. Rancho Tehama also consists of both recreational and commercial areas. The community consists of sparsely dispersed homes and some residents utilize the land to farm crops such as olives, walnuts or almonds.

Rancho Tehama is in a Very High Fire Hazard Severity Zone. Rancho Tehama experienced the Rancho Fire in 2022. There are only two (2) ingress-egress points in this community, making it a highest-priority. The main ingress-egress points are Rancho Tehama Road and Oak Ridge Road, with Stagecoach Road serving as a supplemental ingress-egress point. The community has an existing evacuation plan that outlines three (3) safety zones (Figure 33). Evacuation during fires is crucial to this area to ensure the safety of residents. The evacuation area for Rancho Tehama is 10.35 square miles.

On the north end of Rancho Tehama, there is an access area to Pebble Beach Creek. Tehama Rural Area Express (TRAX) serves the area as well as the Tehama County Fire Station 13 which may serve as an important resource in the event for evacuation. The population of Rancho Tehama is 1,555 people with around 626 households. The average household size is 2.48 and the median age in the town is 51.2 years old. The average household income is \$38,497 and the average price of a home is \$315,517. Most people in the community commute approximately 30-34 minutes to work. 11.2% of people carpool to work and little to no people bike, walk or take public transit.

Key evacuation route considerations for Rancho Tehama:

- Very high population for only one access point
- Possible secondary access (Boggs and Champlain Road) both of which have low PCI
- Identified safe refuge areas
- Medium distance to I-5
- High number of structures and fire risk



Rancho Tehama  
Tehama County Wildfire Hazard Assessment

0 0.4 0.8 1.6 Miles Scale: 1:50,000

- |                                   |                       |                     |
|-----------------------------------|-----------------------|---------------------|
| <b>Hazard Severity</b>            | Community Focus Areas | Fire Station        |
| Unburnable / Urban / Agricultural | Counties              | Airport             |
|                                   | School                | Building Footprints |

Figure 52 – Rancho Tehama Wildfire Hazard Assessment

18.

## RED BANK

Red Bank is in the foothills of the Mendocino National Forest. This area primarily consists of Oak Woodland vegetation with housing dispersed throughout the evacuation area. Red bank is in a Very High Fire Hazard Severity Zone and is 15 miles away from I-5. There are only three (3) ingress-egress points in this community making it one of Tehama’s highest-priority evacuation sites to improve. Evacuation during fires is crucial to this area to ensure the safety of residents. Red Bank experienced the Red Fire in 2020. The evacuation area for Red Bank is 9.11 square miles. The population of Red Bank is 81 people with around 36 households. The average household size is 2.25 and the median age in the town is 52.1 years old. The average household income is \$69,465 and the average price of a home is \$433,333. Most people in the community drive around 10-14 minutes to work. 2.4% of people walk to work and little to no people bike, carpool, or take public transit.

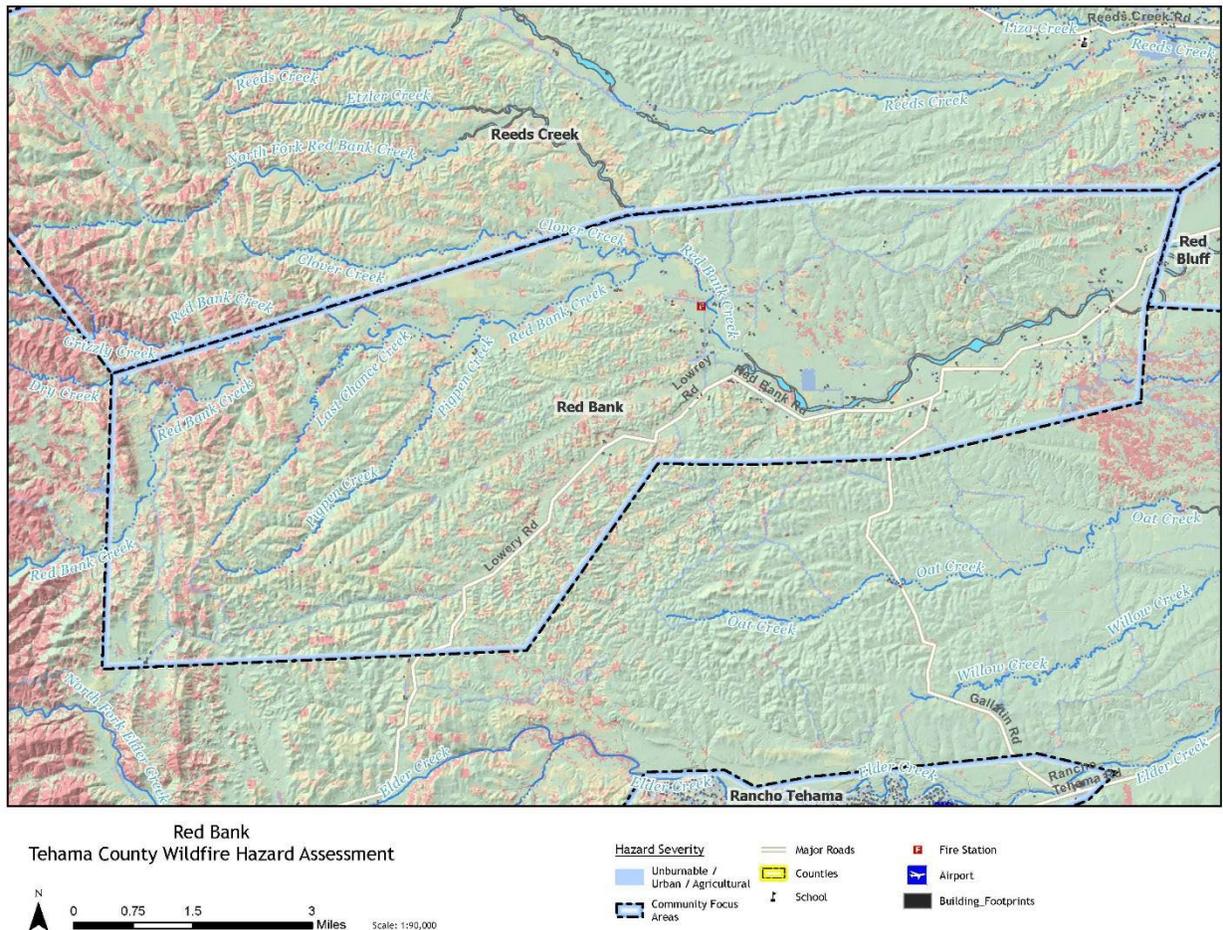


Figure 53 - Red Bank Wildfire Hazard Assessment

## REEDS CREEK

Reeds Creek is an agricultural subdivision community west of Red Bluff and northeast of Red Bank. Residences in this community are primarily rural residential and are bisected by the creek which it is named after. The terrain is hilly as it is near the foothills of the Mendocino National Forest. There are three (3) ingress-egress points: Reeds Creek Road, Live Oak Road, and Red Bank Road. Reeds Creek is in a High Fire Hazard Severity Zone.

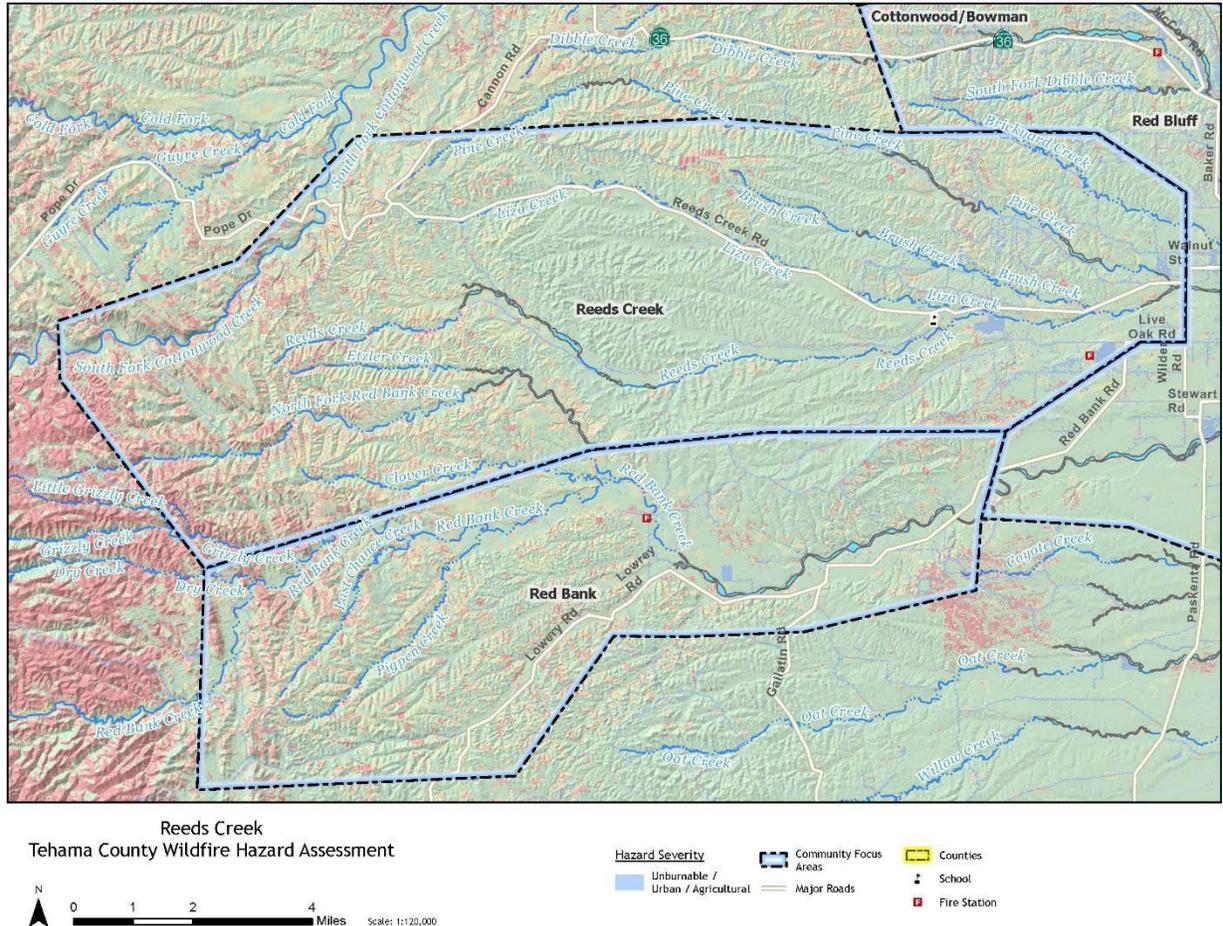


Figure 54 - Reeds Creek Wildfire Hazard Assessment

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## CITY OF RED BLUFF

The City of Red Bluff is the largest city and the most urbanized area in Tehama County. The city is bisected by the Sacramento River and I-5, with a majority of the city located on the west side of the Sacramento River and I-5. The city primarily consists of dense residential areas, businesses, several community parks and its own airport, Red Bluff Airport. The city is served by its own fire station, Red Bluff City Fire Department and CAL FIRE/Tehama County Fire Station 1. There are five (5) ingress-egress points, Main Street, Jackson Street, Monroe Street, Walnut Street and Oak Street. While Red Bluff is in a Low Fire Hazard Severity Zone, there is the potential risk of flooding due to its proximity to the Sacramento River. The population of Red Bluff is 14,557 people with approximately 5,806 households, the average household size is 2.43, and the median age in Red Bluff is 33.9. The median household income is \$41,004 and the average price of a home is \$213,200. Most people in the city commute approximately less than 10 minutes (42.6%) to work. 79.1% drive alone to work, 10.2% carpool, and the remaining 10.7% walk, bike, or take public transportation to work.

### KEY EVACUATION ROUTE CONSIDERATIONS FOR RED BLUFF:

- High number of access points per population
- Over 10 neighborhoods with only one egress point and over 850 residences combined.
- Several key evacuation routes serve as the only access with lower-rated pavement conditions

### SEVERAL ROADWAYS IDENTIFIED IN PUBLIC OUTREACH AS ROADS THAT HAD PREVIOUSLY BEEN UNUSABLE DUE TO A NATURAL EVENT ARE:

- Jackson Street
- Southridge Drive
- McCoy Road
- Reeds Creek Road
- Kaer Avenue
- Antelope Boulevard
- Flores Avenue
- Third Street
- No identified shelter/assembly/refuge locations

### FLEET ANALYSIS IDENTIFIED THE FOLLOWING ROADWAYS THAT MAY BE PINCH POINTS IN AN EVACUATION:

- Main Street
- Belle Mill Road
- Oak Street

- SR 36
- Antelope Boulevard
- Sale Lane
- Breckenridge Street
- Crittenden Street
- **SEVERAL POTENTIAL PINCH POINTS WHERE EVACUATION ROUTES CONVERGE INCLUDE:**
- Beegum Road / Main Street
- Paskenta Street / Walnut Street
- Adobe Road / I-5
- Walton Avenue / Main Street
- Main Street / Adobe Road
- Breckenridge Street / Main Street
- Walnut Street / Jackson Street
- Madison Street / Walnut Street
- Madison Street / Oak Street
- Walnut Street / Main Street
- Oak Street / Main Street
- Jackson Street / Main Street
- Center Avenue / Oak Street
- Oak Street / I-5
- A36 / Sale Lane
- Sale Lane / Belle Mill Road
- Kaer Avenue / Belle Mill Road
- A36 / Chestnut Avenue
- Jackson Street / Madison Street
- Main Street / Diamond Avenue

- Main Street / Luther Avenue
- Main Street / I-5 interchange.

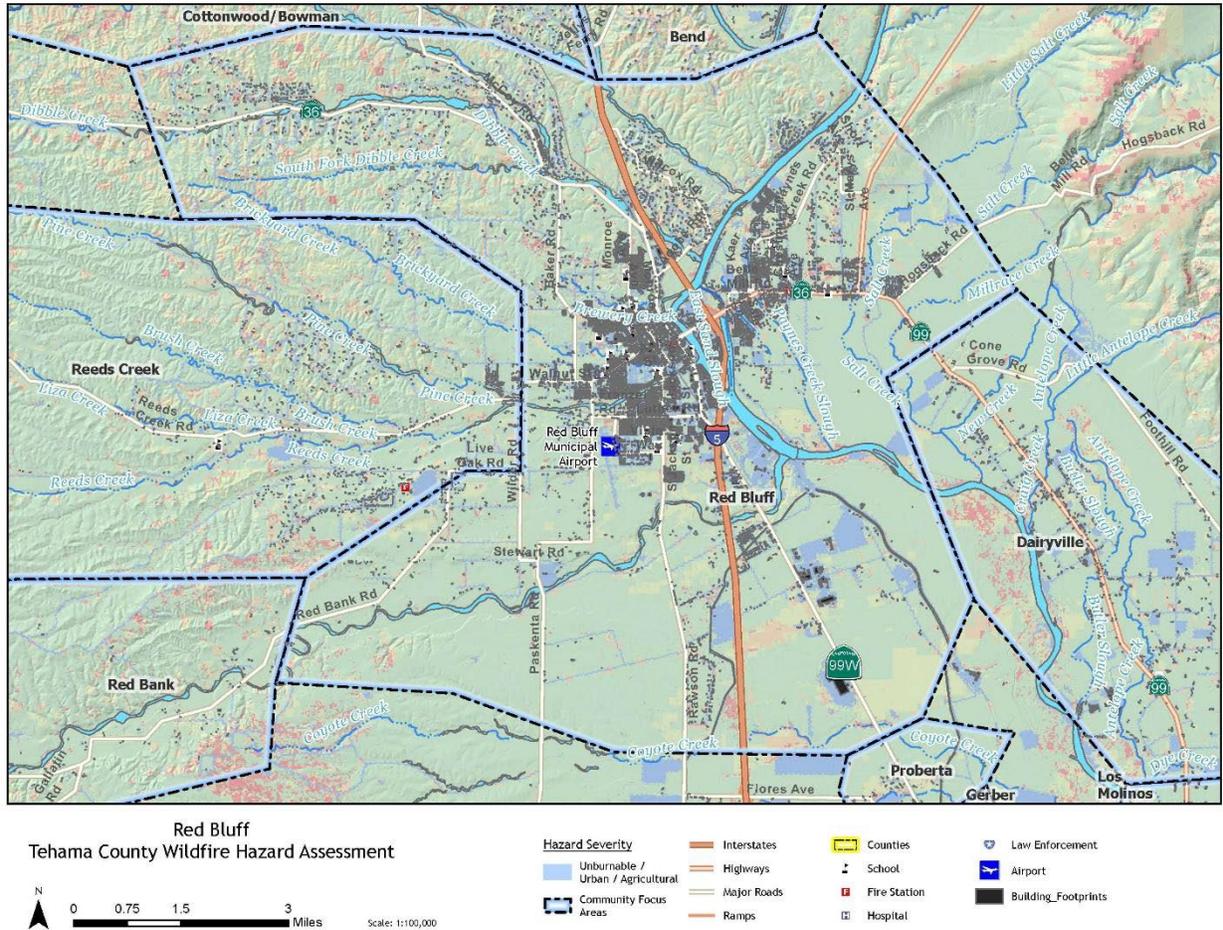


Figure 55 - Red Bluff Wildfire Hazard Assessment

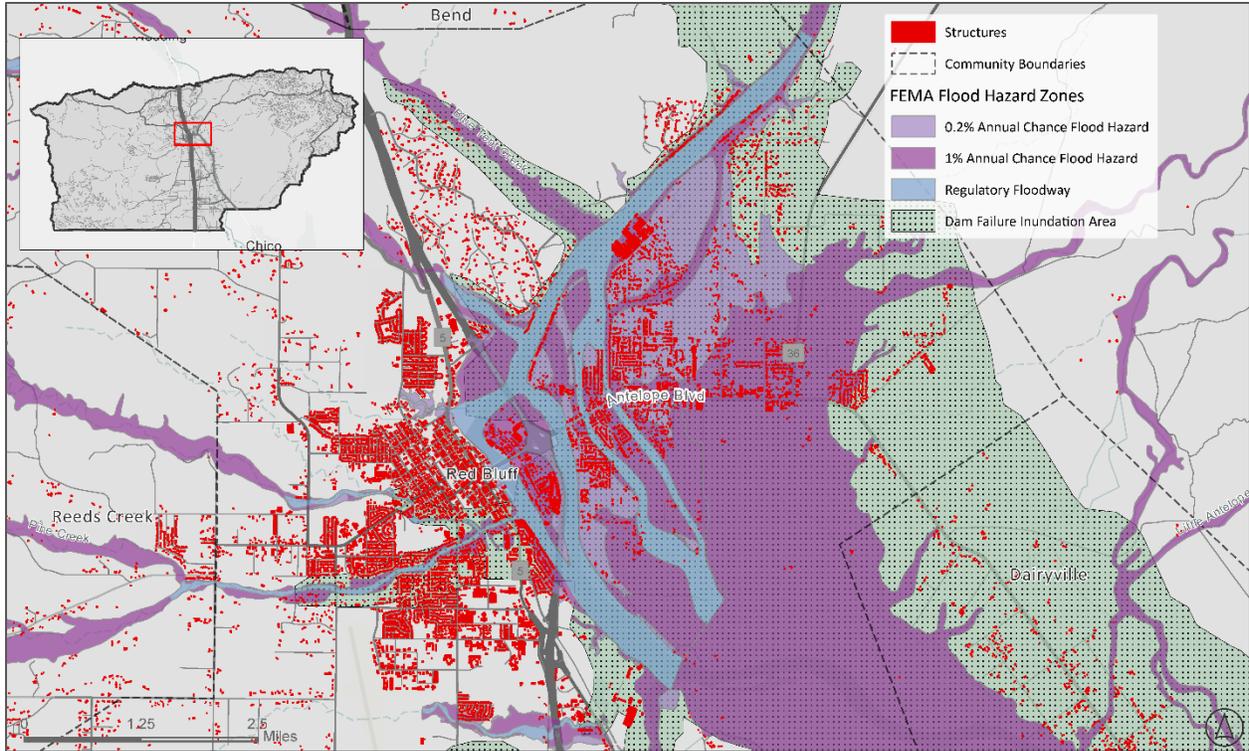


Figure 56 - Red Bluff Flood Hazard Assessment

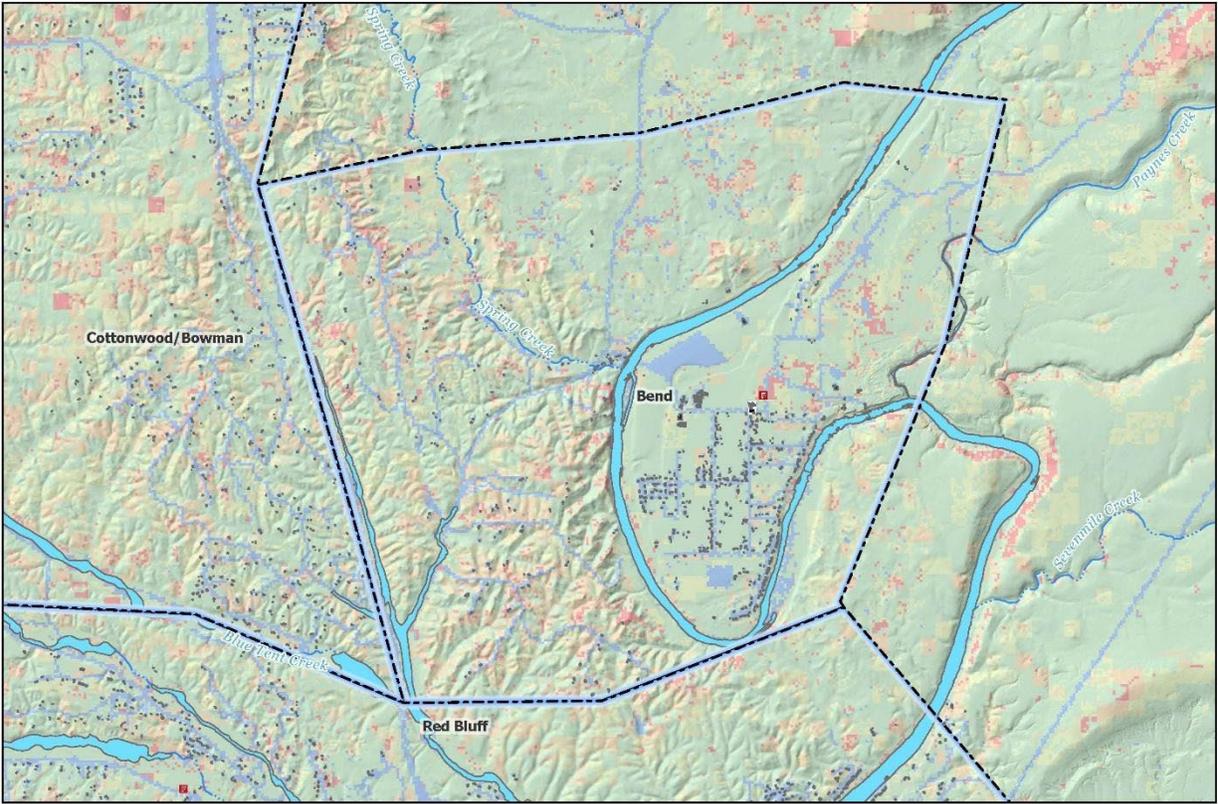
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## BEND

Bend is a small rural town in Tehama County, six (6) miles north-northeast of Red Bluff. The area was historically named Horsethief Bend, Sanders Bend and Big Bend. “Bend” refers to the Sacramento River creating nearly a four (4) mile course in a horseshoe shape and meandering south again, leaving nothing but a short neck of land. Many properties are built along the east bank of the Sacramento River. The population of Bend is 883 people with roughly 382 households. The average household size is 2.30 and the median age in the town is 56.1. The average household income is \$59,067 and the average price of a home is \$426,471. Most people in the community drive around 20-24 minutes to work. 8.6% of people carpool to work, 5.2% walk and few to no people bike or take public transit.

The area is at high risk of flooding due to its proximity to the Sacramento River, particularly the low elevation area just east of the Bend Bridge on Bend Ferry Road. This area is a well known flood prone section. Bend is in a Low Fire Hazard Severity Zone. It is three (3) miles away from I-5 and it has one (1) ingress-egress point over the Bend Bridge, connecting to Jelly’s Ferry Road. Bend has not had any fires recently, but it was near the 2018 Sun fire. The evacuation area for Bend is 15.76 square miles.

Project recommendations that would improve the safety and emergency accessibility in the Bend area include mitigation of the flood hazard on Bend Road with raising the road or re-alignment. Additionally, developing an emergency access improvement near the end of Bend Ferry Road (40.278158932173504, -122.1818146386587), over Paynes Creek to the Hog Lake Trailhead at SR 36.



Bend  
Tehama County Wildfire Hazard Assessment



Figure 57 - Bend Wildfire Hazard Assessment

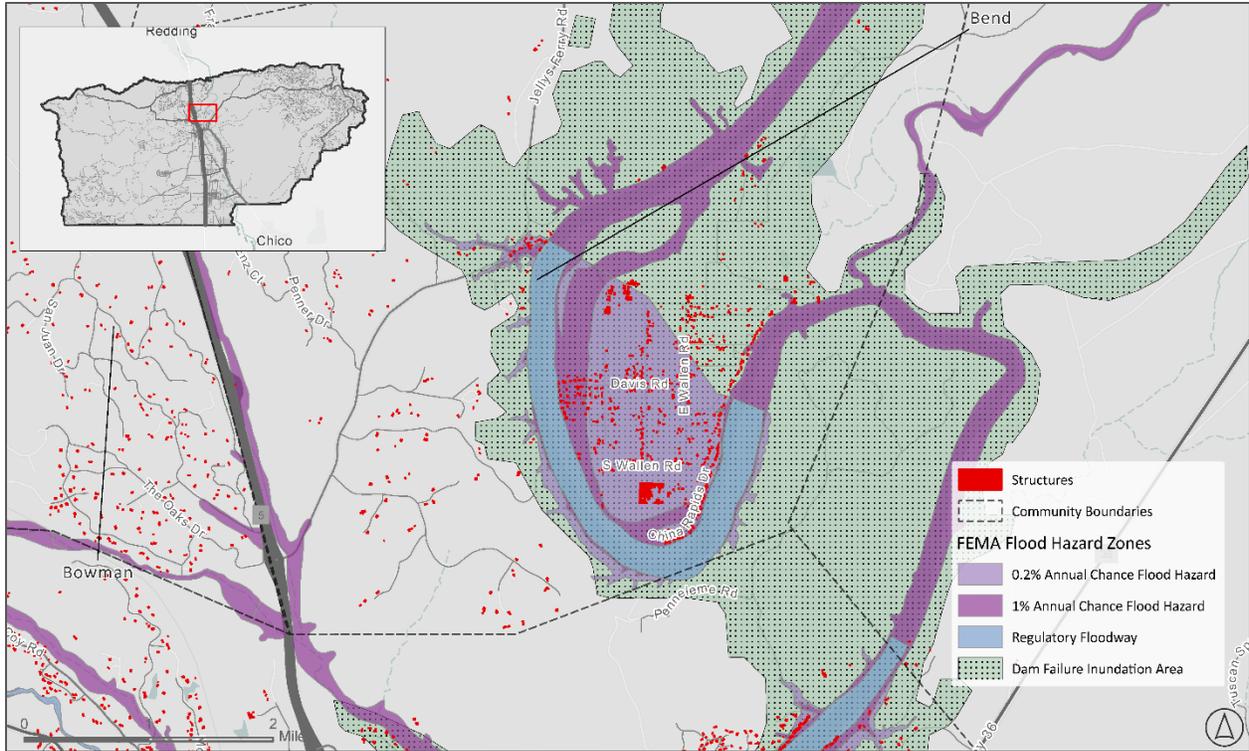


Figure 58 - Bend Flood Hazard Assessment

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## COTTONWOOD

Cottonwood is a larger town on the Tehama/Shasta County border. The southern portion of the town, where it is bisected by Cottonwood Creek, belongs to Tehama County. Additionally, the I-5 bisects the town and in Tehama County, most residences are located on the west side of I-5. Cottonwood primarily consists of agricultural lands and rural subdivisions, including the community of Bowman. The fire risk is greater due to denser vegetation and sloped hillsides. Cottonwood has experienced the Valley Fire in 2004, the Coleman Fire in 2008, and the Clover Fire in 2013. The evacuation area for Cottonwood is 122.77 square miles. The population of Cottonwood is 12,042 people with around 4,530 households. The average household size is 2.66 and the median age in the town is 45.6. The average household income is \$67,019 and the average price of a home is \$360,558. Most people in the community commute approximately 30-34 minutes to work. 4.4% of people carpool to work, 1.9% walk, 0.5% of people take public transit and 87.9% of people drive alone.

Key evacuation route considerations for Cottonwood:

- Separate from Lake California, there are over 15 neighborhoods with only one egress point and over 1,200 residences combined.
  - Several neighborhoods are located on key evacuation routes serving as the only access with lower rated pavement conditions
19. Roadways identified through public outreach as roads that had previously been unusable due to a natural event are:
    - Bowman Road
    - Bywood Drive
  20. Several potential pinch points where evacuation routes converge include, but are not limited to the following:
    21. Locust Road / 4<sup>th</sup> Street
    22. Rhonda Road / Gas Point Road
    23. 4<sup>th</sup> Street / I-5
    24. Main Street / Front Street
    25. Main Street / 1<sup>st</sup> Street

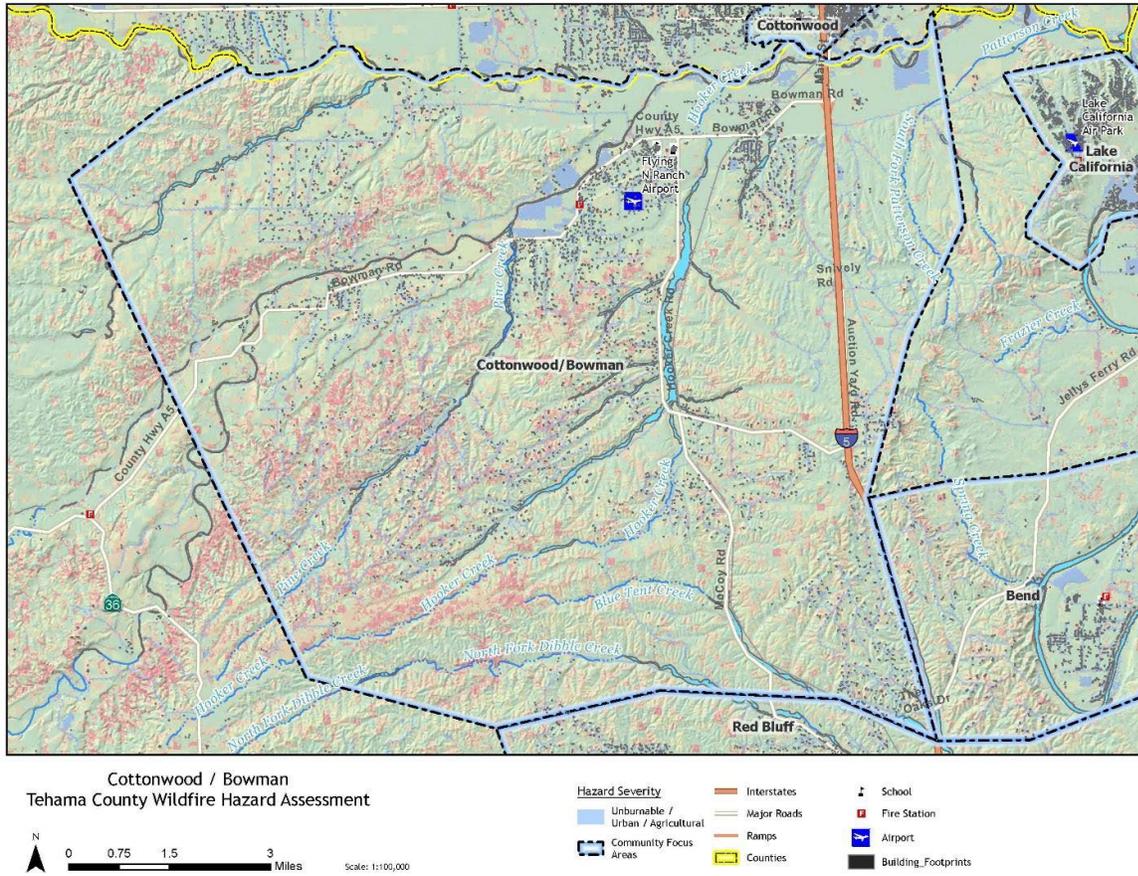


Figure 59 – Cottonwood / Bowman Wildfire Hazard Assessment

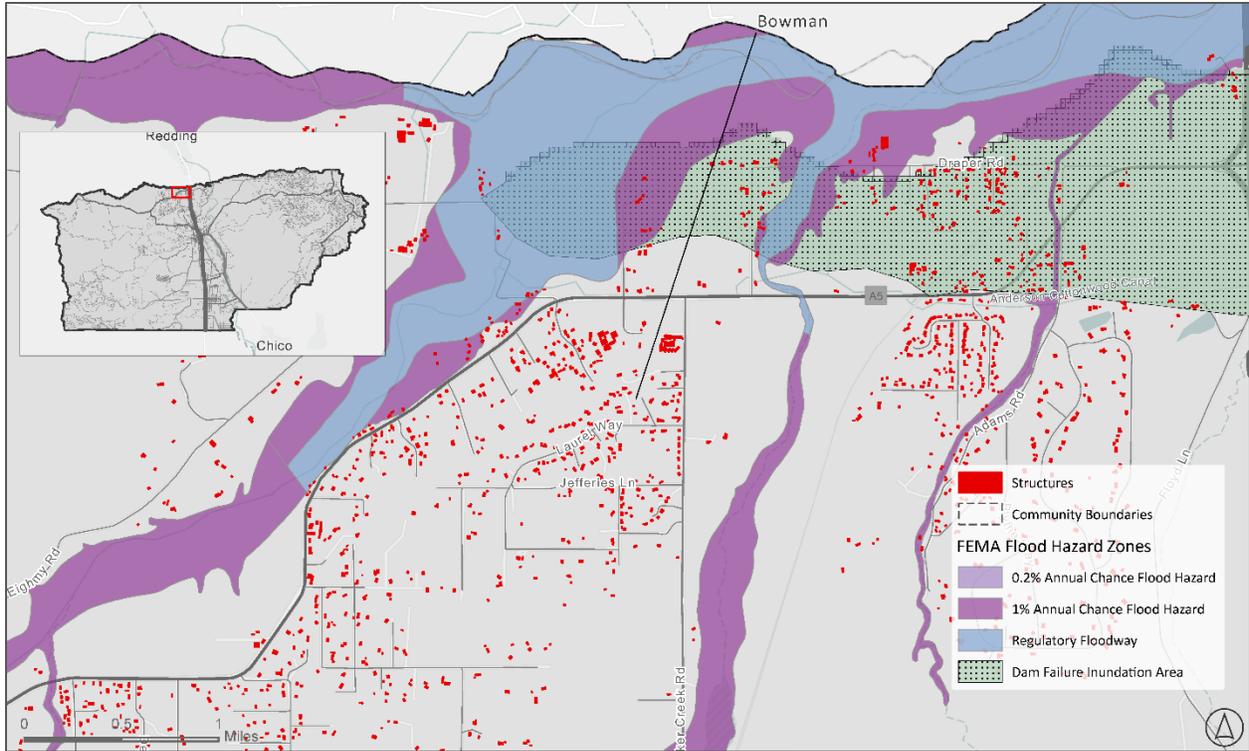


Figure 60 - Bowman Flood Hazard Assessment

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## LAKE CALIFORNIA

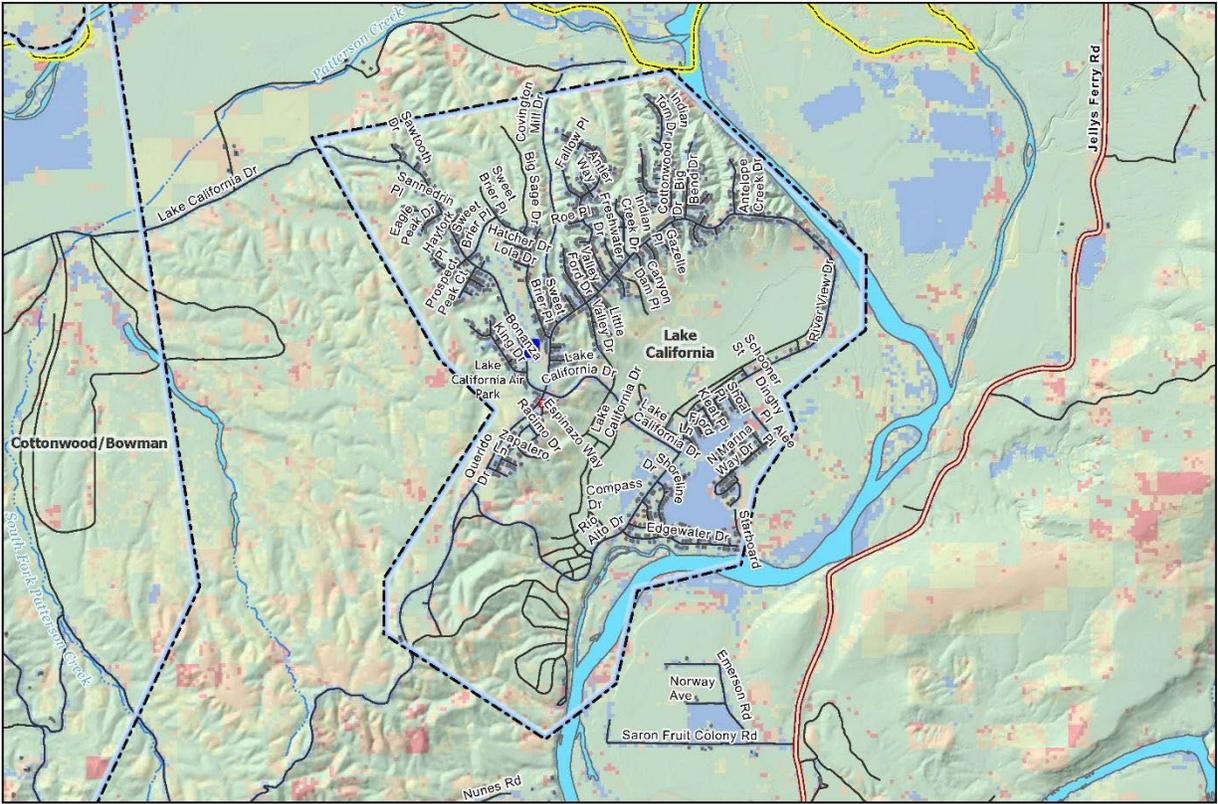
Lake California is a gated, private community situated between Anderson and Red Bluff to the east of Cottonwood. This residential enclave spans approximately 5,950 acres and includes approximately 2,200 lots, and views include Mt. Lassen, Mt. Shasta, and the Trinity and Siskiyou Mountain Ranges in the distance. The community's population comprises approximately 2,893 residents living in around 1,081 households, with an average household size of 2.67. The median age of residents stands at 39 years, and the average household income is \$75,991, with a typical home price of \$269,631. Most residents report a commute time of approximately 30-34 minutes to work, with 1.9% carpooling, and limited usage of biking, walking, or public transit.

This private community features a variety of amenities, such as a private lake for recreational boating and fishing, a swimming pool, tennis courts, airplane landing strip, equestrian center, lakeside clubhouse and event lounge, boating launch into the Sacramento River, campground, ample RV and motorhome storage, parks, and open trails. Notably, the campground and equestrian center present potential fire-related concerns due to the presence of extensive fuels and limited natural fire breaks. Lake California is home to a private airplane landing strip, which serves as a strategic shelter-in-place location. The community is subdivided into two main sections of housing developments, with one densely populated area surrounding Lake California. The primary road for the southern subsection of the community is Rio Alto Drive, while the other section exhibits more scattered developments, with cul-de-sacs along River View Drive and the primary entrance and exit (ingress/egress) point of Lake California Drive.

Lake California's topography comprises rolling hills and an Oak Woodland ecosystem situated on the west bank of the Sacramento River, which naturally acts as a fire break against potential threats from the eastern portion of the County. Residents within this community include retirees and commuters who travel short distances to Redding, Anderson, Cottonwood, and Red Bluff. From the entry/exit gate of Lake California, a 20-minute drive takes one to Redding in the north or Red Bluff in the south. Nearby, residents can access local shops in Cottonwood and Anderson, with additional regional options available in Redding and Red Bluff.

Lake California has previously experienced wildfire events, including the West Fire in 2003 and the Adams Fire in 2018. Situated within a High Fire Hazard Severity Zone, the community possesses just one ingress-egress point, presenting potential challenges for evacuation, like those observed during the Camp Fire in 2018. Lake California is strategically positioned five miles from I-5, offering the potential for additional evacuation routes.

Public outreach and data analysis have identified Lake California as a top area of concern due to its very High Fire Hazard Priority, a high number of structures, and the reliance of many residents on a shared evacuation route. Three evacuation shelter locations and shelter-in-place areas have been identified. The County is pursuing funding to expand Lake California Drive to support a larger traffic flow, which includes the addition of a walking and biking multi-use path to serve as additional access for emergency services. This path will be constructed to accommodate fire trucks, and the County is actively evaluating other ingress and egress routes for further safety enhancements. Additional mitigation measures include a secondary fire lane access south to Jelly's Ferry Road. This project will ultimately be a secondary access to this isolated community.



Lake California  
Tehama County Wildfire Hazard Assessment



Figure 61 - Lake California Wildfire Hazard Assessment

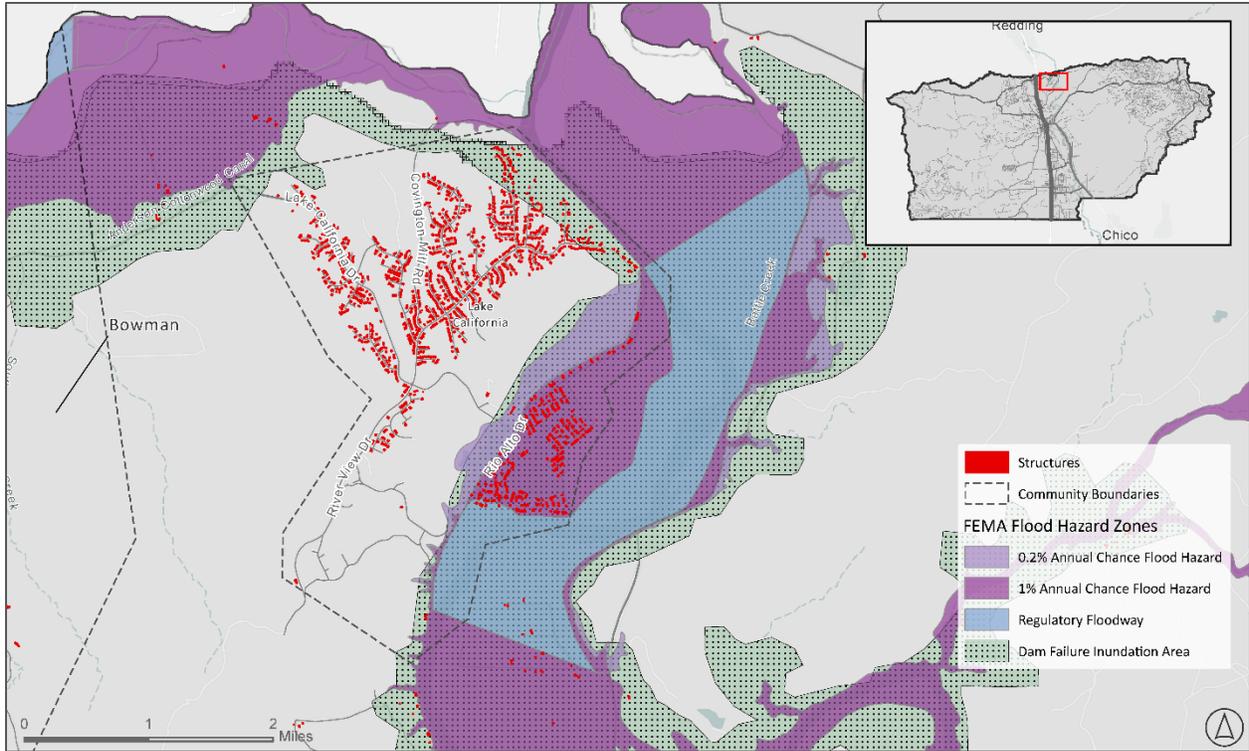


Figure 62 - Lake California Flood Hazard Assessment

DALES

Dales is a community 10 miles northeast of Red Bluff. Dales was a popular travel stop in the mid-1800s due to its location between Red Bluff, Manton, and the Lassen Volcanic National Park. Flooding has historically been an issue in Dales. The Ishi Wilderness, located near Dales is an area dedicated to the Paskenta Band of Nomlaki Indians and Yana-Yahi tribes of which Dales is a part of their ancestral lands. The community is densely forested and bisected by SR-36 and Paynes Creek. Dales is in a Moderate Fire Hazard Severity Zone and has two (2) ingress-egress points. In 2018, Dales experienced the Dales Fire. A lack of safe and available ingress-egress points can lead to high dangers during a potential evacuation. The evacuation area for Dales is 1.36 square miles. The population of Dales is 23 people with around 10 households. The average household size is 2.10 and the median age in the town is 52.5. The average household income is \$37,784 and the average price of a home is \$175,000. Most people in the community commute approximately 90 minutes to work. 0% of people carpool to work and little to no people walk, bike, or take public transit.

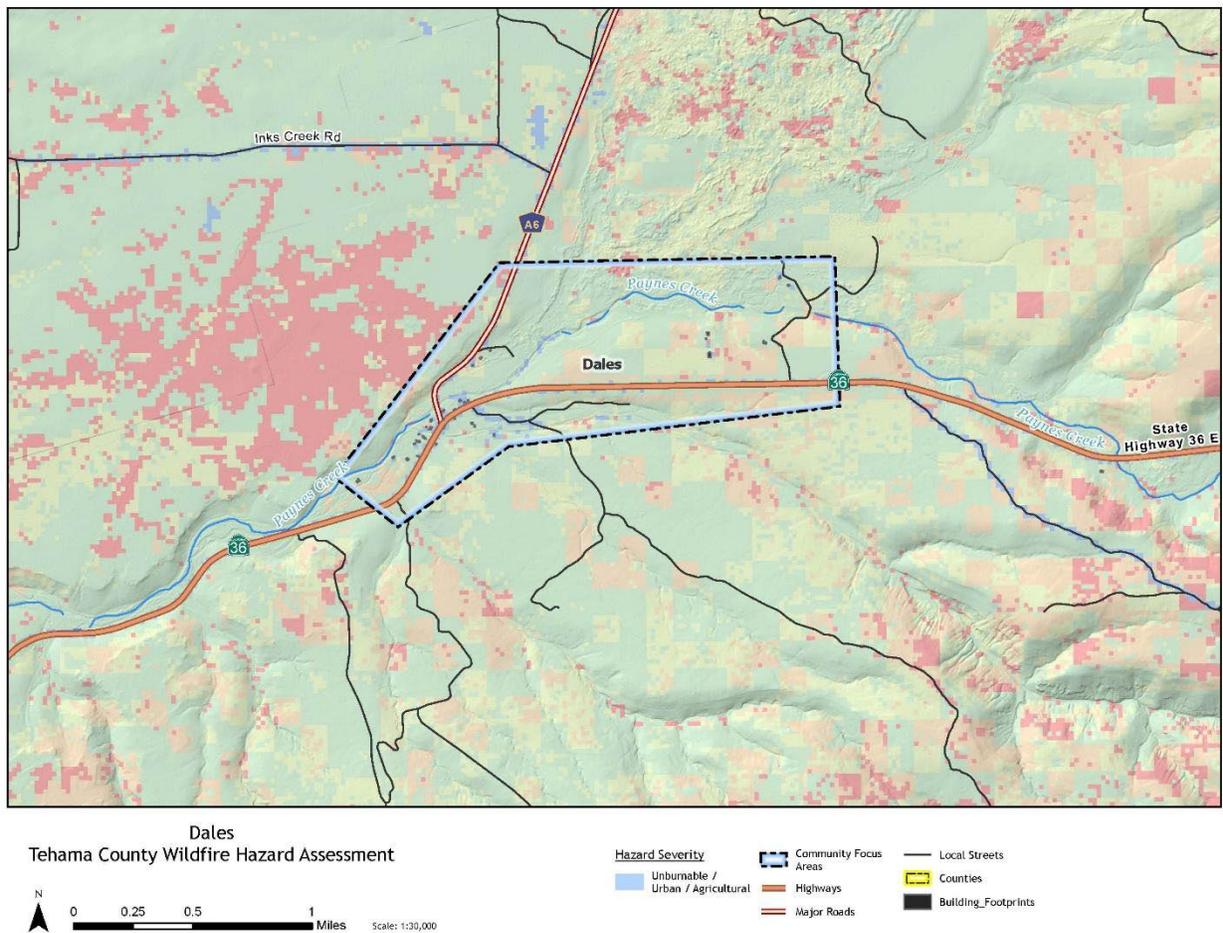


Figure 63 - Dales Wildfire Hazard Assessment

## PAYNES CREEK

Paynes Creek is located along SR-36 and neighbors the creek, which it is named after. Paynes Creek is in a Very High Fire Hazard Severity Zone. There are four (4) ingress-egress points in this community. Paynes Creek experienced the Dye Fire in 2007 and the Lane Fire in 2018. Paynes Creek contains CAL FIRE Paynes Creek Station and Tehama County Fire Station 21. The evacuation area for Paynes Creek is 9.47 square miles. The population of Paynes Creek is 121 people with roughly 20 households. The average household size is 5.60 and the median age is 54.5 years old. The average household income is \$41,246 and the average price of a home is \$183,333. Most people in the community drive over 90 minutes to work. Little to no people bike, carpool or take public transit and 10% of people walk to work.

Key evacuation route considerations for Paynes Creek:

- Long distance from I-5
- Good number of access points per population, very high fire risk

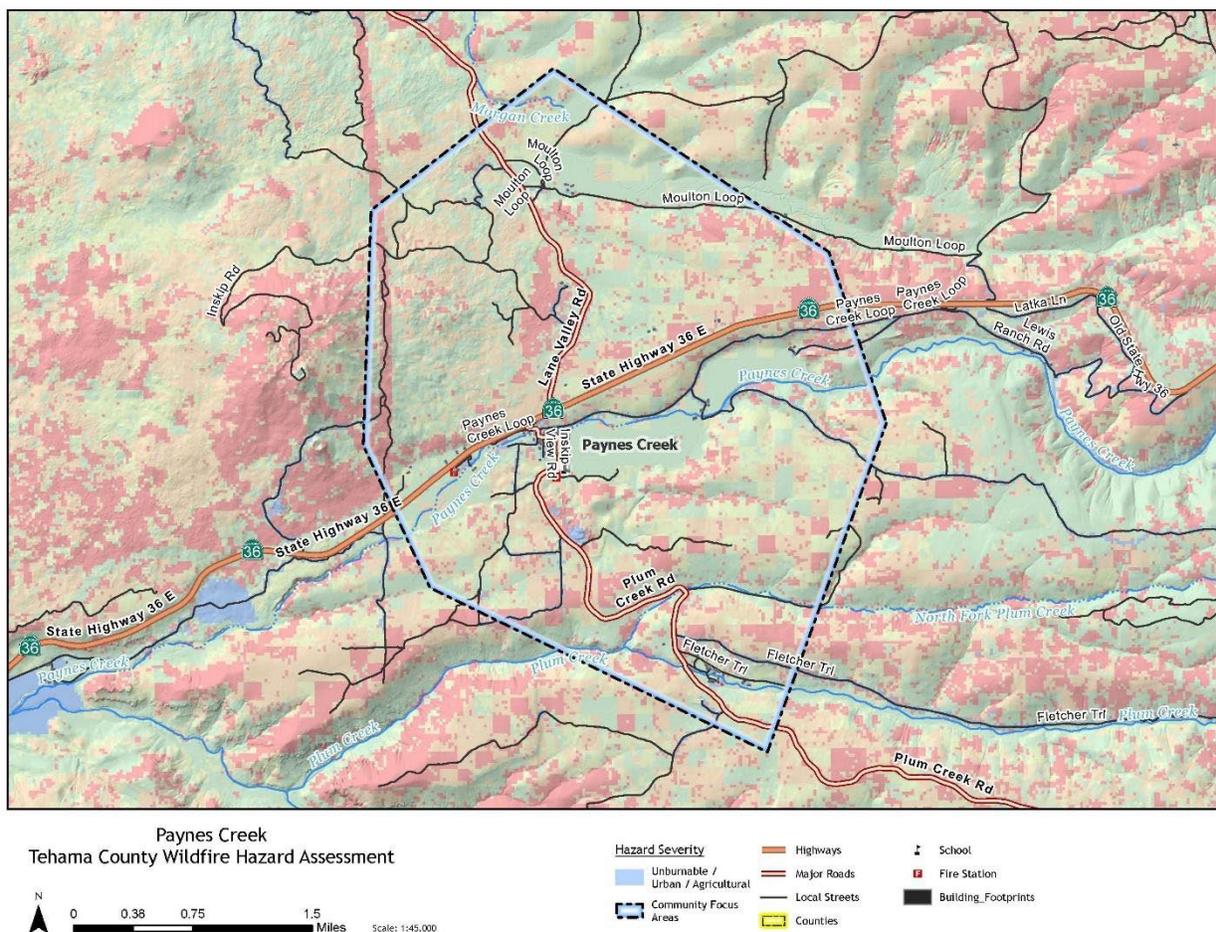


Figure 64 - Paynes Creek Wildfire Hazard Assessment

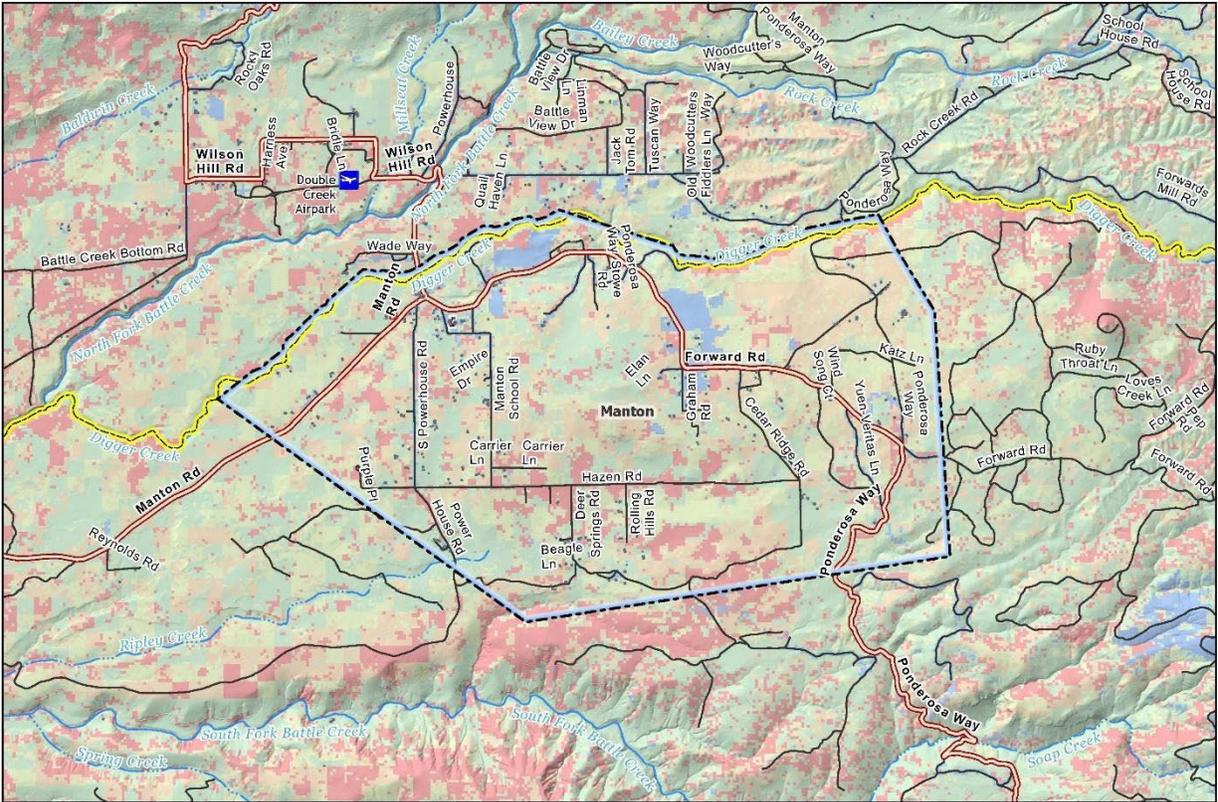
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## MANTON

Manton is a small community located in the northeastern area of Tehama County. The community is bisected by the Tehama/Shasta County line and Digger Creek. Manton is north of SR-36 and west of Mt. Lassen. The community primarily consists of rural residential and agricultural lots, with the CAL FIRE Manton Fire Station located in the town core. The community is in a Very High Fire Hazard Severity Zone due to its relatively flat terrain and densely forested areas within the community. Manton has two (2) ingress-egress points. The population of Manton is 291 people with approximately 146 households and a household size of 1.92. The median age 74.2, raising concern for mobility of the elderly population during potential evacuations. The median household income is \$118,199 and the average price of a home is \$355,400. Most of the community (98.4%) drive alone to work, 44.3% travel less than 10 minutes and little to no people carpool, bike, walk or take public transit.

Key evacuation route considerations for Manton:

- Long distance from I-5
- Good number of access points per population
- Very High Fire Risk
- Identified safe refuge area location



Manton  
Tehama County Wildfire Hazard Assessment



- |                                   |               |                     |
|-----------------------------------|---------------|---------------------|
| <b>Hazard Severity</b>            | Major Roads   | Fire Station        |
| Unburnable / Urban / Agricultural | Local Streets | Airport             |
| Community Focus Areas             | Counties      | Building_Footprints |
|                                   | School        |                     |

Figure 65 - Manton Wildfire Hazard Assessment

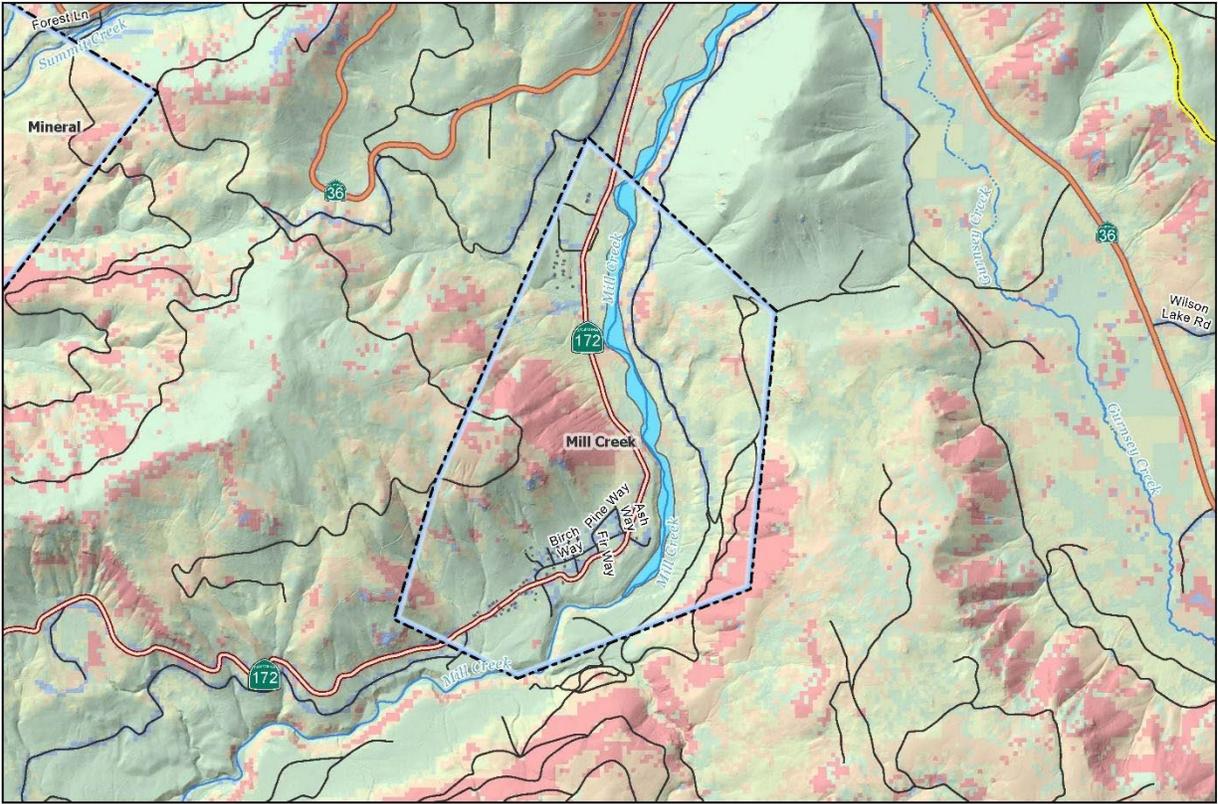
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## MILL CREEK

Mill Creek is a small community that is sparsely dispersed in the Sierras, south of Mt. Lassen and bisected by SR-36. Mill Creek is not currently considered a High Fire Severity Zone because of recent fire history that has resulted in fuel reduction; however, it is near Mineral, which is a High Fire Hazard Severity Zone. It is currently considered a Low Fire Hazard Severity Zone but runs the risk of potential volcanic activity, therefore the community will be evaluated as a High Fire Hazard Severity Zone. There are only three (3) ingress-egress points in this community, SR-36, 89 and 172. Mill Creek experienced the Onion Fire in 2008, Mill Fire in 2012, the Wilson Fire in 2018 and the Stump Fire in 2020. Houses and cabins are dispersed throughout the sparsely forested area. The lack of ingress-egress points makes it a greater area of concern for evacuation. The evacuation area for Mill Creek is 2.24 square miles. The population of Mill Creek is six (6) people with approximately (2) households. The average household size is three (3) and the median age in the town is 65 years old.

Key evacuation route considerations for Mill Creek:

- Long distance from I-5
- 2 access points
- Very High Fire Risk



Mill Creek  
Tehama County Wildfire Hazard Assessment



- |                                   |                       |                     |
|-----------------------------------|-----------------------|---------------------|
| <b>Hazard Severity</b>            | Community Focus Areas | Local Streets       |
| Unburnable / Urban / Agricultural | Highways              | Counties            |
|                                   | Major Roads           | Building Footprints |

Figure 66 - Mill Creek Wildfire Hazard Assessment

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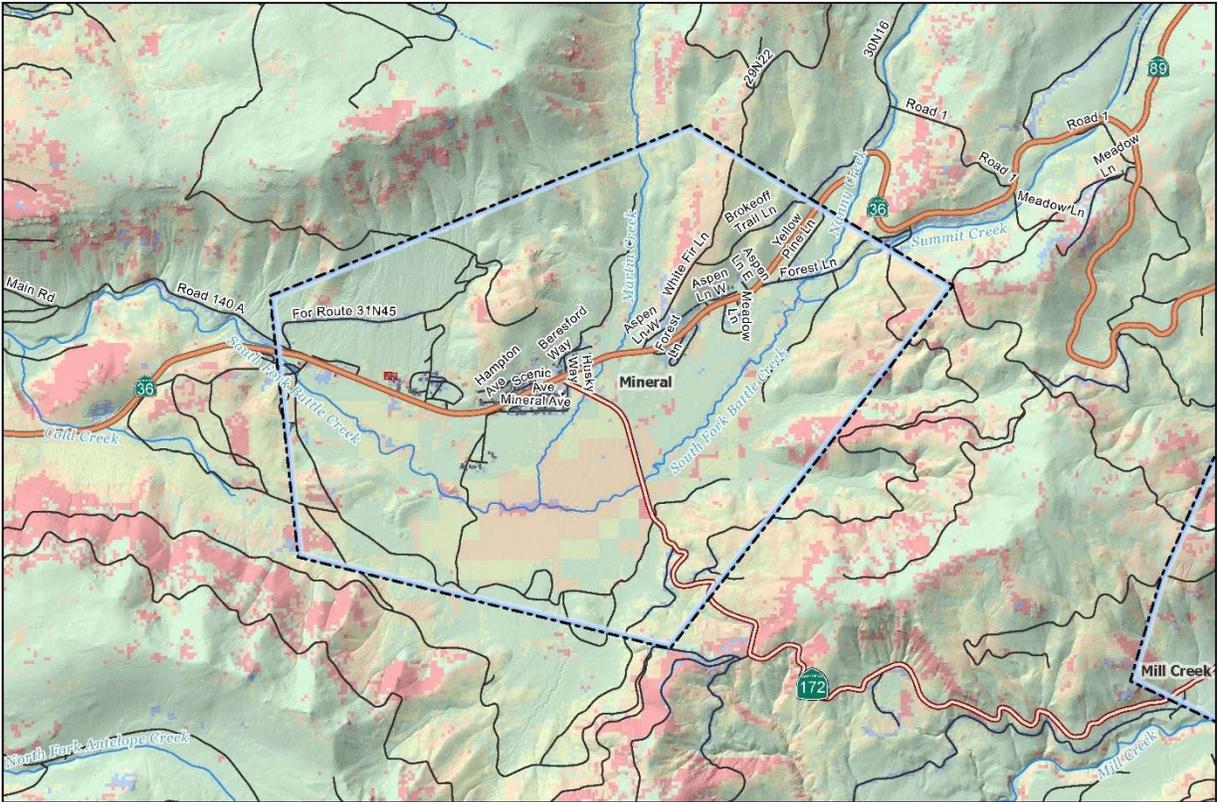
## MINERAL

Mineral is located within a region designated as a Very High Fire Hazard Severity Zone. This sparsely populated area is intersected by several major roads, including SR-36 and SR-172, and is situated to the southwest of Mt. Lassen. The community primarily consists of small cabins scattered along the road network, and a substantial number of homeowners use their properties primarily for vacation purposes. In proximity to Mineral, you can find notable attractions such as the Lassen Volcanic National Park Headquarters and the McGowan Cross Country Ski Area. The landscape of Mineral is characterized by dense forests, with Ponderosa Pine being the predominant vegetation. The community benefits from 3 distinct ingress-egress points.

The Mineral area is traversed by significant transportation facilities, including SR-17, SR-36, SR-172, and SR-89, which may potentially serve as evacuation routes. Beginning at the base of the Sierra Foothills, Mineral ascends to higher altitudes and is situated within a High Fire Severity Zone, primarily due to the presence of Pine trees and the steep sloping terrain. The sparse population, mountainous landscape, and scattered cabins contribute to an elevated risk to both structures and residents in this region, including the nearby Mill Creek area.

Historically, Mineral has faced several wildfire events, including the Onion Fire in 2008, the Mill Fire in 2012, the Wilson Fire in 2018, and the Stump Fire in 2020. The designated evacuation area for Mineral spans 7.07 square miles. The community of Mineral is home to 72 residents living in approximately 42 households. The average household size is 1.57, with a median age of 54.6 years. The average household income is \$36,191, and the typical home price is \$191,667. Most residents in the community report an average commute time of around 90 minutes.

Mineral is situated in the northwest region of the County, a region characterized by low population density and a notable fire risk, often with multiple access points. Although Mineral is somewhat distant from I-5, it benefits from multiple state routes that could potentially serve as evacuation routes. The area boasts a favorable ratio of access points to population. A roadway intersection crucial for evacuation is marked as a planned project for evaluation and reconstruction. Additionally, the community would benefit from vegetation clearing along roadways as a recommended project to slow the spread of fires and reduce heat intensity during fire events.



Mineral  
Tehama County Wildfire Hazard Assessment



- |                                   |                        |                     |
|-----------------------------------|------------------------|---------------------|
| <b>Hazard Severity</b>            | Highways               | Counties            |
| Unburnable / Urban / Agricultural | Major Roads            | School              |
| Community Focus Areas             | Local Streets          | Fire Station        |
|                                   | Ramps, Traffic Circles | Building Footprints |

Figure 67 - Mineral Wildfire Hazard Assessment

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## PONDEROSA / SKY RANCH

Ponderosa Sky Ranch is in a Very High Fire Hazard Severity Zone in a densely forested area. The community has an airport, the Ponderosa Sky Ranch Airport, and borders Highway 36. There are only two (2) ingress-egress points in this community making it one of Tehama’s highest-priority evacuation areas. Ponderosa experienced the Ponderosa Fire in 2012 and was nearly affected by the Lane Fire in 2018. Evacuation during fires is crucial to this area to ensure the safety of its residents. The evacuation area for Ponderosa Sky Ranch is 4.34 square miles. The population of Ponderosa Sky Ranch is 118 people with approximately 41 households. The average household size is 2.66 and the median age is 54.2 years old. The average household income is \$39,191 and the average price of a home is \$191,667. Most people in the community commute approximately 90 minutes to work. Little to no people bike, carpool or take public transit and 10.3% of people walk to work.

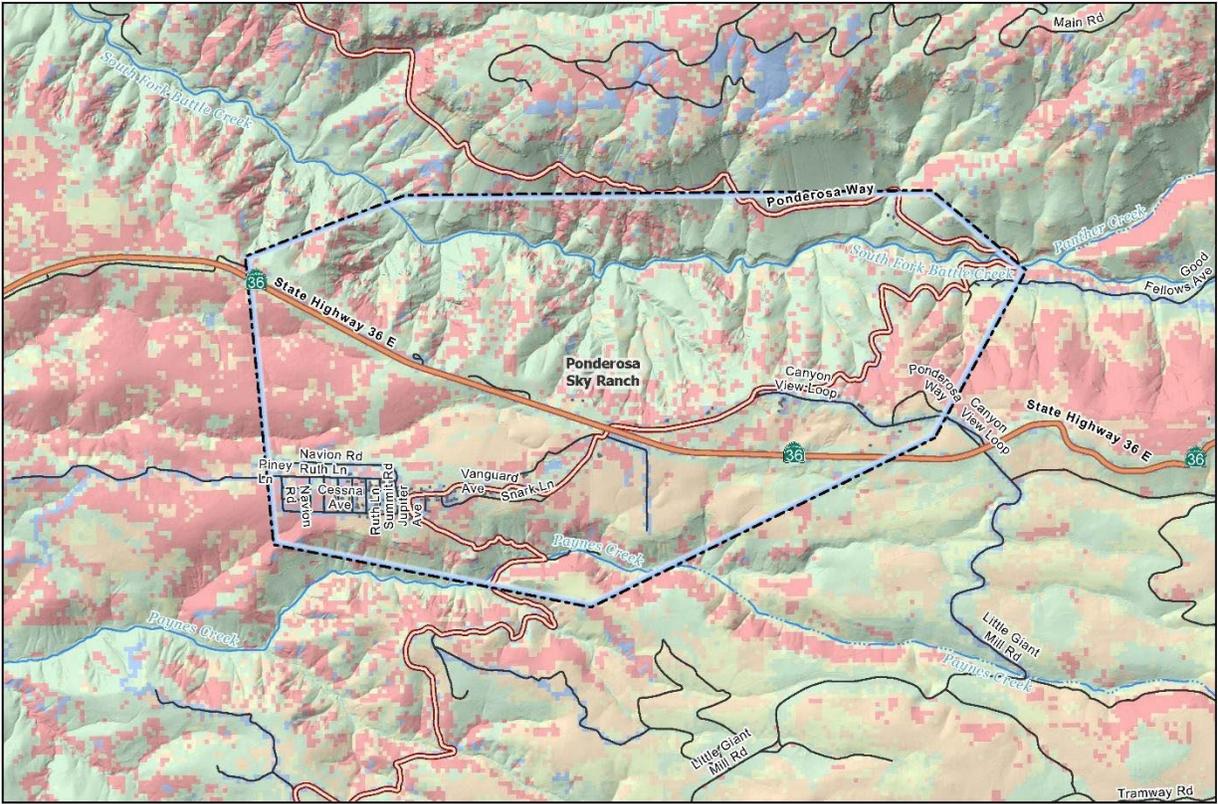
Key evacuation route considerations for Ponderosa Sky Ranch:

- Long distance from I-5
- Medium number of access points per population
- Medium number of structures
- Low fire risk

26. Ponderosa Sky Ranch project recommendations include regular roadside vegetation management projects, and a potential secondary access route to the southeast connecting the community directly to SR 36.

27.

28.



Ponderosa Sky Ranch  
Tehama County Wildfire Hazard Assessment

- |                                   |                       |                     |
|-----------------------------------|-----------------------|---------------------|
| <b>Hazard Severity</b>            | Community Focus Areas | Local Streets       |
| Unburnable / Urban / Agricultural | Highways              | Counties            |
|                                   | Major Roads           | Building Footprints |

Figure 68 - Ponderosa Sky Ranch Wildfire Hazard Assessment

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## SURREY VILLAGE

Surrey Village area is an unincorporated community accessed by Adobe Road on the north bank of the Sacramento River and north of Red Bluff City, containing a population of 1,743 people with 814 housing units. SR-36 is east, and I-5 is west of the community with the town of Bend to the north. The area is zoned very low density residential (RE-B), consisting of primarily residential lots. The area is considered a high fire hazard zone according to the Tehama County Regional Viewer. Residential lots along the Sacramento River are in the FEMA zone designated AE or Area inundated by 100-year flood with floodwater elevation determined.

Surrey Village is served by Adobe Road from the west connecting to Interstate 5 or Main Street in Red Bluff. The development is 2.4 miles from Interstate 5 and is isolated and constrained. Adobe Road serves as the only access route in or out of the community starting at Wilcox Road and eastward.

Key evacuation routes and considerations:

- Adobe Road is the only ingress/egress to Surrey Village.
- The community is vulnerable to flooding and wildfire.

Key project recommendations:

- Explore and plan for a secondary emergency access route to the north of the community linking to Penneleme Road and Jelly's Ferry Road.
- Develop a project that includes paved surface pullouts and passing opportunities on Adobe Road, particularly between Surrey Village and Wilcox Road.
- Identify a location for an area of refuge.

## NEEDS EVALUATION AND RECOMMENDATIONS

The following sections outline Countywide evacuation system recommendations and a potential timeline for implementation (i.e., long-term, medium-term, or short-term). Road network and access recommendations were combined with the proceeding policy recommendations and finally the fire modeling output data then gleaned best practices to produce the recommended priority projects culminating all study data and community input at the end of this chapter.

### 6.1 ROAD NETWORK AND ACCESS RECOMMENDATIONS

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#### SHORT TERM

1. Thin, masticate, and/or prescribed burns in the hot spots along key roadside locations identified in this chapter through extensive GIS analysis, LiDAR flight analysis, and field reviews.
2. Establish inter-agency agreements and communication protocols for manned control of pinch points in an evacuation.
3. Implement an evacuation signage project.
4. Continue efforts to promote awareness of **Genasys: Mass Notification and Evacuation Management Platform** and other evacuation resource guides through traditional means such as websites, printed materials, and social media, and explore new avenues for dissemination to the public.
5. Prepare plans and enhance existing outreach for vulnerable populations that may require assistance.

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#### MEDIUM TERM

1. Evaluate and improve roadways that have previously been unusable during a natural event.
2. Prioritize roadway improvement projects, such as pavement upgrades, drainage improvements, and clear zone expansion on evacuation routes.
3. Establish shelters, assembly points, and safe refuge area. This may include entering into mutual agreements. Include information about the locations in evacuation guides and media.

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#### LONG TERM

1. Explore and construct, as feasible, secondary access routes for communities with only one point of access.
2. Evaluate potential widening or improvement projects for roadways identified in the evacuation modeling as potentially congested during an evacuation.
3. Evaluate and improve, as feasible, bridges located on evacuation routes and single access routes.
4. Evaluate opportunities for and, where feasible, construct multiuse paths along evacuation routes, that can serve as alternate emergency access during an evacuation event, and connect to broader multimodal networks for everyday use.

**RECOMMENDATION 1:** Trim, mastication, and prescribed burning at key hot spot areas along evacuation routes. These roadside areas have been detailed in the projects list at the end of this chapter.

**RECOMMENDATION 2:** Explore and construct as feasible, new emergency fire lane/secondary access for communities with only one access route. There are several identified neighborhood communities and fire hazard risks for those with only one egress. This base list was used as a starting point for further analysis and specific fire lanes and secondary access projects are recommended in the projects list at the end of this chapter.

**Table 2 - Communities/Neighborhoods with 1 Ingress/Egress Point**

COMMUNITY	NEIGHBORHOODS	EST. POPULATION	FIRE HAZARD PRIORITY
Cottonwood	Lake California	2,500	Very High
Cottonwood	Adams	600	Very High
Cottonwood	Broadhurst	500	Very High
Cottonwood	Laurel	400	Very High
Red Bluff	Surrey Village/Adobe Rd.	400	Very High
Cottonwood	Phyllis	300	Very High
Cottonwood	Oak Hollow	300	Very High
Red Bluff	Saddlebrook	300	Very High
Red Bluff	Oak Knoll	300	Very High
Red Bluff	Penner	300	Very High
Cottonwood	Eighmy	200	Very High
Cottonwood	View	200	Very High
Cottonwood	Wildridge	200	Very High
Cottonwood	Farquhar	200	Very High
Cottonwood	Del Norte	200	Very High
Cottonwood	Terry	200	Very High
Cottonwood	Saddleback Ridge	200	Very High
Cottonwood	Prentice	200	Very High
Cottonwood	Plateau	200	Very High
Red Bluff	Via Del Roble	200	Very High
Red Bluff	Noble Oaks	200	Very High
Red Bluff	Sacramento	200	Moderate
Red Bluff	Quercus Lobata	200	Very High
Red Bluff	Meadowgate	200	Very High
Red Bluff	Kinney	200	Very High
Red Bluff	Mater	200	Very High
Cottonwood	North Granite	100	Very High

Cottonwood	Starr	100	Very High
Cottonwood	Bo	100	Very High
Red Bluff	Ranchero	100	Very High
Red Bluff	Pleasant Valley	100	Very High
Red Bluff	Peppertree	100	Very High

**RECOMMENDATION 3:** Improve roadways that have previously been unusable during a natural event.

Table 3 provides a list identified through the public outreach efforts. The roadway network should be further evaluated to identify other roads at risk due to elevation (snow), inadequate clear zones, or other limitations.

Table 3 - Previously Unusable Roads

ROADS PREVIOUSLY UNUSABLE DUE TO NATURAL EVENTS	COMMUNITY
Bowman Road / Bywood Drive	Cottonwood
Jackson Street	Red Bluff
Rancho Tehama Road	Rancho Tehama
Southridge Drive	Red Bluff
McCoy Road	Red Bluff
Bowman Road	Cottonwood
Rivers Edge (area)	Red Bank
Red Bank	Red Bank
Reeds Creek Road	Red Bluff
Bowman Road	Cottonwood
Kaer Avenue	Red Bluff
Antelope Boulevard, Main Street, Chestnut Avenue	Red Bluff
Baker Road	Red Bluff
Flores Avenue and Third Street	Red Bluff
Flores Avenue	Red Bluff
Tehama Avenue	City of Tehama
Hwy 99	Several
CR 306	Paskenta/Flournoy
Hwy 99	Several

**RECOMMENDATION 4:** Evaluate potential widening or other improvement projects for roadways identified in the evacuation modeling as at risk for severe congestion during an evacuation.

Table 4 shows the roadways that were identified in the model as having relatively high levels of traffic and congestion.

**Table 4 - Historically Congested Roadways**

ROUTE	CITY	LOCATION	NOTES
Antelope Blvd / SR 36	Red Bluff	Near I-5	Slowed speeds in simulation and higher/medium traffic densities
I-5	Corning	Solano St	Slowed speeds in simulation
South Ave	Corning	I-5 Connection	Highest traffic densities
Main Street	Red Bluff	I-5 Connection	Highest traffic densities
Belle Mill Rd	Red Bluff	Connects to SR 36/Antelope which leads to I-5	Highest traffic densities
San Benito Ave	Gerber and Proberta	Major Route, connects to SR 99	Highest traffic densities
Oak St	Red Bluff	Connects to Main St to I-5	Highest traffic densities
SR 36	Red Bluff	Connects to Main St/SR 36 to I-5	Higher/medium traffic densities
Sale Ln	Red Bluff	Provides access to SR 36/Antelope	Higher/medium traffic densities
Solano St	Corning	Major route, provides access to I-5	Highest traffic densities
Orangewood Rd	Between Richfield/Corning	Access to SR 99	Highest traffic densities
Breckenridge St	Red Bluff	Access to Main St to I-5	Higher/medium traffic densities
Crittenden St	Red Bluff	Access to Main St to I-5	Highest traffic densities
C St	City of Tehama	Access to SR 99	Highest traffic densities

**RECOMMENDATION 5:** Evaluate and improve as needed, bridges on evacuation routes and single access routes.

**RECOMMENDATION 6:** Evaluate opportunities for multiuse paths along evacuation routes that can serve as emergency response routes during an evacuation and as part of the multimodal network for everyday use (long-term).

The following roadways are evacuation routes that should be considered prime locations for the addition of multiuse paths which could facilitate response during an evacuation and would also connect well and enhance the existing bike/ped network:

1. In the Cottonwood area, Bowman Road and Lake California Drive have existing and proposed trails along evacuation routes.

2. In the Bend area, Jellys Ferry Road has proposed trails along evacuation routes.
3. SR 99 through Dairyville, a primary evacuation route, has planned trails.
4. In Los Molinos, Aramayo Way and SR 99 have existing and proposed trails along evacuation routes.
5. In Corning, Hoag Road, an evacuation route, has proposed trails.

**RECOMMENDATION 7:** Establish agreements/communication protocol for manned control of pinch points in an evacuation (short-term).

Subsequent sections of this report indicate potential pinch points; however, the unpredictable nature of evacuations precludes identifying exact needs. Agreements should be flexible to situational needs.

**RECOMMENDATION 8:** Evacuation signage project (short-term).

Evacuation routes, as identified in **FIGURES 70-95**, should be signed to inform motorists of safe, efficient routes.

**RECOMMENDATION 9:** Prioritize roadway improvement projects, such as pavement upgrades, drainage improvements, and clear zone expansion on evacuation routes (medium-term) as identified for each community in **FIGURES 70-95**.

**RECOMMENDATION 10:** Establish shelters, assembly points, and safe refuge areas. This may include entering into mutual agreements. Include information about the locations in evacuation guides and media (medium-term).

**RECOMMENDATION 11:** Continue efforts to promote awareness of Genasys Protect and other evacuation resource guides through traditional means (websites, printed materials, and social media) and explore new avenues for dissemination to the public (short-term).

**RECOMMENDATION 12:** Prepare plans and enhance existing outreach to vulnerable populations that may require assistance during an evacuation (short-term).

## 6.2 COUNTYWIDE POLICY RECOMMENDATIONS

Emergency evacuation reports typically involve detailed plans and policies for safely and efficiently evacuating people from a location during a crisis or disaster. Action policies within these reports are specific guidelines that outline the steps to be taken by individuals, organizations, or authorities during an evacuation. These policies are crucial for ensuring that people can quickly and safely leave the area, whether it's due to a natural disaster (ex. hurricanes, floods, wildfires, earthquakes), or a man-made emergency (ex: industrial accidents), or other hazardous situations. The specific contents of action policies in an emergency evacuation report will depend on the type of facility or location, the nature of the potential emergencies, and the relevant regulations and best practices. These policies are essential for minimizing risks and ensuring the safety of all individuals involved in an evacuation. Tehama County adheres to California state laws and regulations governing wildfire response, evacuation, and land-use planning to mitigate fire risks. The risk assessment includes factors like climate, topography, vegetation types, and fire history.

Tehama County relies on a coordinated approach involving local, County, and regional agencies for wildfire response and evacuation. This includes local fire departments, law enforcement, and coordination with regional agencies like the California Department of Forestry and Fire Protection (CAL FIRE). Tehama County allocates resources for wildfire evacuations, including a fleet of emergency vehicles and cooperation with local shelters and healthcare providers. Coordination between local, County, and regional agencies ensures efficient resource allocation. Public education campaigns emphasize the importance of preparedness, creating defensible space, and evacuation readiness. Efforts are made to engage non-English speaking populations and individuals with disabilities through community outreach programs. Past wildfires in the County, such as the 2020 Butte Fire, have provided valuable lessons in terms of the need for improved communication and faster evacuations. Adaptations in response strategies are being made based on these experiences.

### RECOMMENDATIONS FOR IMPROVEMENTS INCLUDE:

1. Enhanced road maintenance in evacuation routes.
2. Designated evacuation routes, both primary and secondary, which are well-maintained and marked.
3. Yearly wildfire risk mapping.
4. Improved communication infrastructure using the Genasys notification software framework and solar powered sirens.
5. Collaboration with utility companies to mitigate the risk of power lines causing wildfires.
6. Clearly defined assembly points and staging areas for evacuees.
7. Procedures for timely evacuation notifications through emergency alerts, sirens, and social media.

### R1. EMERGENCY PREPAREDNESS TRAINING

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R1.1 Training Programs: Develop a structured curriculum for emergency preparedness training. This curriculum should cover a wide range of topics, including hazard identification, risk assessment, evacuation procedures, first aid, and communication protocols.

R1.2 Community Engagement: Organize regular community meetings and workshops to engage

residents in the training programs. These can be conducted by local emergency management agencies, experts, or volunteers.

- R1.3 Outreach Materials: Create informative brochures, pamphlets, and online resources that residents can access at any time to reinforce their knowledge and preparedness.

## R2. EVACUATION ROUTE MAINTENANCE

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- R1.4 Evacuation Routes: Establish and maintain well-defined primary and secondary evacuation routes. These routes should consider traffic flow, accessibility, and proximity to vulnerable populations. Maps or diagrams may be provided to illustrate these routes.
- R1.5 Alternative Routes: Identify alternative routes in case primary routes become congested or blocked. These routes should be well-maintained and suitable for evacuation traffic.
- R1.6 Route Analysis: Conduct a detailed analysis of all evacuation routes, considering factors like road conditions, road capacity, terrain, and proximity to emergency shelters.
- R1.7 Regular Inspections: Implement a routine inspection schedule for bridges, tunnels, and critical roadways. Ensure that these structures meet safety standards and can withstand the demands of an emergency evacuation.

## R3. PUBLIC COMMUNICATION AND ALERTS

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- R1.8 Communication: Maintain clear and effective communication channels throughout the evacuation process. This includes continuous updates to residents, coordination among response agencies, and information sharing with the public. All communication will be done through the powerful evacuation notification system Genasys.
- R1.9 Emergency Alert Systems: Establish and maintain the state-of-the-art emergency alert system Genasys. This system should be capable of sending alerts via text messages, phone calls, sirens, social media, and local media outlets.
- R1.10 Siren Installation: Implement a comprehensive plan to install solar-powered emergency sirens in all vulnerable communities throughout Tehama County. These sirens will serve as a vital audible alert system to complement and reinforce evacuation alerts, especially in situations where internet access is disrupted ensuring comprehensive coverage throughout the County.
- R1.11 Evacuation Orders: Issue evacuation orders promptly using Genasys when a wildfire threat is identified. Clearly communicate the areas affected, the nature of the threat, and the urgency of evacuation.
- R1.12 Website and Mobile Apps: Maintain a dedicated emergency website and mobile app where residents can find real-time information on evacuation routes, shelter locations, and emergency updates.
- R1.13 Social Media: Social media to monitor and update official accounts with critical information during emergencies. Engage with the community online and address their concerns.

R1.14 Accountability: Protocols for accounting for all personnel, visitors, or residents to ensure that no one is left behind during the evacuation. This may involve checklists or electronic tracking systems. Efforts are made to ensure that residents with limited access to technology are reached through door-to-door notifications and community networks.

#### R4. TRAFFIC MANAGEMENT

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R1.15 Traffic Management Plan: Develop a comprehensive traffic management plan that includes protocols for road closures, traffic diversions, and adjustments to traffic signal timing during evacuations to prevent congestion and gridlock on evacuation routes.

R1.16 Training for Personnel: Train law enforcement, traffic control personnel, and volunteers in the intricacies of traffic management during emergencies. Ensure they can adapt to evolving situations.

R1.17 Evacuation Drills and Training: Regular evacuation drills and training programs are conducted to familiarize residents and responders with evacuation procedures and to identify areas for improvement.

R1.18 Transportation and Mobility: Coordinate with local transportation providers to ensure the availability of buses, shuttles, and other means of transportation for evacuees, especially those without personal vehicles.

#### R5. EVACUATION SHELTERS AND SERVICES

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R1.19 Assembly Points: Designation of safe assembly areas where evacuees can gather after leaving the area. These areas are crucial for accounting for everyone and for the public to receive further instructions. These areas will be well-marked and accessible. Resources and support may be provided during the evacuation here, such as medical assistance, transportation, or communication facilities.

R1.20 Shelter Network: Establish a network of evacuation shelters strategically located to serve various neighborhoods. Ensure that each shelter is equipped to provide basic services and comfort for evacuees.

R1.21 Resource Stockpiles: Maintain stockpiles of essential resources at shelters, including medical supplies, non-perishable food, water, blankets, and pet care materials.

R1.22 Volunteer Support: Recruit and train volunteers to assist with shelter operations and services. Ensure they are well-coordinated and have clearly defined roles.

#### R6. EVACUATION TIMING

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R1.23 Early Warning System: Implement an early warning system that factors in weather forecasts, fire danger indices, and other critical data to trigger evacuation alerts. Alerts will be announced through Genesys, the evacuation notification software.

R1.24 Community Education: Educate residents about the importance of early evacuation. Conduct outreach campaigns to inform them about evacuation triggers and the potential risks of delaying evacuation.

## R7. SPECIAL NEEDS POPULATION

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- R1.25 Vulnerable Populations: Develop specific plans for evacuating individuals with special needs, such as the elderly, disabled, and those with medical conditions. Provide accessible transportation and shelters for them.
- R1.26 Special Needs: Plans to accommodate people with special needs, such as those with mobility challenges, medical conditions, or language barriers.
- R1.27 Specialized Assistance Plans: Develop individualized evacuation plans for areas with increased need during evacuations, such as the elderly and low-income populations. Assign additional personnel to assist these areas.
- R1.28 Communication Channels: Establish communication channels to reach out to special needs populations during emergencies and provide them with necessary support.
- R1.29 Transportation Assistance: Ensure that specialized transportation options are available for those who require mobility assistance.

## R8. RESOURCE ALLOCATION

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- R1.30 Funding and Resource Allocation: Allocate resources, such as emergency personnel, medical supplies, and shelter provisions, to support evacuees and first responders. Adequate funding includes resource acquisition and maintenance.
- R1.31 Resource Coordination: Establish mechanisms for effective coordination among local, County, and regional agencies, including law enforcement, fire departments, and emergency management agencies. Develop protocols for the rapid and efficient deployment of resources based on the evolving needs of the emergency.
- R1.32 Resource Inventory: Maintain an up-to-date inventory of emergency resources, including personnel, equipment, medical supplies, and fuel.

## R9. COLLABORATION WITH NEIGHBORING COMMUNITIES

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- R1.33 Mutual Aid Agreements: Establish mutual aid agreements with neighboring jurisdictions to provide and receive assistance as needed during emergencies.
- R1.34 Interagency Agreements: Develop interagency agreements with neighboring communities to facilitate coordinated evacuations. Clearly outline roles and responsibilities.
- R1.35 Joint Exercises: Conduct joint training exercises and drills with neighboring communities to ensure seamless collaboration in the event of a large-scale emergency that crosses jurisdictional boundaries.

## R10. COMMUNITY ENGAGEMENT AND EDUCATION

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- R1.36 Public Education and Outreach: Engage in public education campaigns to inform residents about wildfire risks, preparedness, and evacuation procedures. Efforts should be made to reach non-

English-speaking populations and individuals with disabilities.

R1.37 Continuous Outreach: Maintain ongoing outreach efforts through community meetings, workshops, and social media campaigns to keep residents engaged in preparedness efforts.

R1.38 Education Partnerships: Collaborate with schools and educational institutions to include emergency preparedness education in curricula and engage students in preparedness activities.

R1.39 Demonstration Events: Organize demonstrations and simulations to educate the community on evacuation procedures and the proper use of emergency kits.

#### R11. EMERGENCY RESPONSE COORDINATION

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R1.40 Unified Command Structure: Establish a unified command structure among emergency response agencies, clearly defining roles and responsibilities for each agency.

R1.41 Training Exercises: Conduct regular training exercises involving all agencies to ensure seamless coordination in complex emergency scenarios.

R1.42 Communication Protocols: Develop standardized communication protocols to enable agencies to share critical information effectively.

R1.43 Cross-Agency Collaboration: Tehama County emphasizes collaboration among local, County, and regional agencies to ensure a unified response during wildfires.

R1.44 Interagency exercises and joint training sessions are conducted.

#### R12. TECHNOLOGICAL SOLUTIONS

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R1.45 Traffic Monitoring Technology: Invest in state-of-the-art traffic monitoring technology, such as automated traffic cameras, sensors, and real-time traffic management software.

R1.46 GIS Mapping: Utilize Geographic Information Systems (GIS) for real-time mapping, route optimization, and the visual representation of evacuation plans.

R1.47 Mobile Apps and social media: Leverage mobile apps and social media platforms for real-time updates, communication with residents, and the dissemination of important information.

#### R13. POST-EVACUATION SUPPORT

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R1.48 Repopulation Plans: Develop plans for the systematic repopulation of evacuated areas. This should include coordinated efforts to ensure residents can safely return home.

R1.49 Traffic Management After Evacuation: Implement strategies for managing traffic and preventing congestion during the return phase, including staggered re-entry times and clear traffic instructions.

R1.50 Mental Health Support: Offer mental health services and counseling to residents who may have been traumatized by the emergency. Establish support centers and outreach programs to address their needs.

R1.51 Continuity of Operations: Ensure that essential services, businesses, and government operations are maintained during evacuations when possible.

R1.52 Review and Adaptation: Regularly review and update evacuation plans based on lessons learned from previous wildfire events and changing conditions.

R14. RE-ENTRY / REPOPULATION

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R1.53 Re-entry Procedures: Develop clear guidelines for when residents can safely re-enter evacuated areas once it's deemed appropriate. This may involve assessing the safety of infrastructure and air quality.

R15. PETS / LIVESTOCK

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R1.54 Animal Evacuation: Include policies for evacuating pets and livestock, including the availability of animal shelters and transportation for animals.

R16. CONTINUOUS IMPROVEMENT

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R1.55 After-Action Reviews: After each emergency event, conduct thorough after-action reviews involving all relevant agencies to identify strengths and weaknesses in the response and make necessary improvements.

R1.56 Plan Updates: Regularly update the evacuation and routing plans to incorporate lessons learned, accommodate changing infrastructure, and address shifts in demographics.

R1.57 Feedback Mechanisms: Establish feedback mechanisms for residents and responders to share their experiences and suggest improvements.

Action policies for emergency evacuation from wildfires in Tehama County are crucial for ensuring the safe evacuation of residents and communities during wildfire events. These action policies are regularly reviewed, tested, and updated to ensure their effectiveness and responsiveness to the specific wildfire risks faced by Tehama County. In implementing these expanded action policies, close collaboration with local government agencies, emergency management experts, community leaders, and the public is essential. Continuous evaluation, regular updates, and a commitment to the safety and well-being of the community will help ensure the success of the Tehama evacuation and routing study. Tehama County's action policies for wildfire evacuation reflect a proactive approach that addresses the specific risks of the region. The coordination between local, County, and regional agencies, public education initiatives, and a commitment to learning from past experiences demonstrate a comprehensive strategy for wildfire response and evacuation in the County. Ongoing efforts to improve infrastructure, communication, and collaboration is vital for enhancing the safety of residents in Tehama County during wildfire events.

## 6.3 RECOMMENDED PRIORITY PROJECT LIST

The following projects were identified through policy analysis findings, roadway network and access analysis, community outreach input, best practices observed in similar geographic areas, and roadway and fire behavior modelling analyses, producing the following prioritized projects sorted by community:

Table 5 - Priority Project List

Project Name	Project Type	Timeframe	Community	Cost	Location	Description
<b>Evergreen Road Widening Project</b>	Roadway Improvement	Medium-term	Bowman	\$500,000	Evergreen Road	Evergreen Road has been identified for roadway widening and clear zone expansion. The roadway will undergo construction to improve evacuation safety communitywide by creating roadways that are the proper width to support evacuees and emergency vehicles
<b>Luce Griswold Road Paving</b>	Roadway Improvement	Medium-term	Bowman	\$80,000	Bowman Road	Griswold is currently unpaved and the only secondary access road.
<b>Bowman Road Right of Way Thin</b>	Roadside Brush Thinning	Short-term	Bowman	\$19,904	Bowman Road	Thin in right of way as directed by forester. Target gray pine and ladder fuels. Prune larger oaks.
<b>Bowman Road Right of Way Thin</b>	Roadside Brush Thinning	Short-term	Bowman	\$23,264	Bowman Road	Thin in right of way as directed by forester. Target gray pine and ladder fuels. Prune larger oaks.
<b>Bowman Road Right of Way Thin</b>	Roadside Brush Thinning	Short-term	Bowman	\$15,460	Bowman Road	Thin in right of way as directed by forester. Target gray pine and ladder fuels. Prune larger oaks.
<b>Bowman Road Right of Way Thin</b>	Roadside Brush Thinning	Short-term	Bowman	\$15,008	Bowman Road	Thin in right of way as directed by forester. Target gray pine

						and ladder fuels. Prune larger oaks.
<b>Bowman Road Right of Way Thin</b>	Roadside Brush Thinning	Short-term	Bowman	\$43,764	Bowman Road	Thin in right of way as directed by forester. Target gray pine and ladder fuels. Prune larger oaks.
<b>Countywide Emergency Siren System</b>	Emergency Siren System (Countywide)	Short-term	Countywide	\$2,000,000	Countywide Emergency	Solar-powered sirens will be installed to alert those without internet access about evacuations and emergencies in all population areas of Tehama County. See community maps for each siren location.
<b>Countywide Emergency Evacuation Wayfinding and Routing System</b>	Evacuation Routing Signage Wayfinding System	Short-term	Countywide	\$250,000	Countywide	Reflective evacuation signs will be placed at this location to direct residents from their local roads to the nearest collector road(s) and/or arterial highway(s). If alternate evacuation routes are available for the community, these routes will be listed as traversable alternate routes during an emergency. Additionally, shelter-in-place locations for each community will be depicted as well. See community maps for each signage type and location and associated evacuation routes and available shelter areas.

<b>Genasys Countywide Notification System</b>	Genasys Notification Framework Rollout	Short-term	Countywide	N/A	Countywide	The community will be made aware of the new evacuation notification system called the Genasys Protect (formally known as Zonehaven) and other evacuation resource guides through traditional means (websites, printed materials, and social media).
<b>Lake California Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Lake California	Unknown	Lake California Road	Lake California has been identified as needing an additional secondary access road for emergency evacuations. Extensive evaluation, private/public partnerships, project planning, and implementation will be pursued through subsequent projects, funding programs and regular discretionary programs.
<b>Lake California Widening and Multiuse Path</b>	Road widening and dual-purpose multiuse path for emergency ingress/egress and daily recreational use	Medium-term	Lake California	\$260,000	Lake California	Widen Lake California Drive and install a multi-use path along the shoulder to support emergency vehicles and to serve as an emergency response route during an evacuation. This path will double as a multimodal network for everyday use.

<b>Wilson Hill Roadside Thinning</b>	Roadside Mastication	Short-term	Manton	\$25,383	Manton Mill	Remove gray pine and selectively masticate brush for 150' off road.
<b>Forwards Mill Maintenance</b>	Roadside Mastication and Prescription Burning	Short-term	Manton	\$48,834	Manton Mill	Burn to maintain previous thinning. Some thinning may be needed to prep. Retain larger black oak.
<b>Manton Roadside Thinning</b>	Roadside Brush Thinning	Short-term	Manton	\$32,000	Manton Roadside	Thin 125' from road's edge as directed by forester. Target gray pine and ladder fuels. Retain black oak.
<b>Manton Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Manton	Unknown	Manton Roadside	Manton has been identified as needing additional fire lanes/secondary access roads for emergency evacuations.
<b>Forwards Mill Road Thinning – South</b>	Roadside Brush Thinning	Short-term	Manton	\$151,501	Manton Mill	Thin 150' either side as directed by forester. Retain black oak.
<b>Forwards Mill Thinning – North</b>	Roadside Brush Thinning	Short-term	Manton	\$38,521	Manton Mill	Roadside thinning as directed by forester. Retain black oak and sugar pine. Desired future state is to maintain with prescription burning.
<b>State Route 36/Battle Creek Road Safety Access Project</b>	Roadway Improvement	Medium-term	Mineral	\$100,000	Battle Creek Road	Battle Creek Road has previously been unusable during a natural event will be evaluated and improved for efficient and successful evacuation.
<b>State Route 172 Widening</b>	Roadway Improvement	Medium-term	Mineral	\$100,000	State Route 172	Sections of SR 172 near Mineral have been identified for roadway widening and clear zone expansion. The

						roadway will undergo construction to improve evacuation safety communitywide by creating roadways that are the proper width to support evacuees and emergency vehicles
<b>CR 306 Improvement Project</b>	Roadway Improvement	Medium-term	Paskenta	\$100,000	Paskenta Improvement	This roadway is an evacuation route in need of repair and potential coordination for gate access/removal. Paving and vegetation maintenance.
<b>Ponderosa Sky Ranch Roadside Thin</b>	Roadside Mastication	Short-term	Ponderosa Sky Ranch	\$61,005	Ponderosa Sky Ranch	Remove gray pine and selectively masticate 75-100'. Retain black oak.
<b>Ponderosa Sky Ranch Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Ponderosa Sky Ranch	Unknown	Ponderosa Sky Ranch Roadside	Ponderosa Sky Ranch has been identified as needing additional fire lanes/secondary access roads for emergency evacuations.
<b>Ponderosa Way Repaving and Vegetation Management Project</b>	Roadway Improvement	Medium-term	Ponderosa-Sky Ranch	\$100,000	Ponderosa-Sky Ranch Way	This roadway is an evacuation route in need of repair. The road will undergo a pavement upgrade and vegetation maintenance.
<b>Canyon View Loop Repaving and Vegetation Management Project</b>	Roadway Improvement	Medium-term	Ponderosa-Sky Ranch	\$100,000	Ponderosa-Sky Ranch View	This roadway is an evacuation route in need of repair. The road will undergo a pavement upgrade and vegetation maintenance.

<b>Rancho Tehama Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Rancho Tehama	Unknown	Rancho Tehama Roadside	Rancho Tehama has been identified as needing an additional secondary access road for emergency evacuations. Potential access routes to be analyzed: Boggs and Champlain Road, Black Ranch Road, Fawn Road, and Rancho Tehama Road. Extensive evaluation, private/public partnerships, project planning, and implementation would require a long-term process.
<b>Rancho Tehama Road Intersection Widening Project</b>	Intersection Improvement	Medium-term	Rancho Tehama	\$75,000	Rancho Tehama Road	The intersection at the entrance to Rancho Tehama and Stagecoach will be evaluated and improved for efficient and successful evacuation.
<b>Gyle Road Improvement Project</b>	Roadway Improvement	Medium-term	Rancho Tehama	\$100,000	Rancho Tehama Roadside	This previously unusable roadway during a natural event will be evaluated and improved for efficient and successful evacuation. Gyle and Dusty Rds. are the only way out to I-5 and both flood. There has been lots of road flooding and shoulders become soft with floods. The roadways will be further evaluated for flooding.

<b>Rancho Tehama Road Improvement Project</b>	Roadway Improvement	Medium-term	Rancho Tehama	\$100,000	Rancho Tehama Roadside	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
<b>Dusty Road Improvement Project</b>	Roadway Improvement	Medium-term	Rancho Tehama	\$100,000	Dusty Road	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
<b>Tulare Road Improvement Project</b>	Roadway Improvement	Medium-term	Rancho Tehama	\$100,000	Tulare Road	This roadway has been identified for roadway widening and clear zone expansion. The roadway will undergo construction to improve evacuation safety communitywide by creating roadways that are the proper width to support evacuees and emergency vehicles
<b>Charles Drive Thinning</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$27,315	Rancho Tehama	Thin grey pine within 75 feet of road, reduce ladder fuels in rest of project area.
<b>Paynes Creek Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Paynes Creek	Unknown	Paynes Creek Roadside	Paynes Creek has been identified as needing additional fire lanes/secondary access roads for emergency evacuations. Potential use of existing Forest Service and/or logging roads.

<b>Rancho Tehama Park Thinning</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$22,620	Rancho Tehama	Remove gray pine within 75 feet of road. Reduce ladder fuels on remainder of project area.
<b>Mineral Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Mineral	Unknown	Manton Roadside	Mineral has been identified as needing additional fire lanes/secondary access roads for emergency evacuations. Potential use of Forest Service roads and/or logging roads.
<b>Rancho Tehama Roadside Thin</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$23,835	Rancho Tehama	Target gray pine, remove ladder fuels and jackpots.
<b>Pebble Beach Unit</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$3,570	Pebble Beach Road	Target gray pine, remove ladder fuels and jackpots.
<b>Government Gulch Thin</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$38,595	Government Gulch Road	Target gray pine, remove ladder fuels and jackpots.
<b>Upper Stagecoach Roadside Thin</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$31,620	Upper Stagecoach Road	Target gray pine, remove ladder fuels and jackpots.
<b>Hillcrest Roadside Thin</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$34,515	Hillcrest Road	Target gray pine, remove ladder fuels and jackpots.
<b>Mill Creek Fire Lane/Emergency Personnel Secondary Access</b>	Create New Fire Lane Emergency Secondary Access Route for Emergency Personnel	Long-term	Mill Creek	Unknown	Mill Creek Roadside	Mill Creek has been identified as needing additional fire lanes/secondary access roads for emergency evacuations. Potential use of existing Forest Service and/or logging roads.
<b>Stagecoach Roadside Thin</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$28,560	Stagecoach Road	Target gray pine, remove ladder fuels and jackpots.
<b>Oakridge Roadside Thin</b>	Roadside Brush Thinning	Short-term	Rancho Tehama	\$22,980	Oakridge Road	Target gray pine, remove ladder fuels and jackpots.

<b>Red Bank Road Improvement Project</b>	Roadway Improvement	Medium-term	Red Bank	\$100,000	Red Bank Road	Red Bank Road has been identified for roadway widening and clear zone expansion. The roadway will undergo construction to improve evacuation safety communitywide by creating roadways that are the proper width to support evacuees and emergency vehicles
<b>Jackson Street improvements to make road traversable during an evacuation.</b>	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Jackson Street	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
<b>Southridge Drive improvements to make road traversable during an evacuation.</b>	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Southridge Drive	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
<b>Jackson Street improvements to make road traversable during an evacuation.</b>	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Jackson Street	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
<b>McCoy Road improvements to make road traversable during an evacuation.</b>	Roadway Improvement	Medium-term	Red Bluff	\$100,000	McCoy Road	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.

Reeds Creek Road improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Reeds Creek Road	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
Kaer Avenue improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Kaer Avenue	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
Antelope Boulevard, Main Street, Chestnut Avenue improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Multiple roads in Red Bluff	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
Baker Road improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Baker Road	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
Flores Avenue and 3rd Street improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Flores Avenue	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
Flores Avenue improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Flores Avenue	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.

Reeds Creek - residence on Aloha Street - improvements to make road traversable during an evacuation.	Roadway Improvement	Medium-term	Red Bluff	\$100,000	Reeds Creek at Aloha Street	This roadway has previously been unusable during a natural event and will be evaluated and improved for efficient and successful evacuation.
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## 6.4 PLANNED CALTRANS PROJECTS

To the extent feasible, projects developed to support evacuation should be in conjunction with other planned projects. Similarly, other County projects and/or work efforts by other agencies should incorporate Tehama County evacuation needs and goals. Caltrans has several planned projects in Tehama County that directly or indirectly improve the roadway network and support evacuations. Exhibit 2 shows the projects and Table 6 provides a description of projects that are expected to benefit evacuations.

Table 6 - Planned Caltrans Projects in Tehama County

ROUTE	PROJECT NAME	DESCRIPTION	BENEFIT TO EVACUATION
I-5	Thomas Creek Bridge MTCE	Bridge Maintenance	Builds Resiliency into Primary Evacuation Route
I-5	Sacramento River Bridge Seismic	Bridge Retrofit	Builds Resiliency into Primary Evacuation Route
I-5	Tehama CRZ	Improve Clear Zone Recovery	Builds Resiliency into Primary Evacuation Route, reduces Fuel Loads
CA-32	Bridge Maintenance	Bridge Maintenance	Builds Resiliency into Primary Evacuation Route
I-5	Tehama 5 BBMMN	Install Broadband	Improves Real-time Communications
I-5	Satellite Dispatch EOC	Construct rural TMC	Improves Real-time Communications
I-5	Satellite Rural TMC	Construct rural TMC	Improves Real-time Communications
I-5	Cottonwood Toomes Access	Roadside Protect and Restore	Builds Resiliency into Primary Evacuation Route

CA-99	Cottonwood Toomes Access	Roadside Protect and Restore	Builds Resiliency into Primary Evacuation Route
CA-36	Leftover Culvert	Culvert Replacement	Improve Drainage/ Builds Resiliency into Evacuation Route
CA-36	Horse Gulch Culvert	Curve improvement	Builds Resiliency into Evacuation Route
CA-36	Red Bluff Bridges	Bridge Seismic Restoration	Builds Resiliency into Evacuation Route
CA-36	Dibble Creek CAPM	Pavement Rehabilitation	Builds Resiliency into Evacuation Route
CA-99	VP2	Pavement Rehabilitation	Builds Resiliency into Evacuation Route
CA-99	South Ave Safety	Construct Roundabout	Intersection Improvements at potential pinch point
CA-99	Butler Slough Culverts	Culvert Rehabilitation	Improve Drainage/ Builds Resiliency into Evacuation Route
CA-36	Tehama Plumas Scour Mitigation	Bridge Scour Mitigation	Builds Resiliency into Evacuation Route

## 6.5 COMMUNITY IMPROVEMENT PROJECT MAPS

The following maps detail the proposed recommendations tailored to each community within Tehama County. These proposed enhancements encompass a broad spectrum of measures designed to bolster emergency preparedness and response capabilities. Specifically, they include strategic placements of emergency sirens to ensure optimal auditory coverage, new fire lane access corridors/secondary access routes for limited access communities, the designation of refuge areas as safe havens during emergencies for communities that do not already have this type of system in place, and the implementation of evacuation wayfinding solutions—comprising both locations and design schematics—to facilitate intuitive evacuation routes. Additionally, the documents outline targeted areas for roadside vegetation management through thinning and mastication practices, locations identified for controlled prescribed burns to reduce wildfire fuel loads, and a variety of road improvement projects aimed at enhancing evacuation route efficiency and safety.

Complementing these localized improvements, the report advocates for the deployment of policy and programming enhancements across the entire County. These include the initiation of comprehensive fire protection education programs designed to elevate community awareness and preparedness levels, alongside the development of sophisticated evacuation notification frameworks. These countywide initiatives are conceived to foster a culture of preparedness, ensuring that all residents of Tehama County are well-informed, ready to act in the event of an emergency, and equipped with the knowledge and tools necessary to protect themselves and their communities.

EL CAMINO

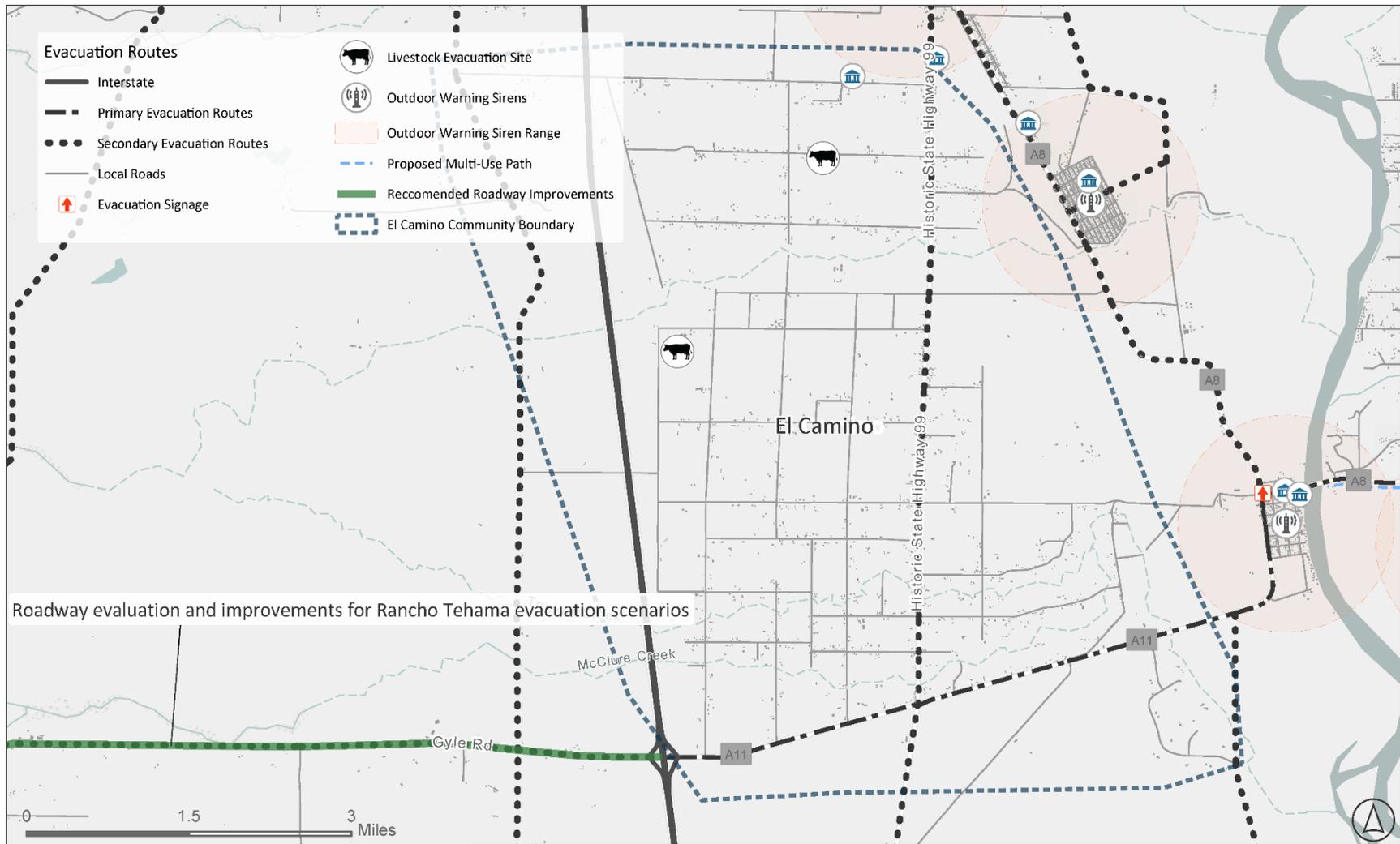


Figure 69 - El Camino Project Improvement Map

El Camino recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

DAIRYVILLE

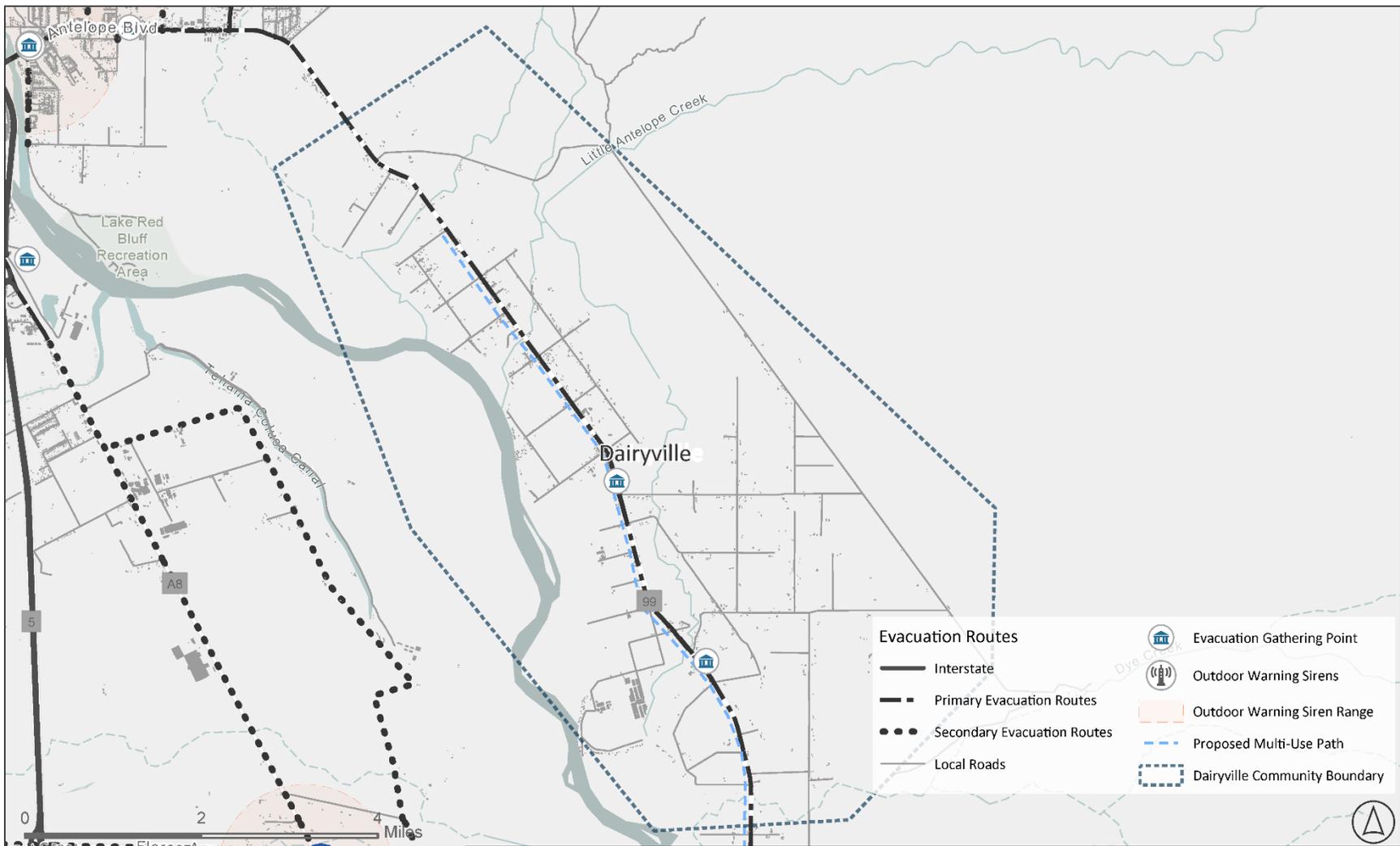


Figure 70 - Dairyville Project Improvement Map

Dairyville recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

GERBER

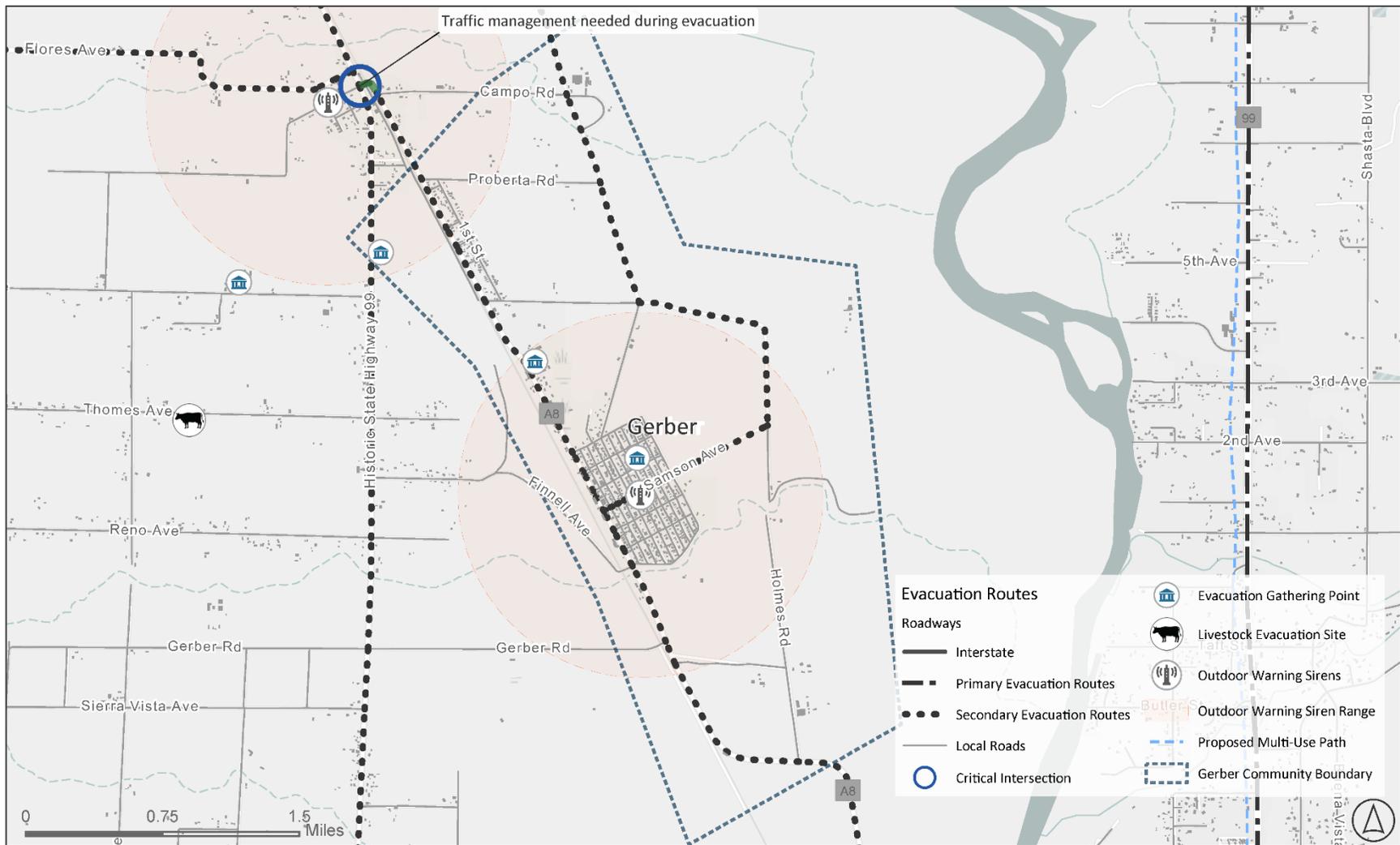


Figure 71 - Gerber Project Improvement Map

Gerber recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

LOS MOLINOS

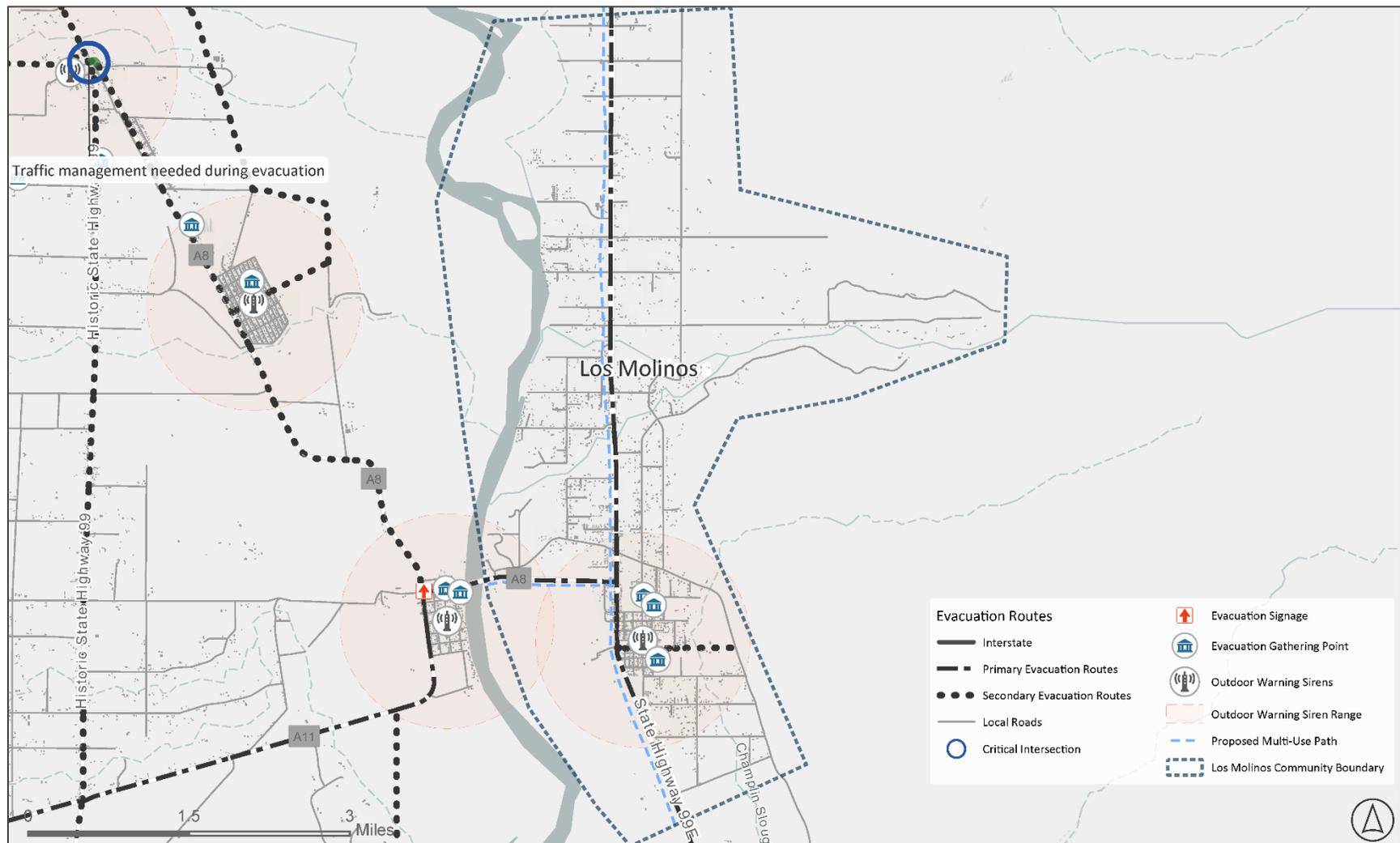


Figure 72 - Los Molinos Project Improvement Map

Los Molinos recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

PROBERTA

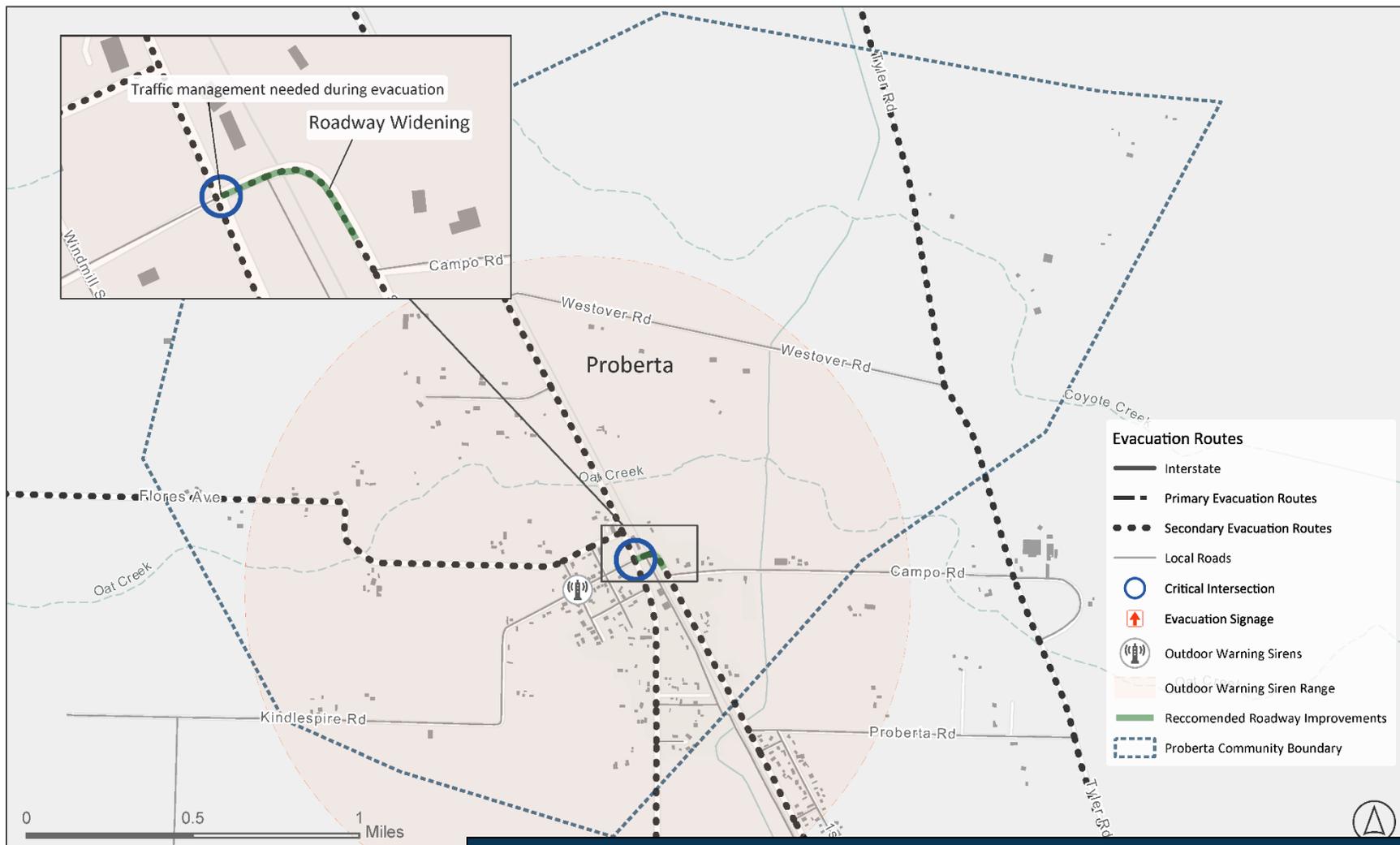


Figure 73 - Proberta Project Improvement Map

Proberta recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

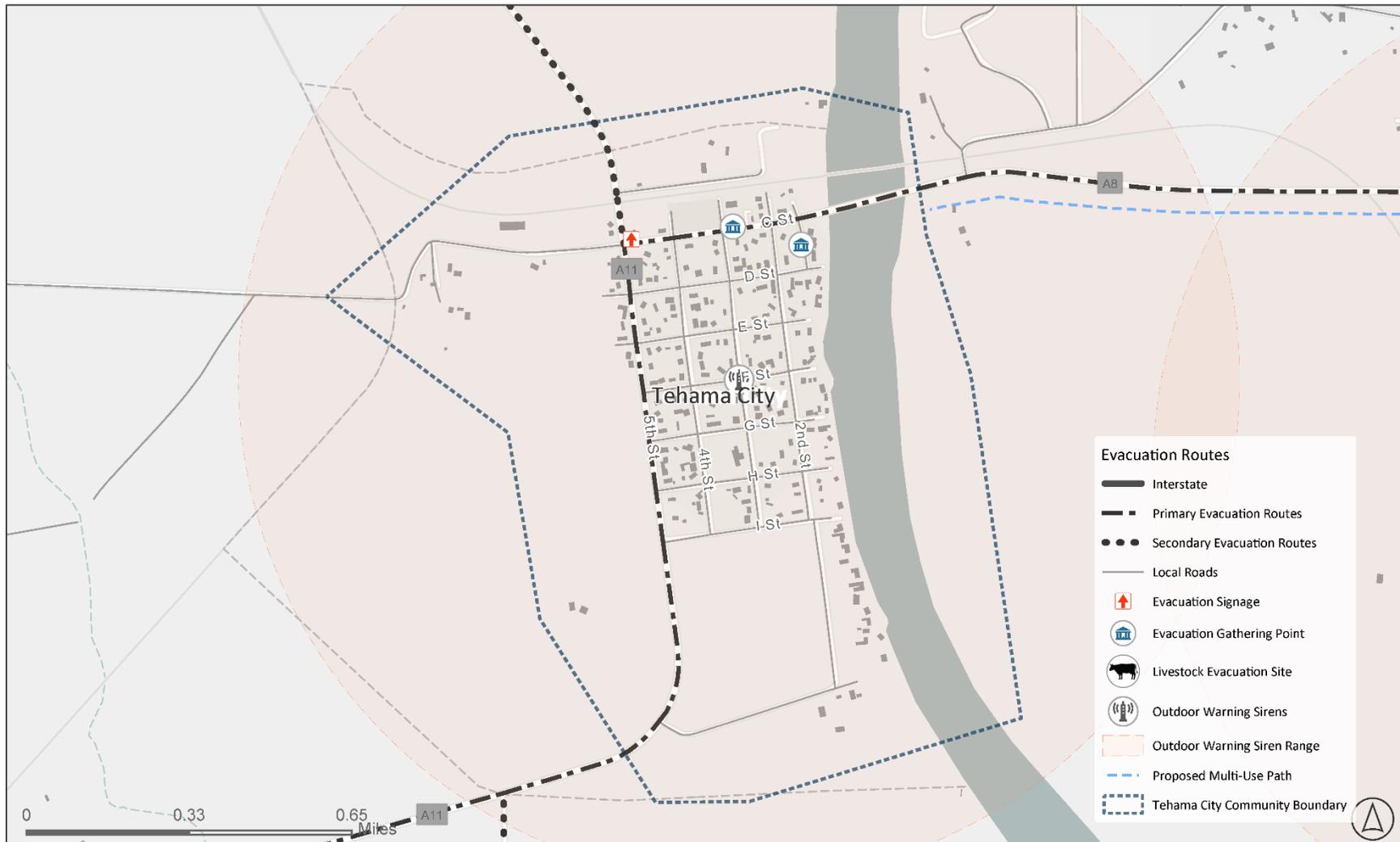


Figure 74 - City of Tehama Project Improvement Map

City of Tehama recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

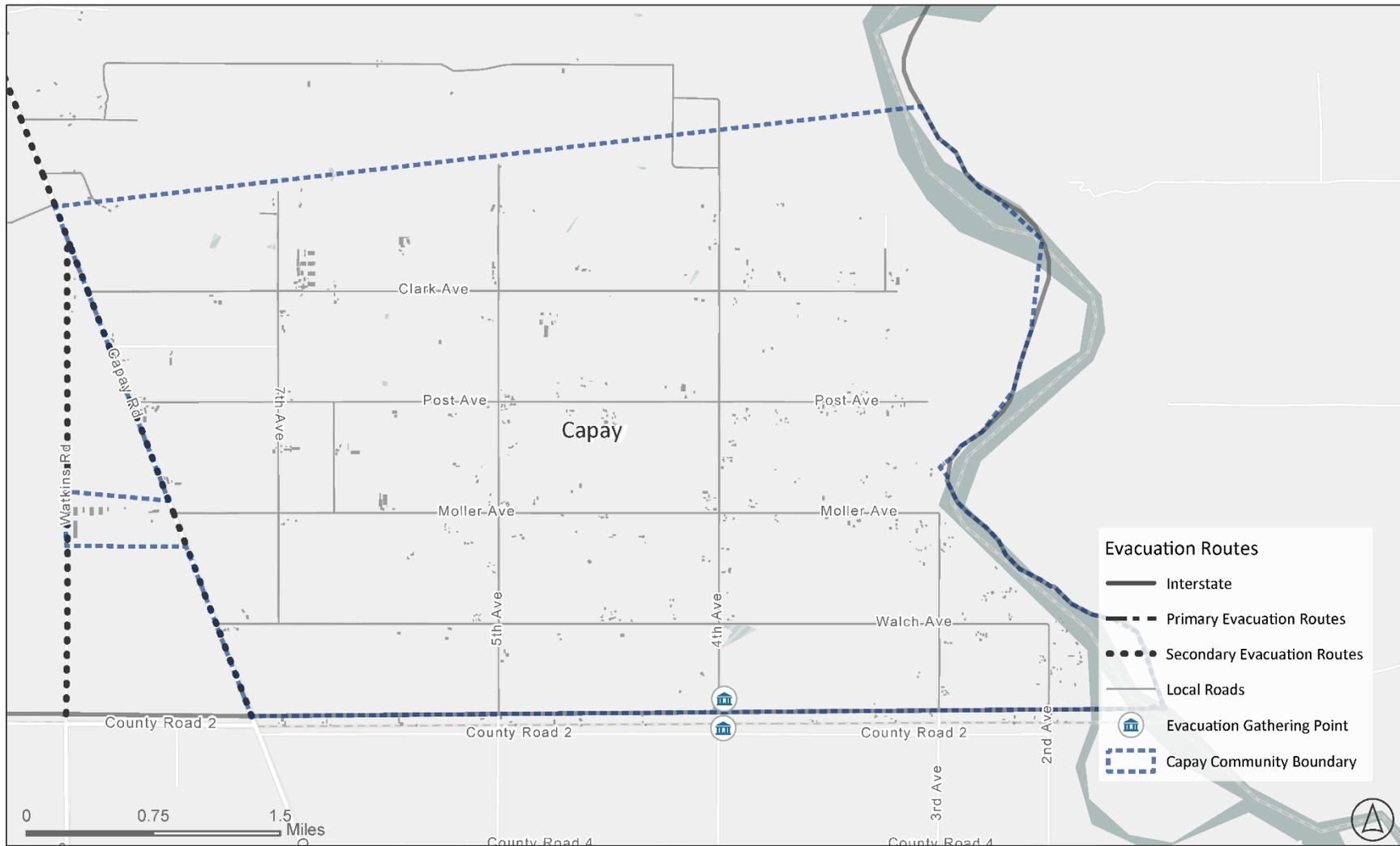


Figure 75 - Capay Project Improvement Map

Capay recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

CORNING

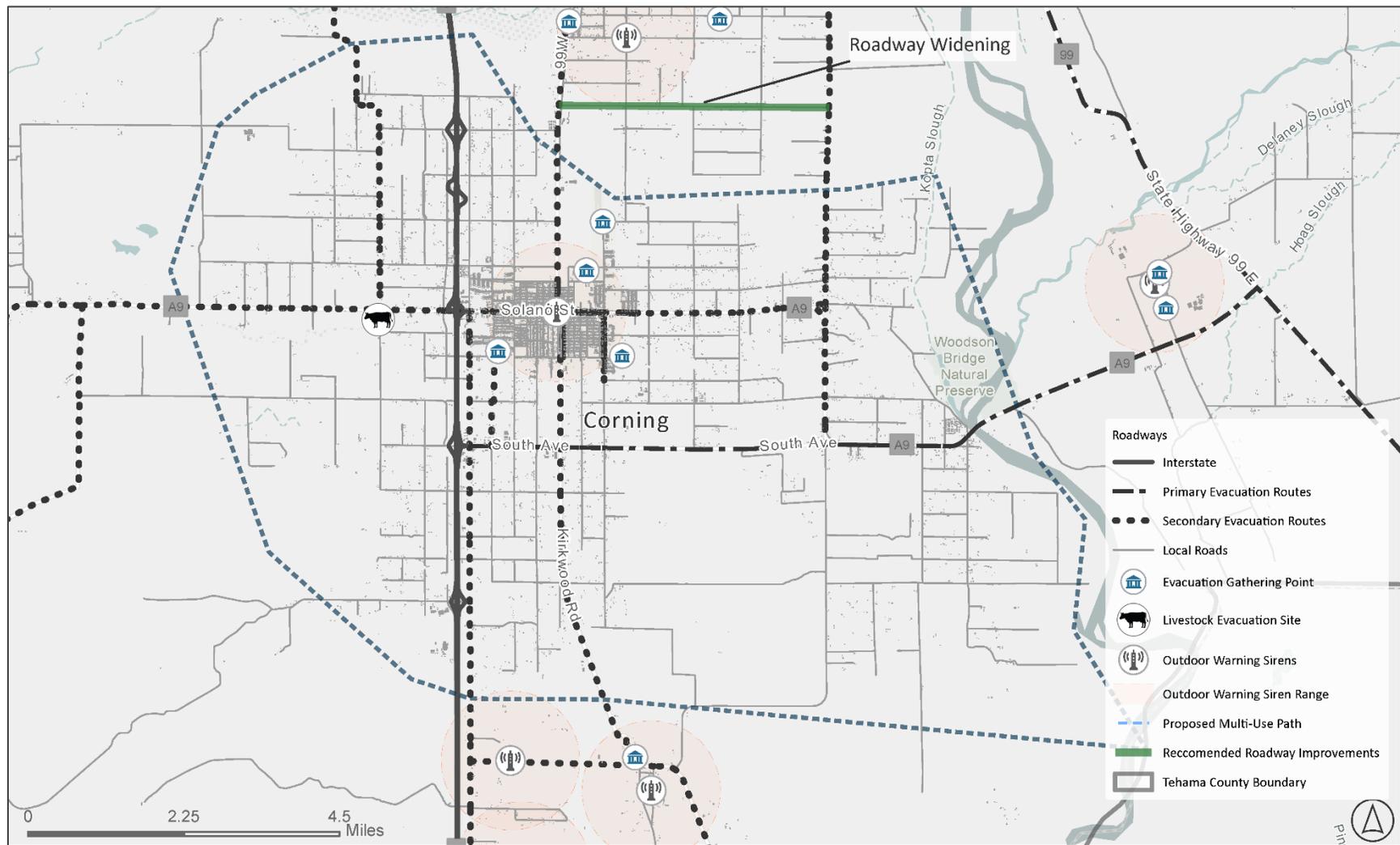


Figure 76 - Corning Project Improvement Map

Corning recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

RICHFIELD

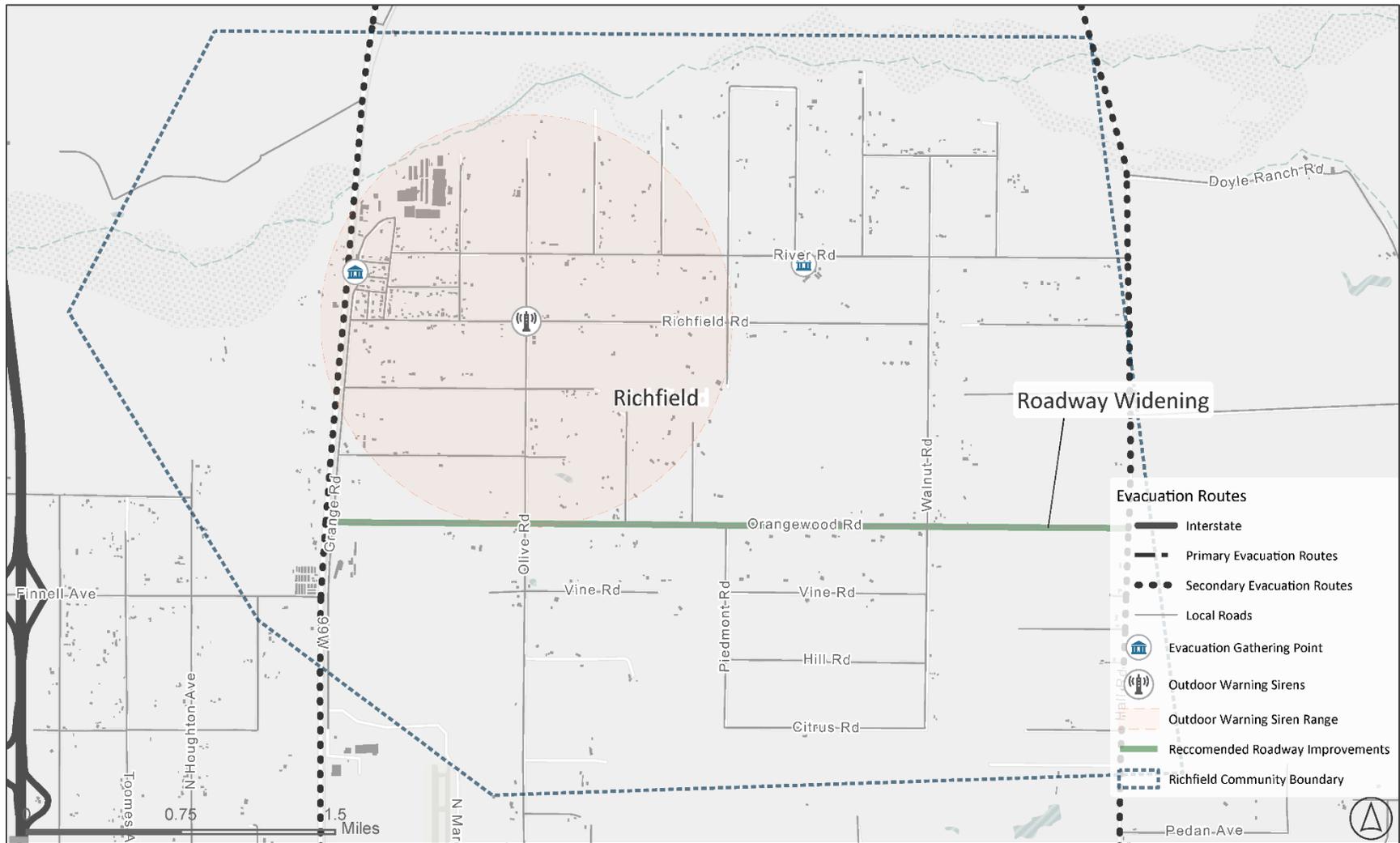


Figure 77 - Richfield Project Improvement Map

Richfield recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

VINA

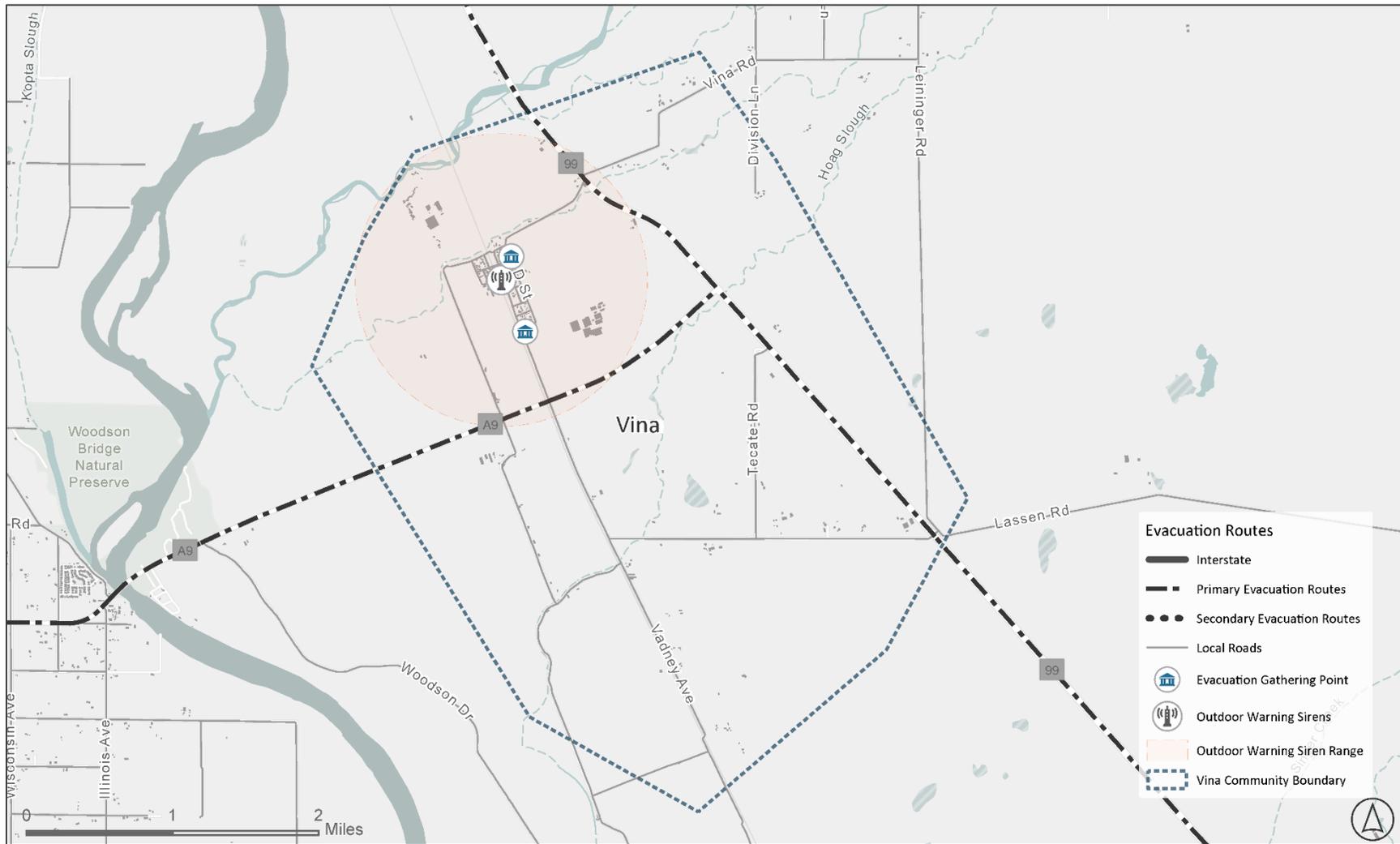


Figure 78 - Vina Project Improvement Map

Vina recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

KIRKWOOD

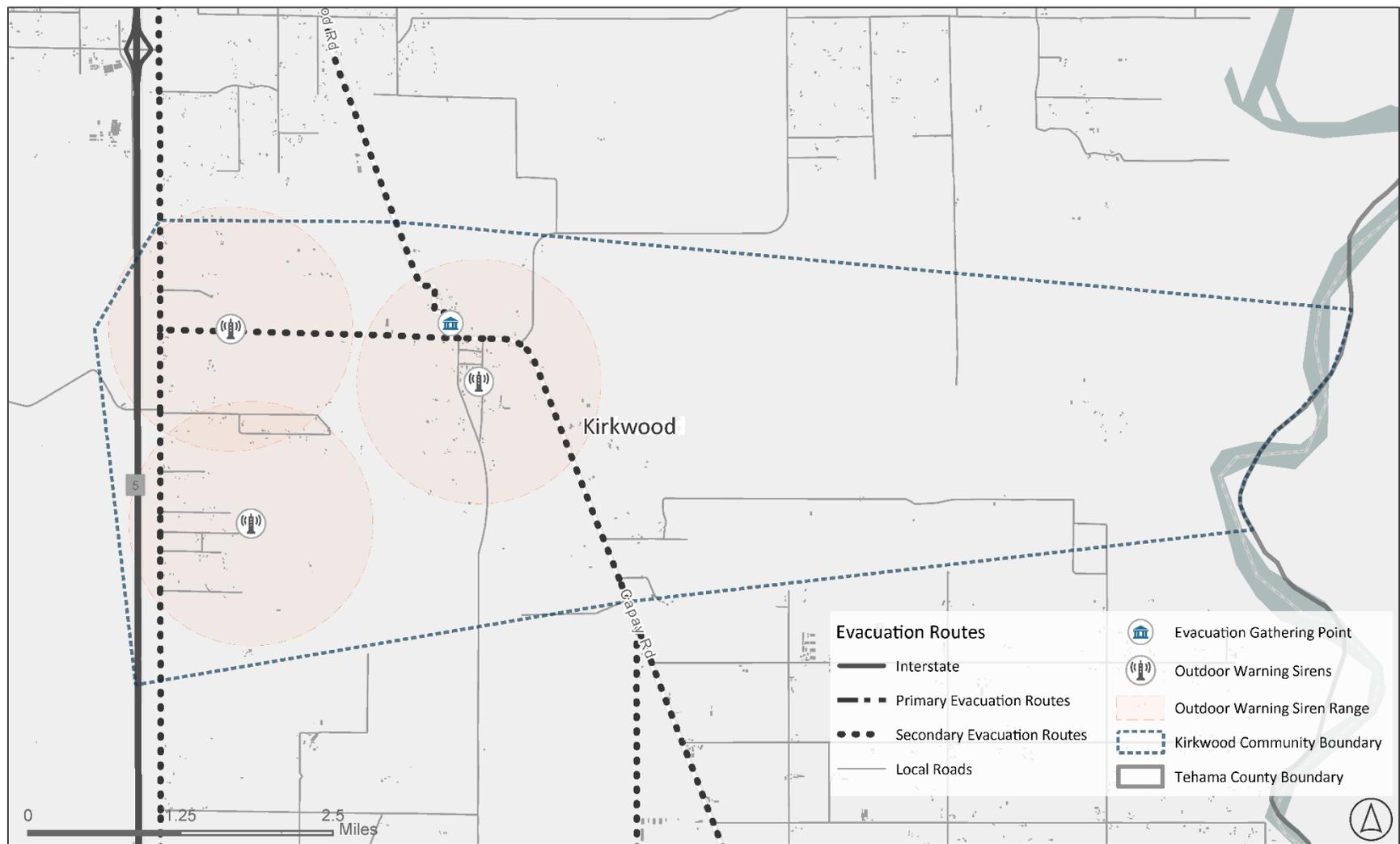


Figure 79 - Kirkwood Project Improvement Map

Kirkwood recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

FLOURNOY

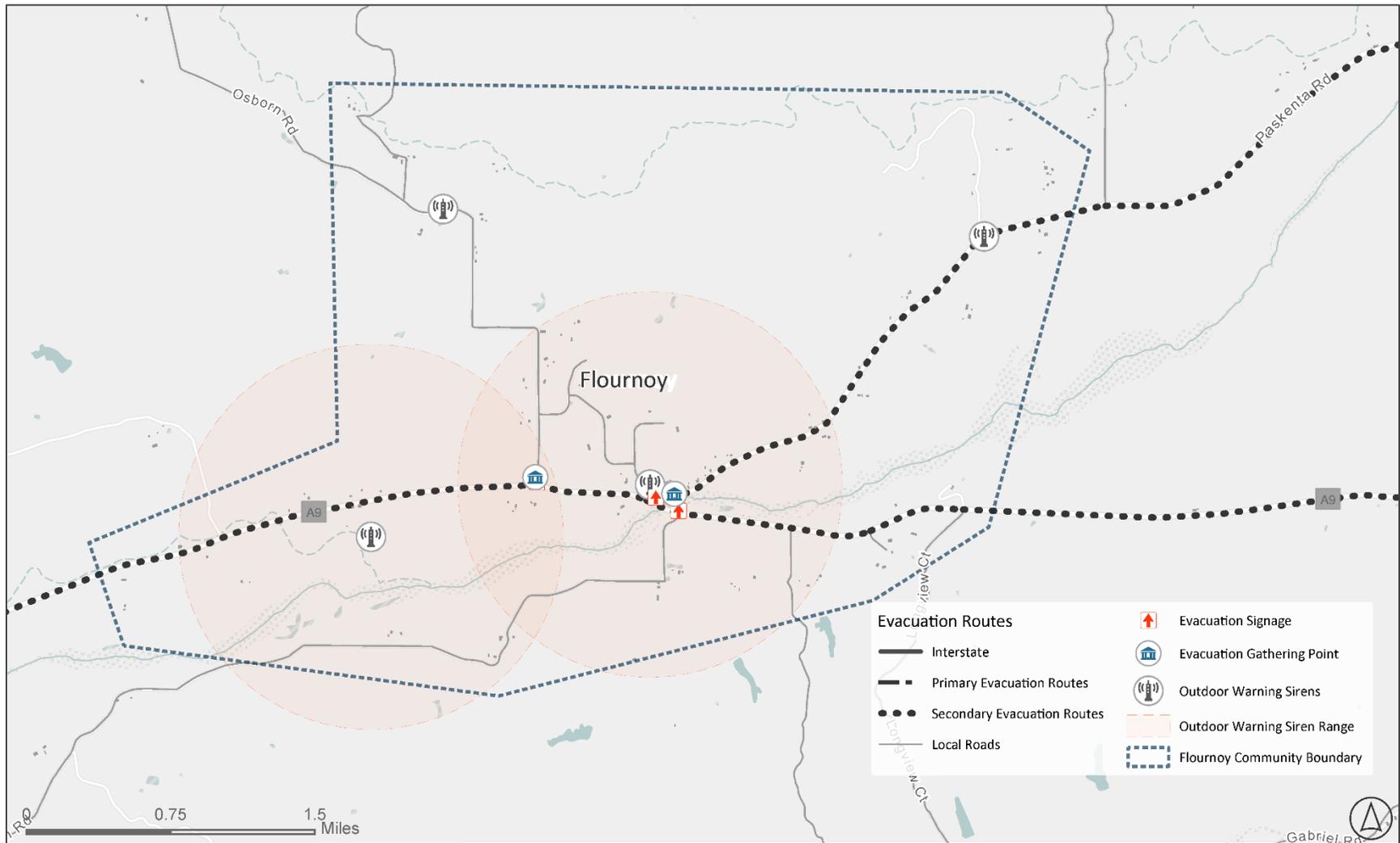


Figure 80 - Flournoy Project Improvement Map

Flournoy recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

PASKENTA

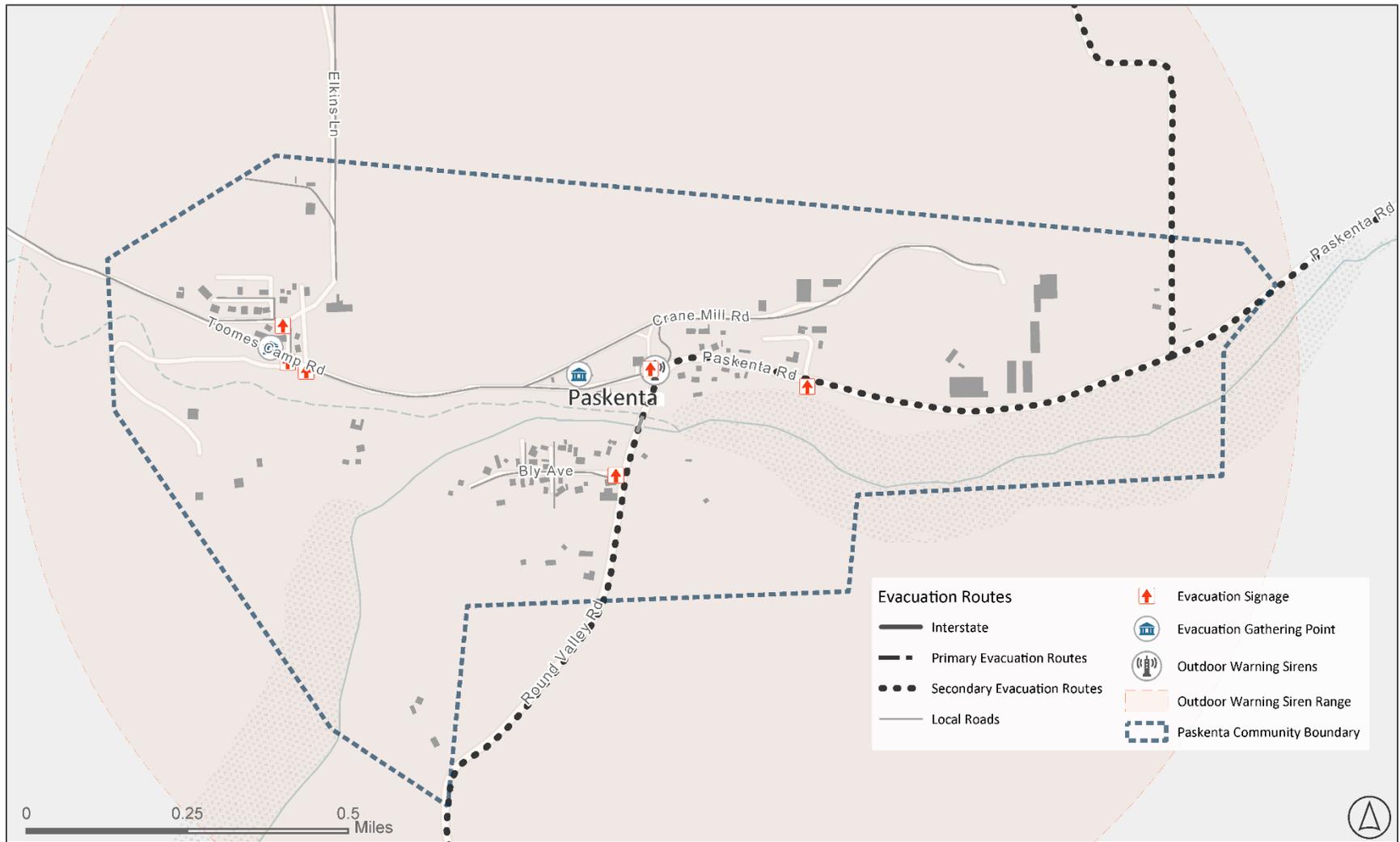


Figure 81 - Paskenta Project Improvement Map

Paskenta recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

RANCHO TEHAMA

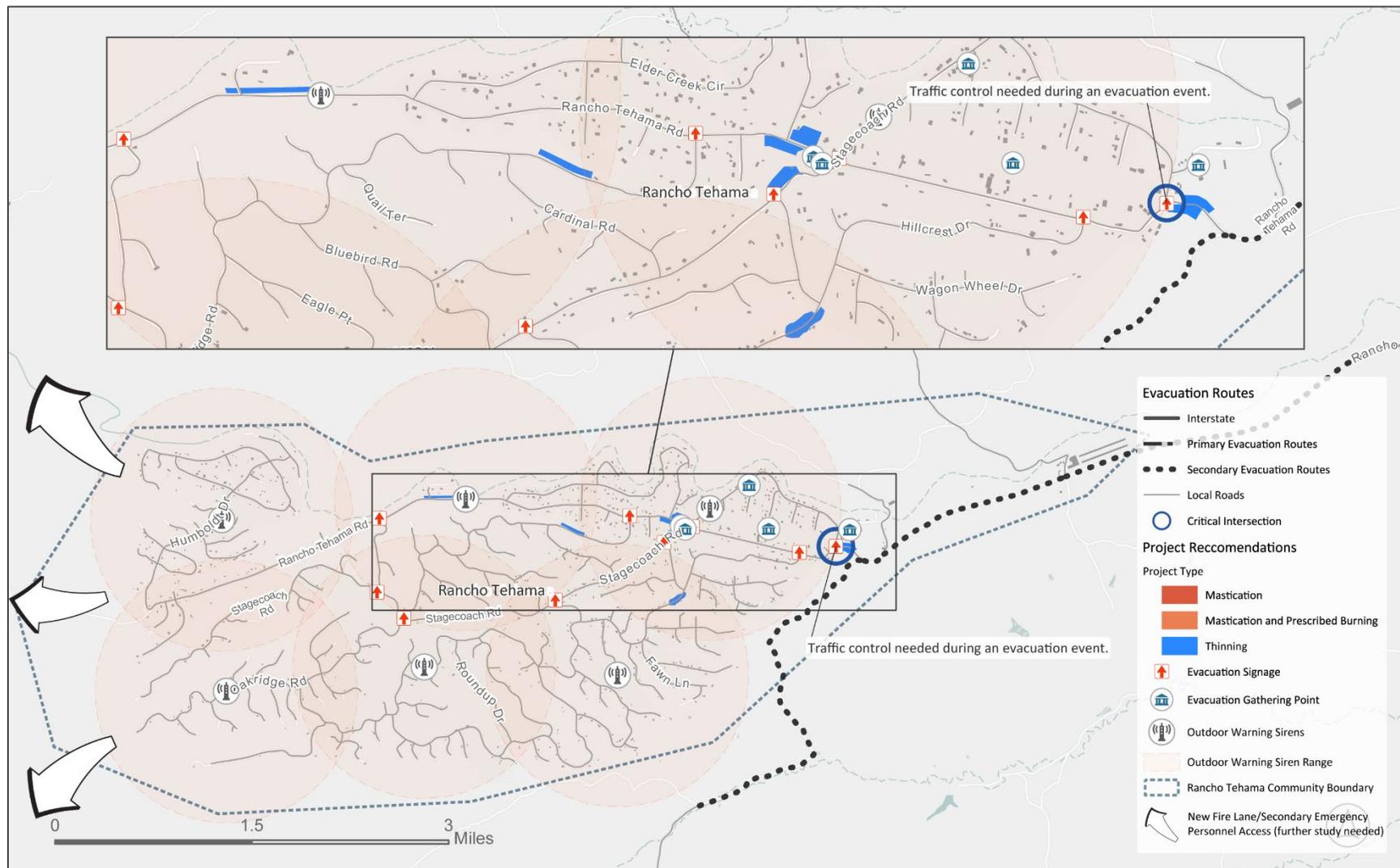


Figure 82 - Rancho Tehama Project Improvement Map

Recommendations for Rancho Tehama include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident and intersection capacity improvements. Recommendations also include siren alert systems, roadside mastication, prescribed burning, formalized safe refuge gathering areas, and new emergency wayfinding signage.

RED BANK

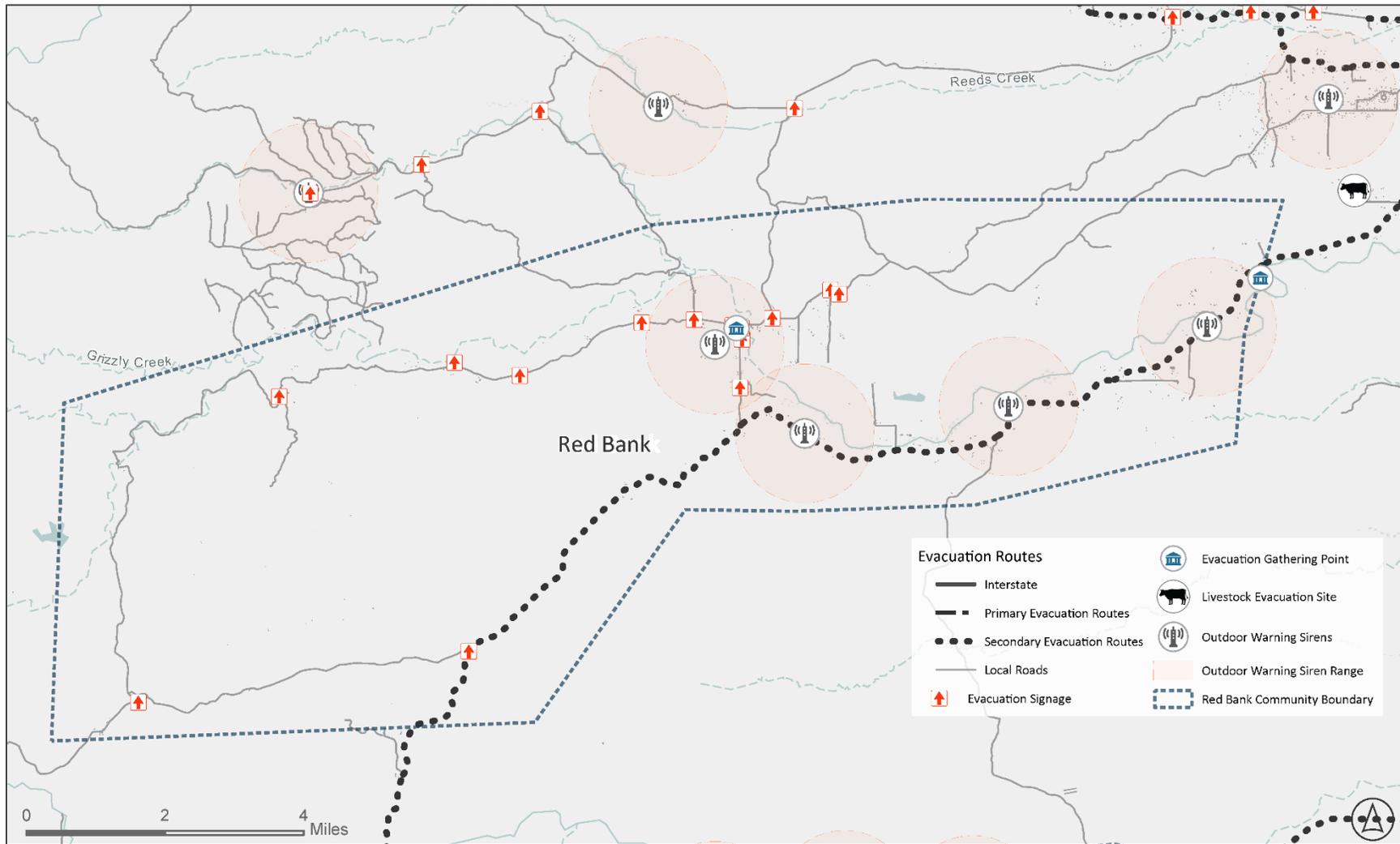


Figure 83 - Red Bank Project Improvement Map

Red Bank recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

REEDS CREEK

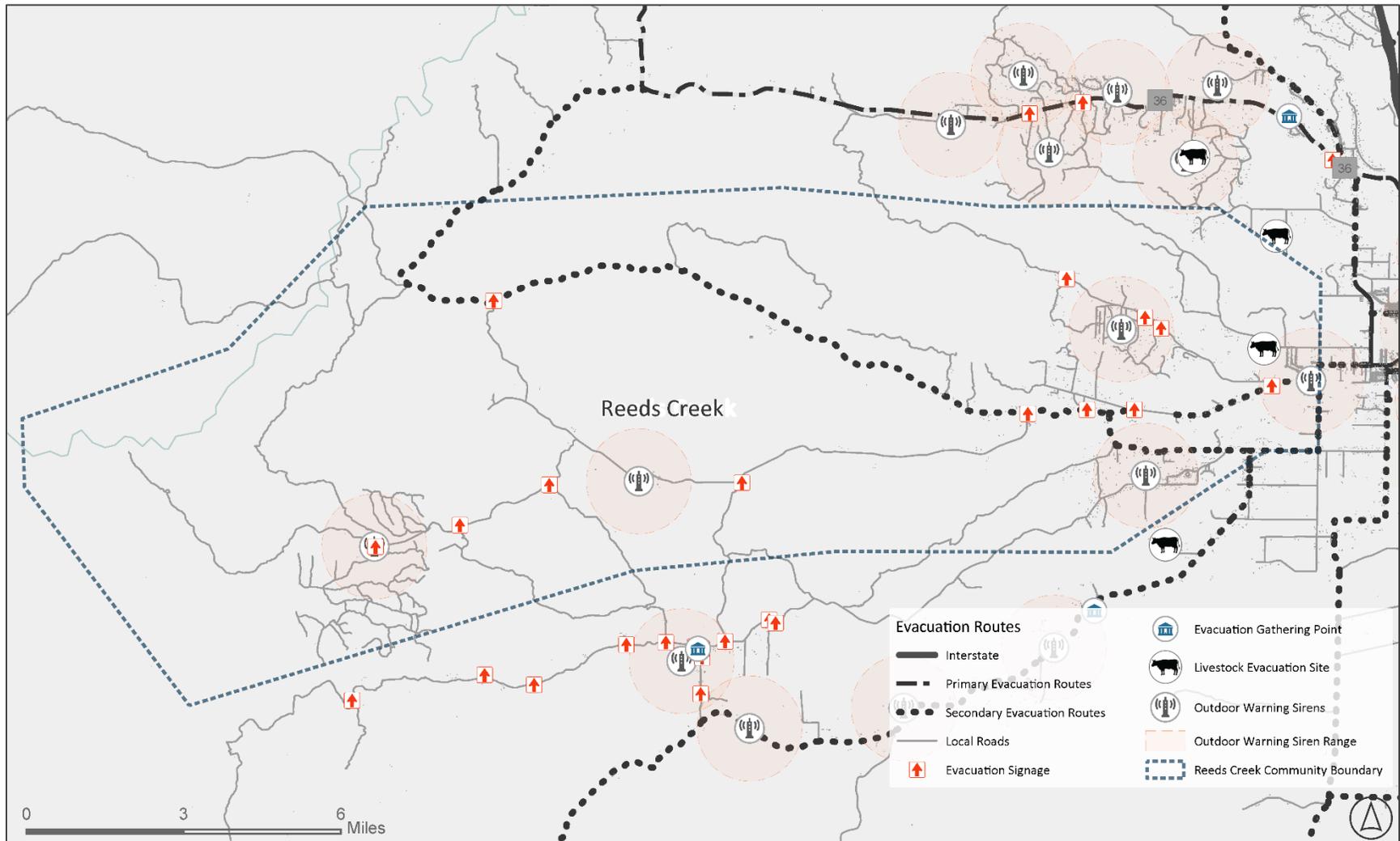


Figure 84 - Reeds Creek Project Improvement Map

Reeds Creek recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations for Paynes Creek also include siren alert systems and new emergency wayfinding signage.

RED BLUFF

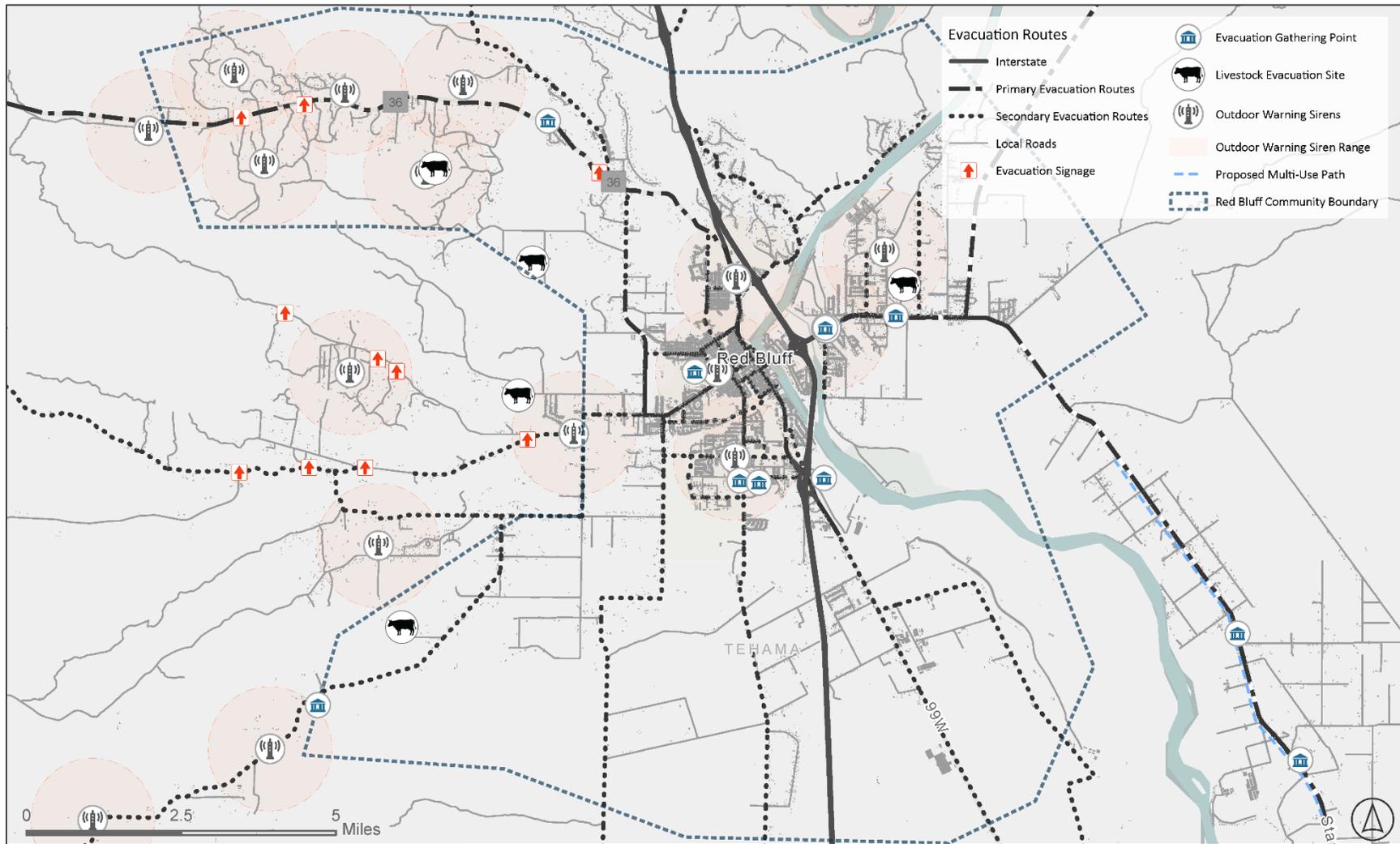
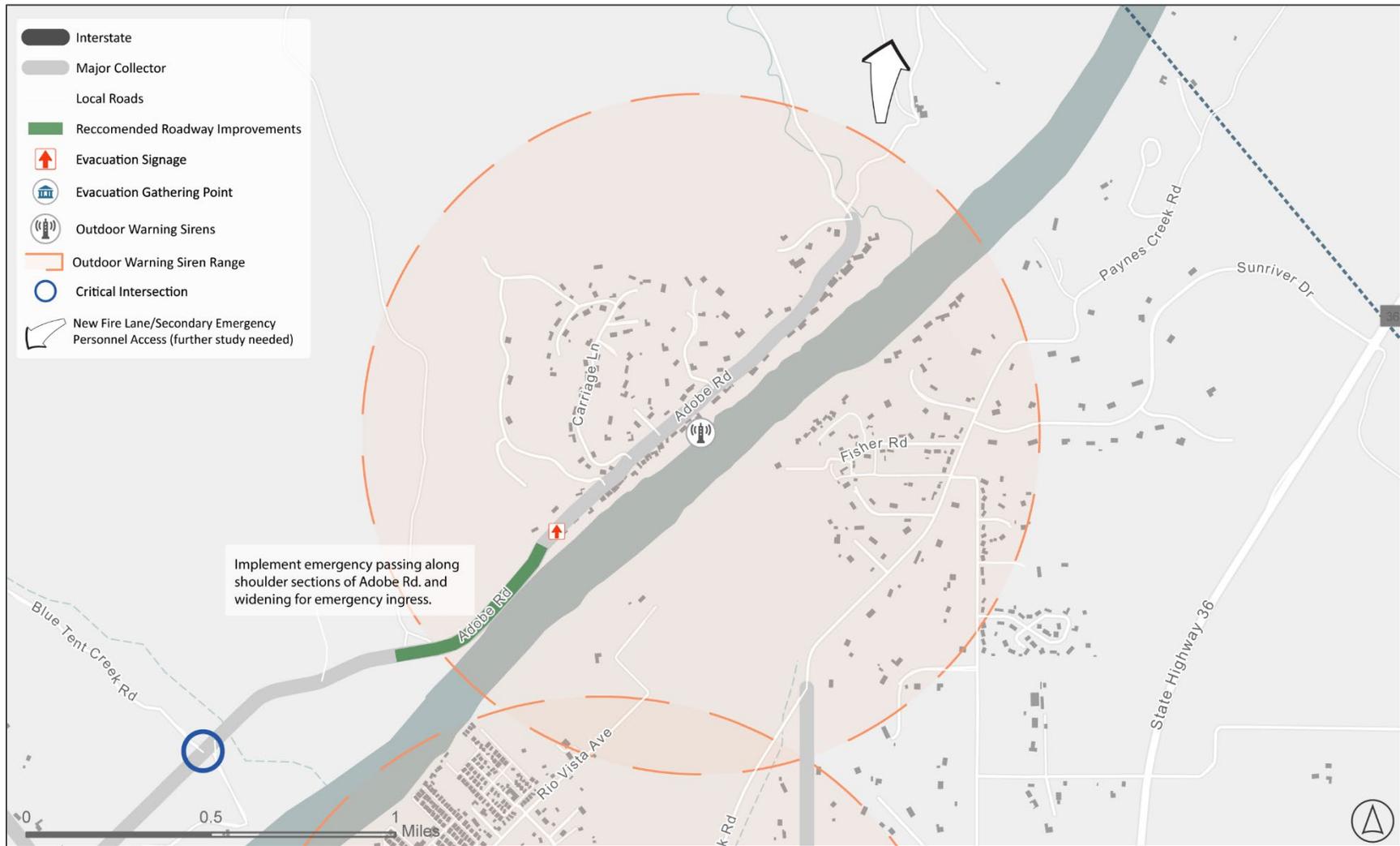


Figure 85 - Red Bluff Project Improvement Map

Red Bluff recommendations include siren alert systems, establishment of community safe refuge gathering points, countywide notification system, and new emergency wayfinding signage.

SURREY VILLAGE



Implement emergency passing along shoulder sections of Adobe Rd. and widening for emergency ingress.

Figure 86 - Surrey Village Improvement Map

Surrey Village recommendations include siren alert systems, future fire lane access northeast of the community, emergency wayfinding signage, and roadway improvements to Adobe Road including new passing sections along the shoulder for emergency ingress/egress.

BEND

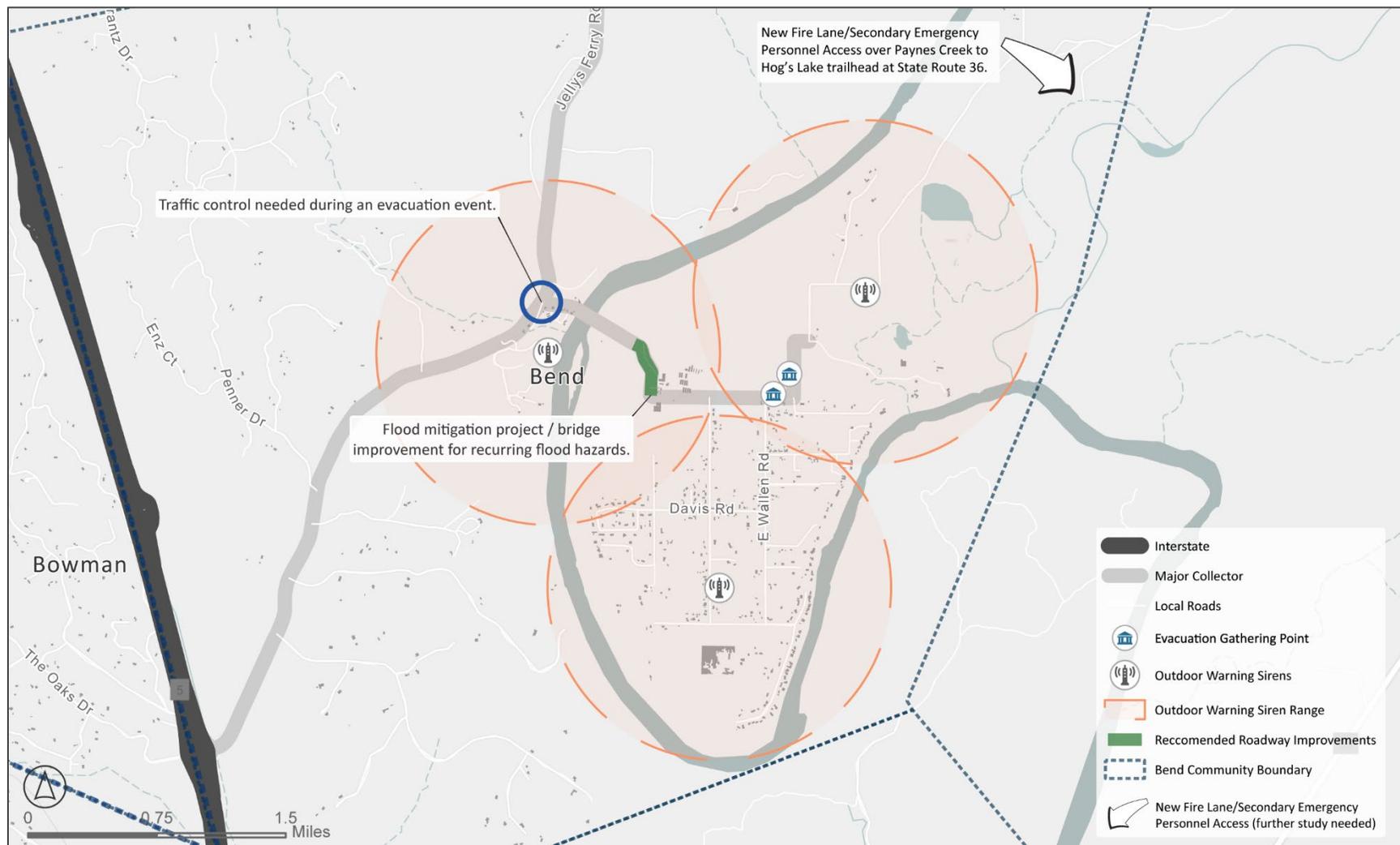


Figure 87 - Bend Project Improvement Map

Bend recommendations include siren alert systems, establishment of community safe refuge gathering points, new fire lane access over Paynes Creek to SR 36, flood mitigation measures and bridge upgrades over the slough on Bend Ferry Rd., and new emergency wayfinding signage.

BOWMAN ROAD / COTTONWOOD

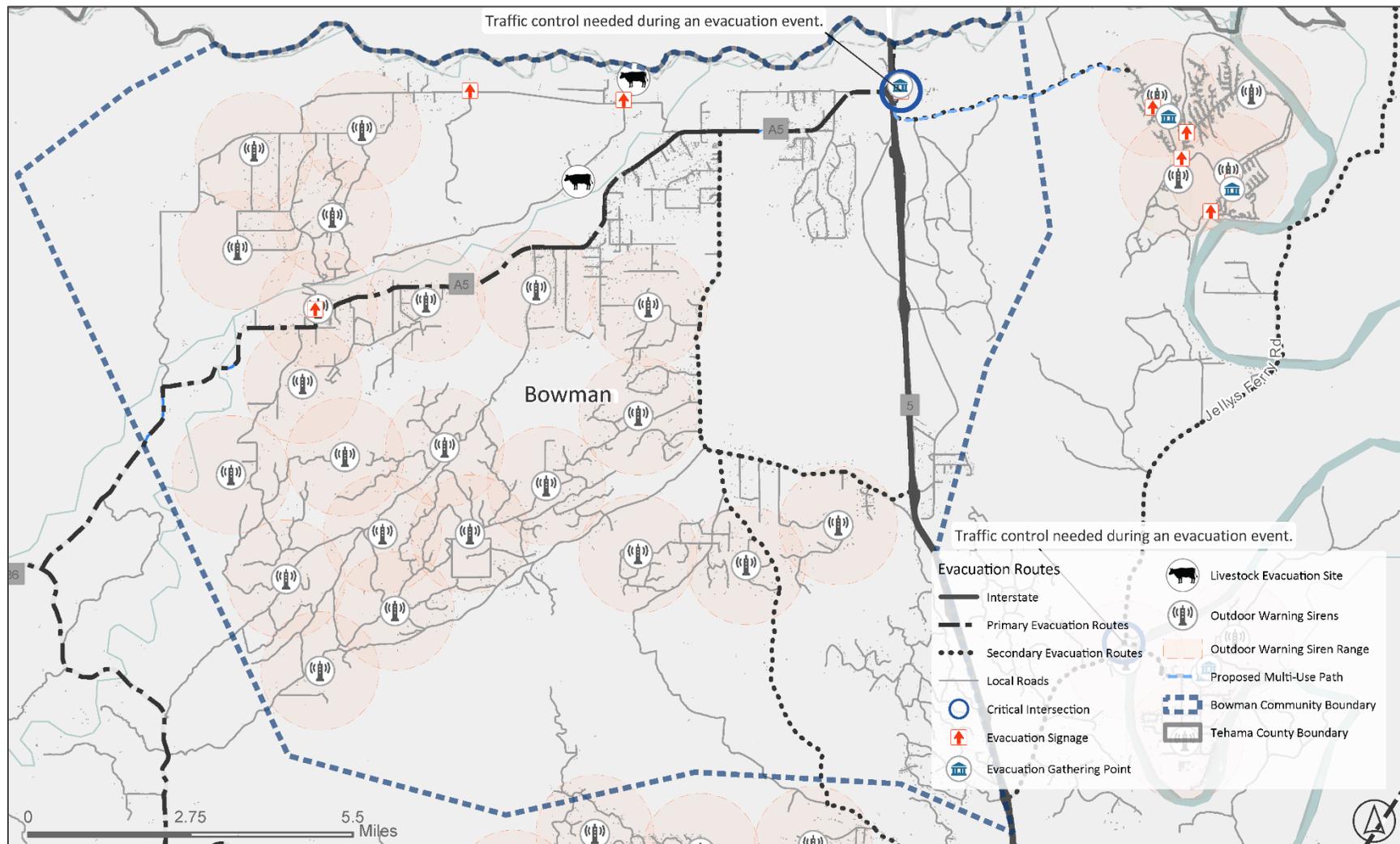


Figure 88 – Bowman Road / Cottonwood Project Improvement Map

Bowman Road / Cottonwood recommendations include siren alert systems, establishment of community safe refuge gathering points, roadside mastication, and new emergency wayfinding signage.

LAKE CALIFORNIA

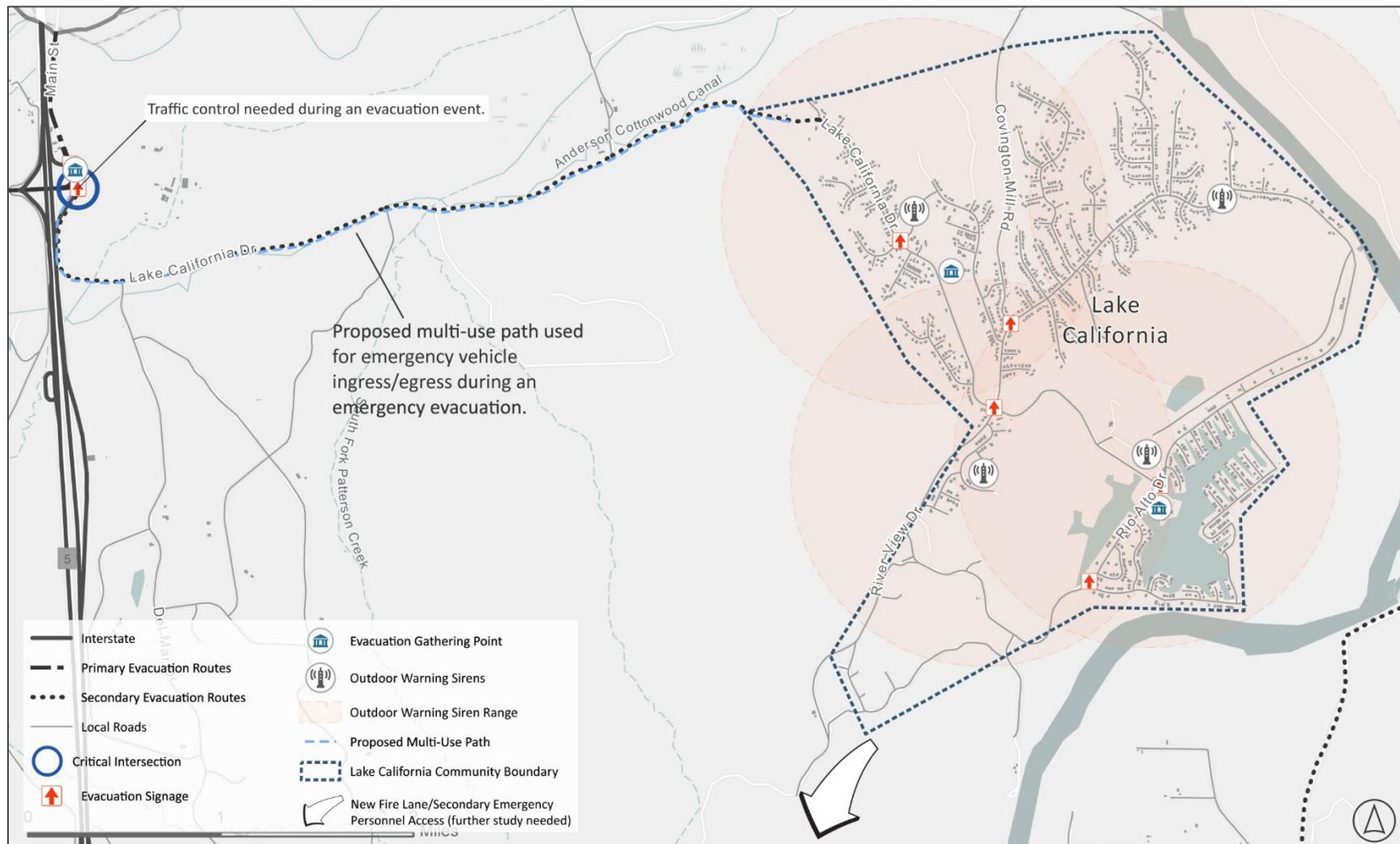


Figure 89 - Lake California Project Improvement Map

Lake California recommendations include a widening and repaving of Lake California Drive including a multi-use path for recreation and capacity increases during an emergency. Recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations for Lake California also include traffic control upgrades at the intersection of I-5, siren alert systems, and new emergency wayfinding signage.

DALES

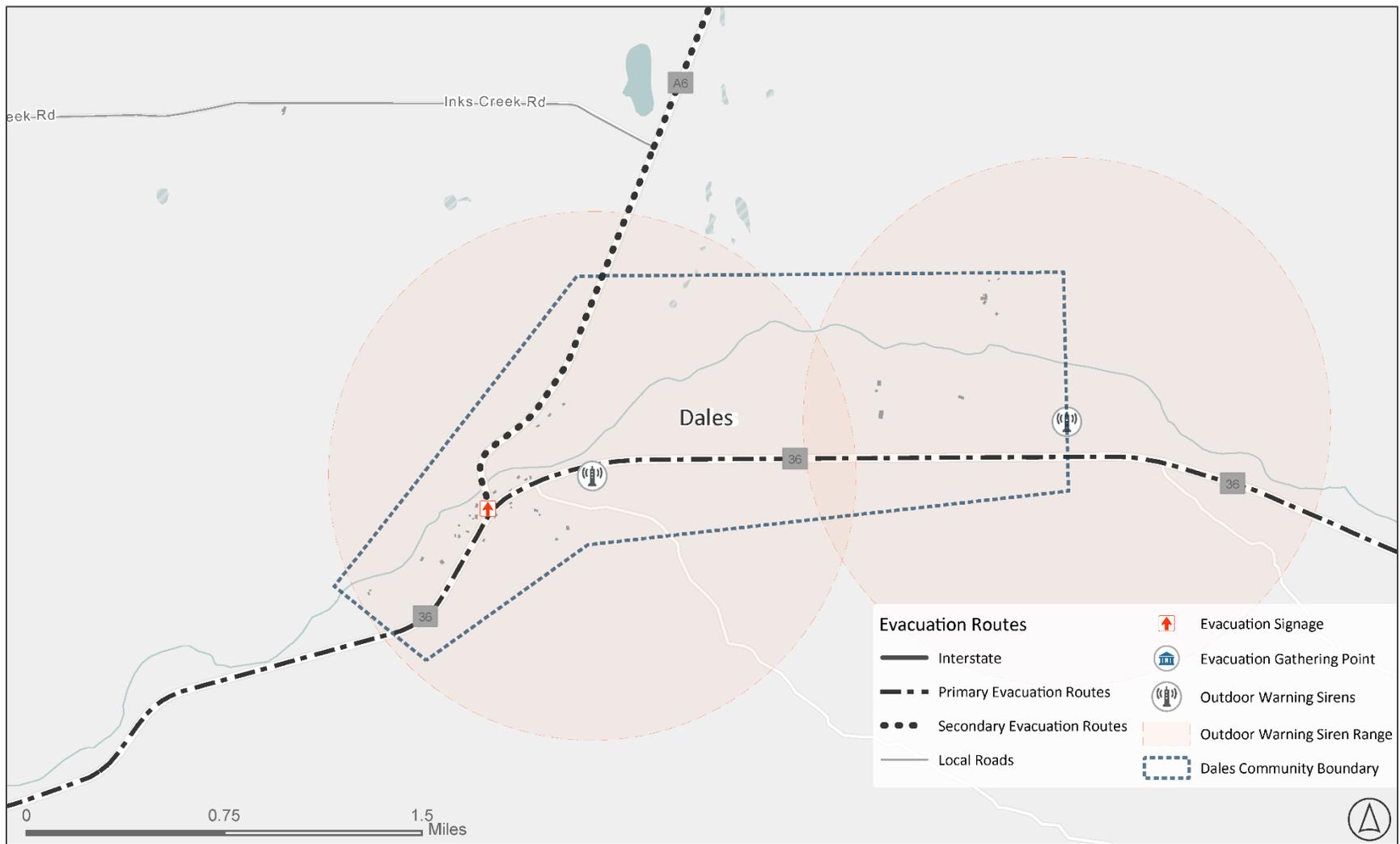


Figure 90 - Dales Project Improvement Map

Dales recommendations include siren alert systems, establishment of community safe refuge gathering points, and new emergency wayfinding signage.

PAYNES CREEK

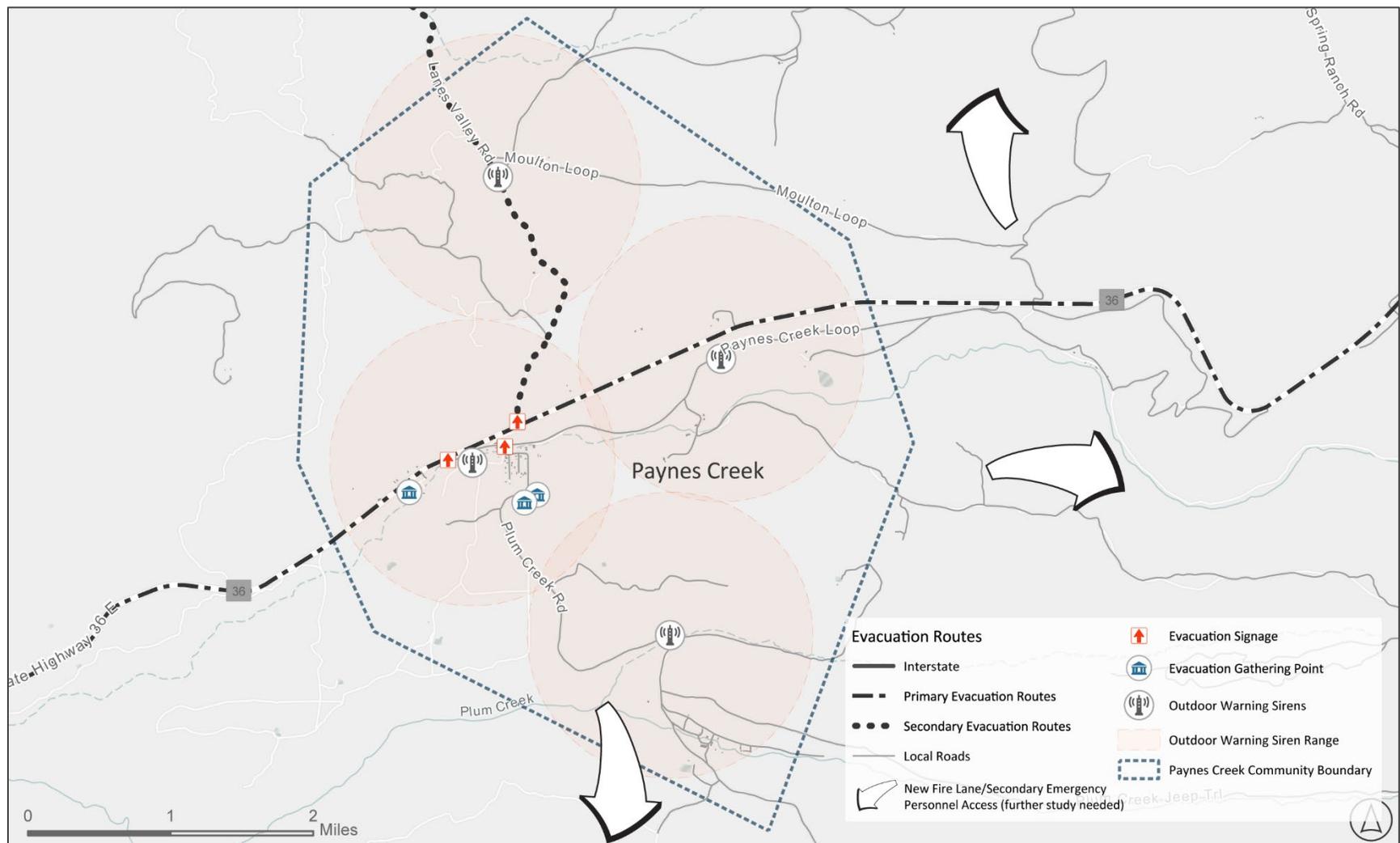


Figure 91 - Paynes Creek Project Improvement Map

Paynes Creek recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations for Paynes Creek also include siren alert systems and new emergency wayfinding signage.

MANTON

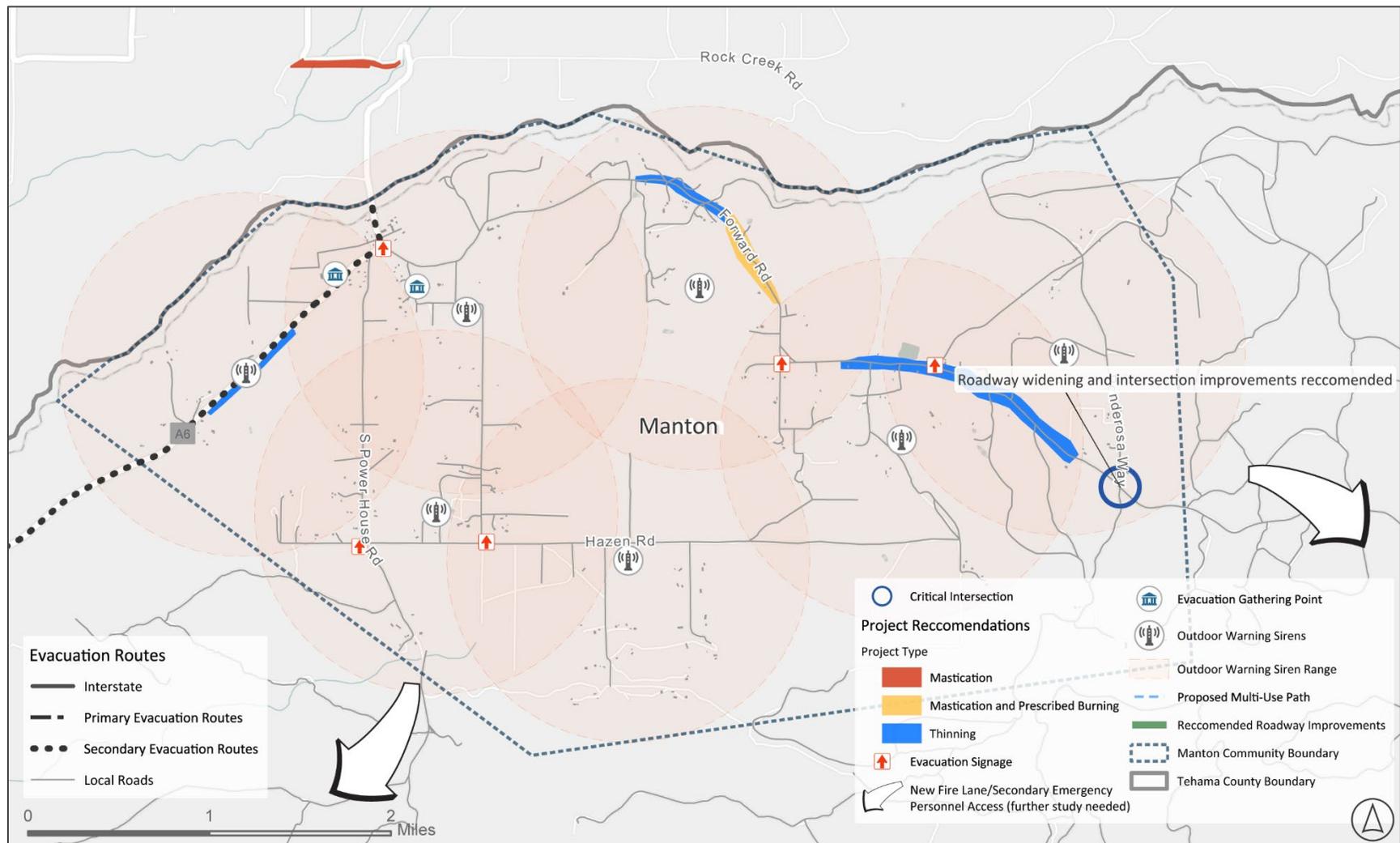


Figure 92 - Manton Project Improvement Map

Manton recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations also include siren alert systems, roadside mastication, prescribed burning, and new emergency wayfinding signage.

MILL CREEK

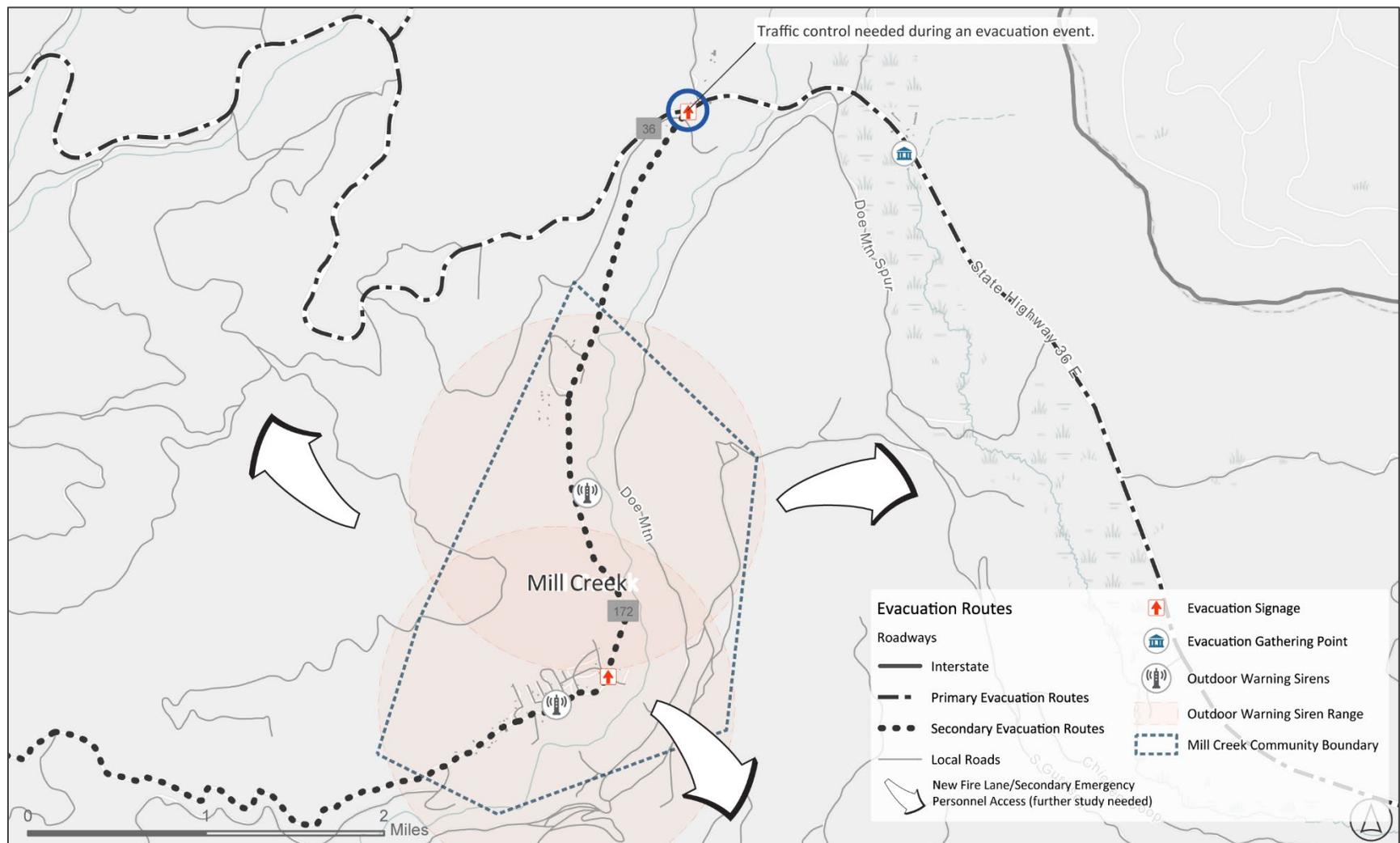


Figure 93 - Mill Creek Project Improvement Map

Mill Creek recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations also include siren alert systems, and new emergency wayfinding signage.

MINERAL

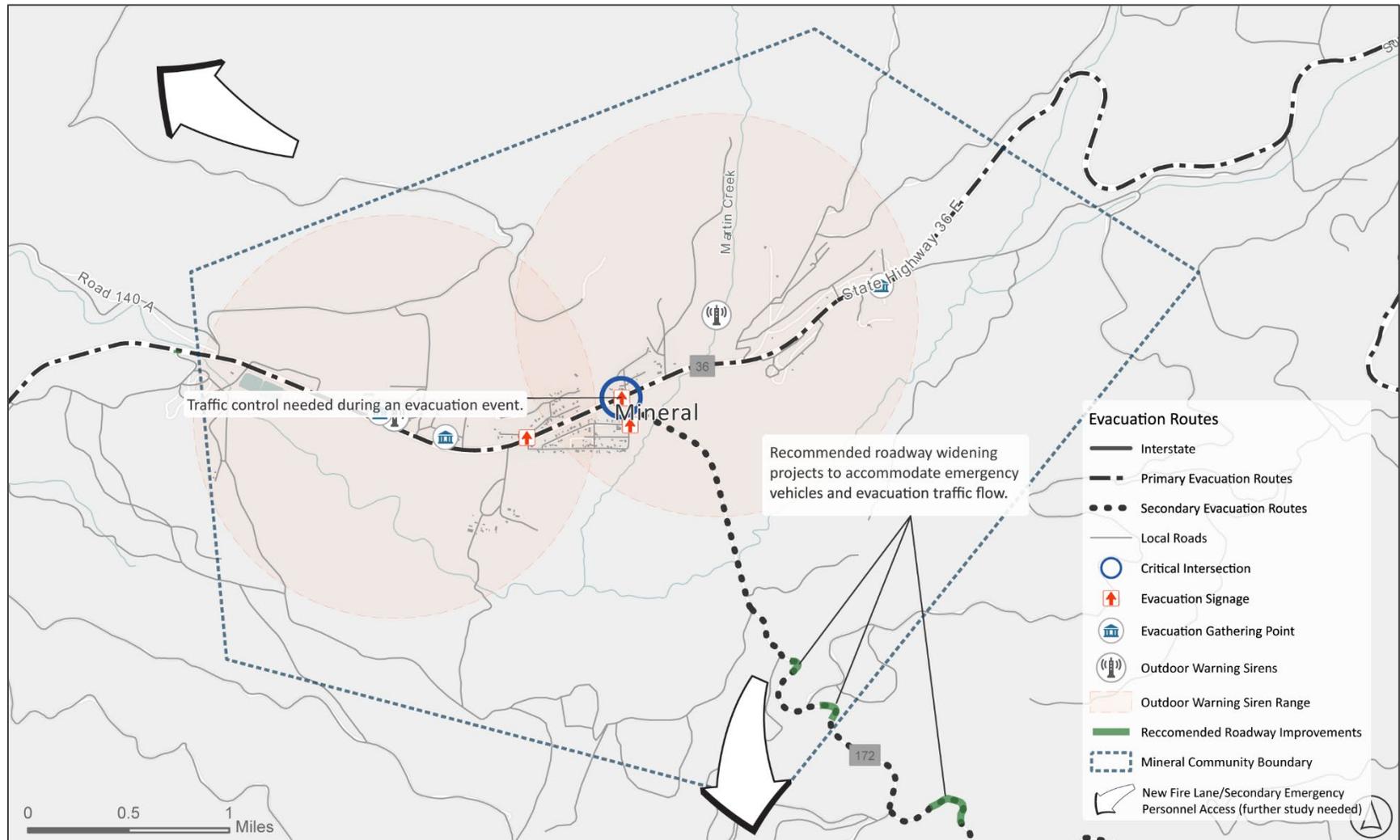


Figure 94 - Mineral Project Improvement Map

Mineral recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations also include siren alert systems and new emergency wayfinding signage.

PONDEROSA SKY RANCH

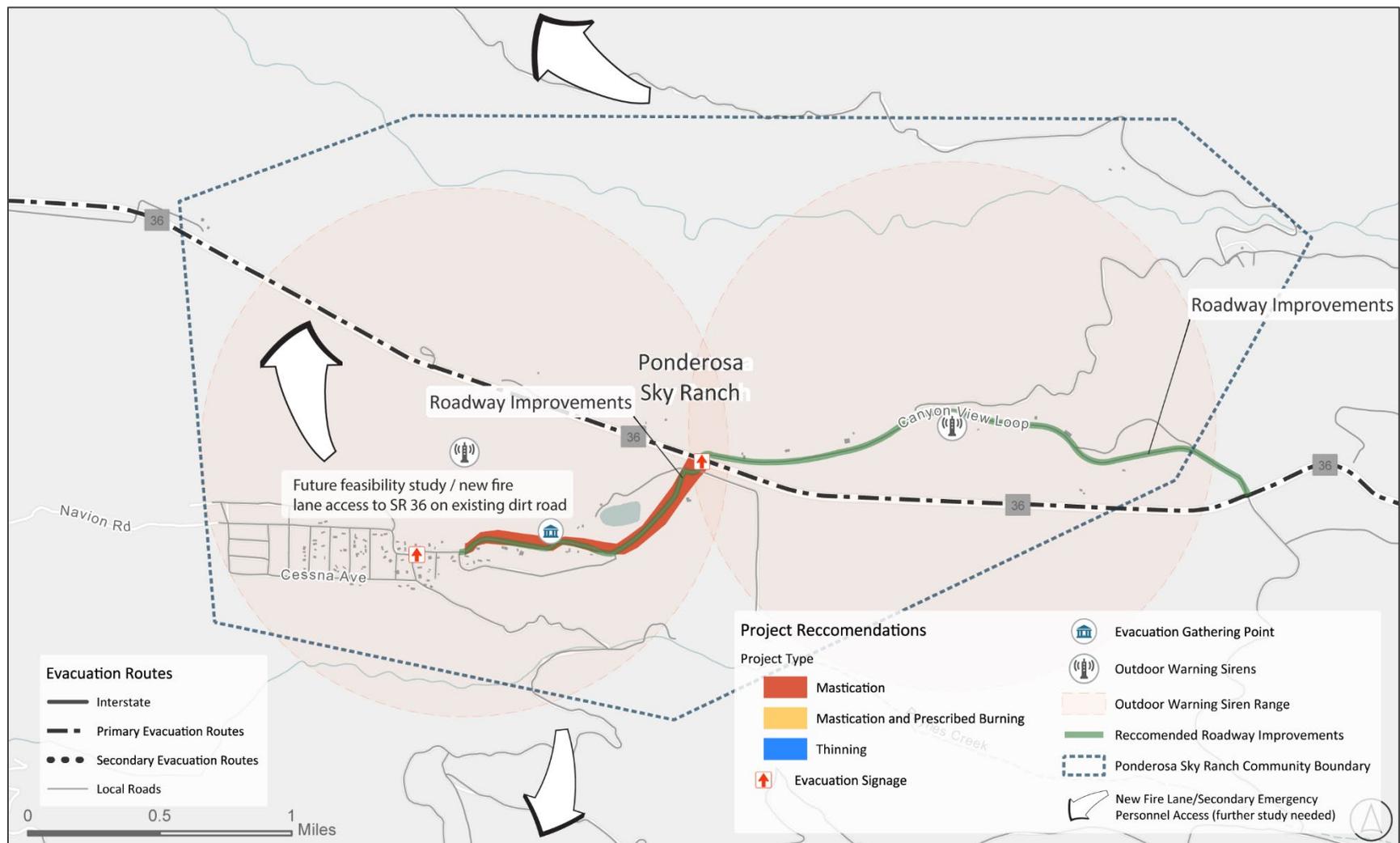


Figure 95 - Ponderosa Sky Ranch Project Improvement Map

Ponderosa Sky Ranch recommendations include installation of a fire lane for emergency personnel ingress during a fire or other hazardous incident. Recommendations also include siren alert systems, roadside mastication, prescribed burning, and new emergency wayfinding signage.

## COMMUNITY AND STAKEHOLDER PARTICIPATION

### 7.1 OUTREACH OVERVIEW

Prior to public engagement being conducted, the Tehama County Transportation Commission (TCTC) and the project team developed a Public Participation Plan (PPP). The PPP identifies and proposes methods of engagement and processes to achieve maximum participation through an inclusive and robust outreach effort.

Throughout the planning process of the Study, stakeholders and community members were encouraged and given the opportunity to participate in decision making processes, provide input and suggestions. Project updates were shared with stakeholders, project partners and community members to provide planning transparency and awareness of the Study's ongoing development. Engagement methods throughout the development of the Study included the following:

- Individual stakeholder contact
- Community workshops
- Pop-up community events
- Board of Supervisor presentations
- Project questionnaire
- Project website
- Informational flyers
- Social media outreach

Community engagement is indispensable in crafting a unified vision that accurately reflects the aspirations and requirements of Tehama County, its communities, and stakeholders. To this end, the project team embarked on a comprehensive community outreach initiative, aimed at discerning evacuation routing priorities. The insights and feedback obtained from community members and stakeholders were pivotal in identifying critical areas of concern, thereby shaping the development of the study's priority projects. Presented below is a table that encapsulates the outreach events conducted throughout the study's formulation, highlighting the concerted effort to integrate community perspectives into the strategic planning process.

Table 7 - Outreach Events

Tehama County Secondary Access & Routing Study			
Outreach Event Table			
Event Type	Location	Date	Time
Community Meeting	Paskenta	March 23, 2023	5:30-7:00 PM
Community Meeting	Cottonwood/Bowman	April 4, 2023	5:00 - 6:30 PM
Pop-Up	Tehama County District Fair	May 4 - May 7, 2023	4:00 - 8:00 PM, 12:00 - 8:00 PM
Community Meeting	Mineral	May 31, 2023	6:00 - 7:30 PM
Pop-Up	Manton Chili Cook-Off	June 10, 2023	10:00 AM - 3:00 PM
Community Meeting	Rancho Tehama	June 15, 2023	5:30 - 7:00 PM

Figure: Summary of Outreach Events

The community engagement received during the outreach phase aided in the development of the recommendations of this Study. The project team seamlessly integrated the County, community members and stakeholders in a transparent and collaborative process. The TCTC and project team were successful in producing an outreach strategy that provided plenty of opportunities for engaging and accessible community participation.



Figure 96 - Outreach Postcard



Figure 97 - Bowman Community Meeting

## 7.2 WEB-BASED OUTREACH

In an increasingly digital world, the TCTC and project team relied on web-based outreach to spread project information with County residents that could not attend in-person meetings. Social media is an important tool in facilitating online public engagement. The project team created project specific social media accounts and a website to promote the project, meeting information and the project survey. The facilitation of the survey online resulted in 40 responses alone.

The project website was created to specifically share the Study's information in a reliable and dedicated space. The project website can be found at [www.tehamaevac.com/](http://www.tehamaevac.com/) and was used throughout the entirety of the project to distribute pertinent project information and collect community input.

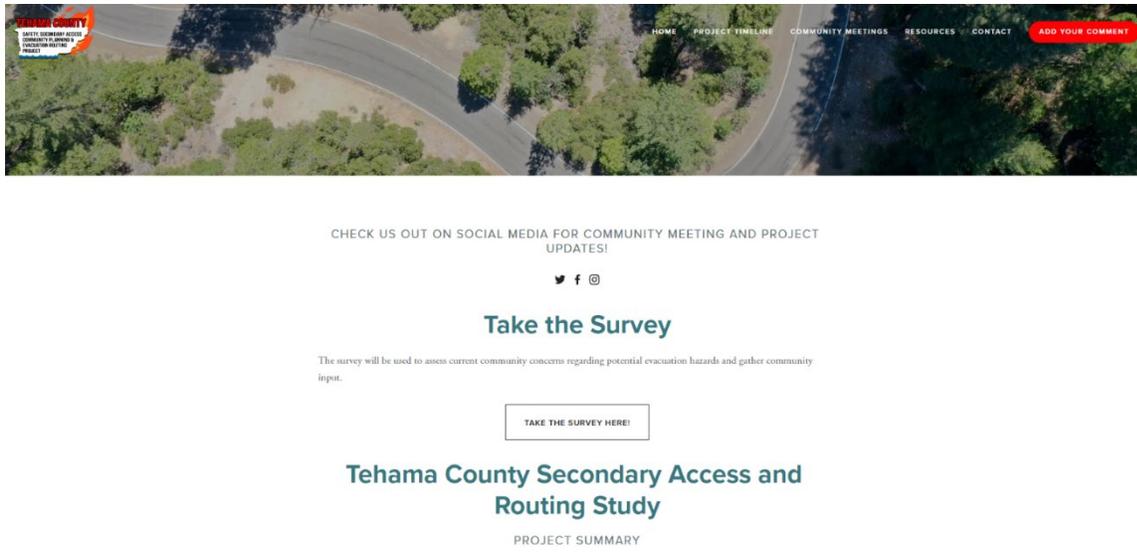


Figure 98 - Study Website

## 7.3 PUBLIC QUESTIONNAIRE

A questionnaire was created for community members and stakeholders to gather information and facilitate participation in the development of the Study. The questionnaire was prepared in both physical and digital formats, including SurveyMonkey’s user-friendly QR code and website integration directly connecting respondents to the online survey. The questions were intended to gauge residents travel behavior and evacuation safety concerns and consisted of eight questions. Physical copies of the questionnaire were also distributed at all in-person community meetings and pop-up events. Question 2 of the survey asked respondents to indicate their biggest evacuation concern. According to the questionnaire results, over 90% of respondents claimed fire was their biggest evacuation concern.

Q2 What is your biggest evacuation concern? Select all that apply

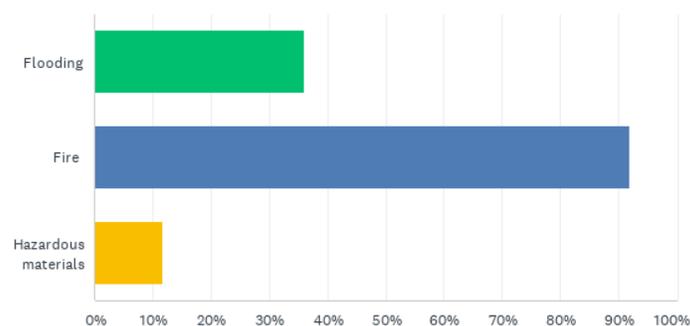


Figure 99 - Survey Response to Question #2

For the complete community survey results and tables, see Appendix C.

## 7.4 OUTREACH SUMMARY

The Tehama County Secondary Access and Routing Study signifies a critical initiative to bolster Tehama County against the perils of natural disasters, particularly wildfires, through comprehensive community resilience and safety strategies. The project, steered by the Tehama County Transportation Commission (TCTC), embraced a robust Public Participation Plan (PPP) to direct its outreach, ensuring widespread engagement and inclusivity throughout the study's development.

Diverse engagement strategies were harnessed to secure active involvement from stakeholders and community members, facilitating their contribution to the decision-making process and keeping them informed on the study's progress. These efforts included direct stakeholder engagement, community workshops, pop-up events, presentations to the Board of Supervisors, a project questionnaire, a dedicated project website, informational flyers, and proactive social media use. This comprehensive outreach strategy was pivotal in identifying evacuation routing priorities, where community and stakeholder feedback illuminated critical areas of concern, notably for communities restricted to a single evacuation route.

Upon the completion of the initial community engagement phase, the project team undertook a thorough compilation and analysis of all feedback received from community members and stakeholders. This process culminated in the creation of an Outreach Summary, which meticulously documented the concerns and suggestions raised, particularly emphasizing the apprehension surrounding communities with limited evacuation options. This summary not only informed the study's priority projects but also fostered a collective aspiration among Tehama County's communities and stakeholders for a more secure and prepared future.

The project's digital outreach strategies played a critical role in extending its reach, utilizing social media and a project-specific website to engage with residents unable to attend physical meetings. This digital presence provided a consistent and accessible information source, facilitating the dissemination of project updates and the collection of community feedback.

Additionally, a public questionnaire was developed and disseminated both online and in print, aiming to capture residents' travel habits, evacuation safety concerns, and primary fears regarding evacuation, with a significant emphasis on the risk of wildfires. This initiative further enriched the study's data collection and analysis, contributing to a comprehensive understanding of the community's needs and concerns.

The project team's strategic outreach implemented throughout the study not only enhanced its findings through community participation but also guaranteed that the planning process remained transparent, inclusive, and reflective of the community's inputs and concerns. The success of these outreach endeavors underscores the critical need for ongoing collaboration and dialogue as Tehama County advances in implementing the Secondary Access and Routing Study's recommendations, aiming to cultivate a safer and more resilient future for all residents.

*For a complete list of comments and additional engagement see Appendix A.*

## Implementation and Funding

The Tehama County Safety, Secondary Access Community Planning & Evacuation Routing Study culminates in a comprehensive set of recommendations aimed at enhancing evacuation efficacy and community resilience amidst natural disasters. These recommendations are articulated through a multi-tiered strategy encompassing short-term, medium-term, and long-term goals.

### SHORT-TERM RECOMMENDATIONS:

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Thinning and prescription burns along key roadside locations, establishing inter-agency communication protocols, implementing an evacuation signage project, and enhancing public awareness about evacuation management platforms.

### MEDIUM-TERM RECOMMENDATIONS:

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Involve evaluating and improving previously unusable roadways during natural events, prioritizing roadway improvement projects, and establishing shelters and safe refuge areas.

### LONG-TERM RECOMMENDATIONS:

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Include exploring and constructing new fire lane access/secondary access routes for communities with only one point of access, evaluating potential widening or improvement projects for roadways identified as potentially congesting during evacuations, and improving bridges on evacuation routes. This study identifies specific neighborhoods with only one ingress/egress point, highlighting their high fire hazard priority and underscoring the urgent need for secondary access routes to enhance safety and evacuation efficiency. These priority communities include Lake California, Rancho Tehama, Ponderosa Sky Ranch , and the Bend community.

### **Policies:**

Policy Recommendations include enhanced road maintenance, designated well-maintained evacuation routes, yearly wildfire risk mapping, and improved communication infrastructure. These policies are vital for ensuring quick and safe evacuations whether due to natural disasters or man-made emergencies.

### **Emergency Preparedness Training, Collaboration and Communication:**

Report findings underscore the importance of emergency preparedness training, involving hazard identification, risk assessment, evacuation procedures, and first aid. Community engagement, meetings and workshops, and the creation of outreach materials are pivotal to reinforcing knowledge and preparedness. Evacuation route maintenance is highlighted, with a focus on well-defined primary and secondary routes that consider traffic flow, accessibility, and proximity to vulnerable populations. Alternative routes are identified to ensure suitability for evacuation traffic, and a detailed analysis of all evacuation routes is recommended.

Public communication and alerts are crucial for maintaining clear communication channels throughout the evacuation process. The implementation of state-of-the-art emergency alert systems and solar-powered emergency sirens in vulnerable communities ensures comprehensive coverage throughout Tehama County. Additionally, this study calls for continuous improvement through after-action reviews, regular updates of evacuation and routing plans, and the establishment of feedback mechanisms. This approach ensures that the evacuation strategies remain effective and responsive to the specific wildfire risks faced by Tehama County.

Continued collaboration with CAL FIRE and the Tehama County Resource Conservation District is essential to implement these recommendations effectively. This partnership will ensure that the strategies for fire risk reduction, land use planning, and community education are aligned with state and local objectives for safety and sustainability.

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