APRIL 2022

THREE RIVERS

COMMUNITY WILDFIRE PROTECTION PLAN

Working together to build fire adapted communities, resilient to wildfire

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The entities listed below participated in the development of and/or reviewed and are in support of the Three Rivers Community Wildfire Protection Plan:

Signature	**Signature**
Name (printed)	**Name (printed)**
Date	**Date**
Agency /Position (printed)	**Agency /Position (printed)**
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We would like to formally thank the Core Team and all stakeholders, notably Tulare County Fire, CAL FIRE (Three Rivers Station), and the Sequoia and Kings Canyon National Park Fire Management, for contributing their time and expertise throughout the planning process. Your participation has contributed to creating resilient landscapes, implementing public education, reducing structural ignitability, and ensuring safe and effective wildfire response.

Funding for this project was provided by the California Department of Forestry and Fire Protection (CAL FIRE) through the California Climate Investments Fire Prevention Grants.

For additional information, questions, or concerns regarding this project, please contact Project Manager Victoria Amato at vamato@swca.com.

For all your planning and implementation needs, please visit www.swca.com.

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EXECUTIVE SUMMARY

WHAT IS THE PURPOSE OF THIS COMMUNITY WILDFIRE PROTECTION PLAN?

The purpose of the 2022 Three Rivers Community Wildfire Protection Plan (CWPP) is to:

1. provide a community-wide scale of wildfire risk and protection needs,
2. protect human life from wildfire and reduce property loss due to wildfire throughout the community
3. bring together all the responsible wildfire management and suppression entities in the planning area to address the identified needs, and
4. provide a framework for future planning and implementation of necessary mitigation measures.

This CWPP aims to assist in protecting human life and reducing property loss due to wildfire throughout the planning area. This 2022 plan was compiled from reports, documents, and data developed by a wide array of contributors. This plan was compiled in 2021 and 2022 as Three Rivers' first CWPP and has been developed in response to the federal Healthy Forests Restoration Act of 2003 (HFRA).

The CWPP meets the requirements of the federal HFRA by addressing the following:

1. Having been developed collaboratively by multiple agencies at the state and local levels in consultation with federal agencies and other interested parties.
2. Prioritizing and identifying fuel reduction treatments and recommending the types and methods of treatments to protect at-risk communities and pertinent infrastructure.
3. Suggesting multi-party mitigation, monitoring, and outreach.
4. Recommending measures and action items that residents and communities can take to reduce the ignitability of structures.
5. Soliciting input from the public on the draft Three Rivers CWPP.

WHERE IS THE PLANNING AREA?

The planning area (the CWPP boundary) includes all of the Three Rivers Fire Safe Council (FSC) jurisdiction, as delineated by its geographic and political boundaries (Figure ES.1). Members of the Fire Safe Council helped to delineate the project boundary.

WHAT ARE THE KEY ISSUES ADDRESSED?

Issues addressed in this CWPP include the following:

- Fuel treatment recommendations for land management agencies and homeowners to mitigate hazard and risk
- Prioritizing hazardous fuels reduction in the wildland urban interface (WUI)
- Prioritizing roadside fuel treatments
- Evacuation concerns
- Raising awareness about the natural role that fire plays in the ecosystem and maintaining resilient landscapes

- Public education and outreach to homeowners to enable individuals to reduce the risk of fire to their properties, particularly regarding the time required for fire response to remote communities
- Constant and consistent messaging for residents and visitors
- Increasing public access to information through the use online materials, including the story map created for this CWPP
- Investing and supporting fire response at all levels, including resources for local fire departments to increase capacity to serve the community
- Increasing public understanding of the fire response process
- Continuing to address wildfire issues at the landscape level, across multiple jurisdictions
- Managing fire to protect values and accomplish resource management goals, including protection and enhancement of wildfire habitat, water supply and quality, and forest health
- Recent climate patterns and associated changes to the wildland fire environment
- Disease and insect outbreaks and associated tree mortality

HOW IS THE PLAN ORGANIZED?

The CWPP provides a Composite Risk-Hazard Assessment, action items, project recommendations, and background information about the Three Rivers wildland fire environment as well as land management plans and agencies. Most of the background information is housed in several appendices.

Chapter 1 provides a general overview of CWPPs, the Core Team, planning area, land ownership, and public involvement.

Chapter 2 presents an overview of the WUI and fire environment as well as specific information about vegetation, fire history, fire management, and response.

Chapter 3 describes the Road Hazard Assessment, Risk-Hazard Assessment, results of the assessments, and community values at risk.

Chapter 4 provides mitigation strategies in accordance with the National Cohesive Wildfire Strategy as well as post-fire protocols and rehabilitation strategies.

Chapter 5 presents a CWPP evaluation guide and monitoring strategies to assist in tracking project progress.

Appendix A contains background information on Three Rivers, including fire policy, past planning efforts, challenges to forest health, public education programs, and federal and state land management agencies.

Appendix B presents additional maps, including fire behavior maps and critical infrastructure.

Appendix C lists the Core Team members and contacts.

Appendix D provides the community risk assessments for WUI communities and contains corresponding risk descriptions and hazard ratings.

Appendix E presents a sample form of the National Fire Protection Association Wildfire Fire Risk and Hazard Severity Form 1144 and the LE-100 defensible space inspection form.

Appendix F details funding opportunities.

Appendix G contains additional resources, including emergency preparedness guides by the Three Rivers Fire Safe Council and Tulare County.

Appendix H presents information on community outreach and engagement with regard to this CWPP.

Appendix I provides the project recommendation matrices (resilient landscapes, fire-adapted communities, and wildfire response).

WHAT IS THE GOAL OF A CWPP?

The goal of a CWPP is to enable local communities to improve their wildfire-mitigation capacity, while working with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. Another goal of a CWPP is to enhance public awareness by helping residents better understand the natural- and human-caused risks of wildland fires that threaten lives, safety, and the local economy. The minimum requirements for a CWPP, as stated in the HFRA, are the following (Society of American Foresters 2004):

- **Collaboration:** Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP.
- **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments and recommend the types and methods of treatment that will protect one or more communities at risk and their essential infrastructures.
- **Treatments of Structural Ignitability:** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

HOW WAS THE THREE RIVERS CWPP DEVELOPED?

A group of multijurisdictional agencies (federal, state, and local), organizations, and residents joined together as a Core Team to develop this CWPP. Several Core Team members have had many years of experience working in fire management in the community and surrounding areas and have contributed their expertise to this CWPP.

The CWPP planning process served multiple purposes. One purpose was to model and map wildfire risk. Another was to identify and map the many physical hazards throughout the planning area that could increase the threat of wildfire to communities. This mapping process allowed the planning team to prioritize treatments tailored specifically for the community to reduce fire risk. The development of the 2022 CWPP also provided for public engagement where community members were highly engaged in providing input. Public meetings were convened to increase awareness and collect local input, and social media and online forums have allowed for further engagement. The CWPP planning process also brings together wildfire responders and land managers into a Core Team, providing opportunities to build lasting working relationships and encourage collaboration. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for the planning area. Overall, the Three Rivers CWPP emphasizes the importance of collaboration among multijurisdictional agencies and the public in developing fuels mitigation treatment programs to address wildfire hazards.

WHY CREATE A STORY MAP FOR THE PROJECT?

The Three Rivers Fire Safe Council opted to develop a story map (online web content) to disseminate information to the public and provide an opportunity for the public to provide input into the plan content.

The story map presents the CWPP in a web layout with accompanying web maps and includes a project tracker. In addition to facilitating information sharing, the story map also provides Three Rivers with a platform that can be readily revised to keep the CWPP document current. The CWPP is shared on the Three Rivers Fire Safe Council ArcGIS Hub site: https://three-rivers-cwpp-tularecounty.hub.arcgis.com/.

WHO PARTICIPATED IN DEVELOPING THE PLAN?

The development of the Three Rivers CWPP was overseen by the Three Rivers Fire Safe Council. Representatives from various government agencies—along with members of fire departments and local communities—formed a Core Team and participated in decision-making activities that led to the development of the Three Rivers CWPP. Several Core Team members have many years of experience working together in fire management for Three Rivers and have contributed their expertise to this CWPP.

WHAT WAS THE PUBLIC INVOLVEMENT?

The Core Team engaged in public outreach using a multimedia approach, using the story map created for the project, social media posts, community surveys, radio interviews, and information distributed through mass emails. The Core Team hosted a public meeting on August 21, 2021, in the Community Presbyterian Church. By incorporating public and Core Team input into the recommendations, treatments are tailored specifically for the planning area.

WHAT IS THE CURRENT WILDFIRE SITUATION?

The Three Rivers community is situated in the Sierra Nevada foothills, where several fire-adapted ecological communities occur, e.g., oak chapparal woodlands and mixed conifer forests. These fire-dependent ecological communities are where many of the large wildfires in California have been occurring in recent years. For instance, frequent drought, suppression-based forest management tactics, and climate change have all worked together to increase forest vulnerability. Specifically, fire suppression efforts—in a fire-dependent ecosystem—have interacted with drought, insects, and diseases and resulted in increased fuel build-up and alterations to vegetation composition. These forest changes have increased the risk and incidence of uncharacteristically large, high-severity fires (California Department of Fish and Wildlife 2021a). In the past few years, fires have grown to record sizes and are burning earlier, longer, hotter, and more intensely than they have in the past (Westerling et al. 2006; Westerling 2016).

The shifting climate, particularly rising temperatures, combined with changing wind patterns, and increasing temporal and spatial variability of water availability, are considerably escalating wildfire risk across California. The recurrence of severe fire weather during the autumn months has more than doubled in California since the 1980s, and, considering climate change, this prevalence is projected to increase in the future. As stated by California's Fourth Climate Change Assessment, if greenhouse gas emissions continue to increase, California is expected to experience a 50% increase in fires larger than 25,000 acres as well as a potential 77% increase in average area burned by 2100.

The state has already begun to encounter the impacts of increased fire occurrence and severity. In fact, the top five largest wildfires in California occurred in the last 3 years, including the August Complex Fire (August 2020) and the Dixie Fire (July 2021). The August Complex and Dixie Fires alone burned a combined total of nearly 2 million acres and well over 2,000 structures (California Department of Forestry and Fire Protection 2021b). Extreme wildfire events continue to present a significant threat to California's communities.

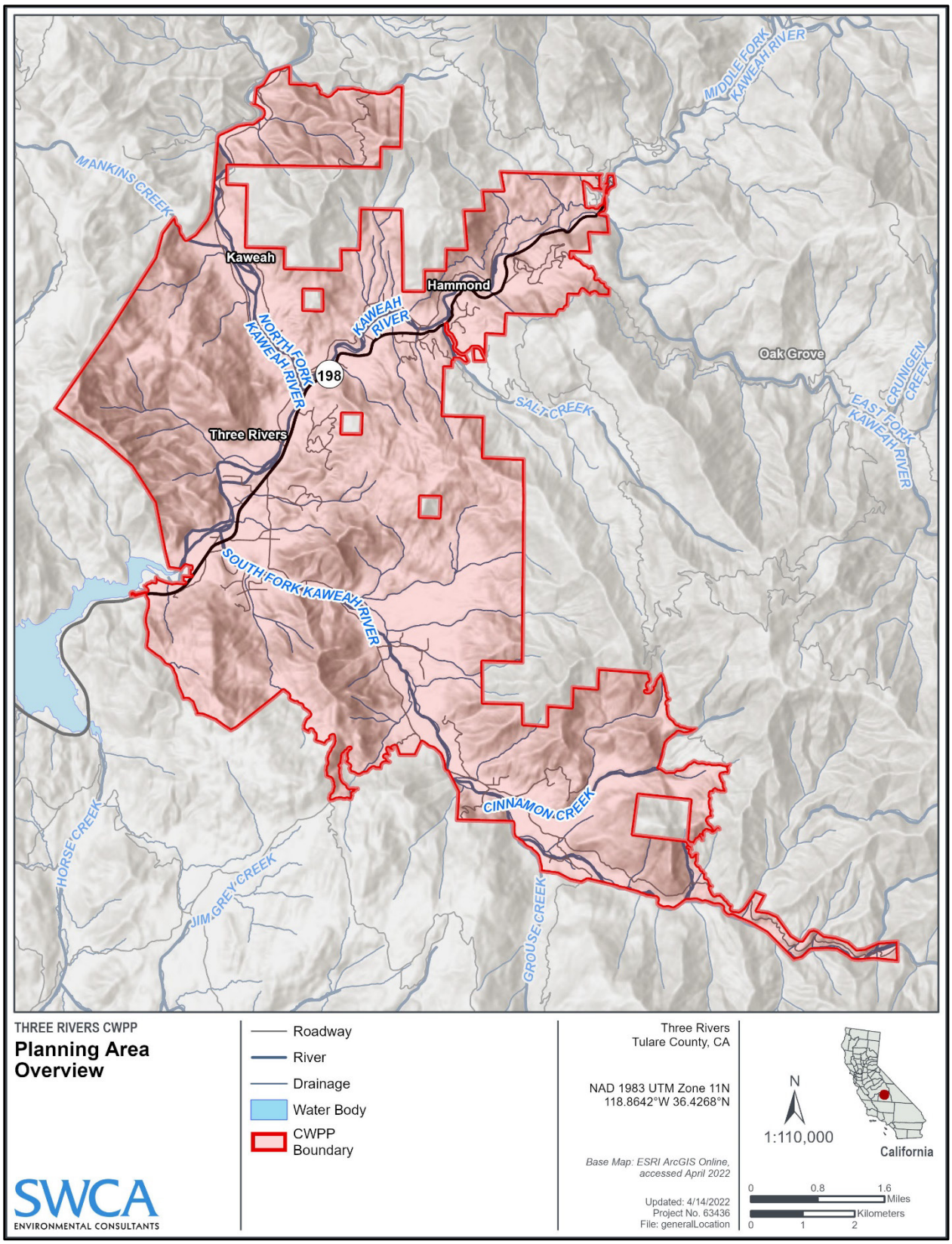

Figure ES.1 Three Rivers CWPP planning area.

WHAT RECENT FIRES OCCURRED HERE?

The Three Rivers community and surrounding environment consist of diverse landscapes that produce a complex wildfire setting due to variable topography, patchy tree mortality, and an assortment of vegetation types. Recent large, severe wildfires include the Castle Fire and KNP Complex Fire, both of which were lightning-caused fires. The Castle Fire occurred in August 2020 and ultimately consumed nearly 171,000 acres (National Park Service [NPS] 2021a). The KNP Complex Fire started on September 9, 2021, when two smaller lightning-caused fires (Colony and Paradise fires) merged into one. By the time of containment, the KNP complex had burned close to 90,000 acres (NPS 2021b). Thus, the Three Rivers community is familiar with large wildfires.

WHAT IS THE PURPOSE OF THE RISK-HAZARD ASSESSMENT?

The purpose of the risk assessment is to evaluate and provide information pertaining to the risk of wildland fires within the WUI of the Three Rivers community. The Risk-Hazard Assessment is twofold and combines a geographic information system (GIS) model of hazard based on fire behavior and fuels modeling technology (Composite Risk-Hazard Assessment) and a Core Team–generated assessment of on-the-ground community hazards and values at risk (VARs).

The risk assessment considers:

- Fire behavior modeling, which includes:
  - Fire history
  - Probability of fire occurring
  - Intensity of a fire if one occurs
- Evacuation route risk analysis
- Road entrapment risk analysis
- Exposure and susceptibility of VARs to wildfire based on their locations

Some of the highest risk areas identified in the planning area are communities located within and near the WUI.

HOW IS MY COMMUNITY RATED?

Community risk assessments, summarizing information on hazard and risk for each WUI community within Three Rivers, are provided in this plan. A team from SWCA Environmental Consultants conducted on-the-ground community risk assessment surveys throughout the planning area between August 17 and 20, 2021, using the National Fire Protection Association 1144 standard for assessing structure ignitability in the WUI. Using this standard provided a consistent process for assessing wildland fire hazards around existing structures to determine the potential for structure ignition from wildland fire ignitions.
The community assessments provide a total score of risk and hazard based on various parameters observed during the surveys, and a corresponding descriptive rating of low, moderate, or high are available in Appendix D.

WHAT ARE THE STRATEGIES TO ADDRESS WILDFIRE HAZARDS?

Goal 1 of the Cohesive Strategy/Western Regional Action Plan is to **Restore and Maintain Landscapes**: Landscapes across all jurisdictions are resilient to fire and other disturbances in accordance with management objectives.

Recommendations for hazardous fuels treatments include**:**

- Implementing strategic fuel treatments to create roadside buffers
- Enhancing fire breaks and potential fire containment features
- Increasing capacity to complete and maintain needed hazardous fuels projects across multiple jurisdictions
- Implementing California Environmental Quality Act (CEQA) and California Vegetation Treatment Program training for select Three Rivers/Tulare County staff
- Focusing on mitigation measures within areas of high exposure potential
- Pursuing actions to enhance, facilitate, and fund burned area recovery

Goal 2 of the Cohesive Strategy/Western Regional Action Plan is **Fire-Adapted Communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property.

Recommendations for public outreach and education include:

- Implementing community events focused on populations at risk
- Developing a youth Fire Safe Council
- Educating the public on how to mitigate risk and damage from wildfire
- Identifying vulnerable populations who may require assistance during fire prevention, fire response, and post-fire phases

Recommendations for reducing structural ignitability include:

- Increasing structure hardening of public buildings and structures
- Improving enforcement of defensible space standards

Goal 3 of the Cohesive Strategy/Western Regional Action Plan is **Wildfire Response:** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

Recommendations for improving fire response capabilities include:

- Developing strategies to enhance safe wildfire response in areas with poor ingress and egress
- Solidifying a coordination plan for all fire departments (Fire Safe Council, county, state, and federal)
- Developing a coordinated approach between the fire department and water district to identify needed improvements to the water distribution system
- Initiate annual pre-fire coordinated training/wildland fire drills to improve communication between agencies

- Develop and coordinate an online comprehensive emergency preparedness, response, and recovery plan for wildfire

WHAT DOES POST-FIRE RESPONSE AND RECOVERY INVOLVE?

There are many aspects to post-fire response recovery, including but not limited to:

- Returning home and checking for hazards
- Coordinating and mobilizing a group of teams in the community to respond to emergencies
- Rebuilding communities and assessing economic needs—securing the financial resources necessary for communities to rebuild homes, business, and infrastructure
- Restoring the damaged landscape—restoration of watersheds, soil stabilization, and tree planting
- Prioritizing the needs of vulnerable and disadvantaged communities during response and disaster recovery efforts
- Evaluating and updating disaster recovery plans every 5 years to respond to changing needs and characteristics of the community.
- Coordinating with planning, housing, health, and human services, and other local, regional, or state agencies to develop contingency plans for meeting the short-term, temporary housing needs of those displaced during a catastrophic wildfire event

HOW WILL THE PLAN BE IMPLEMENTED?

The CWPP does not require implementation of any of the recommendations, but the message throughout this document is that the greatest fire mitigation can be achieved through the joint actions of individual homeowners, tribes, and local, state, and federal governments.

The recommendations for fuels reduction projects are general in nature; site-specific planning that addresses location, access, land ownership, topography, soils, and fuels needs to be employed upon implementation. Also, it is important to note that the recommendations are specific to WUI areas and are expected to reduce the loss of life and property.

In addition, implementation of fuels reduction projects needs to be tailored to the specific project and will be unique to the location depending on available resources and regulations. In an effort to streamline project implementation, this CWPP has identified the pertinent land management/ownership agencies associated with each recommendation. On-the-ground implementation of the recommendations in the CWPP planning area will require development of an action plan and assessment strategy for completing each project.

WHEN DOES THE CWPP NEED TO BE UPDATED?

The CWPP should be treated as a live document to be updated annually or immediately following a significant fire event. The plan should continue to be revised to reflect changes, modification, or new information. These elements are essential to the success of mitigating wildfire risk throughout the Borough and will be critical in maintaining the ideas and priorities of the plan and the communities in the future. The CWPP was developed with an accompanying hub and story map to facilitate expedited updates and ensure that the plan content remains current and is sustainable. The hub includes a project tracking application to aid in project implementation and continuous monitoring and update of project accomplishments.

CHAPTER 1 – INTRODUCTION

The United States is facing urgent forest and watershed health concerns. While the number of annual wildfires throughout the United States has been slightly decreasing (67,700 fires in 2016 vs. 59,000 fires in 2020), the number of acres burned has been on the rise (Congressional Research Service [CRS] 2021). An average of 7 million acres is burned every year due to wildfire; more than doubling the annual average of acres burned in the 1990s (CRS 2021). Communities are seeing the most destructive wildfire seasons in history. The 2015 fire season had the most acreage impacted in a single year since 1960 at 10.13 million acres. 2020 was the second most extensive year for wildfire with 10.12 million acres burned (CRS 2021). These statistics demonstrate that wildfires are becoming larger and increasingly impactful.

The California's Forests and Rangelands 2017 Assessment states that California, like other western states, faces urgent issues concerning frequent and severe pest and wildfire events that are unprecedented. These events threaten the sustainability of ecosystems, the economic and environmental services they provide, and the built environment. These issues require reexamination of land and fire management policies and practices as human populations demand more from natural systems and climate change continues (California Department of Forestry and Fire Protection [CAL FIRE] 2018a).

The KNP Complex Fire illustrates the increasing risk of wildfire in the Three Rivers community. The KNP Complex Fire consumed nearly 90,000 acres and threatened homes; destroyed structures and giant sequoia groves, which draw in visitors from around the world; and triggered the evacuation of sections of Three Rivers and surrounding communities (Tulare County Sheriff 2022a).

As wildfire severity increases, communities need a plan to help prepare for, reduce the risk of, and adapt to wildland fire events. Community Wildfire Protection Plans (CWPPs) help accomplish these goals. A CWPP provides recommendations that are intended to reduce, but not eliminate, the extreme severity or risk of wildland fire.

The development of the Three Rivers CWPP has included meaningful collaboration among many local stakeholders including local, state, and federal officials, as well as other interested parties such as non-governmental stakeholders and private citizens. The planning process involves looking at past fires and treatments using the knowledge and expertise of the professional fire managers who work for the various agencies and governing entities in the planning area. Using this information, the CWPP identifies the

current local wildfire risks and needs that occur in the planning area, which is further supported with relevant science and literature from the western region of the United States.

In addition, this document, the 2022 Three Rivers CWPP, reviews, verifies, and/or identifies potential new priority areas where mitigation measures are needed to protect from wildfire the irreplaceable life, property, and critical infrastructure in the planning area. However, this CWPP does not attempt to mandate the type and priority for treatment projects that will be carried out by the land management agencies and private landowners. The responsibility for implementing wildfire mitigation treatments lies at the discretion of the landowner; the 2022 Three Rivers CWPP only identifies potential treatments and a suggested priority for these projects.

GOAL OF A COMMUNITY WILDFIRE PROTECTION PLAN

The goal of a CWPP is to enable local communities to improve their wildfire-mitigation capacity, while working with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. Another goal of the CWPP is to enhance public awareness by helping residents better understand the natural- and human-caused risk of wildland fires that threaten lives, safety, and local economies. The minimum requirements for a CWPP, as stated in the Healthy Forests Restoration Act (HFRA), are the following (Society of American Foresters [SAF] 2004):

- **Collaboration:** Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP.
- **Prioritized Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments and recommend the types and methods of treatment that will protect one or more communities at risk (CARs) and their essential infrastructures.
- **Treatments of Structural Ignitability:** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

It is the intent of this 2022 Three Rivers CWPP to provide a community-wide scale of wildfire risk and protection needs, as well as bring together the responsible wildfire management and suppression entities in the area to support planning and implementation of the necessary mitigation measures. Additional information regarding the planning process is available in Appendix A.

NAVIGATION

The plan provides background information, a Risk-Hazard Assessment, and recommendations to reduce or mitigate wildfire risk to communities. The CWPP is designed to be used by the residents of the Three Rivers community, as well as stakeholders tasked with forest, fire, and emergency management. Some information is therefore highly technical as to provide sufficient detail to aid in project implementation.

This CWPP has been supplemented with online content compiled into a project story map. The story map serves as a synopsis to the larger plan and is designed to make the information in this plan more accessible to the reader as it allows the public and stakeholders to interface with the various map products that have been developed through this planning process. The story map and CWPP will be readily updated as conditions change throughout the planning area. The CWPP is shared on the Three Rivers Fire Safe Council ArcGIS Hub site: https://three-rivers-cwpp-swcagis.hub.arcgis.com/

This CWPP is organized into several chapters, with more detailed information compiled into appendixes. Chapter 1 provides an overview of CWPPs and describes the need for a plan; Chapter 2 gives an overview of the fire environment and introduces the reader to fire history information and fire response; Chapter 3 describes the methodology for the Risk-Hazard Assessment and the results in detail; Chapter 4 outlines the mitigation strategies that could be implemented to reduce wildfire risk under the umbrella of the National Cohesive Strategy (Cohesive Strategy) including action plans that outline priorities and recommendations for reducing fuels, initiating public education and outreach, reducing structural ignitability, and improving fire response capabilities; and Chapter 5 provides suggested approaches to monitoring actions.

The CWPP does not require implementation of any of the recommendations; however, these recommendations may be used as guidelines for the implementation process if funding opportunities become available. The recommendations for fuels reduction projects are general in nature; site-specific planning that addresses location, access, land ownership, topography, soils, and fuels would need to be employed upon implementation. Also, it is important to note that the recommendations are specific to wildland urban interface (WUI) areas and are expected to reduce the loss of life and property. All recommendation tables and the California Environmental Quality Act (CEQA) process for the California Vegetation Treatment Program (CalVTP) are provided in Chapter 4 and Appendix I.

In developing the CWPP, a large amount of background information on the planning area is compiled and analyzed, including location and land use data, climate and weather data, baseline vegetation data, historic conditions, human population (and its respective demographics), the CWPP planning process, fire regime and baseline conditions, and fire policy, among other supporting background information. This information is presented in Appendix A, Community and CWPP Background Information.

Additional appendices to this CWPP include maps in Appendix B; the Core Team contact list in Appendix C; community descriptions and hazard ratings in Appendix D; the National Fire Protection Association (NFPA) Wildfire Fire Risk and Hazard Severity Form 1144 in Appendix E; funding opportunities in Appendix F; resources for homeowners in Appendix G; community outreach in Appendix H; and project recommendations in Appendix I.

ALIGNMENT WITH THE NATIONAL COHESIVE STRATEGY

The 2022 CWPP has been aligned with the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) and its Phase III Western Regional Action Plan by adhering to the nation-wide goal: "*To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire*" (Forests and Rangelands 2014:3).

The primary national goals identified as necessary to achieving the vision are:

- **Restore and maintain landscapes**: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- **Fire-adapted communities**: Human populations and infrastructure can withstand a wildfire without loss of life and property.
- **Wildfire response**: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

For more information on the Cohesive Strategy, please visit: https://www.forestsandrangelands.gov/strategy/documents/strategy/CSPhaseIIINationalStrategyApr2014.pdf

Alignment with these Cohesive Strategy goals is described in more detail in Chapter 4, Mitigation Strategies.

In addition to aligning with the Cohesive Strategy, the CWPP also incorporates information on post-fire recovery, the significant hazards of a post-fire environment, and the risk that post-fire effects pose to communities (Figure 1.1).

Figure 1.1. CWPP incorporating the three primary goals of the Cohesive Strategy and post-fire recovery and serving as holistic plan for fire prevention and resilience.

ALIGNMENT WITH STATE PLANS AND AGREEMENTS

This CWPP is aligned with multiple local, state, and federal planning documents. These documents and agreements are summarized in Appendix A. In addition, fire policy and legislative direction are also summarized in Appendix A.

CORE TEAM

The development of the Three Rivers CWPP was overseen by the Three Rivers Fire Safe Council. Representatives from various government agencies—along with members of fire departments and local

communities—formed a Core Team and participated in decision-making activities that led to the development of the Three Rivers CWPP. Stakeholder involvement is critical in producing a meaningful document that included all collaborators' diverse perspectives. The Core Team drives the planning process in its decision making, data sharing, experience, and communication with community members who are not on the Core Team. The project was kicked off on March 8, 2021; the Core Team met for the first time on April 29, 2021, and convened again on August 20, 2021, and lastly on March 23, 2022.

The Core Team List is provided in Appendix C.

PLANNING AREA

The planning area includes all of Three Rivers Fire Safe Council jurisdiction, as delineated by its geographic and political boundaries (Figure 1.2). Members of the Fire Safe Council helped to delineate the project boundary.

LAND OWNERSHIP

Three Rivers is primarily composed of privately owned land (99.76%). The state owns 0.17%, and the federal government (National Park Service [NPS]) owns the remaining 0.07% (Figure 1.3).

PUBLIC INVOLVEMENT

A key element in the CWPP process is the meaningful discussions it generates among community members regarding their priorities for local fire protection and forest management (SAF 2004). More information on public outreach efforts (including URLs) can be found in Appendix H.

Recommendations for future community engagement and outreach are provided in Chapter 4, Table 4.4.

Public education and outreach programs are a common factor in virtually every agency and organization involved with the wildfire issue. Detailed information on these programs is provided in Appendix A.

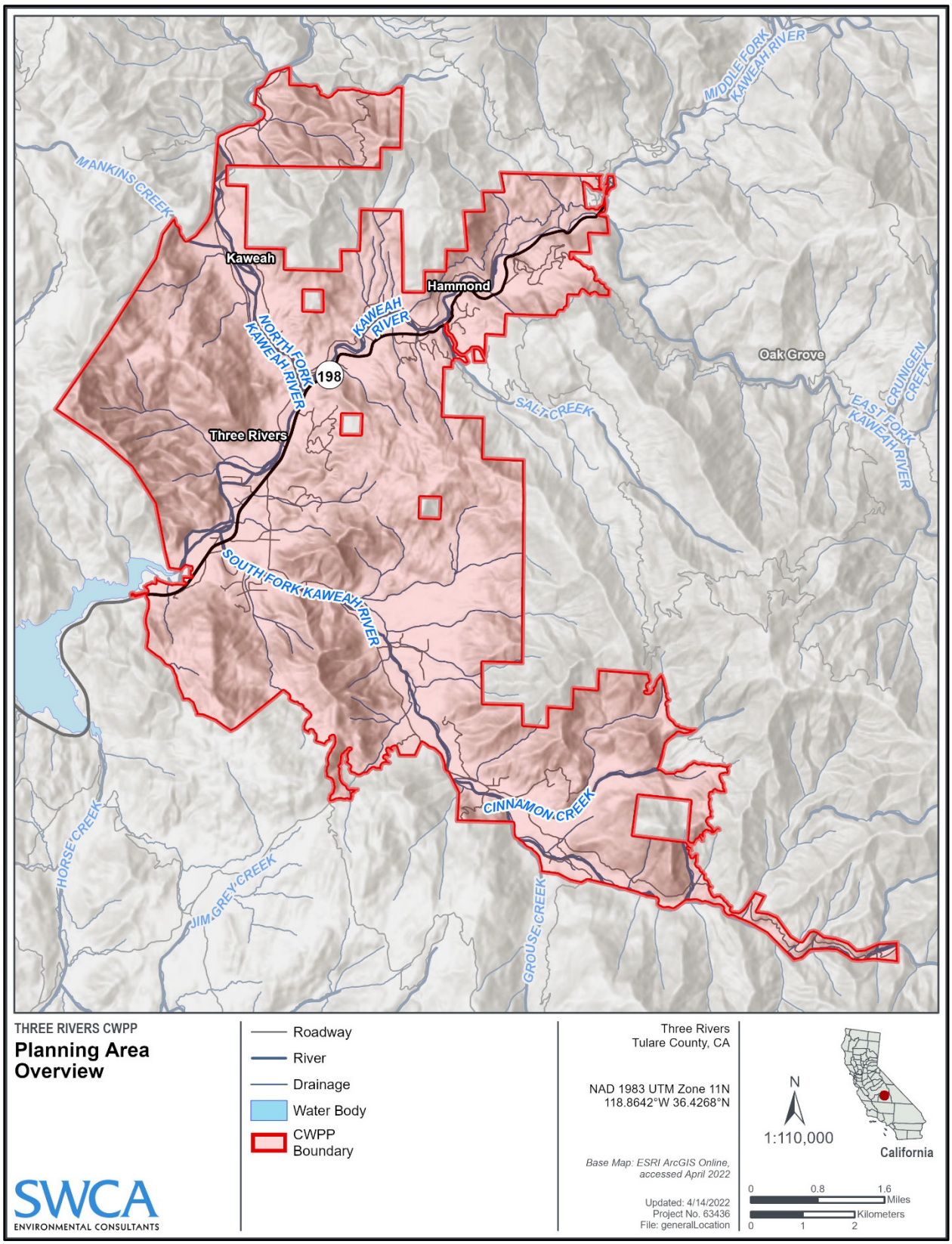

Figure 1.2. Three Rivers CWPP general location.

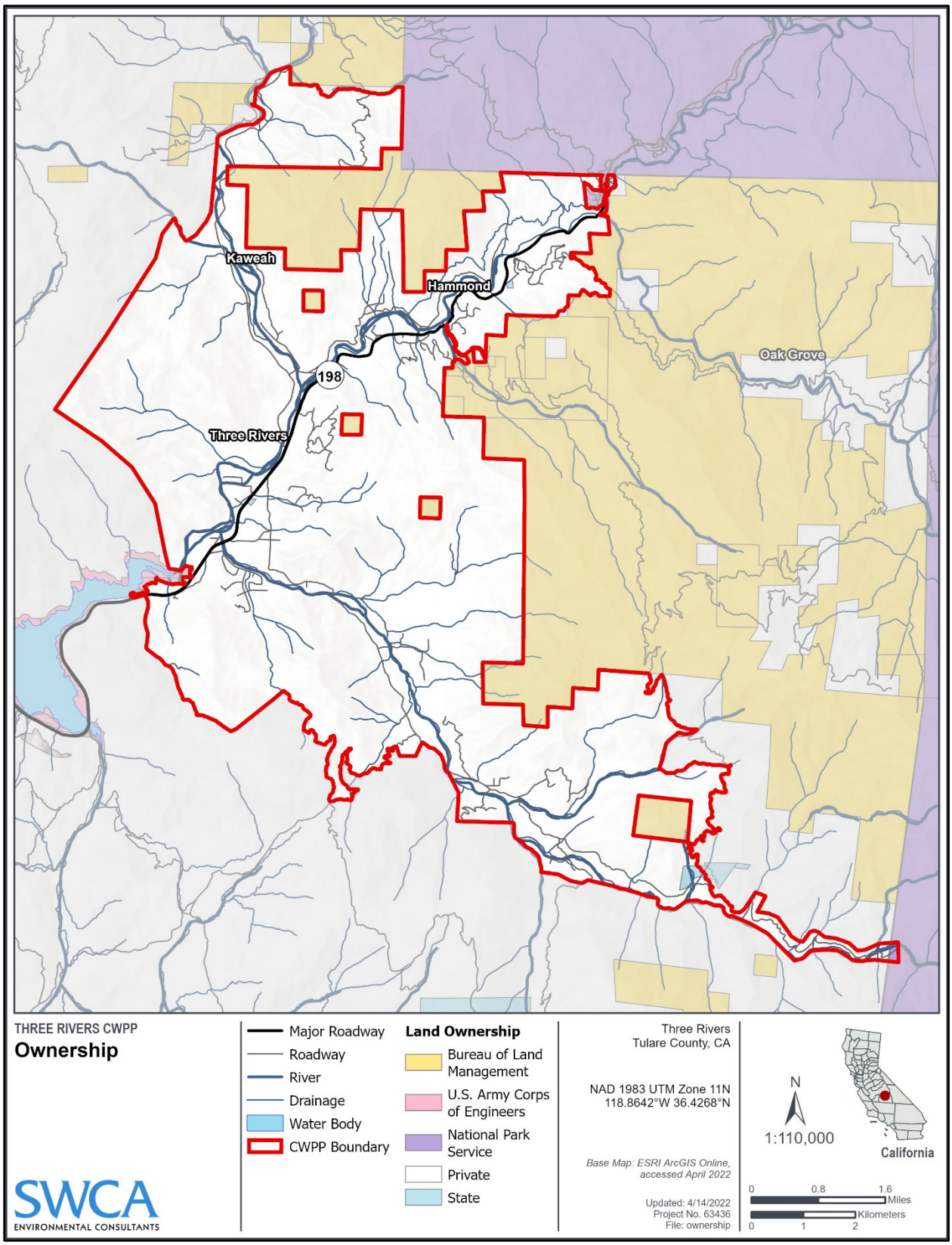

Figure 1.3. Three Rivers land ownership.

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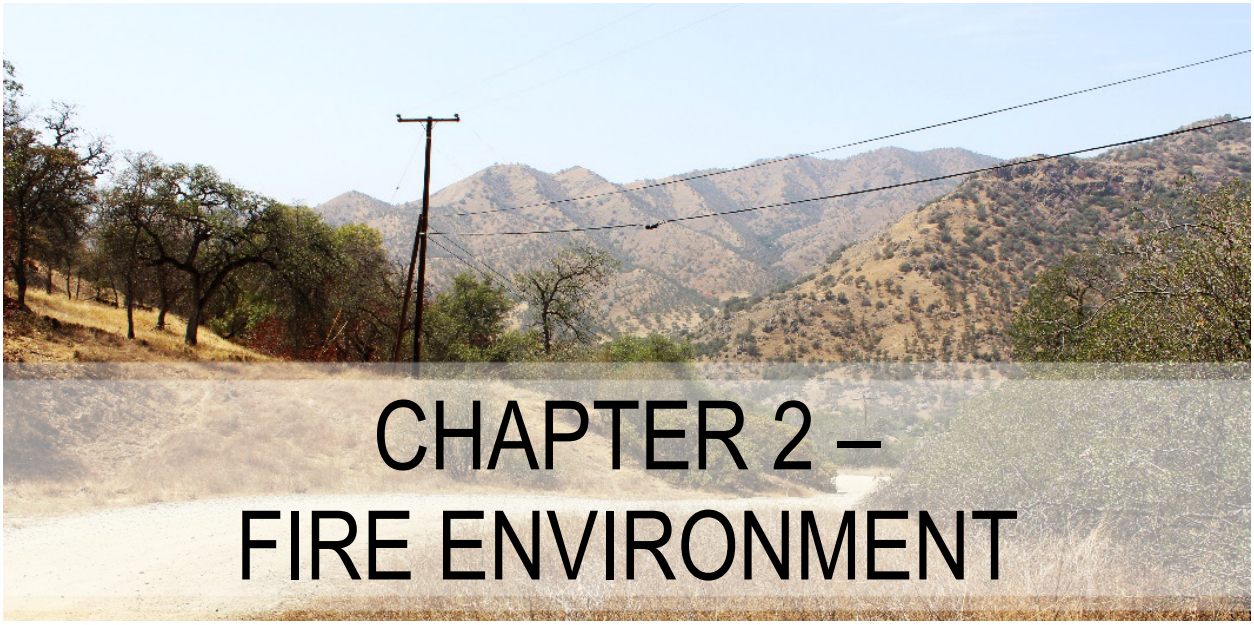


CHAPTER 2 – FIRE ENVIRONMENT

WILDLAND URBAN INTERFACE

A WUI is composed of both interface and intermix communities and is defined as areas where human habitation and development meet or intermix with wildland fuels (U.S. Department of the Interior and U.S. Department of Agriculture [USDA] 2001:752–753). Interface areas include housing developments that meet or are in the vicinity of continuous vegetation. Intermix areas are those areas where structures are scattered throughout a wildland area where the cover of continuous vegetation and fuels is often greater than the cover by human habitation. In addition, the WUI has an area of influence, or influence zone. This area is described with respect to wildland and urban fire; it is an area with a set of conditions that facilitate the opportunity for fire to burn from wildland fuels to the home and or structure ignition zone (National Wildfire Coordinating Group [NWCG] 2021a).

A CWPP offers the opportunity for collaboration of land managers to establish a definition and a boundary for the local WUI; to better understand the unique resources, fuels, topography, and climatic and structural characteristics of the area; and to prioritize and plan fuels treatments to mitigate for fire risks. At least 50% of all funds appropriated for projects under the HFRA must be used within the WUI.

According to the HFRA, the WUI can be defined by a CWPP. In this CWPP, the WUI is defined as:

- An area extending 1.5 miles from the boundary of an at-risk community.
    - In the event a strategic fuel project enhances community protection, the WUI boundary may extend beyond the traditional 1.5-mile buffer to include said areas where the strategic project would be completed. For example, sustained slopes and ridgelines may continue beyond the 1.5-mile buffer. However, it is still important that project work is completed in those high-risk areas. Therefore, the entire strategic planning area would be considered as WUI, not just the sections within the 1.5-mile buffer.

At-risk communities were delineated prior to the on-the-ground community hazard assessments and were based on the presence of homes and structures surrounded by wildland fuels. Maps with buffers representing the 1.5-mile area for WUI as defined above are presented in Appendix D (Maps D.1–D.7) for each community.

The WUI creates an environment in which fire can move readily between structural and vegetative fuels, increasing the potential for wildland fire ignitions and the corresponding potential loss of life and property. Human encroachment upon wildland ecosystems in recent decades is increasing the extent of the WUI throughout the country, which is having a significant influence on wildland fire management practices. Combined with the collective effects of aggressive suppression policies, resource management practices, land use patterns, climate change, and insect and disease infestations, the expansion of the WUI into areas with high fire risk has created an urgent need to modify fire management practices and policies and to understand and manage fire risk effectively in the WUI (Pyne 2001; Stephens and Ruth 2005). Mitigation techniques for fuels and fire management can be strategically planned and implemented in WUI areas; for example, with the development of defensible space around homes and structures. Figures 2.1 and 2.2 show examples of the WUI within the planning area, and Figure 2.3 displays the at-risk communities within the planning area. These WUI communities are buffered by 1.5 mile to represent the WUI boundary (see Appendix D).

WILDLAND URBAN INTERFACE LAND USE

Cities and counties are continuously challenged to accommodate both current and future residents in need of safe and affordable housing. In California, approximately 180,000 homes need to be constructed annually to meet demand (California Department of Housing and Community Development 2018). Over the past few decades, jurisdictions across the state have approved many new housing units. These are often placed within or near to wildland areas, creating "wildland-urban interface" (WUI) conditions. Today, more than 46 million residences in 70,000 communities across the U.S. are at risk for WUI fires (U.S. Fire Administration [USFA] 2021a). When it comes to wildfire, this trend is of special concern since WUI conditions are linked with an increased risk of loss of human life, property, natural resources, and economic assets. According to the 2018 Strategic Fire Plan for California, “since the turn of the century there has been a steep increase in structures lost compared to the 1990s” (CAL FIRE 2018b).

Development in high or very high fire hazard areas is required to be constructed in a way that reduces the risk from fire hazards and meets all appropriate county and state fire standards. The requirement includes the use of fire-resistant materials produced to minimize fire susceptibility within high or very high fire hazard areas as per the 2001 California Fire Code, Fire Safe Regulations, and other standards. New development schemes must contain certain fire protection plans, codes, and actions for fire engineering components for buildings and structures in very high fire hazard zones (Tulare County Resource Management Agency [RMA] 2012).

The following sections describe important wildfire attributes within and around the WUI in the planning area.

Appendix D houses descriptions and hazard ratings accompanied by a WUI delineation map for each community evaluated within the planning area (Figure 2.4 provides an example). The WUI maps depict the entire WUI boundary for each community. The WUI buffer is an area where fuel treatments should be prioritized in order to provide additional protection to the community from potential wildfire spread. During Core Team meetings, stakeholders agreed that the WUI buffer should be flexible to allow WUI hazardous fuels treatments to occur at distances beyond the 1.5 miles delineated because treatments should be aligned, when possible, with strategic topographic locations that could serve as anchor points.

Figure 2.1. Example of the wildland urban interface in the planning area.

Figure 2.2. Example of the wildland urban interface in the planning area.

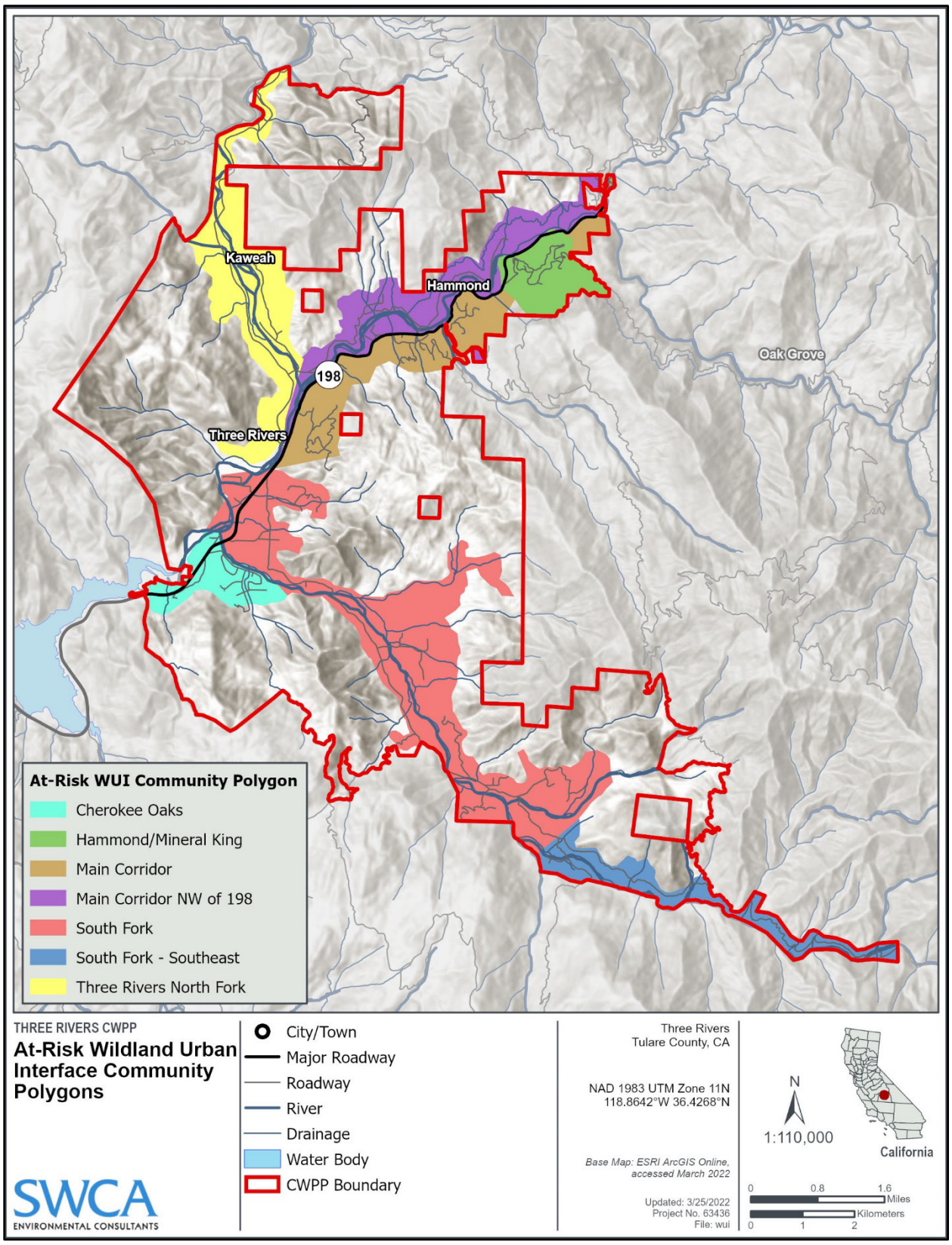


Figure 2.3. At-risk wildland urban interface communities in the planning area.

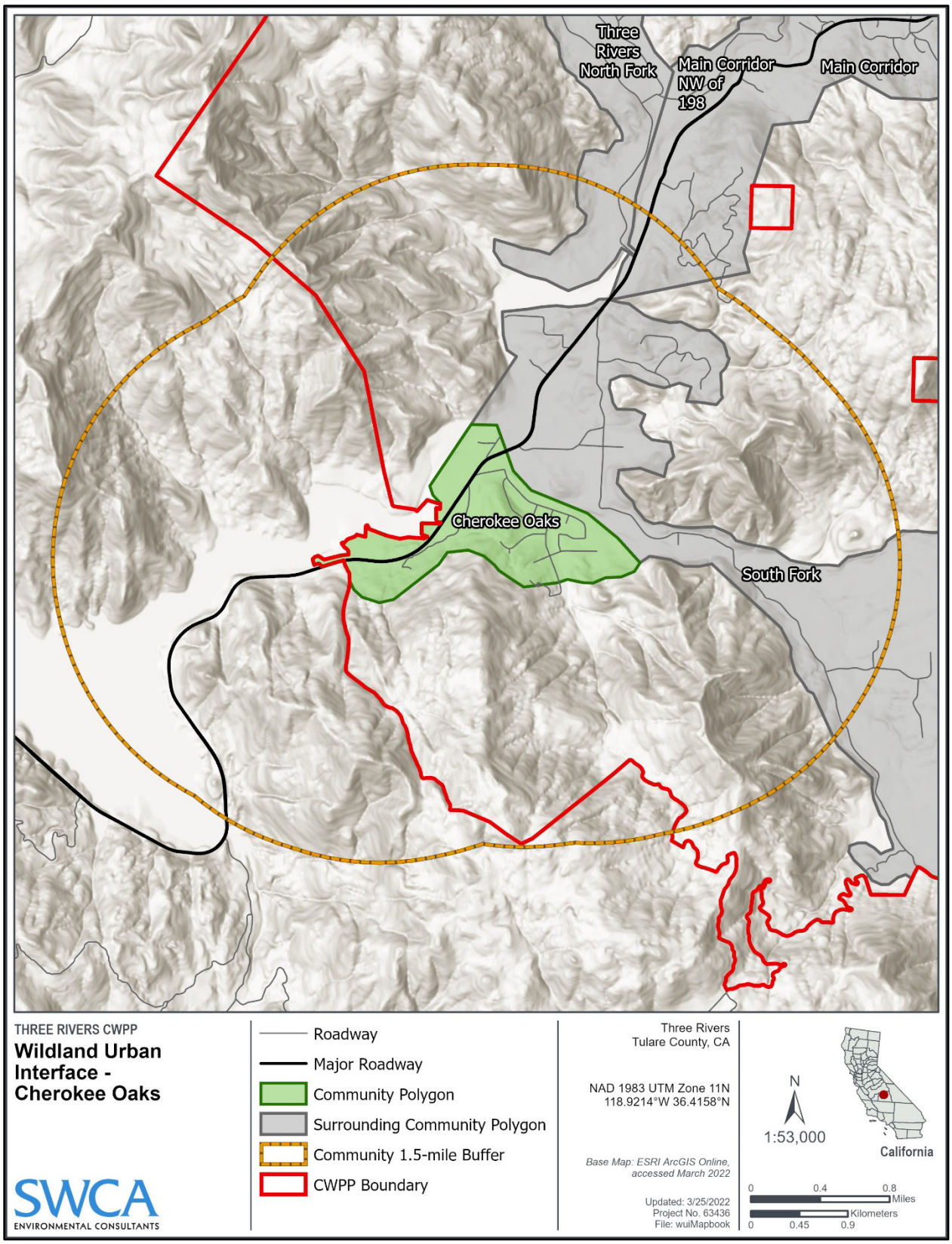


Figure 2.4. Example of the wildland urban interface delineation maps provided in Appendix D.

FIRE HISTORY

Fire is a natural part of California's diverse landscapes and is essential to many ecosystems across the state. Almost all of California's diverse ecosystems are fire-dependent or fire-adapted. For centuries, many California Native American tribes recognized this interdependence between fire and the ecosystem and used prescribed burning to maintain and restore ecosystem health. However, in the 1800s, a shift in management actions—settlers began enforcing strict fire suppression regimes—led to issues such as dense stand conditions and increased vulnerability to fire. Wildland fire suppression regimes, in conjunction with other management actions (e.g., human expansion into wildlands) and climate change, have resulted in an imbalance between wildfire and ecosystem interactions (California Department of Fish and Wildlife [CDFW] 2021).

RECENT FIRE OCCURRENCE

Historic wildfire activity and information regarding fire regime are described in detail in Appendix A.

Fire history data from the period from 1925 to 2020 displays an episodic pattern of consecutive years with relatively low fire events marked by one or two consecutive years with higher fire events (Figure 2.5). The fire history graph (see Figure 2.5) also shows a decreasing interval between high and low fire occurrence years, e.g., the 54-year gap between 1930 and 1984 contrasted with the 27-year gap between 1993 and 2020. Historically, most fires have been scattered throughout the planning area (Figure 2.6). However, recent fires (2001–2020) have been occurring more frequently in the South Fork and Hammond/Mineral King communities as well as on the southeast portion of the main corridor (see Figure 2.6).

In addition to higher frequency, a significant number of fires have burned large areas; six fires have individually burned 300 to 1,000 acres, and 10 fires have individually burned more than 1,000 acres (Figure 2.7). Large, severe fires in recent times include the Castle Fire and KNP Complex Fire, both of which were lightning-caused fires. The Castle Fire occurred in August 2020 and ultimately consumed nearly 171,000 acres (NPS 2021a). The KNP Complex Fire started on September 9, 2021, when two smaller lightning-caused fires (the Colony and Paradise Fires) merged into one. By the time of containment, the KNP Complex Fire had burned nearly 90,000 acres (NPS 2021b).

The majority of fire events have occurred during the months of June through August, which is when high temperatures and hot, dry winds are most frequent (Figure 2.8). This local trend coincides with California's fire season, which usually occurs between July and November. However, fire seasons are increasing in length each year. Climate change acts as a key driver of increased fire season duration due to warmer spring and summer temperatures, delayed fall precipitation, extended droughts, decreased snowpack, and earlier spring snow melt (CAL FIRE 2021a).

The top two causes of fire events in the planning area are arson and lightning; powerlines, smoking, and structure fires are the next highest causes (Figure 2.9). Human-caused fires and anthropogenic activity altogether account for approximately 42% of the wildfires recorded in and around the planning area since 1925 (see Figure 2.9). Lightning accounts for 16% of the wildfires since 1925, while 32% of fire causes are unknown (see Figure 2.9). Overall, fires that begin at lower elevations are mostly due to vehicle or electrical power (human-caused), while fires beginning at higher elevations are mostly caused by lightning. Although infrequent, fire starts in the higher elevations within the area present a great potential for a major fire. This is because most high-elevation areas contain elevated levels of dead trees (e.g., Case Mountain), as well as little to no road access for firefighting resources (CAL FIRE Tulare Unit [CAL FIRE TUU] 2021).

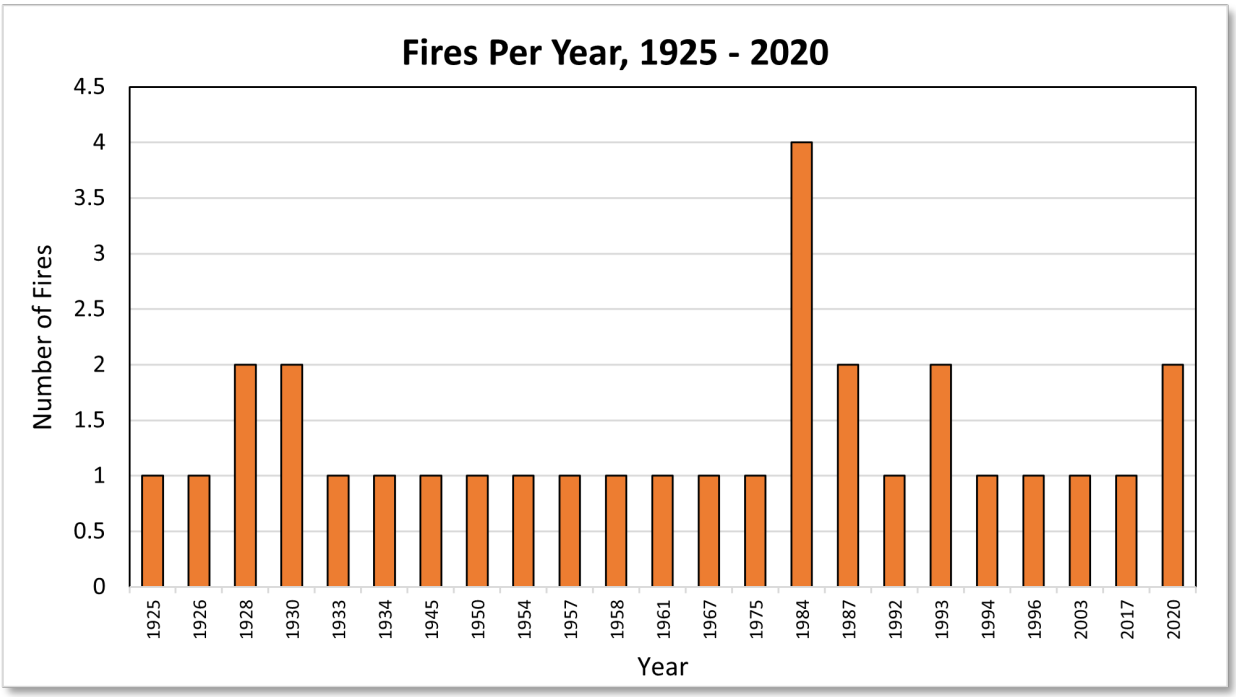


Figure 2.5. Annual wildfire frequency in the planning area from 1925 to 2020, based on available data.

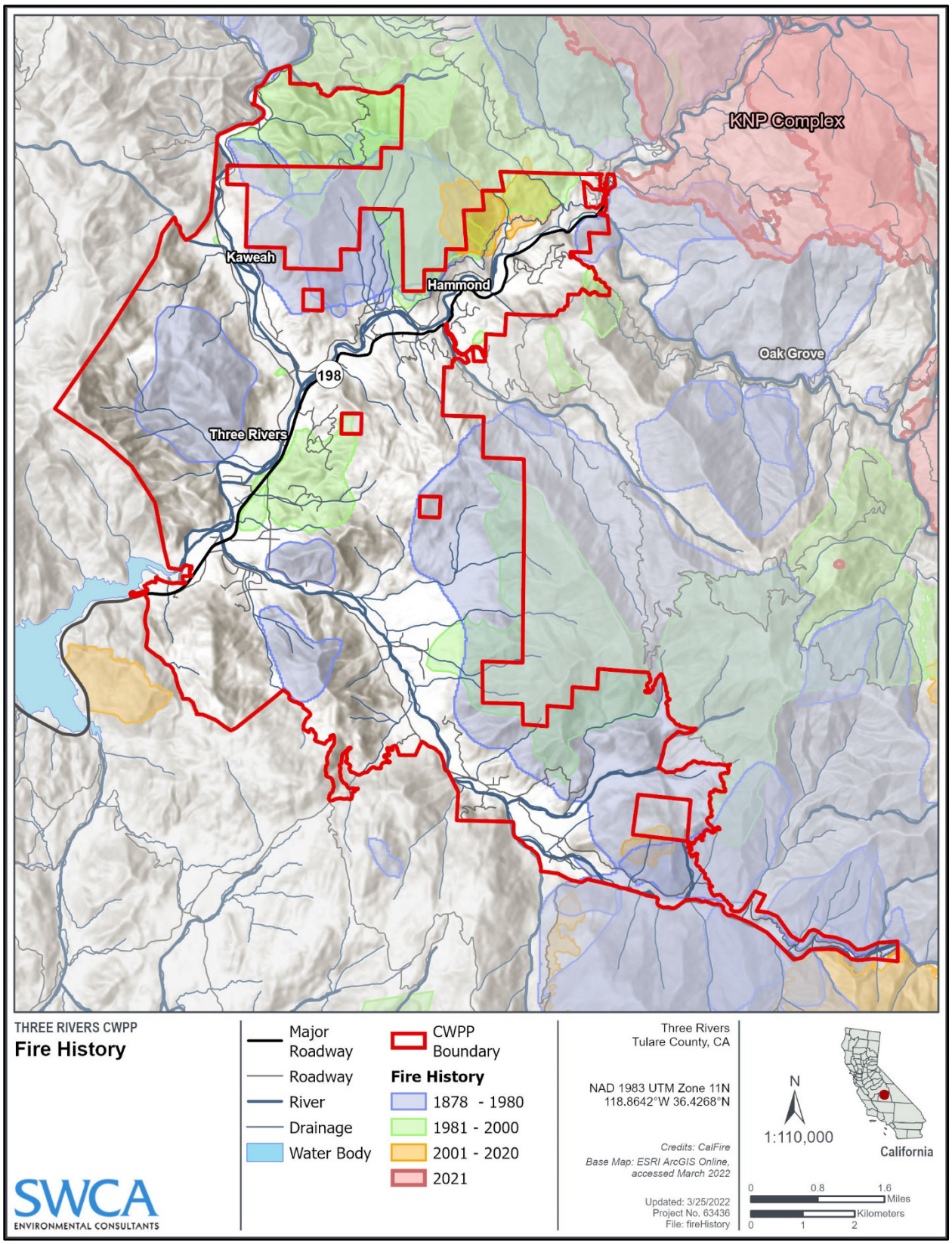


Figure 2.6. Fire history for the planning area from 1921 to 2021.

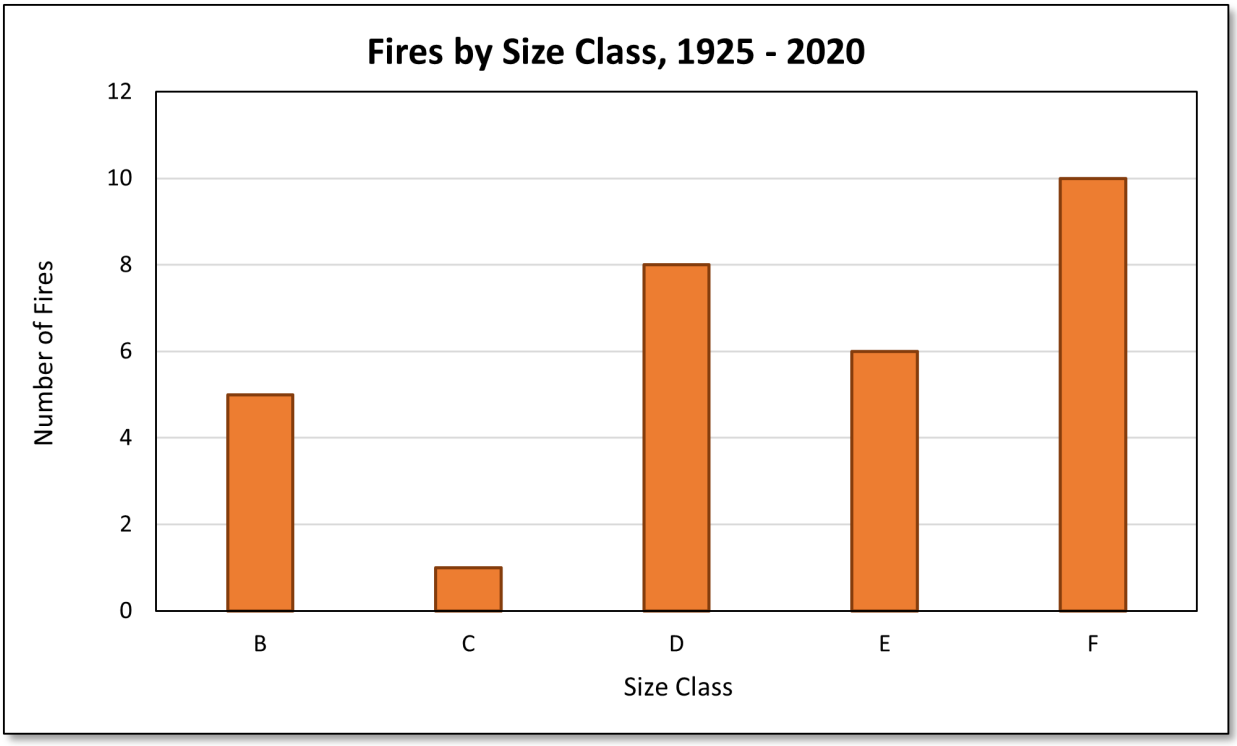


Figure 2.7. Fire size statistics for the planning area based on fire history data from 1925 to 2020.

Size Class: A = 0.25 acre or less; B = greater than 0.25 to 10 acres; C = 10 to 100 acres; D = 100 to 300 acres; E = 300 to 1,000 acres; F = 1,000+ acres.

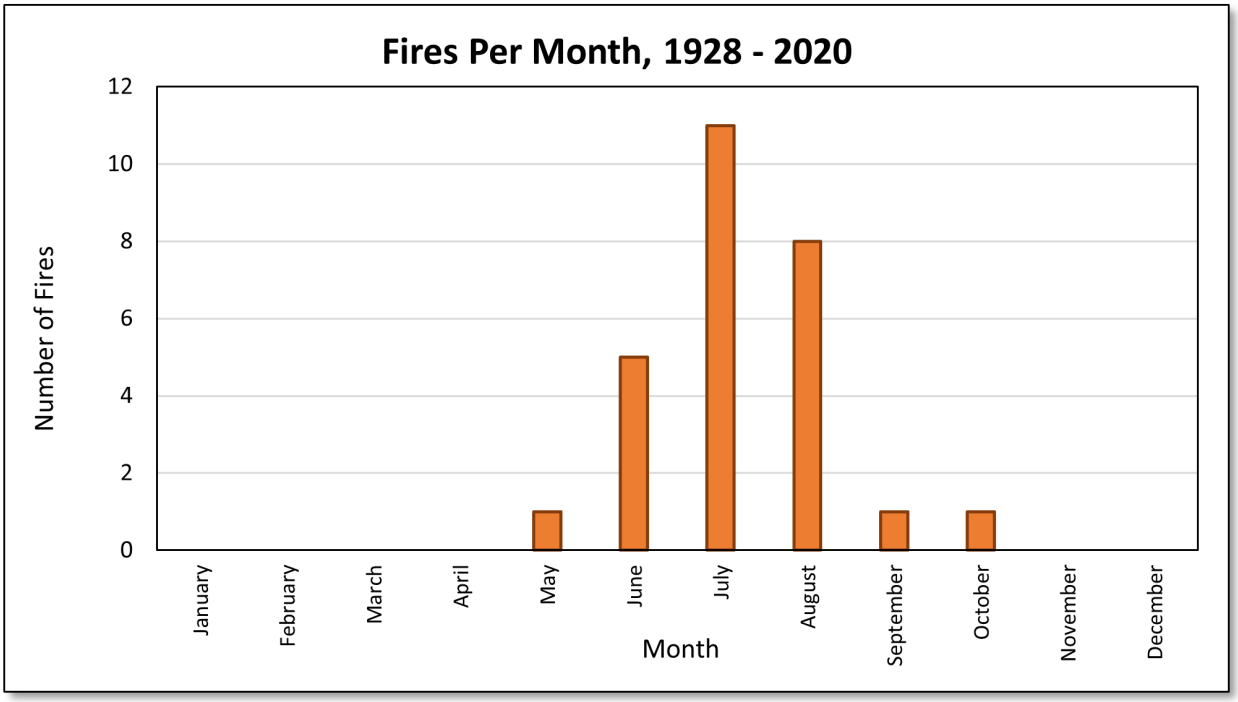


Figure 2.8. Monthly fire frequency in the planning area based on data from 1928 to 2020.

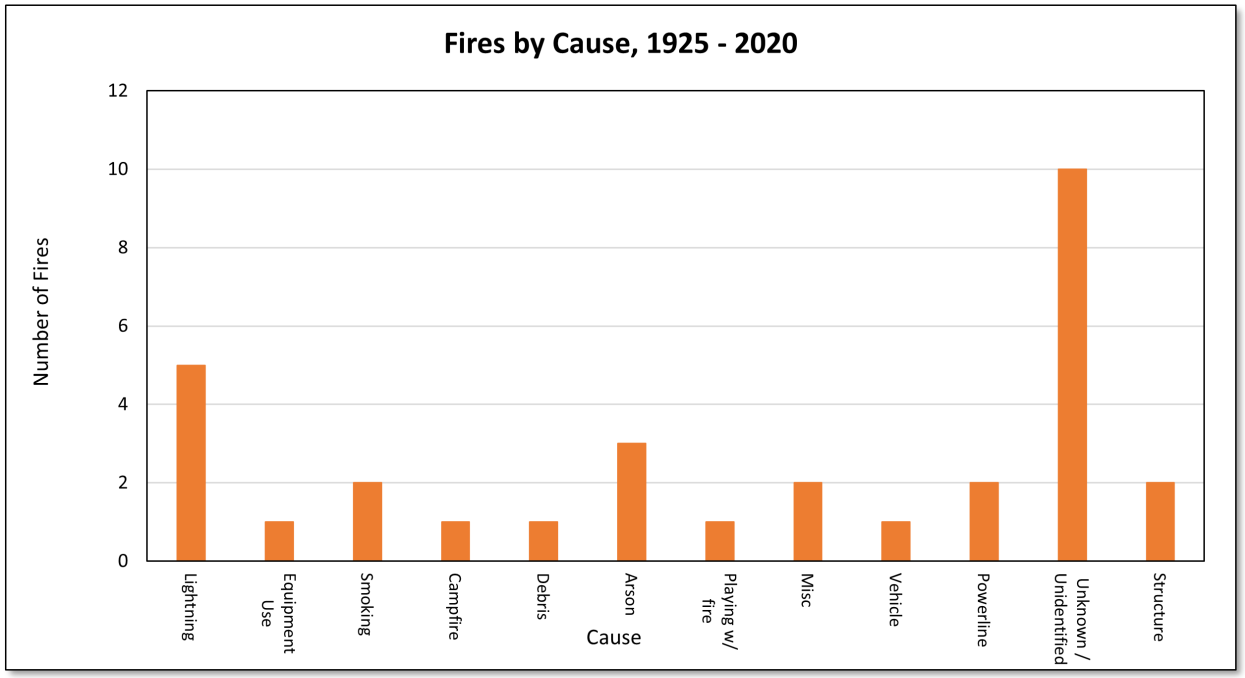


Figure 2.9. Fire causes for the planning area from 1925 to 2020.

Information regarding fire regime (a measure of the general pattern of fire frequency and severity typical to a particular area or type of landscape) is described in detail in Appendix A.

FUTURE CHALLENGES

IMPACT OF CLIMATE CHANGE

Frequent drought, suppression-based forest management tactics, and climate change have all worked together to increase forest vulnerability in recent years. The absence of fire in a fire-dependent ecosystem, in combination with drought, insects, and diseases, have altogether resulted in increased fuel build-up and alterations to vegetation composition. These forest changes have increased the risk and incidence of uncharacteristically large, high-severity fires (CDFW 2021). In the past few years, fires have grown to record sizes and are burning earlier, longer, hotter, and more intensely than they have in the past (Westerling et al. 2006; Westerling 2016).

According to the National Interagency Fire Center (NIFC), occurrence of uncharacteristically large and severe wildfires has greatly increased over the last 20 years. Westerling et al. (2006) claim that a study of large (>1,000 acres) wildfires throughout the western United States for the period 1970 to 2003 saw a pronounced increase in frequency of fire since the mid-1980s (1987–2003 fires were four times more frequent than the 1970–1986 average). The length of the fire season was also observed to increase by 78 days (comparing 1970–1986 with 1987–2003).

An update to Westerling et al.'s 2006 work found that the frequency of large wildfires has continued to increase with each decade since 1970 (Westerling 2016). Within just the last 10 years, a record number of acreages have burned, and numbers are continually getting larger (NIFC 2021a). In 2020, 58,950 fires were reported nationwide, burning 10.1 million acres (NIFC 2021a). In California, 4,257,863 acres were burned by wildfire in 2020 (CAL FIRE 2020a). With increased fires comes increased suppression costs; 2018 beat all previous records, with federal firefighting costs hitting $3,143,256,000 (NIFC 2021b). With

regard to the 2021 fire season in Tulare County, the KNP Complex and Windy Fires alone cost $86 million to fight (*Fresno Bee* 2021). In addition, the KNP Complex and Windy Fires damaged infrastructure and destroyed a combined total of 27 structures in the Sequoia National Forest (NF), Sequoia and Kings National Parks (SEKI NPs), and surrounding areas (personal communication, Angel Prieto 2022, Andrew Cremers 2022, Jefferey McLaughlin 2022).

The shifting climate, particularly rising temperatures, combined with changing wind patterns and increasing temporal and spatial variability of water availability, are considerably escalating wildfire risk across California. The recurrence of severe fire weather during the autumn months has more than doubled in California since the 1980s, and, considering climate change, this prevalence is projected to increase in the future. As stated by California's Fourth Climate Change Assessment, if greenhouse gas emissions continue to increase, California is expected to experience a 50% increase in fires larger than 25,000 acres as well as a potential 77% increase in average area burned by 2100.

The state has already begun to encounter the impacts of increased fire occurrence and severity. In fact, the top five largest wildfires in California occurred in the last 3 years, including the August Complex Fire (August 2020) and the Dixie Fire (July 2021). The August Complex and Dixie Fires alone burned a combined total of nearly 2 million acres and well over 2,000 structures (CAL FIRE 2021b). Extreme wildfire events continue to present a significant threat to California's communities.

In addition to direct damage (e.g., structure and property damage) caused by wildfires, uncharacteristically large and severe wildfires also cause indirect impacts to the environment and ecosystem. Wildfires are known to deteriorate local and regional air quality, pollute waterways, displace native species (animal and plant), and increase carbon dioxide emissions. The increased carbon dioxide emissions are of special concern since carbon dioxide is a greenhouse gas. Greenhouse gases are implicated in climate change, and climate change is a critical factor exacerbating frequency and severity of wildfires (California Governor's Office of Planning and Research [OPR] 2019).

Moreover, as energy companies responded to the growing threat of wildfire events and likely risk of ignition by electrical transmission equipment, communities across the state were impacted by public safety power shutoff events. Furthermore, utility credit reductions result in higher consumer rates, and homeowners insurance in the WUI is also becoming more difficult and expensive to obtain in California (OPR 2019).

It is also important to note that fire is a natural part of California's diverse landscapes and is essential to many ecosystems across the state. Almost all of California's diverse ecosystems are fire-dependent or fire-adapted (CDFW 2021). Frequent, uncharacteristically large, high-severity wildfires are the primary source of the catastrophic damage listed above. Wildfire, when not intensified by human actions, works to balance ecosystems, and restore their natural functions.

TREE MORTALITY

Rising temperatures, extensive droughts, extreme wildfires, and insect outbreaks have contributed to widespread tree mortality in the Sequoia NF and SEKI NPs. However, tree mortality and associated hazards are not limited to National Park or National Forest boundaries, in fact, elevated levels of deceased trees have been detected within the planning area. Moreover, wildfire hazards posed by high levels of tree mortality in adjacent public land contribute to the wildfire threat in and around the planning area.

Tree mortality due to the aforementioned factors is a natural process in forest ecosystems. However, when compound disturbances occur, many trees can die in a brief time period over large regions, impacting forest health. In addition to disrupting ecosystem functions, widespread tree mortality near developed or recreational areas present hazards as trees can fall and potentially endanger the public and infrastructure. Furthermore, the level of risk posed by hazard trees is contingent on the amount of time that has passed since the individual or population has died and the amount of fuel that has fallen to the forest floor. In the Sierra Nevada, due to recent droughts and rising temperatures, fuels that reach the ground tend to persist for a longer period and present a significant wildfire hazard. As such, any increase in tree mortality results in increased fuels and more severe or frequent wildfires in the region (NPS 2021c).

During the 2012–2016 drought in the region, tree mortality increased significantly. Rising temperatures and reduced water availability have stressed trees, thereby increasing their physiological stress and their susceptibility to insect and pathogen infestations (California Office of Environmental Health Hazard Assessment 2019). Roughly 129 million trees were estimated to have died between 2012 and 2017. In 2016 alone, 62 million trees died, with 95% of tree mortality occurring in the Sierra Nevada (University of California, Agriculture and Natural Resources [UCANR] 2017). Recent surveys indicate that the tree mortality trend is likely to continue. In its 2019 annual aerial survey, the U.S. Forest Service (USFS) detected 15.1 million dead trees statewide, mostly California red or white fir, bringing the cumulative total to 163 million dead trees since 2010 (USFS 2019a). Most of the surveyed tree mortality occurred in the southern areas of the Sierra Nevada range. In Tulare County, 167,000 acres with 1,409,000 deceased trees were detected (USFS 2019a).

While it is known that tree mortality affects several aspects of wildfire behavior, the extent to which tree mortality influences wildfire severity has not been established. Researchers from the University of California Davis and the USFS conducted a study to answer this question (Wayman and Safford 2021). The researchers focused on the 2015 Rough Fire and the 2016 Cedar Fire areas for their assessment. These areas presented the perfect opportunity to study the effects of tree mortality on wildfire severity since they had recently burned and had existing tree mortality. The researchers found that two measures of wildfire severity (area killed by fire and canopy torch) were significantly influenced by pre-fire tree mortality. That is, the higher the degree of tree mortality in an area, the higher the potential for a canopy fire and fire-killed trees. Considering that deceased trees pose an increased risk of intense wildfire, the researchers emphasized that fuel reduction treatments, such as thinning and prescribed fire, not only reduce the risk of catastrophic wildfire but can also reduce the severity of future bark beetle outbreaks (Wayman and Safford 2021).

Recent fires have also contributed to increased tree mortality in the SEKI NPs and the Sequoia NF. The 2020 Castle Fire resulted in a loss of 10% to 14% of all sequoia trees over 4 feet in diameter in the Sierra Nevada. The 2021 Windy Fire and KNP Complex Fire burned a combined total of 27 sequoia groves, which translates to 6,109 acres of giant sequoia groves. As a result, it is estimated that 2,261 to 3,637 sequoias over 4 feet in diameter have been killed or will die within the next 3 to 5 years. While sequoias are fire-adapted, increasing fire severity challenges sequoia persistence. Recruitment failure could arise if the cones/seeds are destroyed during crown fires, seeds are incinerated in the soil, or seeds are carried away by surface erosion in high severity burn areas (NPS 2021d).

As previously stated, elevated tree mortality levels are widespread throughout the region, including the planning area. Accordingly, tree mortality is a direct concern within the planning area. CAL FIRE TUU has identified the planning area as particularly susceptible to catastrophic fires due to the high number of dead trees. Higher elevations in the area have between 20 to 40 dead trees per acre, and the Case Mountain and Grouse areas have a mortality rate over 75% in conifer trees (CAL FIRE TUU 2021).

Additional information on forest health considerations and wildlife are summarized in Appendix A.

FIRE RESPONSE CAPABILITIES

PLANNING AND DECISION SUPPORT

As wildfires have continued to grow in extent and severity over the last decade, fire managers need to institute more robust pre-fire planning as well as adapt and improve decision-making tools in order to reduce risk to fire responders and the public.

A primary decision tool utilized by fire managers across all agencies is the Wildland Fire Decision Support System (WFDSS), a system that assists fire managers and analysts in making strategic and tactical decisions for fire incidents (U.S. Geological Survey [USGS] 2021a). The WFDSS combines desktop applications for fire modeling into one web-based system. It provides a risk-informed decision process and documentation system for all wildland fires, and it also introduces economic principles into the fire decision process in order to improve efficiencies, while also ensuring safe and effective wildfire response.

One intent of WFDSS is to ensure that when fire response decisions are made, they fall in line with agency land and resource management plans. Agencies have recently been moving away from the traditional written fire management plans and instead are developing spatial fire management plans that can be housed within WFDSS (USGS 2015). The SEKI NPs, for example, will have all management requirements and strategic objectives for fire management contained within the WFDSS, so that in the event of a fire, incident managers consider this information when making decisions and developing a strategic direction for the wildfire incident (USGS 2015).

FIRE RESPONSE RESOURCES

California contains many federal, state, and local fire protection organizations that are well integrated through a variety of mutual aid and fire protection agreements and coordinated by organizations such as the California Wildfire Coordinating Group, the Northern and Southern California Geographic Area Coordination Centers, and FIRESCOPE (an interagency resource coordination system for fire and other emergencies in the southern California). Agencies such as California Emergency Management, USFS, and CAL FIRE contribute to the substantial wildfire response capacity, which can be deployed to incidents throughout the state. California contains one of the strongest wildfire suppression capabilities in the nation.

Within California, fire response is broken down into three areas: Local, State, and Federal Responsibility Areas (Appendix B, Map B.6). Local Responsibility Area (LRA) is a legal term defining the area where the local government has financial responsibility for the prevention and suppression of wildfire. State Responsibility Area (SRA) defines where the state government is responsible for wildfire response, and Federal Responsibility Area (FRA) defines where the federal government is responsible.

LOCAL RESPONSE

Tulare County Fire Department

The Tulare County Fire Department (TCFD) was established on July 1, 2007. Before the establishment of the TCFD, CAL FIRE provided fire protection services to Tulare County residents through a contract. The Three Rivers planning area falls within an SRA, meaning CAL FIRE provides all initial attack and perimeter control. Tulare County Fire will respond though cooperative agreements to assist with wildland fires. TCFD's mission is "to provide leadership, coordination and customer-based service through fire

prevention, suppression, and emergency medical services" (TCFD 2021a). TCFD is an "all risk" fire department and is responsible for responding to wildland, agricultural, structure, and vehicle fires as well as other emergencies, such as medical emergencies and motor vehicle accidents within the county. TCFD also provides services to unincorporated communities, hamlets, and rural areas. There are 27 fire stations distributed throughout Tulare County, with combined personnel exceeding 200. TCFD staff is composed of paid personnel; therefore, it is regarded as a career fire department (Tulare County RMA 2012).

The department is divided into three key functions (TCFD 2021b):

- **Fire Prevention Bureau** - The Bureau is responsible for the application and enforcement of building and fire regulations. This includes reviewing development site plans and site construction, occupancy inspections, grass/weed abatement, investigating complaints and suspicious fires, and hazardous materials coordination. The Bureau also conducts youth fire setter intervention and fire safety education.
- **Operations Division** - The Operations Division responds to fires, medical emergencies, and hazardous conditions and provides advanced and basic life support. Specialized teams include search and rescue (water, trench, rope, and structural collapse), hazardous materials response, and technical rescue.
- **Training Division** – The Training Division coordinates and provides continuous education and advanced training to all personnel. Training includes structural and wildland firefighting, emergency medical care, and technical rescue operations.

The nearest TCFD station serving the planning area is the Three Rivers Fire Station 14 (Figure 2.10), located at 41412 South Fork Drive, Three Rivers, California 93271

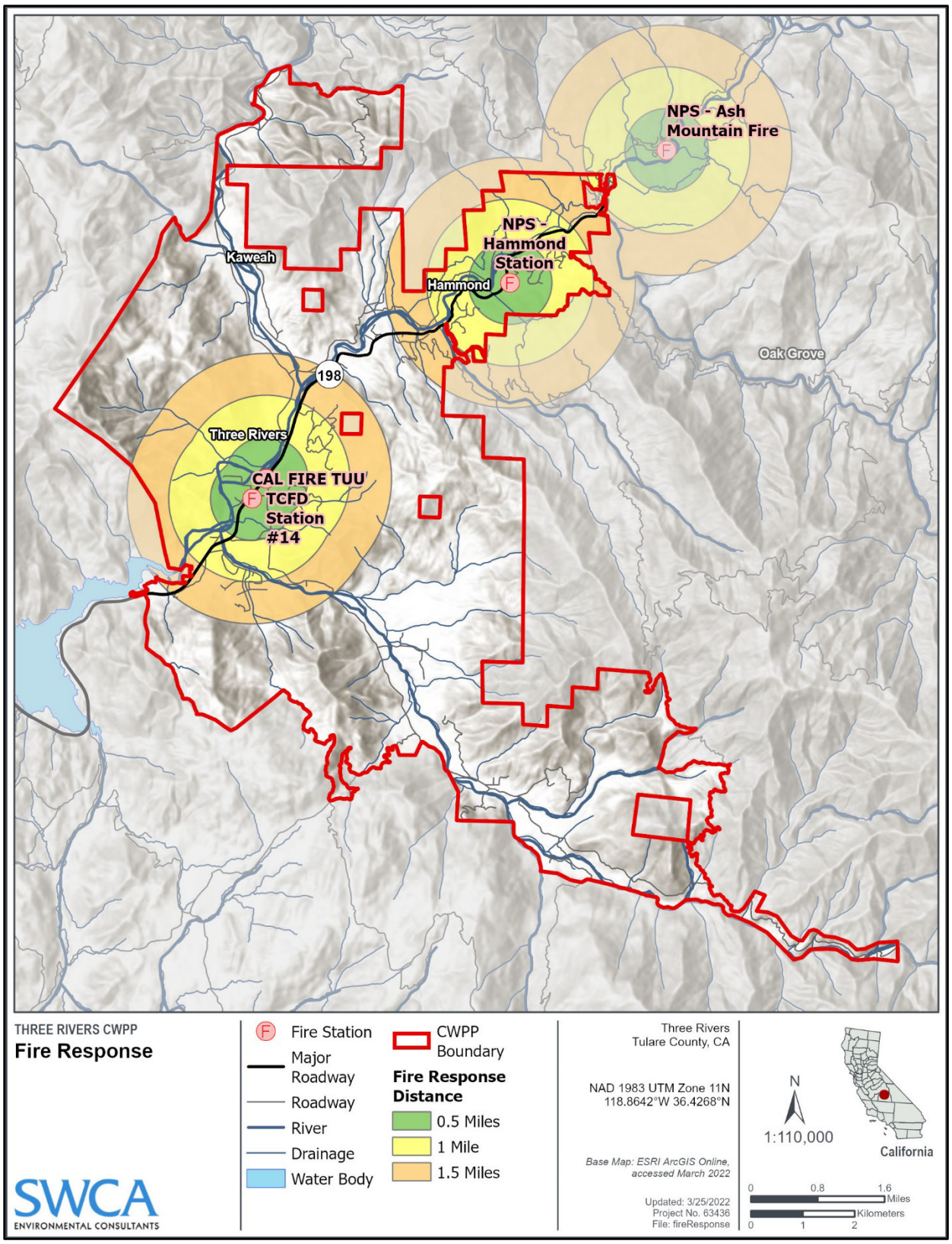


Figure 2.10. Fire stations within the planning area.

Note: Figure 2.10 doesn't indicate a fire responsibility area, rather it displays distances from fire stations that may respond to a fire. For more information about initial attack responsibilities and mutual aid agreements, refer to the local, state, and federal response sections below and above.

STATE RESPONSE

CAL FIRE Tulare Unit

The Tulare Unit (TUU) is part of CAL FIRE. CAL FIRE TUU has primary responsibility for land within CAL FIRE jurisdiction (SRAs) (CAL FIRE TUU 2021) within Tulare County. The entirety of the planning area falls under SRA land (see Map B.6 in Appendix B); therefore, Three Rivers' dispatch, coordination, and logistical support is provided via the Southern California Geographic Coordination Center, also known as Operations Southern California (OSCC). Resource distribution for all-risk incidents, such as aircraft and equipment requests, is handled by the Southern Operations Command Center. The OSCC is a cooperative effort amongst various agencies, including the USFS, U.S. Fish and Wildlife Service, U.S. Department of the Interior, NPS, Bureau of Land Management (BLM), California Governor's Office of Emergency Services (Cal OES), and CAL FIRE (OSCC 2021).

The nearest CAL FIRE TUU station serving the planning area is the Three Rivers Fire Station under the Kaweah Battalion, located at 40900 Sierra Drive, Three Rivers, California 93271

FEDERAL RESPONSE

The management of wildfire ignitions for multiple resource objectives (managing naturally burning fires in forests as a tool for helping to restore forest health and mitigating the escalating costs of fire suppression) is practiced on federal land but depends on a thorough assessment of risk to values at risk (VARs) in the WUI. Depending on the location and nature of a wildfire, policies developed through interagency collaboration outline appropriate management responses to guide district personnel in the application of specific suppression techniques. All large wildfire response would be based on assessment using WFDSS (USGS 2021a).

National Park Service – Sequoia and Kings National Parks

The NPS manages more than 85 million acres in all 50 states, the District of Columbia, and U.S. territories (NPS 2021e). The NPS provides fire response on SEKI NPs. Fire management and suppression protocols are directed by the Wildland Fire Strategic Plan (NPS 2020a). The NPS Division of Fire and Aviation Management is the NPS's national office that provides policy guidance, management, and oversight for the Wildland Fire Management, Structural Fire Management, and Aviation Management programs in National Parks (NPS 2020b). Ash Mountain Fire Dispatch, stationed just northeast of Three Rivers, acts as the dispatch center for the fire and aviation program within SEKI NPs, tracking all fire personnel and resources. From May through November, the station is staffed with one or two permanent dispatchers and an additional one to two seasonal dispatchers (NPS 2021f).

Within the planning area, the NPS provides fire response on SEKI NPs and, within these boundaries, has the responsibility for initial attack (initial response). Like CAL FIRE TUU, NPS fire response is dispatched via the OSCC (OSCC 2021). The NPS maintains mutual aid agreements (MAAs) with CAL FIRE TUU, TCFD, and USFS. Under the MAAs, agency personnel may respond to incidents outside their agency boundaries (CAL FIRE TUU 2021).

The Hammond Fire Station in Three Rivers houses two crews, the Kaweah Wildland Fire Module (KWFM) and Engine 72. As part of SEKI NPs fire resources, the crews maintain MAAs with CAL FIRE TUU and the Sequoia NF (personal communication, Andrew Cremers 2022).

The mission of the KWFM is to "provide an innovative, safe, highly mobile, logistically independent, and versatile fire module with a primary commitment to maintain fire's role as a natural ecological process for wildland fire management and incident operations" (NPS 2019a). In addition to its primary objective, the

KWFM may engage in initial attack activities (NPS 2019a). At full capacity, the KWFM houses 10 personnel, including one captain, 3 permanent firefighters (about 8 months per year), and 6 seasonal firefighters (6 months per year) (personal Communication, Andrew Cremers 2022).

Engine 72 is the principal wildland engine for Sequoia National Park, and its mission is to support the NPS in "a team-oriented, safe, and efficient environment that fosters career training opportunities" (NPS 2019b). In addition to fire suppression, the crew is trained in the utilization of fire management tools and strategies such as chainsaws, drip torches, fire hoses, and prescribed fire. Engine 72 joins local, county, and state organizations on hazardous fuel mitigations and defensible space projects (NPS 2019b). At full capacity, Engine 72 houses eight personnel, including one captain, two permanent firefighters (about 8 months per year), and five seasonal firefighters (6 months per year) (personal communication, Andrew Cremers 2022).

Sequoia National Forest

Overall, the USFS provides wildfire response and management for over 193 million acres of National Forest System land within the United States (CRS 2021). National Forest lands are considered FRAs, which are regions where the federal government is responsible for fire response. National Forest lands are found southeast of Three Rivers, adjacent to the Sequoia National Park. On USFS land, the USFS has the responsibility for initial attack (initial response).

Fire response for the Sequoia NF is coordinated through the OSCC in partnership with the National Interagency Coordination Center (OSCC 2021). Under the OSCC is the Central California Interagency Communications Center (CCICC). The CCICC is a cooperative effort among the USFS, BLM, Bureau of Indian Affairs, and the Tule River Reservation Fire Department (CCICC 2021). The Sequoia NF maintains MAAs with TCFD, CAL FIRE, BLM, and Tule River Reservation. Under the agreements, agency personnel may respond to incidents outside their agency boundaries.

Bureau of Land Management

Three Rivers, which is in Tulare County, falls under the California Central District, Bakersfield Field Office and the California Desert District, Ridgecrest Field Office. While the BLM does not have a specific fire and aviation program within the Bakersfield or Ridgecrest offices, the BLM is a member of the California Forest Management Task Force (CA FMTF). The CA FMTF is composed of several state, federal, and local wildland firefighting agencies. Additionally, the CA FMTF joins local communities to prevent or minimize fire danger (BLM 2021).

MUTUAL AID

The wildland fire community is well known for its development of MAAs at the federal, state, and local levels. Such automatic aid agreements allow for closest forces to respond to an incident as quickly as possible, regardless of jurisdiction. Such agreements may also describe how reimbursement will be conducted; state resources responding to wildfires on federal land may have their associated costs reimbursed by the responsible federal agency, and the reverse is true for federal resources suppressing a wildfire on state land.

CAL FIRE TUU has MAAs with the following agencies: NPS (SEKI), TCFD, Visalia City Fire Department, USFS (Sequoia NF), Tule Indian Reservation, and Kern County Fire Department (CAL FIRE TUU 2021).

In addition, the TCFD participates in the Statewide Mutual Aid system and maintains agreements with local response organizations, including incorporated cities, neighboring counties, and state and federal wildland agencies (TCFD 2021c).

EVACUATION RESOURCES

Evacuation planning is a joint effort among county departments, with law enforcement as the lead agency. Three Rivers operates under the Tulare County evacuation procedures. At a county level, evacuation planning is incorporated into the General Plan, per HS-7.3, which requires Tulare County to develop, update, and maintain an emergency evacuation plan for the wide variety of natural and human-caused disasters and response activities that could potentially impact Tulare County. Provisions for safe evacuation are stated in the General Plan, including HS-1.9: Tulare County shall require, where feasible, road networks (public and private) to provide for safe and ready access for emergency equipment and provide alternate routes for evacuation (Tulare County RMA 2012). In addition, the Tulare County Ordinance Code Part VII: Chapter 1, Article 3 and Chapter 19, Articles 1 and 3, regulate minimum road width for the emergency vehicle access and egress and supports fire mitigation tactics by setting road width standards to support evacuation (Tulare County Office of Emergency Services [OES] 2018). Evacuation information should come only from official government sources. Fire Safe Councils may also be under civilian evacuation orders, and therefore may not always have the most up-to-date information or ability to disseminate information.

Some residents, particularly those who live where ingress and egress are limited, should prepare for the eventuality that they may need to shelter in place during a wildfire event. While no formal delineation of safety zones is included in this plan and emergency responders always encourage residents to follow evacuation guidelines, residents are encouraged to assess their properties and surrounding areas for potential areas to shelter in a worst-case scenario if evacuation is not possible. These areas may include large, developed areas of continuous black top (for example, a parking lot), irrigated agricultural fields, or areas with very minimal fuels (for example, a recreation area or sports field).

Recently, CAL FIRE has awarded funding to the TCFD to carry out evacuation-related fuel treatments such as trimming, pile burning, chipping, and vegetation maintenance.

As part of emergency management protocols, Tulare County has guidelines for evacuations detailed in the 2011 Disaster Preparedness Guide (Tulare County OES 2011). Both the English and Spanish versions of the 2011 Disaster Preparedness Guide are provided here: https://oes.tularecounty.ca.gov/oes/preparedness/disaster-guide/

You can sign up for Tulare County emergency notifications, Alert TC, here: https://alerttc.com/

In addition, Tulare County has created a list of emergency tips and steps to take in the event of an emergency: https://tularecounty.ca.gov/_api/render/file/?fileID=4FFB0B2C-5056-BBFD-60207629B0CB2B03

Furthermore, the Three Rivers Fire Safe Council has a disaster preparedness page: https://www.3rfsc.org/listos-california/

The Fire Safe Council also provides an emergency evacuation guide: https://cafiresafecouncil.org/resources/evacuation-guide/

An evacuation route risk analysis and road entrapment analysis are described in detail under Chapter 3.

Additional evacuation and wildfire preparedness resources are available in Appendix G.

ROAD SYSTEMS

Much of the planning area is accessible via surfaced roads and highways; however, some communities are accessed only via unsurfaced roads (Figure 2.11), which are often narrow and windy with many dead-ends (Figure 2.12). These routes may prove hazardous during emergency evacuation, especially where they are adjacent to forested land with vegetation close to or overhanging the road (see the evacuation route risk analysis in Chapter 3). In fact, CAL FIRE TUU has identified several roads with high fuel loading along the roadway (CAL FIRE TUU 2021). Continued fuel treatment may be needed along some roads where vegetation is overhanging and could prevent safe evacuation of residents or safe access by emergency responders. Some rural roads and driveways may also have narrow bridges with weight limits that may impact access with large emergency apparatus.

In addition, according to the Tulare County General Plan, many roads in the planning area are in need of maintenance and repair (Tulare County RMA 2012).

Figure 2.11. Example of unsurfaced winding road.

Figure 2.12. Example of unsurfaced, narrow, and winding road.

PEOPLE

The safe and efficient evacuation of people from wildfire requires several factors, including:

- **Emergency notification methods:** Tulare County has established Alert TC, an emergency notification system that utilizes phone, email, and text communication channels. Three Rivers falls within the coverage area of this notification system. Residents must register their contact information in the system (Tulare County OES 2011). Social networking sites such as Facebook, Twitter, and email distribution lists, are other resources that have become highly valued during wildfires in nearby communities.
- **Preplanning by the public**: Many factors complicate evacuation and require public preplanning, including limited route options, poor or missing signage, and conflicts with emergency vehicles driving into the community while the public exits. Uncertainty about where to find temporary refuge can cause families to become separated and delay reunions. Some individuals without transportation or with limited mobility may be accidentally left behind. The combination of these factors highlights the need for detailed and thorough pre-event planning.
- **Public awareness**: These two items will fail to occur throughout CARs if the residents are unaware of notification methods: 1) the need for preplanning and 2) the elements that should be included in preplanning. Therefore, public education and outreach on these topics should be part of all efforts conducted by agencies such as fire departments in a wide variety of venues.

PETS AND LIVESTOCK

Many rural homeowners also have horses and other large animals and livestock, and pets are common in homes throughout the planning area. In the event of a wildfire, it is important that residents and fire responders have a plan for evacuation of pets and livestock. Evacuation planning often neglects to describe how animals will be evacuated and where they will be taken. The loading of horses, for example, and transport of stock vehicles down narrow roads under stressful situations can be very difficult. Public

education could emphasize the need to practice loading horses quickly, for example, as evacuation is often disrupted by families not being willing to leave animals behind during an emergency and not understanding how to keep them safe due to a lack of planning.

There is also a need to pre-identify where animals can be taken, such as county fairgrounds, for large animal shelter. Similarly, locations where small animals such as dogs and cats picked up in the fire area should also be pre-identified, as well as the lead agencies, such as humane societies, coordinating this work.

Tulare County Animal Services (TCAS) helps with evacuating small and large animals from fire areas (Figure 2.13); this applies to Three Rivers residents as well. In addition, TCAS also offers emergency housing for evacuated animals. For more information, see: https://tcanimalservices.org/animalservices/

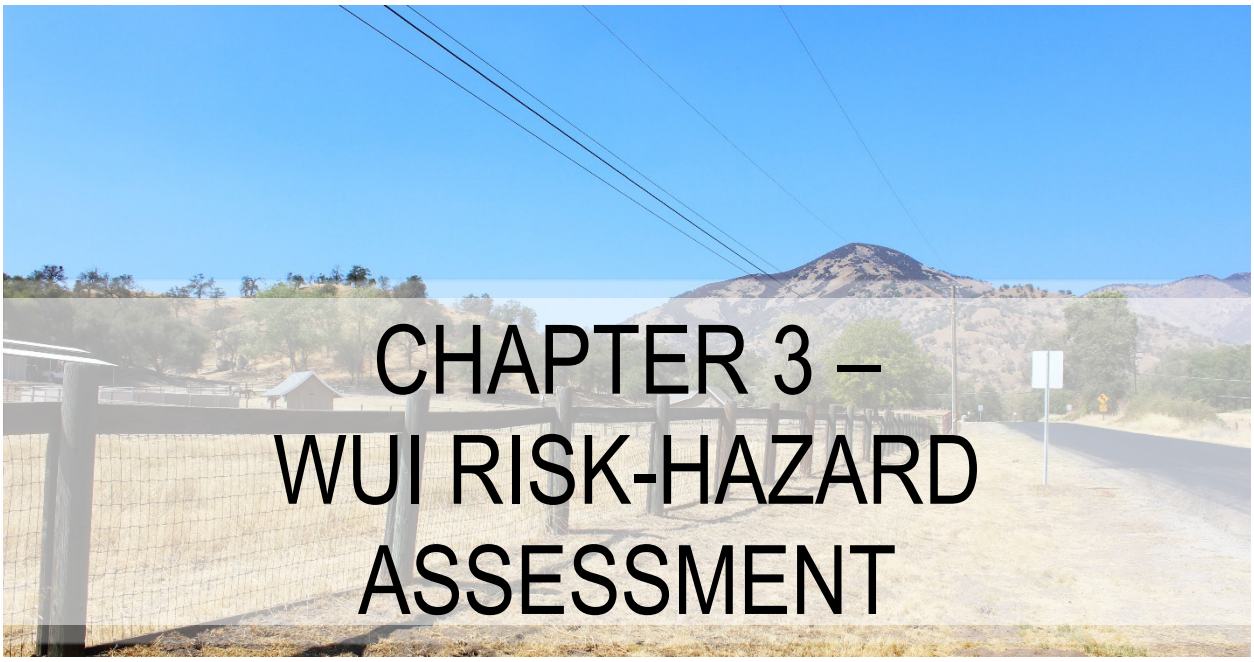
Figure 2.13. TCAS announcement shared by Three Rivers Fire Safe Council.

WATER AVAILABILITY AND SUPPLY

California experienced the second driest year on record during the period of September 2020 to September 2021, and recent trends suggest that droughts are likely to persist. The months of January and February 2022 were the driest consecutive January and February on record in the Sierra Nevada (State of California 2022). Droughts can have significant adverse impacts on public health and safety. These impacts are mainly associated with severe wildfire risk and drinking water shortages. Small-scale water systems in small towns, rural areas, and private residential wells are particularly vulnerable to the effects of drought (California Department of Water Resources 2022).

Water supply is variable in and around the planning area and may be provided by hydrants, pumps, springs, ponds, and tanks. There are many water suppliers in the planning area, with water districts serving just a few homes to several hundred. These water districts are provided primarily for residential water supply and hydrants for use by firefighters for structural protection. They are not designed to support wildland fire suppression, and water sources can therefore be heavily impacted when used in large active wildfire events. Impacts may include consumption of power to replenish depleted tanks and wells, wear and tear or damage to infrastructure, and additional maintenance burden for water districts. In order to reduce impacts to private water districts, efforts are made to bolster public supply specifically for fire response. There have been upgrades at fire stations implemented in some areas of the Three Rivers community, including installation of aboveground and belowground water tanks. However, additional water storage is still needed in many areas.

Surface water sources, such as ponds and rivers (such as Lake Kaweah, Kaweah River, and branches of the Kaweah River), provide primary water sources for wildfire suppression, and stations within and around the planning area have the capability and equipment to draft, but suitable drafting sources are not always known to firefighters that are assigned from other geographical areas. The identification of water infrastructure and supply improvements, and associated funding to implement projects, is a key focus for the Fire Safe Council and agency fire responders. Prospective funding sources for such projects are listed alongside the water distribution improvements recommendation in Table 4.5.



CHAPTER 3 – WUI RISK-HAZARD ASSESSMENT

PURPOSE

The purpose of developing the Risk-Hazard Assessment model described here is to create a unique tool for evaluating the risk of wildland fires to communities within the WUI areas of Three Rivers. Although many definitions exist for hazard and risk, for the purpose of this document, these definitions follow those used by the firefighting community:

> **Hazard** is a fuel complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition and resistance to control.
>
> **Risk** is defined as the chance of a fire starting as determined by the presence and activity of causative agents (NWCG 1998).

The Risk-Hazard Assessment is twofold and combines a geographic information system (GIS) model of hazard based on fire behavior and fuels modeling technology (Composite Risk-Hazard Assessment) and a Core Team–generated assessment of on-the-ground community hazards and VARs.

From these assessments, land use managers, fire officials, planners, and others can begin to prepare strategies and methods for reducing the threat of wildfire, as well as work with community members to educate them about methods for reducing the damaging consequences of fire. Moreover, using this Risk-Hazard Assessment, fuels reduction treatments can be implemented on both private and public land. Through these treatments, community members have the opportunity to actively participate, as well as recommend treatments on public land that they use or care about.

The Tulare County Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) (Tulare County OES 2018) lists the portions of Tulare County within the WUI as highly susceptible to wildfire, with steeper terrain increasing the threat of wildfire. Specifically, the risk of wildfire is greater in the Sierra Nevada mountains and foothills (Tulare County OES 2018). The Risk-Hazard Assessment completed by the CWPP planning team has confirmed the findings of the MJLHMP.

As described previously, the planning area experienced large, severe fires during the summer of 2021, after which the Risk-Hazard Assessment had been drafted for this planning effort. The Risk-Hazard Assessment for the CWPP was revised to address the fact that residual fuels in these burn areas would exhibit very different fire behavior in future years until areas recover to post-fire fuel loads. The fire behavior modeling and post-fire fuel calibration process is described in Appendix A.

FIRE BEHAVIOR MODEL

OVERVIEW

The wildland fire environment consists of three factors that influence the spread of wildfire: fuels, topography, and weather. Understanding how these factors interact to produce a range of fire behavior is fundamental to determining treatment strategies and priorities in the WUI. In the wildland environment, vegetation is synonymous with fuels. When sufficient fuels for continued combustion are present, the level of risk for those residing in the WUI is heightened.

Fire spreads in three ways: 1) surface fire spread—the flaming front remains on the ground surface (in grasses, shrubs, small trees, etc.) and resistance to control is comparatively low; 2) crown fire—the surface fire "ladders" up into the upper levels of the forest canopy and spreads through the tops (or crowns) independent of or along with the surface fire, and when sustained is often beyond the capabilities of suppression resources; and 3) spotting—embers are lifted and carried with the wind ahead of the main fire and ignite in receptive fuels; if embers are plentiful and/or long range (>0.5 mile), resistance to control can be very high. Crown fire and spotting activity has been a concern for fire managers particularly under extreme weather conditions. In areas where homes are situated close to timber fuels and/or denser shrubs and trees, potential spotting from woody fuels to adjacent fuels should always be acknowledged as this poses significant risk to homes.

Treating fuels in the WUI can lessen the risk of intense or extreme fire behavior (Martinson and Omi 2013; Safford et al. 2009). Studies and observations of fires burning in areas that have undergone fuel treatment have shown that the fire either remains on or drops to the surface, thus avoiding destructive crown fire, as long as activity fuels are treated or removed (Graham et al 2004; Pollet and Omi 2002; Prichard et al. 2010; Safford et al. 2012; Waltz et al. 2014). Fuel mitigation efforts therefore should be focused specifically where these critical conditions could develop in or near CARs.

For this plan, an assessment of fire behavior has been carried out using well-established fire behavior models: FARSITE, FlamMap, BehavePlus, and FireFamily Plus housed within the Interagency Fuel Treatment Decision Support System (IFTDSS), as well as ArcGIS Desktop Spatial Analyst tools. Data used in the Composite Risk-Hazard Assessment is largely obtained from LANDFIRE (2012).

Information regarding the modeling approach and components is included in Appendix A. Spatial data from the 40 Fire Behavior Fuel Model are shown in Appendix B, Map B.1.

COMPOSITE RISK-HAZARD ASSESSMENT

The Composite Risk-Hazard Assessment modeling approach utilizes a Weighted Sum Model, which "stacks" geographically aligned datasets and evaluates an output value derived from each cell value of the overlaid dataset in combination with the weighted assessment. In a Weighted Sum Model, the weighted values of each pixel from each parameter dataset are added together so that the resulting dataset contains pixels with summed values of all the parameters. This method ensures that the model resolution is maintained in the results and thus provides finer detail and range of values for denoting fire

risk. Figure 3.1 illustrates the individual datasets and the relative weights assigned within the modeling framework. Maps B.2, B.3, B.4, and B.5 for flame length, fireline intensity, rate of spread, and crown fire activity, respectively, are located in Appendix B.

The data layers in Figure 3.1 represent the fire modeling results post summer 2021 following fuel calibration. The 2021 KNP Complex Fire burned nearly 90,000 acres to the east and north of Three Rivers. As a result, the existing fuel model layer that was used in the fire behavior modeling process required calibration in order to acknowledge that relic vegetation in the burn area would now burn differently from the original classified fuels.

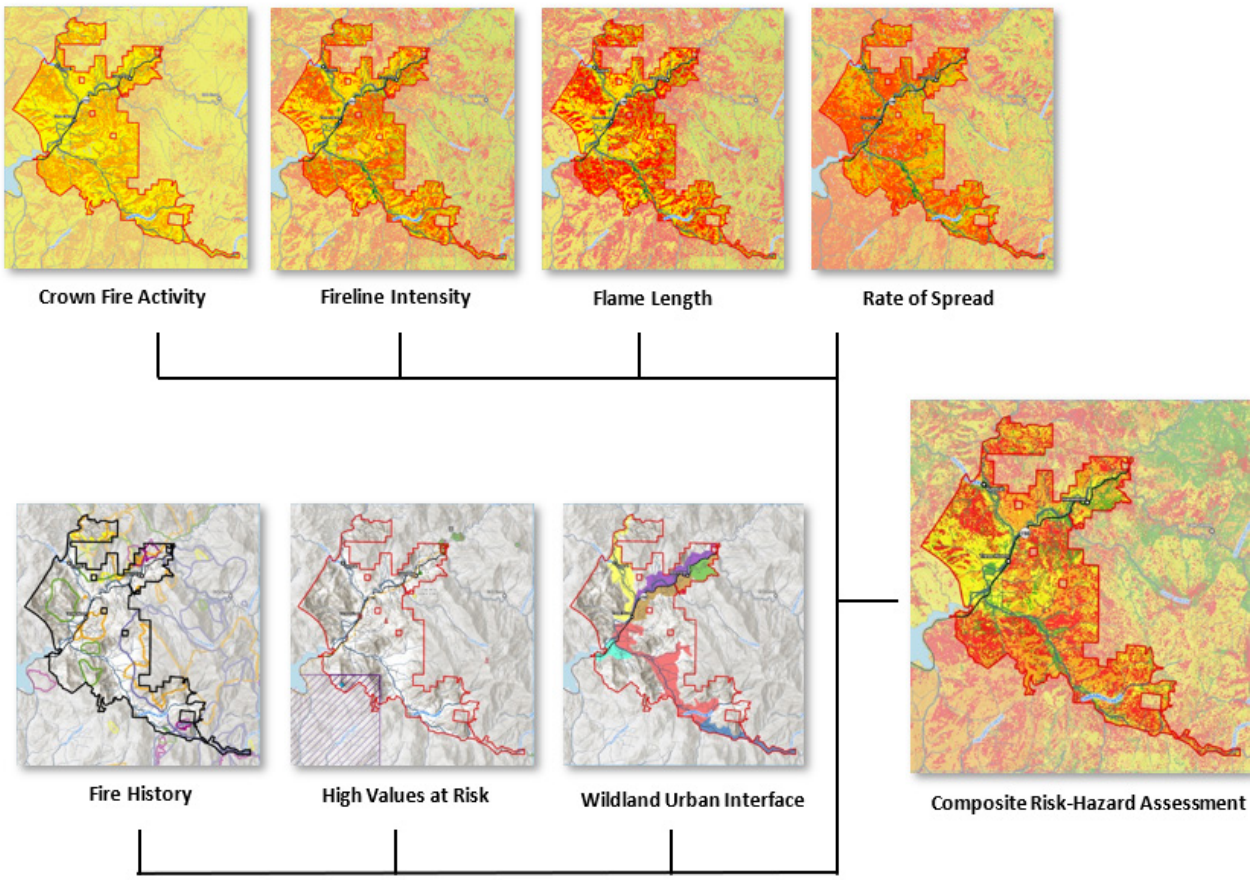


Figure 3.1. Composite Risk-Hazard Assessment overlay process.

Figure 3.2. shows the Composite Risk-Hazard Assessment for the planning area; it combines all fire behavior parameters described above. The assessment classifies the planning area into low, moderate, high, and extreme risk categories.

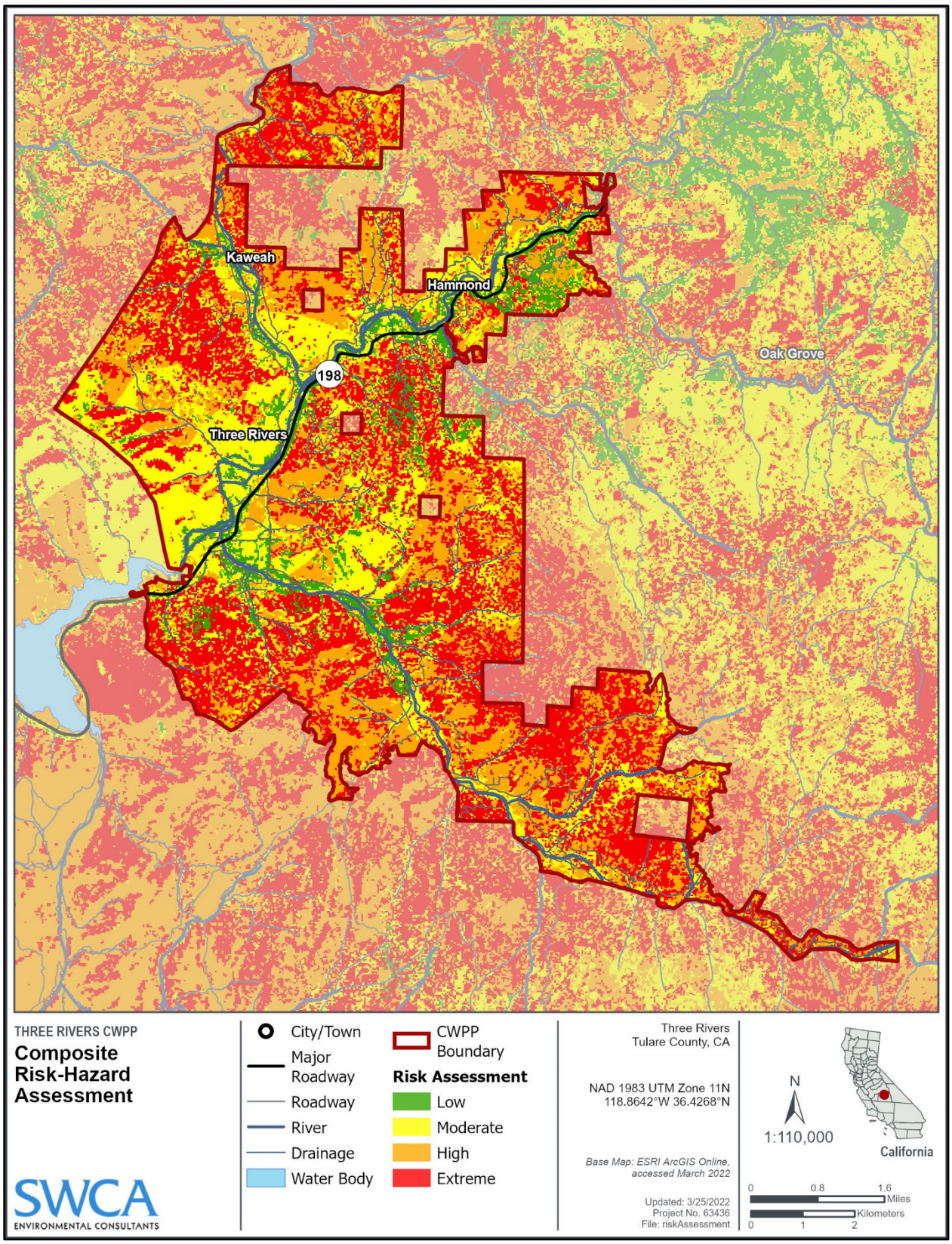


Figure 3.2. Composite Risk-Hazard Assessment.

EVACUATION ROUTE RISK ANALYSIS

Excess fuel loads along escape routes have been identified as an issue in the planning area (Figure 3.3) (CAL FIRE TUU 2021). Fuel loads along such roads could potentially compromise evacuation should a fire emergency occur. In addition, road grade, curvature (sinuosity), length, surface material (e.g., paved vs. unpaved), connectivity (e.g., local access road vs. main transportation corridor), stability (e.g., bridged vs. unbridged), and adjacent structure density contribute to potential evacuation complications. Figure 3.4 shows the level of risk in the roads present in the planning area. Overall, the main transportation corridors (i.e., Sierra Drive and South Fork Drive) received a low-risk rating, whereas smaller residential roads (i.e., driveways and local access roads) received a higher risk rating.

The layers (geographic data) used to generate Figure 3.3 were sourced from the web map provided by the Core Team. The evacuation zones and roads with high fuel loads were identified and/or delineated by the TCFD, Tulare County Sheriff's Office, and Tulare County Resource Agency. The zones are meant to facilitate evacuation management and, if necessary, may be divided into smaller units to ease management efforts. The original web map can be accessed here: https://sartopo.com/m/MH7QU

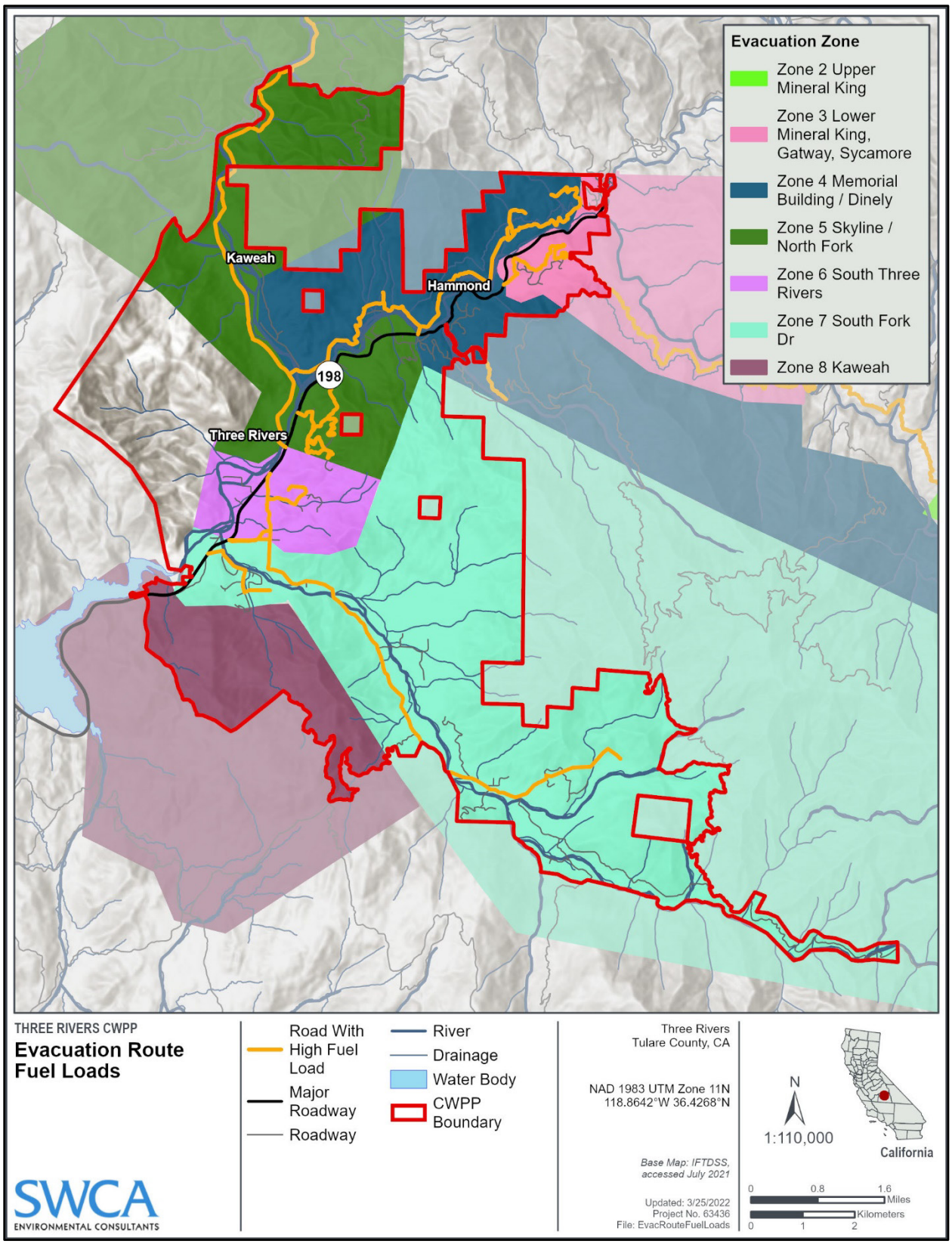


Figure 3.3. Evacuation routes with high fuel loads within the planning area.

Several road features were used as inputs to determine road risk: road sinuosity (degree of curvature), grade/slope, connectivity (number of connections to other roads), surface material (i.e., paved or unpaved), length, stability (i.e., bridged or unbridged), degree of overhanging tree cover, and surrounding building density. The inputs are illustrated in Figure 3.5. Data for these features were gathered from roads and buildings footprints from Open Street Map and satellite imagery from the USGS. The inputs were processed in ArcGIS Pro (geospatial software). All inputs were adjusted to a common scale to facilitate comparison and evaluation, i.e., a risk score on a scale from 0 to 1 was assigned to all input features, with lower values representing lower risk and higher values representing higher risk. For features that have a range of values (e.g., degree of slope), a decimal value was assigned. For example, a moderately steep road would receive a score of 0.6, whereas a road with a gentle slope would receive a score of 0.1. For features that were evaluated by presence or absence, either a 0 or a 1 was assigned. For example, an unsurfaced road would receive a score of 1, whereas a paved road would receive a score of 0.
All inputs were combined to produce a final risk score; each feature was assigned a weight, i.e., a value based on how much influence that feature has on risk. The final weights are shown in Table 3.1.

Table 3.1. Final Weights Assigned to Each Feature

Input	Weight
Sinuosity	0.2
Grade	0.15
Bridge	0.05
Surface Material	0.1
Connectivity	0.15
Length	0.1
Tree Cover	0.1
Building Density	0.15

The final map (see Figure 3.4) is the end result of the analysis; it accounts for all features in Table 3.1 and their respective weights. Red segments represent portions of the roads that are rated as high risk, and green segments represent portions of the roads that are rated as low risk.

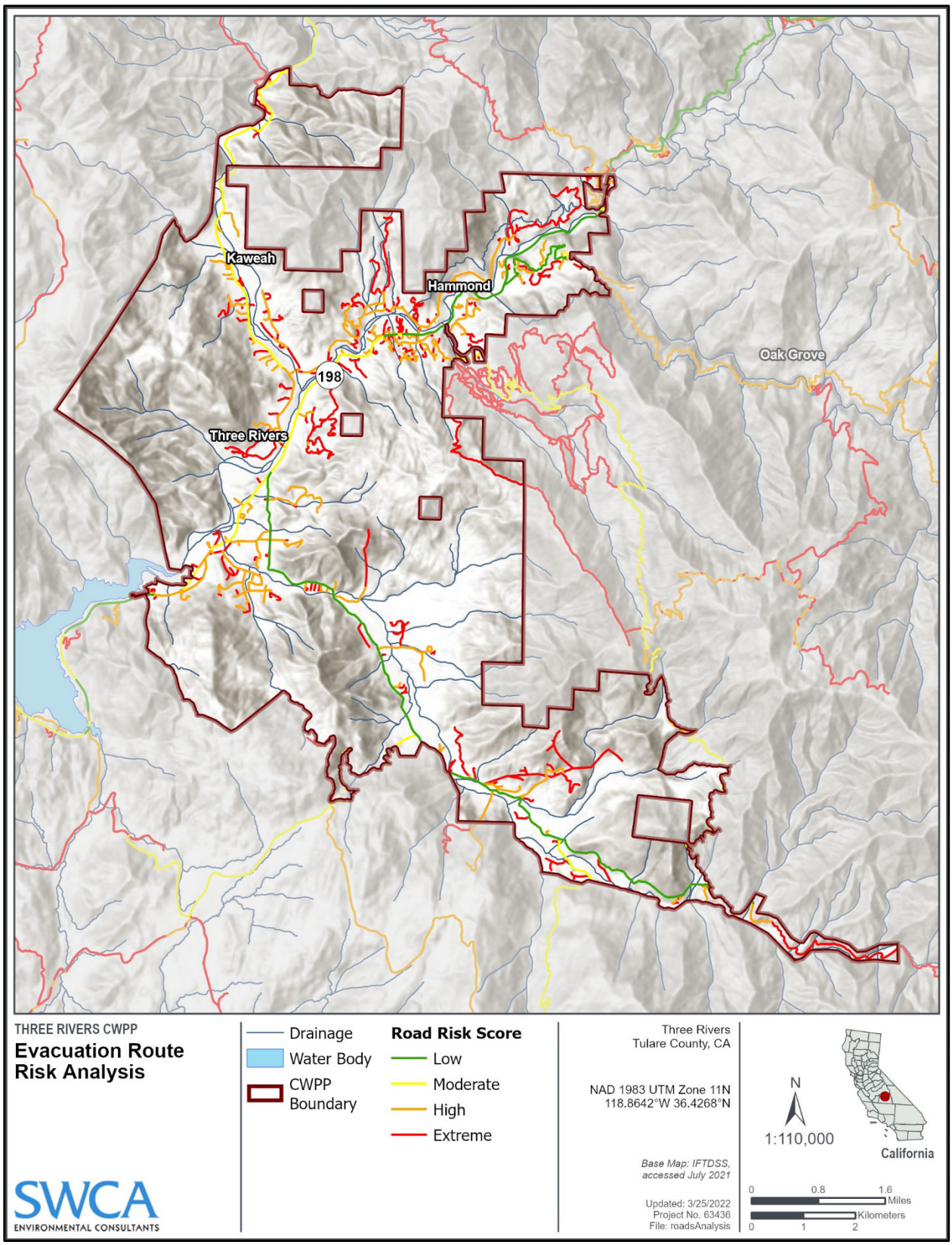


Figure 3.4. Evacuation route risk analysis.

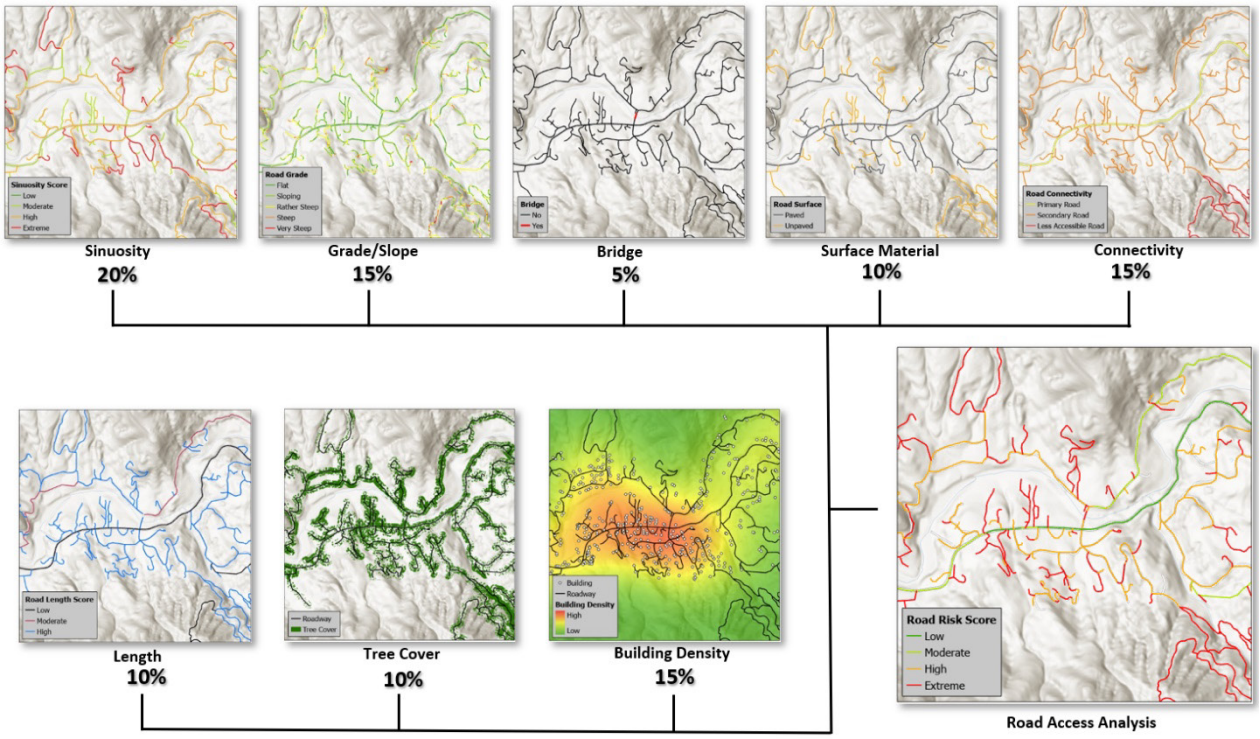


Figure 3.5. Evacuation route risk analysis inputs.

ROAD ENTRAPMENT ANALYSIS

While tree cover was included in the evacuation route risk analysis (see Figure 3.5), specific fire behavior due to vegetation characteristics, weather, and topography was not accounted for. The road entrapment analysis (Figure 3.6) considers the proximity of roads to landscapes that exhibit high flame lengths in the planning area. Specifically, roads that are within 25 feet of adjacent landscapes that exhibit flame lengths of 8 feet or greater are designated as likely to cause entrapment. Overall, 95.7 miles of roadway within Three Rivers were analyzed, of which 20.9% (29.6 miles) were identified as likely to jeopardize evacuation activities and/or cause entrapment. The input for this analysis (flame length) can be found in Appendix B.

Figure 3.6 shows the roads or portions thereof that would likely compromise evacuation efforts due to exhibited fire behavior of the surrounding landscape. Yellow segments indicate roads that are within 25 feet of adjacent landscapes that exhibit flame lengths of 8 feet or more.

To provide finer detail, a close-up of the Hammond/Mineral King area is provided in Figure 3.7 below.

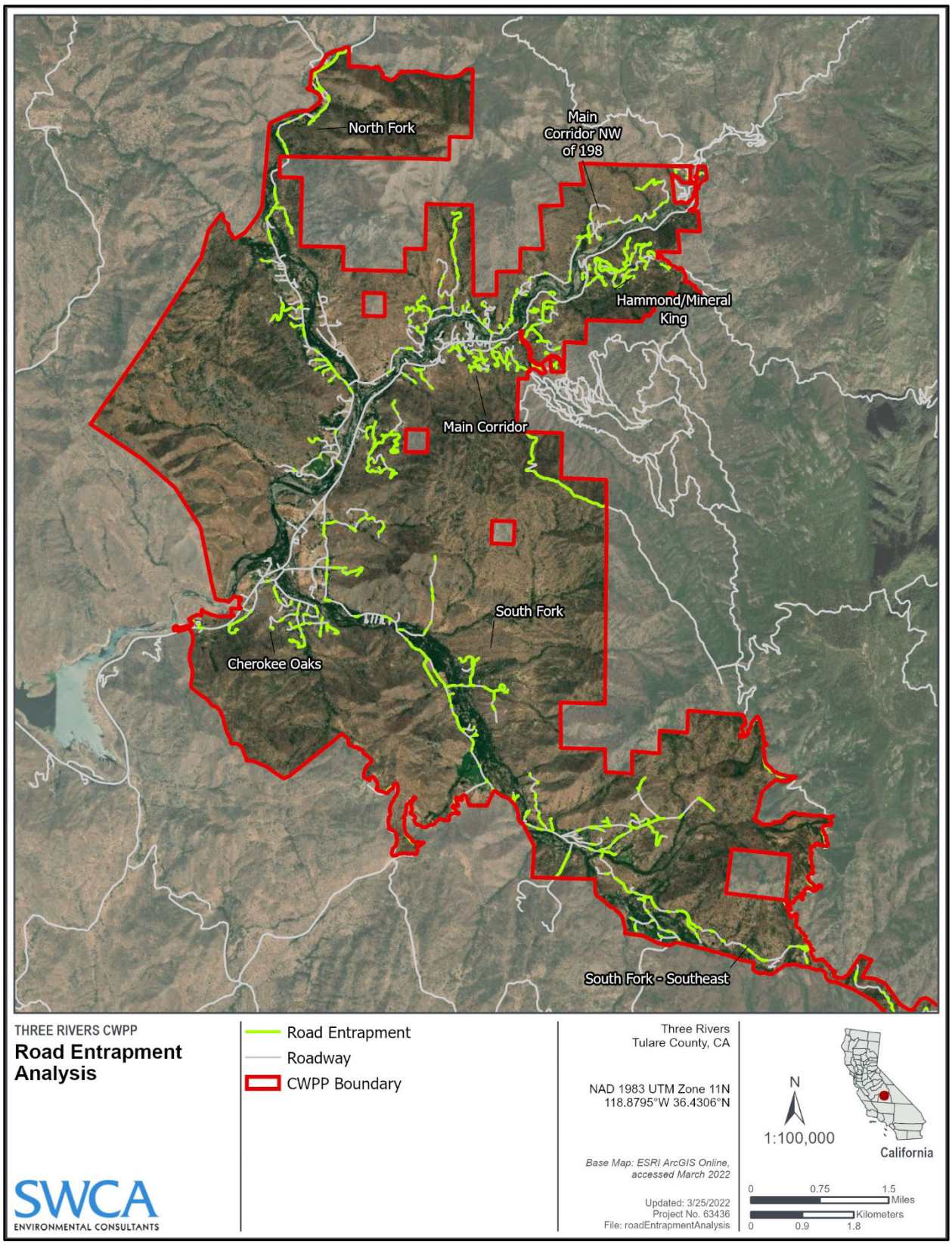


Figure 3.6. Road entrapment analysis.

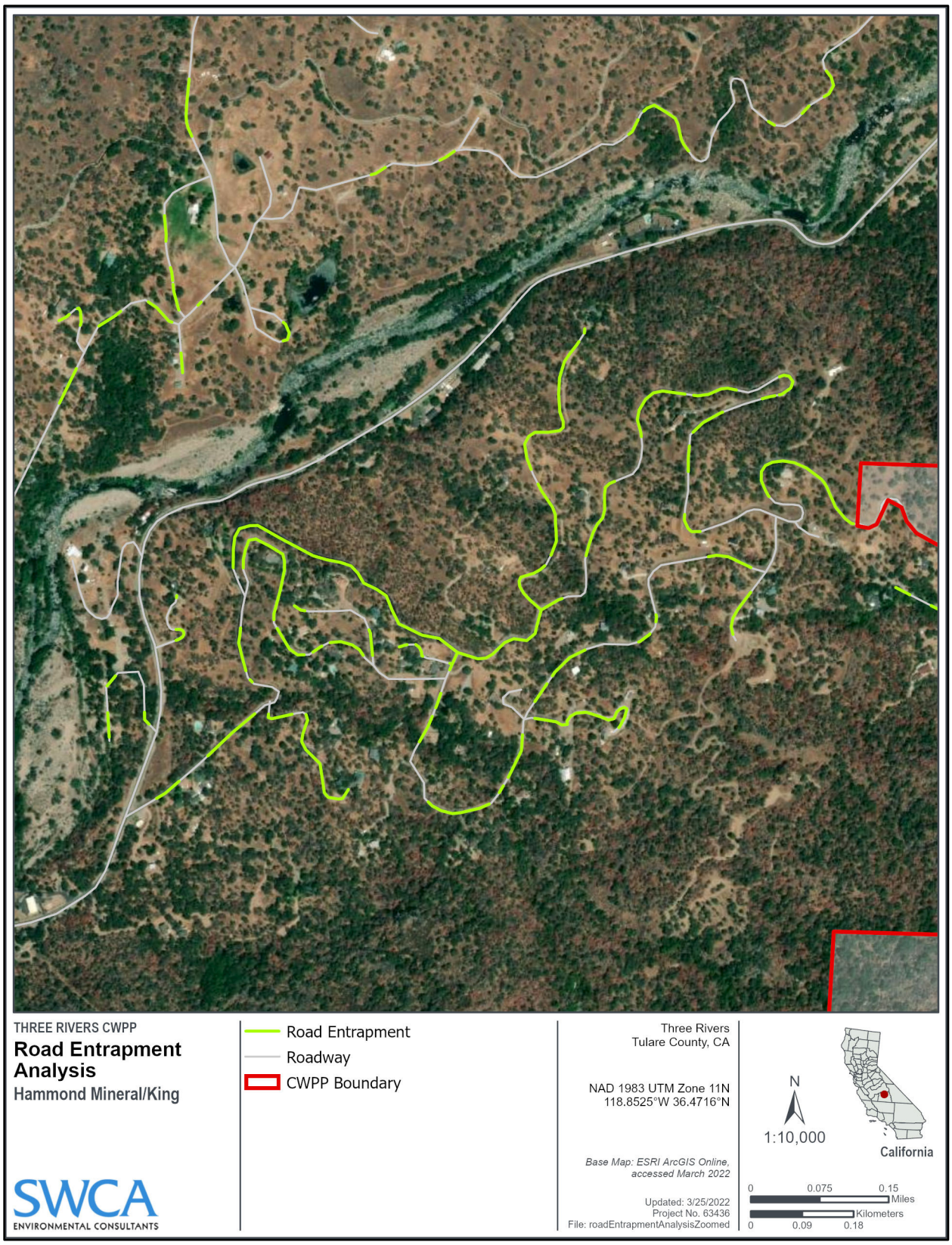


Figure 3.7. Close-up of the road entrapment analysis for the Hammond/Mineral King community.

ROAD HAZARD ASSESSMENT (GIS)

The preceding GIS analyses (road entrapment and evacuation route risk) were used in conjunction with field observations to evaluate road hazards in the planning area. Table 3.2 presents the issues and/or likely hazards found in or around the roads of Three Rivers as well as suggested mitigation measures. Table 3.3 shows the roads that are within 25 feet of landscapes that high exhibit flame lengths (>8 feet).

Table 3.2. Escape Route Hazards and Mitigation Recommendations

Community	Roads	Issues	Recommendations
South Fork – Southeast	South Fork Drive and connecting residential roads	• Many local access and residential roads have high degrees of sinuosity • Some roads with high grade • Some roads unsurfaced • Overhanging vegetation • Many road sections are adjacent to landscapes that exhibit high flame lengths	• Reduce fuel volumes within 50 feet on both sides of South Fork Drive • Clear vegetation within 20 feet of electrical utilities • Install turnouts • Remove hazard trees within 25 feet on both sides of South Fork Drive
South Fork – Northwest	South Fork Drive, Old Three Rivers Road, and connecting residential roads	• Residential roads with dense vegetation and tree cover • Portions of South Fork Drive with overhanging vegetation • Most of the main road and residential roads are adjacent to landscapes that exhibit high flame lengths	• Reduce fuel volumes within 50 feet on both sides of residential roads and South Fork Drive • Clear vegetation within 20 feet of electrical utilities • Remove hazard trees within 25 feet on both sides of South Fork Drive
Cherokee Oaks	Residential roads (Cherokee Oaks, Crystal, Ferndale, Grouse, Oak Ridge, and Meadow Drives)	• Overhanging vegetation • Vegetation covering electrical utility lines • Relatively densely populated community with limited access to main transportation corridors • Residential roads have high degrees of sinuosity • Most residential roads are adjacent to landscapes that exhibit high flame lengths	• Clear roads from encroaching vegetation and overhanging trees* • Clear vegetation within 20 feet of electrical utilities

Community	Roads	Issues	Recommendations
Three Rivers North Fork	North Fork Drive, Kaweah River Drive, and connecting residential roads	• Many residential and local access roads have high degrees of sinuosity • Overhanging trees • Vegetation covering electrical utility lines • Some residential roads are adjacent to landscapes that exhibit high flame lengths	• Reduce fuel volumes within 50 feet on both sides of residential roads and North Fork Drive • Clear vegetation within 20 feet of electrical utilities • Install turnouts • Remove hazard trees within 25 feet on both sides of North Fork Drive and residential roads
Main Corridor – North of Highway 198	Kaweah River Drive, Dinley Drive, and connecting residential roads	• Some roads with high road grade • Overhanging trees • Vegetation covering electrical utility lines • Large segment of Dinley Drive has only one access point and terminates in a dead end • Many residential and local access roads have high degrees of sinuosity • Many segments of residential roads are adjacent to landscapes that exhibit high flame lengths	• Reduce fuel volumes within 50 feet of both sides of Dinley Drive and Kaweah River Drive • Remove hazard trees within 25 feet on both sides of Dinley Drive and Kaweah River Drive • Install turnouts along Dinley Drive • Clear vegetation within 20 feet of electrical utilities
Main Corridor – Southeast of Highway 198	Residential roads (Eggers, Mynatt, Alta Acres, Deer Canyon, and Skyline Drives, among others)	• Majority of residential roads off Highway 198 have high degrees of sinuosity • Overhanging trees • Large sections of all residential roads are adjacent to landscapes that exhibit high flame lengths • Some roads unsurfaced • Vegetation covering electrical utilities • Many residential roads with only one access point to Highway 198	• Reduce fuel volumes within 50 feet of both sides of residential roads • Install turnouts • Clear vegetation within 20 feet of electrical utilities • Remove hazard trees within 25 feet on both sides of residential roads

Community	Roads	Issues	Recommendations
Hammond/Mineral King	Mineral King Road and connecting residential roads	• Overhanging trees • Some roads with high grade • Many residential roads with only one access point to Highway 198 • Most residential roads have high degrees of sinuosity • All roads, except for Highway 198, are adjacent to landscapes that exhibit high flame lengths	• Reduce fuel volumes within 50 feet of both sides of Mineral King Road and connecting roads • Install turnouts • Remove hazard trees within 25 feet on both sides of Mineral King Road and connecting roads

*Distance value was not provided due to the proximity of many homes to the road.

Table 3.3. Roads Adjacent to Landscapes with High Flame Lengths

Community						
Cherokee Oaks	Hammond/ Mineral King	Main Corridor	Main Corridor NW of Highway 198	South Fork Southeast	South Fork	North Fork
Cherokee Oaks Drive	Crest Lane	Alta Acres Drive	Canyon View Drive	Grouse Valley Road	Blossom Drive	North Fork Drive
Crystal Drive	Hammond Drive	August Drive	Edison Road	South Fork Drive	Buckhorn Train	
Edison Drive	Mineral King Road	Deer Canyon Road	Kaweah River Drive		Cinnamon Canyon Road	
Ferndale Drive	Oak Grove Drive	Eggers Drive	Oak Leaf Trail		Redbud Trail	
Grouse Drive	Sierra King Drive	Hawk Hollow Drive	Quail Run Drive		Sequoia Oaks Drive	
Meadow Drive		La Cienega Drive	Sierra Drive		South Fork Drive	
Oak Ridge Drive		Manzanita Drive	South Kaweah River Drive			
Pierce Drive		Mynatt Drive	Sycamore Drive			
Sierra Drive		Noel Drive	Washburn Drive			
		Oak Drive				
		Skyline Drive				

COMMUNITY HAZARD ASSESSMENTS

To accurately complete the Composite Risk-Hazard Assessment and properly assess hazards in and around perceived “at risk” communities (sub-communities within Three Rivers), several field days were implemented to carry out on-the-ground community assessments.

The assessments were conducted in summer 2021 (prior to the 2021 KNP Complex Fire) using the NFPA Wildland Fire Risk and Hazard Severity Form 1144 (Appendix E). This form is based on the NFPA’s *Standard for Reducing Structure Ignition Hazards from Wildland Fire*, 2013 edition. The NFPA standard focuses on individual structure hazards and requires a spatial approach to assessing and mitigating wildfire hazards around existing structures. It also includes ignition-resistant requirements for new construction and is used by planners and developers in areas that are threatened by wildfire and is commonly applied in the development of Firewise communities (for more information on Firewise, see www.firewise.org).

Each of the seven areas visited during the assessments was rated based on conditions within the community and immediately surrounding structures, including access, adjacent vegetation (fuels), defensible space, adjacent topography, roof and building characteristics, available fire protection, and placement of utilities. Where a range of conditions was less easily parsed out, a range of values was assigned on a single assessment form. Each area visited was given a score, which was assigned a corresponding adjective rating of low, moderate, or high. Following the assessments, three areas were designated to be at extreme risk and four areas were designated to be at high risk from wildland fire.

The purpose of the community assessment and subsequent hazard ratings is to identify fire hazard and risks and prioritize areas requiring mitigation and more detailed planning. These assessments should not be seen as tactical pre-suppression or triage plans. The community assessment helps to drive the recommendations for mitigation of structural ignitability, community preparedness, and public education. The assessment also helps to prioritize areas for fuels treatment based on the hazard rating. The NFPA ratings serve as the CAR ratings.

The CAR hazard ratings from the community assessment and the GIS Risk-Hazard Assessment are provided in Table 3.4. This table also includes a summary of the positive and negative attributes of a community as they relate to wildfire risk. Full CAR descriptions are provided in Appendix D.

Table 3.4. CAR Ratings and Assessment Summaries for Communities within the Planning Area

Fire Stations	Community	CAR Rating (based on NFPA 1144)	Positive	Negative
Three Rivers: CAL FIRE TUU, TCFD 14, and NPS Hammond	Cherokee Oaks	127 Extreme	• Street signs visible and reflective • Low previous fire occurrence • Nearby fire station and other resources	• Narrow driveways, many unmarked • Limited turnarounds for longer fire trucks • Limited defensible space • Timber litter surrounding homes
	Hammond/Mineral King	123 Extreme	• Street signs visible and reflective • Low previous fire occurrence • Nearby fire station and other resources	• Narrow driveways, rough and steep • Limited turnarounds for longer fire trucks • Shrub fuels surrounding some homes • Limited hydrants, no inspection of water tanks
	Main Corridor – Northwest of Highway 198	87 High	• Street signs visible and reflective • Two or more surfaced roads in and out • Nearby fire station and other resources • Most homes located in the river valley	• Side roads are narrow and steep • Limited turnarounds for longer fire trucks • Shrub fuels surrounding some homes • Combustible building construction materials
	Main Corridor	101 High	• Street signs visible and reflective • Low previous fire occurrence • Nearby fire station and other resources • Short driveways	• Narrow roads with limited turnarounds • Mixture of shrub and tall grass surrounding homes • Limited defensible space • No inspection of water tanks
	Three Rivers North Folk	100 High	• Surfaced highway • Street signs visible and reflective • Many homes at base of slope • CAL FIRE, Tulare County, and NPS fire stations nearby	• One road in and out; narrow and windy roads in places • Limited turnarounds • Some tree mortalities could contribute to fuel hazard • High potential for severe fire weather (hot and dry)

Fire Stations	Community	CAR Rating (based on NFPA 1144)	Positive	Negative
	South Fork	111 High	• Most homes in river valley and away from slopes • Riparian vegetation (less flammable) • Some utility poles with fire-resistant materials • Good separation between homes; more defensible space	• One road in and out; limited turnarounds; blind corners • Relatively far from fire stations • Tall grass and dry shrubs • Combustible building construction materials
	South Fork - Southeast	112 Extreme	• Some utility poles with fire-resistant materials • Low population density • Good defensible space: large lots • Street signs visible and reflective	• One major route in and out; steep and narrow; blind corners • Limited turnarounds • Some areas more than 5 miles from a fire station • Shrub fuels surrounding homes

VALUES AT RISK

Earlier compilation of the critical infrastructure in the planning area, coupled with the community assessments, public outreach, and Core Team input, has helped in the development of a list of VARs from wildland fire. These data are also supplemented with highly valued resources and assets (HVRAs) data, which is a data set that is being gathered nationwide and available through IFTDSS (IFTDSS 2021). The public was encouraged to provide additional VARs through flip charts at a public outreach event (Figure 3.8), Facebook live, community survey, and during the public comment period for the draft document. Based on feedback provided, this section and the associated mapping was revised.

In addition to critical infrastructure, VARs can also include natural, social, and cultural resources (see Maps B.7 and B.8 in Appendix B). It is important to note that although identification of VARs can inform treatment recommendations, a number of factors must be considered in order to fully prioritize areas for treatment; these factors include appropriateness of treatment, land ownership constraints, locations of ongoing projects, available resources, and other physical, social, or ecological barriers to treatment.

The scope of this CWPP does not allow determination of the absolute natural, socioeconomic, and cultural values that could be impacted by wildfire in the planning area. In terms of socioeconomic values, the impact due to wildfire would cross many scales and sectors of the economy and call upon resources locally, regionally, and nationally for response and recovery.

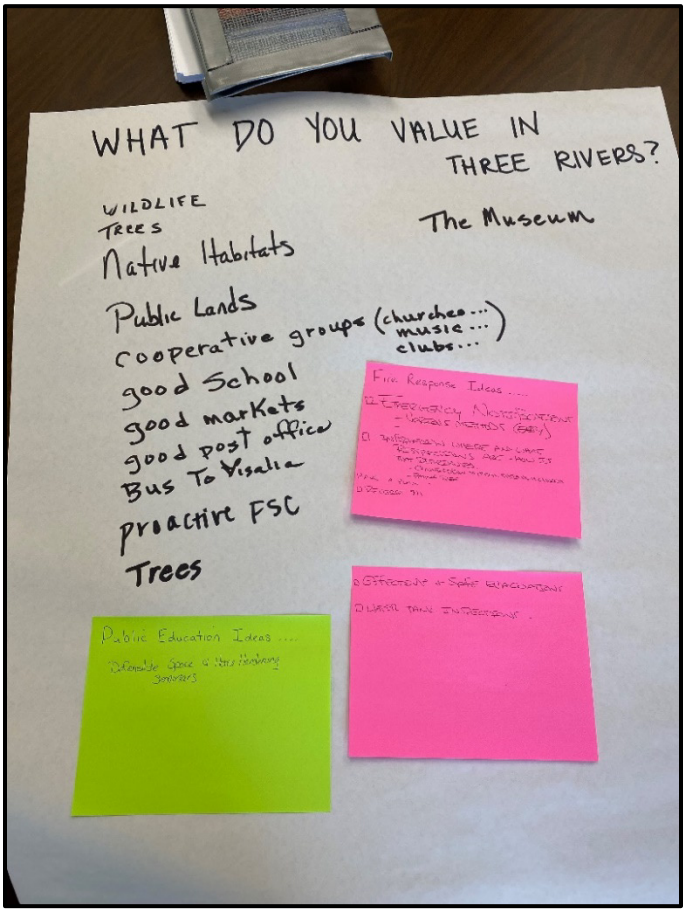


Figure 3.8. Flip chart from the public outreach event.

NATURAL VALUES AT RISK

The CWPP planning area has a variety of natural resources of particular concern to land managers, such as rare habitats and listed plant and wildlife species. Public outreach throughout the planning area has emphasized the importance of natural/ecological values to the general public. Examples of natural values identified by the public and the Core Team include the following:

- Public land
- Trail systems
- Agricultural land
- Viewsheds
- Wildlife habitat and game species
- Watersheds and water quality (Figure 3.9)
- Giant sequoias
- National Parks (SEKI)

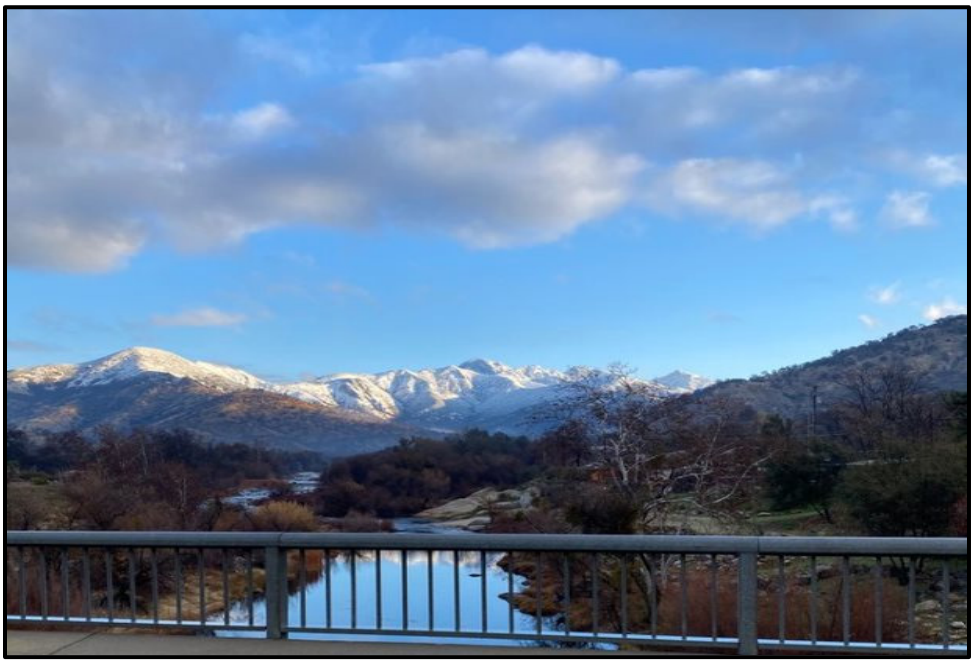


Figure 3.9. Example of a natural VAR, a river.

SOCIOECONOMIC VALUES AT RISK

Social values include population, recreation, infrastructure, agriculture, and the built environment. Much of the built environment in the planning area falls within the WUI zones. Examples include the following:

- Tourism
- Schools
- Fire departments (Figure 3.10)
- Highways
- Hotels
- Camps
- Recreation sites
- National Parks (SEKI)

Figure 3.10. Tulare County Fire Station.

CULTURAL VALUES AT RISK

Many culturally important features/structures are scattered throughout the planning area. Particular cultural VARs that have been identified by the Core Team and the public in the CWPP planning area are the following:

- Churches (Figure 3.11)
- Barns
- Historic houses
- Agricultural infrastructure

Figure 3.11. Example of a cultural VAR, a church.

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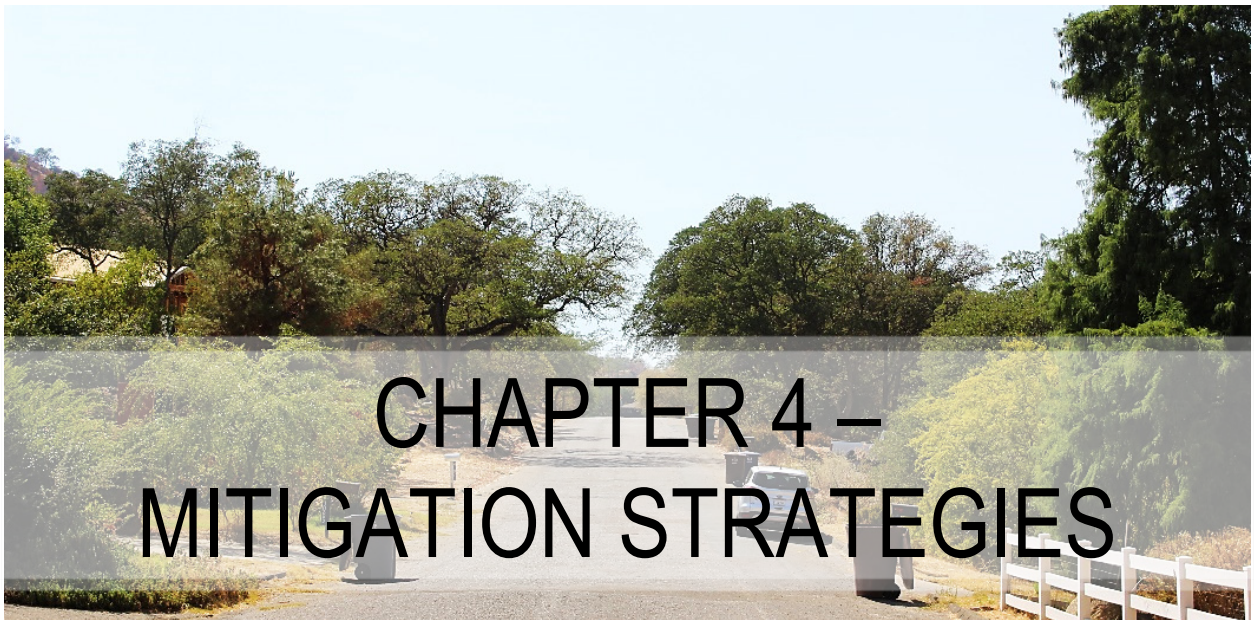

CHAPTER 4 – MITIGATION STRATEGIES

This chapter provides project recommendations and implementation guidance. However, mitigation does not stop there. In addition to the recommendations, recognizing wildfire mitigation, preparedness, and resilience means being prepared both pre- and post-fire. Postfire response and rehabilitation information can be found at the end of this chapter.

This plan has been aligned with the Cohesive Strategy and its Phase III Western Regional Action Plan by adhering to the nationwide goal:

> *"To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire." (Forests and Rangelands 2014:3).*

Thus, CWPP recommendations have been structured around the three main goals of the Cohesive Strategy: restoring and maintaining landscapes, fire-adapted communities, and wildfire response. Many of the recommendations listed can be implemented at the homeowner or community level. Projects requiring large-scale support can be prioritized based on the Composite Risk-Hazard Assessment.

Considering the fires in late 2021 (the KNP Complex Fire nearby and the Windy Fire south of Three Rivers in Tulare County), it is clear that most WUI communities are at risk for severe wildfire. Therefore, it is important for homeowners to implement the mitigation measures outlined in this chapter.

Recommendation matrices are used throughout this chapter to serve as an action plan for implementation. Recommendations have been aligned with the strategies in the 2021 California's Wildfire and Forest Resilience Action Plan (CA FMTF 2021a) wherever possible.

COHESIVE STRATEGY GOAL 1: RESTORE AND MAINTAIN LANDSCAPES

Goal 1 of the Cohesive Strategy/Western Regional Action Plan is Restore and Maintain Landscapes: Landscapes across all jurisdictions are resilient to fire and other disturbances in accordance with management objectives.

> *"Sustaining landscape resiliency and the role of wildland fire as a critical ecological process requires a mix of actions that are consistent with management objectives. The West will use all available methods and tools for active management of the landscape to consider and conserve a diversity of ecological, social, and economic values. The West will coordinate with all partners and seek continued stakeholder engagement in developing market-based, flexible and proactive solutions that can take advantage of economies of scale. All aspects of wildland fire will be used to restore and maintain resilient landscapes. Emphasis will be placed on protecting the middle lands near communities."* (Western Regional Strategy Committee [WRSC] 2013:14).

In this CWPP, recommendations to restore and maintain landscapes focus on vegetation management and hazardous fuel reduction.

This region has been home to an active and committed fuel treatment program by land managers for many years. Figure 4.1 shows existing fuel treatments that have been completed or planned in and around the planning area. This information is derived from CAL FIRE and the USFS. The reader is referred to agency websites and the Federal Register for the latest information on planned or ongoing actions on adjacent public land (see Figure 4.1). The treatment momentum already observed surrounding the planning area should be built upon in order to increase fuel treatment effectiveness across the landscape.

RECOMMENDATIONS FOR HAZARDOUS FUEL REDUCTION

Fuels management of public and private land in the WUI is key to the survival of homes during a wildfire event, as well as the means to meet the criteria of Goal 1. Research has shown how fuel treatments in the WUI can change fire behavior to support suppression activities and protect homes (Evans et al. 2015). The importance of fuels management is reflected in policy at the federal level, with the HFRA requiring that federal land management agencies spend at least 50% of their fuels reduction funds on projects in the WUI.

This CWPP has been developed with a priority placed on implementation of actions that would reduce hazardous fuels. Fuels should be modified with a strategic approach to reduce the threat that high-intensity wildfires pose to lives, property, and other values. This section provides information on fuel treatment methodologies that can be applied to first protect structures (defensible space), then near community boundaries (fuel breaks, cleanup of adjacent open spaces), and finally in the wildlands beyond community boundaries (larger-scale forest health and restoration treatments).

While not necessarily at odds with one another, the emphasis of each of these treatment types is different. Proximate to structures, the recommendations focus on reducing fire intensity consistent with Firewise and International Fire Code standards. Further into open space areas, treatments tend to emphasize forest health and increasing resiliency to catastrophic wildfire and other disturbances. Cooperators in fuels management should include federal, state, and local agencies, as well as interested members of the public to increase collaboration. Federal land management plans focus on these more landscape-level treatments, so the CWPP incorporates most federal land management by reference to those land management planning documents. The CWPP focuses primarily on projects within or adjacent to the planning area.

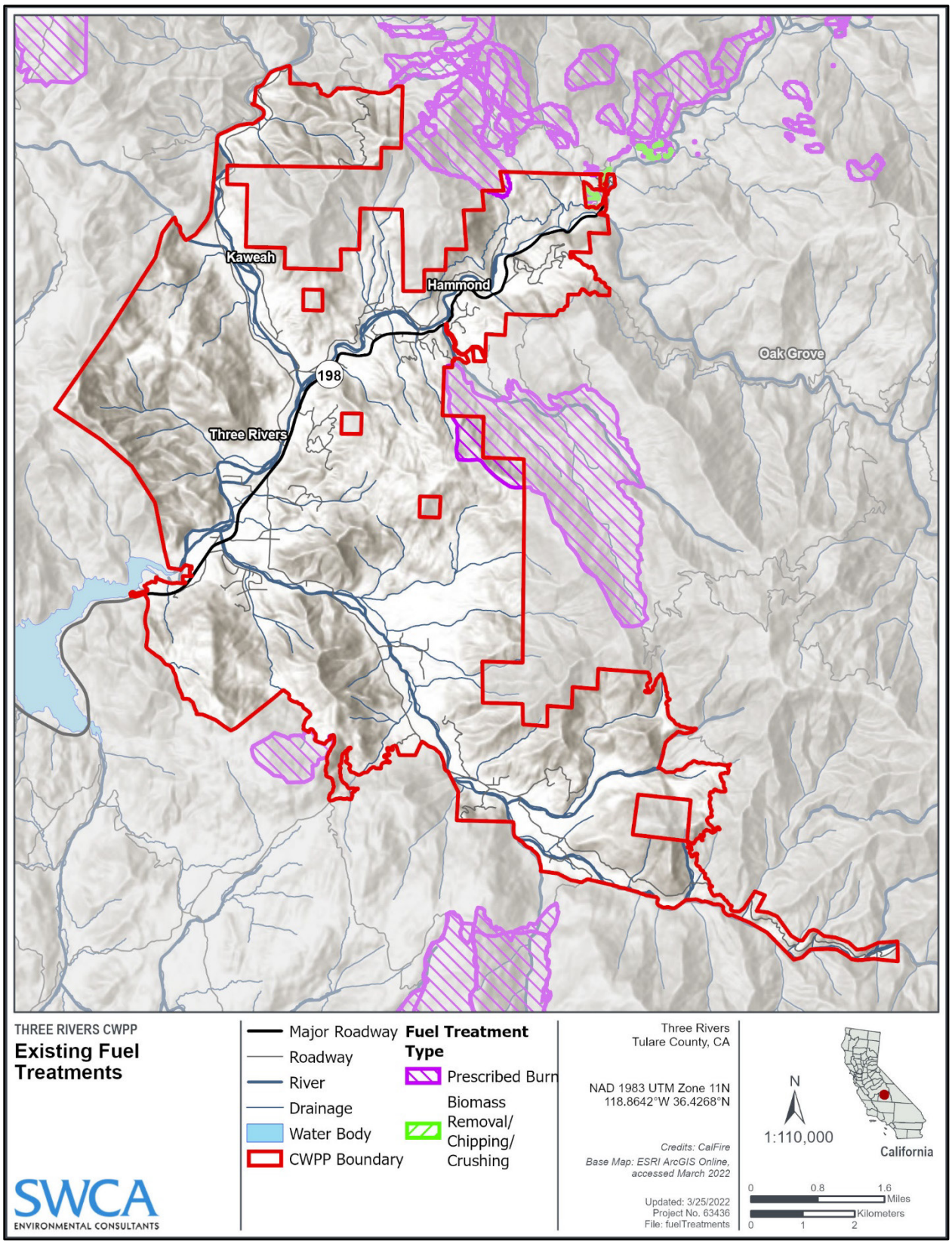

Figure 4.1. Existing fuel treatments across all jurisdictions.

Table 4.1 summarizes the types of treatments recommended throughout the planning area. The majority of the treatments are focused on higher risk areas, as defined by the Composite Risk-Hazard Assessment and Core Team input. Many of these treatment recommendations are general across the communities because similar conditions occur in each area. Figure 4.2 presents areas of concern that should be prioritized for future fuel treatments in alignment with projects outlined in Table 4.1. Table 4.1 also addresses the requirement for an action plan and assessment strategy by providing monitoring guidelines and a timeline for implementation. This timeline is dependent on available funding and resources, as well as National Environmental Policy Act (NEPA) and CEQA protocols for any treatments pursued on public land. Figure 4.3 illustrates the CEQA process for CalVTP implementation.

The areas of concern have been delineated based on the Risk-Hazard Assessment and Core Team input. Areas of concern include regions of high concentrations of HVRAs that coincide with high potential exposure to wildfire (see Figure 3.2) and/or areas where land management agencies have ongoing vegetation management treatments that could be enhanced by adjacent projects). These are areas where land managers should consider employing mitigation measures to protect life, property, and other values. It is recommended that treatment plans be developed to execute mitigation measures in these areas. Treatment types will be site specific but should address a need to slow fire spread or mitigate potential extreme fire behavior parameters, such as high flame lengths or fireline intensity. This section outlines various different treatment approaches that could be considered for the future management of the planning area. Many projects may be eligible for grant funds available from federal and/or state sources. For a list of funding sources, please refer to Appendix F.

When applying fuel treatments, every effort should be made to align treatments with the State Forest Action Plan Assessment and Strategy (CAL FIRE 2018a, 2018b) with consideration of all appropriate best management practices and sound science. In addition, treatments should be strategically located in areas to maximize effectiveness of other existing and ongoing projects (see Figure 4.1).

Table 4.1. Recommendations for Creating Resilient Landscapes (Hazardous Fuels Reduction)

Symbol Key:

- = Aligns with goals from the 2017 Tulare MJHMP
- = Aligns with goals from the 2018 Tulare MJHMP
- = Aligns with goals from the 2021 Tulare Fire Unit Plan
- = Aligns with goals from the California Strategic Fire Plan

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources
HFR # 1	Implement strategic fuel treatments to provide road buffers	H	Ongoing	Highest risk roadways as identified in the risk assessment. Priority: see road hazard analysis in Chapter 3.	Three Rivers Fire Safe Council (FSC), County, State, Interstate	<u>Road right of way (ROW) vegetation improvements:</u> • Annual spring maintenance of ROW • Treat surface fuels for a minimum 10-foot buffer and up to 30 feet where possible • Trim fuels (limbing-up timber) to allow safe passage of emergency vehicles • Control for invasive species that may contribute to rapid fire spread (i.e., weeds and grasses). • Utilize CalVTP to expedite treatments (Figure 4.3).	Provides for safe and effective wildfire response capabilities Creates a strategic fuel break along roadways to create potential firebreak	Spring of 2022	• Regular maintenance needed to ensure the roads are drivable for emergency response vehicles	• Hazard Mitigation Grant Program (HMGP)/HMGP – Post Fire • Building Resilient Infrastructure and Communities (BRIC) • Firewise Grants • National Fire Plan (NFP) Grants • California Department of Forestry and Fire Protection (CAL FIRE) Grant Programs • Emergency Forest Restoration Program (EFRP) • National Forest Foundation (NFF); Innovative Finance for National Forests Grant Program

HFR # 2	Enhance existing fire breaks and potential fire containment features	H		Highest risk areas as identified in the risk assessment:
				Priority: see risk assessment in Chapter 3.
					FSC, County, State, Federal	• Increase fire breaks to double as access within the WUI or difficult to access areas and look for opportunities to widen some public trails to better serve as fuel breaks/fire access roads.
						  ○ Encourage clearance of an additional width when possible.
						• Create additional buffer zones between existing development and the forest, ensuring fire suppression access. Maintain existing fire breaks and buffers (Figure 4.1).
						• Fuel break prescriptions should be site specific depending on the fuel type, topography, soils, and adjacent land management practices.
						  ○ The prescriptions will incorporate the use of best management practices for habitat protection (i.e., protection of vulnerable species and habitat and prevention of invasive species).
						• Work with adjacent landowners to develop internal capacity to help enhance fire access through road and trail improvements on those lands.
						• Utilize CalVTP to expedite treatments (Figure 4.3).
							Protect life and property by mitigating fuels, providing defensible space for firefighters protecting structures.
							Create a fuel arrangement unlikely to support crown fire.
							Ensure the protection of vulnerable ecosystems and values at risk.
							Strategic placement of fuel breaks will help to limit the spread of wildland fire and increase access to difficult areas.
								Spring of 2024	• Regular maintenance needed to ensure the fuel break remains clear of vegetation.
									• Monitor for invasive species.
									• Continued management of fire breaks maintained by grazing, brush breaking, controlled burns.
										• BRIC
										• Firewise Grants
										• NFP
										• CAL FIRE Grant Programs
										• EFRP
										• NFF; Innovative Finance for National Forests Grant Program

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources
HFR # 3	Increase capacity to complete and maintain needed hazardous fuels projects across multiple jurisdictions	H		FSC and adjacent county, state, and federal lands (public and private)	Local, State, Federal	• Collaboratively identify vegetation and fuels management needs based on the risk assessment. • Develop equipment needs to accomplish work (including maintenance) and seek funding for purchase. • Create an educational tool for land /property owners re: various methods, techniques, and cost for various fuel treatments. • Cultivate and support partnerships with various agencies, NGOs, and volunteer groups to support implementation of projects. • Utilize drone technology to identify areas of high hazard • Support the implementation and maintenance of defensible space inspections around structures (Goal adopted from CA Strategic Plan) • Utilize CalVTP to expedite treatments (Figure 4.3).	Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI. Create and maintain accountability with local landowners.	Spring of 2024	• Set up a standing multi-agency meeting every fall to review accomplishments and address future needs	• GSA Federal Excess Personal Property (FEPP) • Firewise Grants • BRIC • HMGP/HMGP – Post Fire • CAL FIRE Grant Programs • Regional Catastrophic Preparedness (RCP) Grants
HFR # 4	Implement CEQA and CalVTP training for select Tulare County staff	H		Tulare County	Fire Department, partnering agencies	• Require select personnel (those working on project implementation and permitting) to complete CEQA and/or CalVTP training • https://bof.fire.ca.gov/projects-and-programs/calvtp/	Increase the level of project preparation/permitting that can be completed in-house.		Designate specific roles that will need to complete the training. • Update qualifications annually or as needed to maintain the certification	• Internal budgets
HFR # 5	Protect rare species habitats	H		FSC and adjacent county, state, and federal lands (public and private) Kaweah ACEC Ecological Reserve (South Fork)	Local, State, Federal	• Work with land management agencies to develop fuel treatments that serve as habitat improvements.	Balance the reduction of hazardous fuels with the protection of highly sensitive resources.	Spring of 2023	• Monitor accomplishments in addressing species protections while reducing wildfire risk.	• Environmental Quality Incentives Program (EQIP) • Northern California Forests and Watersheds Program • BLM Forest and Woodlands Resource Management • CAL FIRE Grant Programs • Leonardo DiCaprio Foundation Grants
HFR # 6	Work with local HOAs to develop fuel break measures and associated access improvements for increased community protection	H		FSC Prioritize highest risk areas as identified in the risk assessment.	FSC/Private	• To assure defensible space in WUI will be maintained, require property owners to establish sufficient structure clearance around all structures.	Create resilient landscapes and address potential for extreme wildfire behavior in and around communities. Create and maintain accountability with local landowners.	Spring of 2024	• Carry out a 2-year review of accomplishments in improving defensible space. • Repeat NFPA1144 assessments every 5 years to document improvements in defensible space.	• BRIC • National Urban and Community Forestry Challenge Cost Share Grant Program • Firewise Grants • State Farm Good Neighbor Citizenship (GNC) Grants • NFP • Fire Management Assistance Grant (FMAG)

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources

HFR # 7	Focus on mitigation measures within areas of high exposure potential	H		Prioritize highest risk areas as identified in the risk assessment.	State and Local	• Utilize the fire behavior modeling completed for the CWPP to identify areas that would burn with uncharacteristically high flame lengths and rapid rates of spread, to mitigate fire behavior and provide for areas where fire responders could more safely suppress future wildfire.
						• Map all existing structures within very high fire hazard severity zones that do not conform to current fire code standards and identify mitigation needs.
						• Form collaborative relationships to aid in implementation of mitigation efforts.
						• Focus on following treatments:
						  ○ Removing ladder fuels to reduce extreme fire behavior, intensity, and rates of spread.
						  ○ Carryout understory vegetation management to minimize surface to canopy continuity.
						  ○ Treat small patches of land tucked into residential areas.
						  ○ Create mosaic of vegetation types and stand ages to reduce vertical continuity of vegetation to limit fire spread.
						  ○ Prepare to treat fine fuels that establish in fuel treatment areas.
						  ○ Preferentially treat hazardous fuel types first- e.g., chapparal.
							Assess hazard mitigation opportunities to protect values at risk within areas of highest exposure potential.
							Consider a full tool kit of mitigation measures.
								Spring of 2024	• Carry out a 2-year review of accomplishments in reducing hazardous fuels.
									• Calibrate fuel model based on treatment effectiveness at altering fuel loading.
									• Re-run fire behavior modeling after 5 years to quantify impacts of treatment on fire behavior potential.
										• BRIC
										• HMGP/HMGP – Post Fire
										• FMAG
										• RCP
										• National Urban and Community Forestry Challenge Cost Share Grant Program
										• CAL FIRE Grant Programs

HFR # 8	Integrate wildfire management with meeting other resource management objectives	H		State and Public Lands	BLM, NPS, USFS, County, FSC	• Leverage the information from the development of the CWPP and the MJHMP to combine fuel reduction and habitat restoration projects. • Incorporate native species habitat needs in restoration and recovery efforts. • Maximize funding sources through integrating fuel projects with other land management goals, including ecological restoration, habitat improvements and recreation.	Restore degraded landscapes to build a more resilient fire environment.	Spring of 2027	• Carry out a 2-year review of accomplishments in reducing hazardous fuels and success at meeting other resource management objectives.	• EQIP • BLM Forest and Woodlands Resource Management • CAL FIRE Grant Programs • Northern California Forests and Watersheds Program • Leonardo DiCaprio Foundation Grants
HFR # 9	Firewise treatments on individual properties/structures	H		Three Rivers	FSC	• Conduct Firewise Community-based assessments of individual homes. • The professional assessment would help identify the most critical actions that an individual could take. Assessments could also include marking trees and shrubs suggested for removal.	Reduce risk of home ignitions. Empower homeowners to take the most effective actions. Allow funding to address a larger number of homes.	Spring of 2024	• Conduct on-site inspections with owners; identify and mark trees or shrubs for removal within the 100-foot safety zone. • Develop a community task force to carry out assessments of properties.	• Firewise Grants • Urban Land Institute (ULI) Grants • GNC Grants • NFP • CAL FIRE Grant Programs
HFR # 10	Pursue actions to enhance, facilitate and fund burned area recovery in both the short- and long-term.	H		Burn areas from 2021 fires.	Land management agency responsible for burned area	• Convene a post-fire restoration working group. • Implement the 2018 MJHMP action- Develop burn area recovery plans that incorporate strategic fire safe measures developed during the fire suppression, such as access roads, fire lines, safety zones, fuel breaks, and helispots. • Convene land management agencies to discuss recovery across boundaries. • Work with academic institutions to identify research projects for long term recovery and restoration. • Carry out post fire monitoring to document impacts to soils, vegetation, hydrology and infrastructure and develop restoration measures.	Restore degraded landscapes across jurisdictions to protect values at risk from post-fire effects.	Within three quarters of 2022	• Monthly meetings of participants until actions are identified and solidified. • Bi-annual review of accomplishments. • Annual reports with monitoring summaries.	• Emergency Watershed Protection (EWP) Program • HMGP/HMGP – Post Fire • CAL FIRE Grant Programs • Northern California Forests and Watersheds Program • GNC Grants

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources
HFR # 11	Support fuel reduction efforts on private property by addressing green waste management.	H		Three Rivers	FSC	• Implement the 2018 MJHMP action: Develop a debris management plan • Increase opportunities for green waste processing- more frequent chipper day events. • Provide curbside collection service once or twice a year.	Support residents in taking responsibility for their own fire mitigation actions.	Spring of 2024	• Annual review of Debris Management Plan goals and accomplishments.	• NFP • Firewise Grants • CAL FIRE Grant Programs • EFRP • GNC Grants • State of CA Grants Portal
HFR # 12	Implement Priority #1, Highway 198 Fuels Reduction and North Fork Drive Fuels Reduction from the 2021 Tulare Fire Unit Plan	H		Three Rivers	CAL FIRE, FSC, CALTRANS	• Fuels reduction along Highway 198 and North Fork Drive through the community of Three Rivers. • North Fork Drive remains a priority for CAL FIRE until the fuel reduction is complete in that area. The County continues to pursue funding to implement projects.	Open the primary escape routes for the community and tourists in the area.	Ongoing	• Ensure that a maintenance schedule is included in all fuel management planning and funding pursuits.	• HMGP/HMGP – Post Fire • BRIC • Firewise Grants • NFP • CAL FIRE Grant Programs • State of CA Grants Portal
HFR # 13	Increase use of prescribed burning where appropriate	M		Sequoia National Forest, Sequoia National Park BLM	NPS, BLM, USFS	• Continue prescribed fire program to provide hazardous fuel reduction to serve as community protection and promote forest health. • Utilize prescribed burn planning that follows agency and regulator protocols. • Closely follow plan prescriptions. • Utilize prescribed burn program to provide training for local fire department personnel and volunteers. • Emphasize the benefits of prescribed fire as part of educational outreach (both targeted at local residents, tourists and absentee homeowners). Focus on smoke impacts from prescribed fire compared with wildfire and ecological benefit of frequent fire in these forest fire regimes.	Protect communities and infrastructure by reducing fuel loads. Increase capacity and training for fire departments.	Spring of 2027	• Carry out inventory each year of number and acreage of prescribed fire completed. • Collaboratively set goals for upcoming year. • Establish training needs and funding.	• Forest Health Grants (CAL FIRE) • BLM Forest and Woodlands Resource Management • RCP • State of CA Grants Portal
HFR # 14	Establish fire defense strategies (such as fire ignition resistant areas) that provide adequate fire protection without dependency on fire resources (both air and ground) and could serve as safety zones for the public or emergency support personnel	M		Three Rivers	County	• If possible, delineate shelter in place locations. • Formal delineation of safety zones is largely dependent on fire location and jurisdiction. However, suitable locations that could be assigned in the event residents cannot evacuate include Lion Club Roping Arena, the school, the Memorial Building, and Slick Rock Recreation Area. • Pre-defined areas may require a land use agreement. • When evac orders are given CAL FIRE will direct people to a shelter. • Emphasize that homeowners need to make their homes resilient in the event of shelter in place. • Temporary places for shelter could include green pasture/irrigated lands.	Increase protection of life safety.	Spring of 2024	• Annual review of status.	• CAL FIRE Grant Programs • State of CA Grants Portal

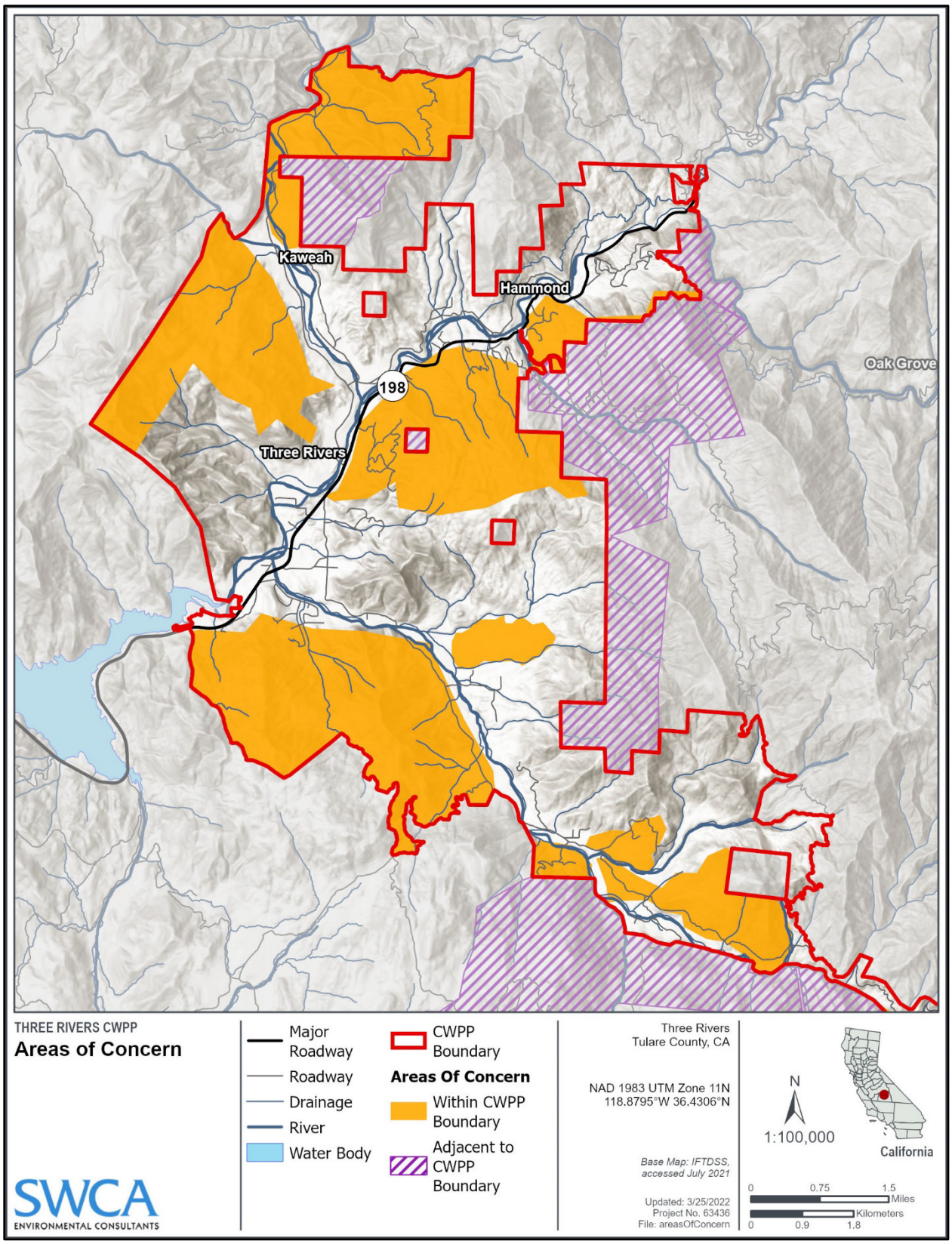

Figure 4.2. Areas of concern within the planning area.

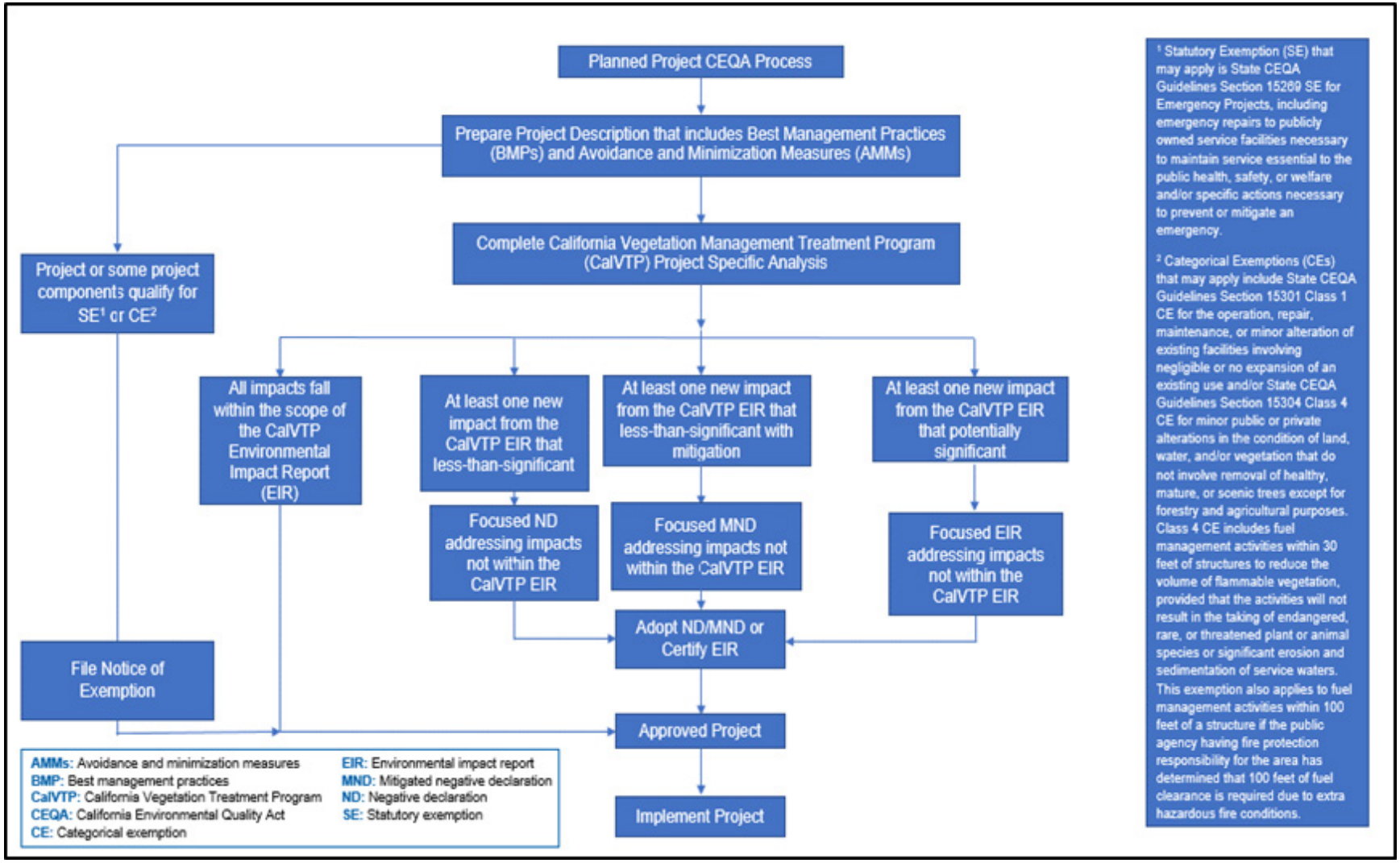

Figure 4.3. CEQA process for CalVTP implementation.

Fuels Treatment Types

Defensible Space

Defensible space is perhaps the fastest, most cost-effective, and most efficacious means of reducing the risk of loss of life and property. Although fire agencies can be valuable in providing guidance and assistance, creating defensible space is the responsibility of the individual homeowner (Figure 4.4).

The definition of defensible space via state and local codes, its maintenance by homeowners and property owners, and enforcement by fire agencies as needed is a common part of wildfire risk mitigation. The California State Board of Forestry issued General Guidelines for Creating Defensible Space in 2008, following a change in Public Resources Code 4291 that expanded defensible space clearance requirements from 30 to 100 feet around buildings and structures within SRAs or very high fire hazard severity zones within LRAs. The Public Resources Code was amended in January 2021 to require an ember-resistant zone within 5 feet of the home/structure on or before January 1, 2023. This translates to having a clearance of 5 feet between the home/structure and any materials that would likely be ignited by embers (CAL FIRE 2021c).

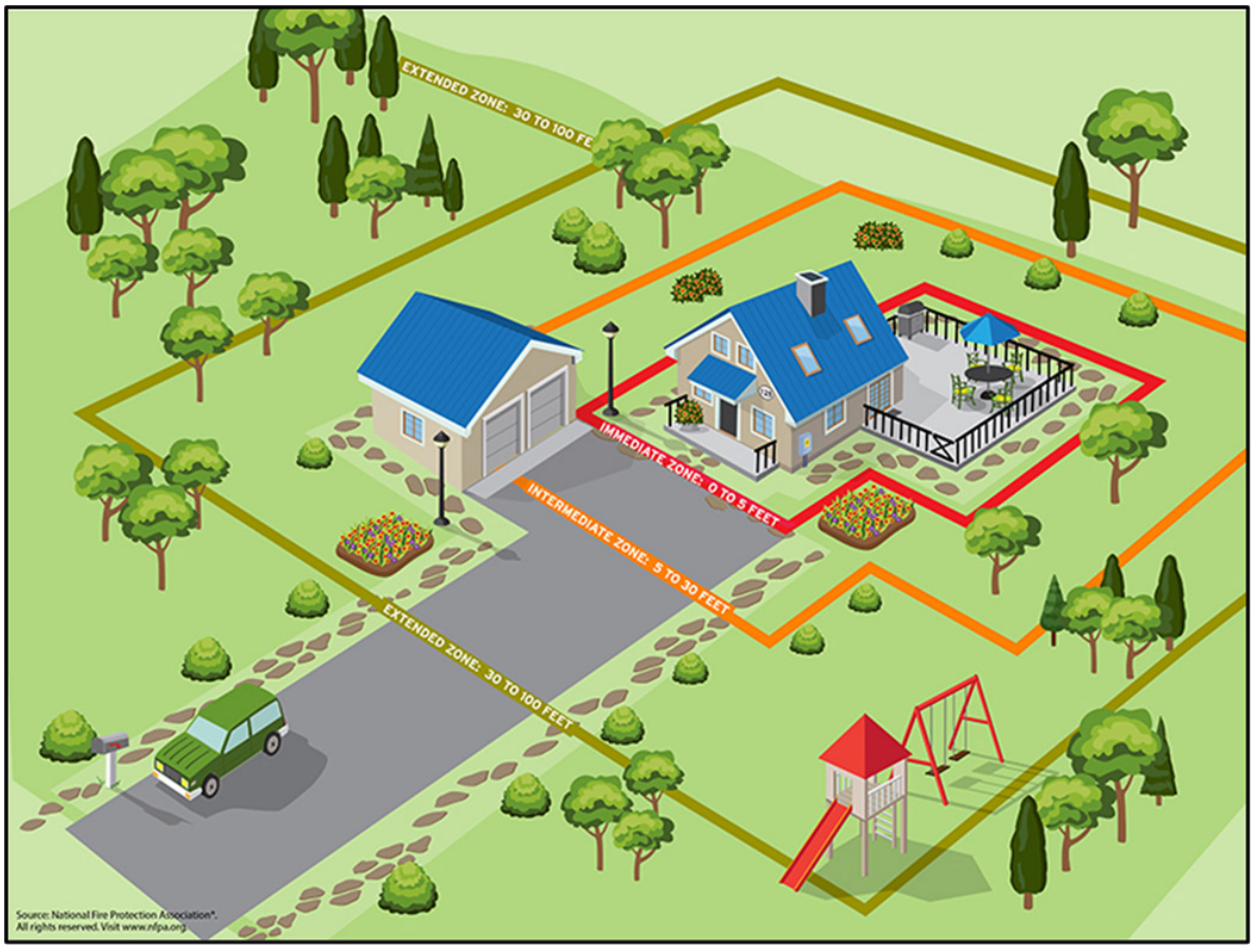

Figure 4.4. Defensible space providing clearance between a structure and adjacent woodland or forest fuels.

Source: NFPA

Some aspects about WUI defensible space that are often overlooked include:

- The amount of defensible space needed may vary due to local conditions, such as slope, fuel density, building materials, or location.
- Fuel reduction has more to do with disrupting fuel continuity so that the spread of fire is impeded, rather than creating a denuded zone around a home. For example, pruning the lower limbs of trees creates a break between ground fuels and tree canopies, reducing the chances that a fire will move from a ground fire to a crown fire.
- Communities may wish to develop defensible space areas that are greater than 100 feet for even better protection; the code sets only a minimum distance. However, expanding treatments beyond property lines can only be done with if allowed by state law, local ordinance, rule, or regulation.
- Defensible space also provides a safer environment within which firefighters can work. This environment is more than vegetation clearance; defensible space also involves emergency vehicle access, water supply, and clear street signs and addresses. All these factors, and many more as identified by previous community-level CWPPs, affect the usefulness of defensible space in structure protection.
- Vegetation fuel reduction projects require compliance with all federal, state, or local environmental protection laws.

Effective defensible space is an essentially fire-free zone adjacent to a home, a treated secondary zone that is thinned and cleaned of surface fuels, and (if the parcel is large enough) a transitional third zone that is basically a managed forest area. These components work together in a proven and predictable manner. Zone 0 keeps fire from burning directly to the home; Zone 1 reduces the adjacent fire intensity and the likelihood of torching, crown fire, and ember production; and Zone 2 provides the same at a broader scale, keeping the fire intensity lower by maintaining a more natural, historic condition (Figure 4.5).

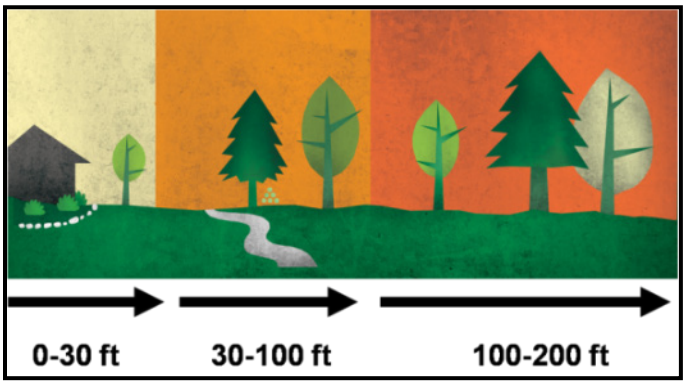

Figure 4.5. Defensible space zones.
Source: www.firewise.org.

It should be emphasized that defensible space is just that—an area that allows firefighters to work effectively and with some degree of safety to defend structures. While defensible space may increase a home's chance of surviving a fire on its own, a structure's survival is not guaranteed, with or without firefighter protection. Nevertheless, when these principles are consistently applied across a neighborhood, everyone benefits. The three zones for defensible space actions are described below (CAL FIRE 2021c):

Zone 0 – Immediate Zone, Ember Resistant**:** This zone is not currently required by state law. However, as of January 1, 2023, Assembly Bill 3074 will require the Board of Forestry and Fire Protection to develop the regulation for Zone 0. While not yet required, Zone 0 has been proven to be the most important defensible space zone for protecting a home against wildfire. This zone consists of the immediate area around a home and is defined as 0 to 5 feet from the property structure, including areas under and around all structure attachments, such as sheds or decks. Zone 0 requires the most stringent wildfire fuel reduction methods as actions taken within this zone can directly influence whether a property ignites. Recommendations for treating Zone 0 include (CAL FIRE 2021c):

- Use non-combustible landscaping materials, such as gravel in place of mulch.
- Clear all dead and dying debris from around a structure, including branches, dead leaves, pinecones, pine needles, grasses, and shrubs. Remember to check areas where the debris can accumulate, such as gutters, stairways, porches, and roofs.
- Clear all branches or vegetation within 10 feet of any chimney or stovepipe outlet.
- To keep vegetation within the 5-foot buffer around a structure, make sure plants are thoroughly watered, and keep non-woody, low-growing plant species if possible.
- Limit the use of combustible materials, such as outdoor furniture, on decks or patios.
- Relocate firewood or lumber to Zone 2.
- Replace structures attached to a home, such as fencing or gates, with non-combustible materials.
- If possible, keep garbage receptacles outside of Zone 0.
- If possible, keep all vehicles, boats, ATVs, and any other machines outside of Zone 0.

Zone 1 – Intermediate Zone, Clean and Green: Zone 1 consists of the first 30 feet from structures, including home, decks, garages, etc. If a property line extends less than 30 feet, Zone 1 is the distance from structures to the property line. This zone features fuel reduction efforts and serves as a transitional area between Zones 0 and 2. Recommendations for treating Zone 1 include (CAL FIRE 2021c):

- Remove all dead and dying vegetation, including vegetation debris such as leaf litter. Be sure to check roof and gutters as well.
- Maintain a minimum buffer of 10 feet between a chimney and any vegetation, including dead or overhanging branches. Be sure to remove all branches that hang over the roof.
- Maintain trees by trimming them regularly and keeping a minimum 10-foot buffer between tree canopies.
- Relocate fire or lumber to Zone 2.
- Trim or remove any flammable vegetation near windows.
- Remove any items or vegetation that could catch fire and ignite other property structures, such as vegetation under decks or stairs.
- Separate any items that could ignite, such as trees, shrubs, swing sets, patio furniture, etc.

Zone 2 – Extended Zone, Reduced Fuel: This zone encompasses an area 30 feet from a structure out to 100 feet, or the property line, whichever is closer. This zone addresses fuel reduction to prevent wildfires from spreading. Recommendations for treating Zone 2 include (CAL FIRE 2021c):

- Maintain all grasses to reach a maximum height of 4 inches.
- For shrubs or trees, maintain a distance between plants of at least two times a plant's size. Additional space between vegetation is needed for properties on slopes.
    - Flat to mild slope (less than 20%): Minimum distance of 10 feet between trees and two times the size of other plants. Example: For shrubs 2 feet in diameter, at least 4 feet are needed between shrubs.
    - Mild to moderate slope (20%–40%): Minimum distance of 20 feet between trees and four times the size of other plants. Example: For shrubs 2 feet in diameter, at least 8 feet are needed between shrubs.
    - Moderate to steep slope (greater than 40%): Minimum distance of 30 feet between trees and six times the size of other plants. Example: For shrubs 2 feet in diameter, at least 12 feet are needed between shrubs.
- Create vertical space between vegetation by clearing all branches at least 6 feet from the ground for isolated trees, or for trees with nearby shrubs, clear at least 3 times the shrub height.
    - Example: A 4-foot shrub is growing near a tree; a clearance of 12 feet (3 × 4) is needed between the top of the shrub and the lowest tree branch.
- Vegetation debris such as dead leaves, branches, twigs, pinecones, etc., may be allowed up to 3 inches in depth. However, it is best to remove vegetation debris.
- All wood or lumber piles must have a 10-foot buffer of bare mineral soil in all directions; no vegetation is allowed.

In addition to the recommendations listed above, CAL FIRE suggests maintaining a clearance zone of 10 feet around any outbuildings or liquid propane gas storage tanks, and an additional 10-foot clearance zone with no flammable vegetation (CAL FIRE 2021c).

Specific recommendations should be based on the hazards adjacent to a structure such as slope steepness and fuel type. The TCFD provides fire safety inspections, new construction (Title 14) inspections, information regarding NFPA 1142 water supply tank requirements, and a hazard abatement program that minimizes the risk of fire due to excess flammable vegetation and other exterior combustible hazards (e.g., overgrown weeds and grass). In addition, CAL FIRE TUU carries out fire hazard inspections (LE-100 program). All homes and structures in the SRA are subject to inspection. The objective of the program is to prevent the loss of homes and structures during a wildfire. The inspection form (LE-100) is in Appendix E.

In addition to inspections, the Fire Safe Council can provide wildfire hazard assessments that provide guidance to homeowners on defensible space and home hardening. The hazard assessments are not inspections, so residents are reminded that a favorable hazard assessment result does not mean that their home would pass a required County or State inspection.

Homeowners are encouraged to take advantage of local resources for fire prevention and mitigation. Firewise guidelines and the homeowner resources provided in Appendix G are excellent resources, but creating defensible space does not have to be an overwhelming process. Assisting neighbors may be essential in many cases. Homeowners should consider assisting the elderly, sharing ladders for gutter cleaning, and assisting neighbors with large thinning needs. Homeowner actions have been found to also motivate neighbors to act, increasing the scope of the wildfire mitigation across a community (Evans et al.

2015). Adopting a phased approach can make the process more manageable and encourage maintenance (Table 4.2).

In Three Rivers, it is becoming increasingly popular for homes to be rented as vacation rentals to tourists. It is especially important that owners and caretakers of these homes maintain defensible space year round, even if they are only occupied seasonally. Lack of defensible space around a property can significantly increase risk for first responders and neighbors.

Additional homeowner resources regarding defensible space and fuels treatments are in Appendix G.

Table 4.2. Example of a Phased Approach to Mitigating Home Ignitability

Year	Project	Actions
1	Basic yard cleanup (annual)	Dispose of clutter in the yard and under porches. Remove dead branches from yard. Mow and rake. Clean off roofs and gutters. Remove combustible vegetation near structures. Coordinate disposal as a neighborhood or community. Post 4-inch reflective address numbers visible from road.
2	Understory thinning near structures	Repeat basic yard cleanup. Limb trees up to 6–10 feet. Trim branches back 15 feet from chimneys. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
3	Understory thinning on private property along roads and drainages	Limb trees up to 6–10 feet. Trim or cut down brush. Remove young trees that can carry fire into forest canopy. Coordinate disposal as a neighborhood or community.
4	Overstory treatments on private property	Evaluate the need to thin mature or diseased trees. Prioritize and coordinate tree removal within neighborhoods to increase cost effectiveness.
5	Restart defensible space treatment cycle	Continue the annual basic yard cleanup. Evaluate need to revisit past efforts or undertake those that were bypassed.

The next location priority for fuels treatments should be where the community meets wildland. This may be the outer margins of a town or an area adjacent to occluded open spaces such as a park.

Fuel Breaks

Fuel breaks (also known as shaded fuel breaks) are strips of land where fuel (e.g., living trees and brush, dead branches, leaves, or downed logs) has been modified or reduced to limit the fire's ability to spread rapidly. Fuel breaks should not be confused with firebreaks, which are areas where vegetation and organic matter is removed down to mineral soil. Shaded fuel breaks may be created to provide options for suppression resources or to provide opportunities to introduce prescribed fire. In many cases, shaded fuel breaks may be created by thinning along roads. This provides access for mitigation resources and firefighters, as well as enhancing the safety of evacuation routes.

Fire behavior in the CWPP planning area has been modeled using FlamMap. This assessment provides estimates of flame length and rate of spread; the information should be used by land managers when prescribing treatments. Land managers are cautioned, however, that fuel breaks will not always stop a fire under extreme fire behavior or strong winds; these should only be seen as a mitigating measure and not a fail-safe method for fire containment. Furthermore, fuel break utility is contingent upon regular maintenance, as regrowth in a fuel break can quickly reduce its effectiveness and vegetation in this ecosystem is known to quickly re-sprout and reestablish. Maintenance of existing breaks could be more cost efficient than installation of new features.

Strategic placement of fuel breaks is critical to prevent fire from moving from wildland fuels into adjacent neighborhoods. For effective management of most fuels, fuel breaks should be prescribed based on the conditions in each treatment area. It is not possible to provide a standard treatment prescription for the entire landscape because fuel break dimensions should be based on the local fuel conditions and prevailing weather patterns. For example, in some areas, clearing an area too wide could open the landscape to strong winds that could generate more intense fire behavior and/or create windthrow. Finally, in some situations it is best to leave the site in its current condition to avoid the introduction of more flammable, exotic species that may respond readily following disturbance.

Larger-scale Treatments

Farther away from WUI communities, the emphasis of treatments often becomes broader. While reducing the buildup of hazardous fuels remains important, other objectives are often included, such as forest health and resiliency to catastrophic wildfire and climate change considerations. Wildfires frequently burn across jurisdictional boundaries, sometimes on landscape scales. As such, these larger treatments need to be coordinated on a strategic level. This requires coordination between projects and jurisdictions, as is currently occurring within the planning area.

Specifically, land managers have carried out numerous forest restoration projects across SEKI NPs and the Sequoia NF and have ongoing projects planned on public land that are designed to reduce hazardous fuels to protect communities and resources, while restoring fire-adapted communities.

Fuel Treatment Methods

Several treatment methods are commonly used for hazardous fuels reduction, including manual treatments, mechanized treatments, prescribed fire, and grazing (Table 4.3). This brief synopsis of treatment options is provided for general knowledge; specific projects will require further planning. The appropriate treatment method and cost will vary depending on factors such as the following:

- Diameter of materials
- Proximity to structures
- Acreage of project
- Fuel costs
- Steepness of slope
- Area accessibility
- Density of fuels
- Project objectives

It is imperative that long-term monitoring and maintenance of all treatments is implemented. Post-treatment rehabilitation such as seeding with native plants and erosion control may be necessary to ensure ecosystem health.

Table 4.3. Summary of Fuels Treatment Methods

Treatment	Comments
Machine mowing	Appropriate for large, flat, grassy areas on relatively flat terrain.
Prescribed fire	Can be very cost effective. Ecologically beneficial. Can be used as training opportunities for firefighters. May require manual or mechanical pretreatment. Carries risk of escape, which may be unacceptable in some WUI areas. Unreliable scheduling due to weather and smoke management constraints. Can be combined with other treatment methods, such as fuel breaks, to protect values.
Brush mastication	Brush species tend to re-sprout vigorously after mechanical treatment. Frequent maintenance of treatments is typically necessary. Mastication tends to be less expensive than manual (chainsaw) treatment and eliminates disposal issues.
Timber mastication	Materials up to 10 inches in diameter and slopes up to 30% can be treated. Eliminates disposal issues. Environmental impact of residue being left on site is still being studied.
Manual treatment with chipping or pile burning	Requires chipping, hauling, and pile burning of slash in cases where lop and scatter is inappropriate. Pile burning must comply with smoke management policy.
Feller buncher	Mechanical treatment on slopes more than 30% or of materials more than 10 inches in diameter may require a feller buncher rather than a masticator. Costs tend to be considerably higher than masticator.
Grazing (goats)	Can be cost effective. Ecologically sound. Can be applied on steep slopes and shrubby and flashy fuels. Requires close management.

Manual Treatment

Manual treatment refers to crew-implemented cutting with chainsaws. Although it can be more expensive than mechanized treatment, crews can access many areas that are too steep or otherwise inaccessible with machines. Treatments can often be implemented with more precision than prescribed fire or mechanized methods allow. Merchantable materials and firewood can be removed, while non-merchantable materials are often lopped and scattered, chipped, or piled and burned on-site. Care should be exercised to not increase the fire hazard by failing to remove or treat discarded material in a site-appropriate manner.

Strategic timing and placement of fuels treatments is critical for effective fuels management practices and should be prescribed based on the conditions of each treatment area. Some examples of this would be to place fuel breaks in areas where the fuels are heavier and in the path of prevailing winds and to mow grasses just before they cure and become flammable. Also, fuel reductions on slopes/ridgelines extending from the WUI to enhance community protection. In areas where the vegetation is sparse and not continuous, fuels treatments may not be necessary to create a defensible area where firefighters can work. In this situation, where the amount of fuel to carry a fire is minimal, it is best to leave the site in its current condition to avoid the introduction of exotic species.

Mechanized Treatments

Mechanized treatments include mowing, mastication (grinding timber into small pieces), and whole tree felling. These treatments allow for more precision than prescribed fire and are often more cost-effective than manual treatment.

Mowing, including ATV and tractor-pulled mower decks, can effectively reduce grass fuels adjacent to structures and along highway rights-of-way and fence lines. For heavier fuels, several different masticating machines can be used, including drum- or blade-type masticating heads mounted on machines and ranging in size from a small skid-steer to large front-end loaders. Some masticators can grind standing timber up to 10 inches in diameter. Other masticators are more effective for use in brush or surface fuels. Mowing and mastication do not actually reduce the amount of on-site biomass but alter the fuel arrangement to a less combustible profile.

In existing fuel break areas, maintenance is crucial, especially in areas of encroaching shrubs or trees. In extreme risk areas, more intensive fuels treatments may be necessary to keep the fire on the ground surface and reduce flame lengths. Within the fuel break, shrubs should be removed, and the branches of trees should be pruned from the ground surface to a height of 4 to 8 feet, depending on the height of the fuel below the canopy, and thinned with a spacing of at least two to three times the height of the trees to avoid movement of an active fire into the canopy.

Mechanical shears mounted on feller bunchers are used for whole tree removal. The stems are typically hauled off-site for utilization while the limbs are discarded. The discarded material may be masticated, chipped, or burned in order to reduce the wildfire hazard and to speed the recycling of nutrients.

Grazing

Fuel modifications targeted toward decreasing both vertical and horizontal continuity in fuels is critical as a prevention method against fire proliferation. The primary objectives for these modifications are treating surface fuels and producing low-density and vertically disconnected stands. Goat grazing is an effective, nontoxic, nonpolluting, and practically carbon-neutral vegetation treatment method. A goat grazing system typically consists of a high density of goats enclosed by a metallic or electrified fence guided by herders. Goats feed on a variety of foliage and twigs from herbaceous vegetation and woody plants (Lovreglio et al. 2014).

Prescribed Burning

Prescribed burning is also a useful tool to reduce the threat of extreme fire behavior by removing excessive standing plant material, litter, and woody debris while limiting the encroachment of shrubby vegetation (Figure 4.6). Where possible, prescribed fire should occur on public land since fire is ecologically beneficial to fire-adapted vegetation communities and wildlife habitat. Prescribed burning requires detailed planning and coordination. In 2019, the CAL FIRE Prescribed Fire Working Group developed the CAL FIRE Prescribed Fire Guidebook with the intent of educating CAL FIRE employees on how the department utilizes prescribed fire to reduce fuels at a landscape scale while improving ecosystem health in California (CAL FIRE 2019a). CAL FIRE and USFS are already Implementing prescribed burning in and around Three Rivers.

Within Three Rivers, a permit from CAL FIRE must be obtained to start a residential or open burn and can only do so during “permissive burn days”, which are determined by the State Air Resources Board or the local air district (CAL FIRE 2021d). Said permits are only necessary during fire season, approximately May 1 to November 1. While permits are not required outside of fire season, notifying your local

authorities is still recommended (UCANR 2021a). Furthermore, CAL FIRE permits are valid only on SRA land (CAL FIRE 2021d) as fire seasons are becoming longer as a result of climate change.

Figure 4.6. The SEKI NPs have an active prescribed burning program.
Source: Andrew Cremers, NPS, personal communication, 2022.

Figure 4.7a. East Fork – Pre-Prescribed Fire

Figure 4.7b. East Fork – Post-Prescribed Fire

Figure 4.7c. Grant Grove – Pre-Prescribed Fire

Figure 4.7d. Grant Grove – Post-Prescribed Fire

Source: Andrew Cremers, NPS, personal communication, 2022.

Cultural Burning

Within the Pacific West, fire has historically been a means forest management and restoration by Indigenous communities (Long et al. 2021). Cultural burning has been defined as the "purposeful use of fire by a cultural group (e.g., family unit, Tribe, clan/moiety, society) for a variety of purposes and outcomes," and is included under the terms Indigenous fire management, Indigenous burning, and Indigenous stewardship (Long et al. 2021).

Rather than focusing solely on fuel reduction, or as a means of wildfire mitigation, cultural burning is done with a more holistic view, under the philosophy of "reciprocal restoration," meaning, as stewardship responsibilities to the land are fulfilled, those actions will in turn benefit the peoples who depend on those ecosystems (Long et al. 2021). Cultural burning is typically performed with a variety of objectives, such as landscape management, ecosystem and species biodiversity and health, transmission of environmental and cultural knowledge, ceremonies and spiritual wellbeing, a sense of place, and material services (i.e., food, medicine, plan materials, etc.). Extensive site preparation is typically carried out before a burn, and post-burn monitoring and additional cultural practices are a common factor of the land stewardship tradition (Long et al. 2021).

Impacts of Prescribed Fire and/or Cultural Burning on Communities

Prescribed burning produces smoke, which is composed of toxic particulate and gaseous pollutants, therefore, the California Air Resources Board (CARB) has smoke management guidelines to protect the health and welfare of Californians from the impacts of smoke (CARB 2001). Inappropriate management of prescribed fires can be bothersome to residents and can negatively affect community health. Smoke from burning vegetation produces air pollutants that are regulated by both the U.S. Environmental Protection Agency (EPA) and the state of California (EPA 2019). Additionally, smoke can increase ambient air pollution levels to a level that exceeds air quality standards (CARB 2003). Therefore, effective smoke management is a vital component of planning and conducting prescribed fires.

In addition, the NWCG released the NWCG Smoke Management Guide for Prescribed Fire in 2020 (NWCG 2020). This plan is designed to act as a guide to all those who use prescribed fire. Smoke management techniques, air quality regulations, public perception of prescribed fire, foundational science behind prescribed fire, modeling, smoke tools, air quality impacts, and more are all discussed in this plan. The document is meant to pair with NWCG's Interagency Prescribed Fire Planning and Implementation Procedures Guide for planning and addressing smoke when prescribed fire is used (NWCG 2020). To view the plan, please visit: https://www.nwcg.gov/sites/default/files/publications/pms420-3.pdf.

Management of Nonnative Plants

The California Department of Food and Agriculture (CDFA) maintains a list of noxious weeds rated from A to C based on the current degree of infestation of the species and the potential for eradication (CDFA 2021a). Fuel treatment approaches should always consider the potential for introduction or proliferation of invasive nonnative species as a result of management actions.

COHESIVE STRATEGY GOAL 2: FIRE-ADAPTED COMMUNITIES

Goal 2 of the Cohesive Strategy/Western Regional Action Plan is Fire-Adapted Communities: Human populations and infrastructure can withstand a wildfire without loss of life and property. The basic premise of this goal is:

> *"Preventing or minimizing the loss of life and property due to wildfire requires a combination of thorough pre-fire planning and action, followed by prudent and immediate response during a wildfire*

> *event. Post-fire activities can also speed community recovery efforts and help limit the long-term effects and costs of wildfire. CWPPs should identify high-risk areas and actions residents can take to reduce their risk. Fuels treatments in and near communities can provide buffer zones to protect structures, important community values and evacuation routes. Collaboration, self-sufficiency, acceptance of the risks and consequences of actions (or non-action), assisting those who need assistance (such as the elderly), and encouraging cultural and behavioral changes regarding fire and fire protection are important concepts. Attention will be paid to values to be protected in the middle ground (lands between the community and the forest) including watersheds, viewsheds, utility and transportation corridors, cultural and historic values, etc."* (WRSC 2013:15).

In this CWPP, recommendations for fire-adapted communities include public education and outreach actions and actions to reduce structural ignitability.

RECOMMENDATIONS FOR PUBLIC EDUCATION AND OUTREACH

Just as environmental hazards need to be mitigated to reduce the risk of fire loss, so do human hazards. Lack of knowledge, lack of positive actions (e.g., failing to create adequate defensible space), and negative actions (e.g., keeping leaf litter and exposed propane tanks close to structures) all contribute to increased risk of loss in the WUI.

Most residents in the WUI understand the risk that wildfire poses to their communities. However, it is important to continuously engage the community as a partner in order to expand wildfire mitigation options across land ownership (McCaffrey 2004, 2020; McCaffrey and Olsen 2012; Winter and Fried 2000).

Methods to bolster public education could include increasing awareness about fire department response and resource needs; future workshops and demonstration sites showing Firewise landscaping techniques or fuels treatment projects; organizing community cleanups to remove green waste; publicizing availability of government funds for treatments on private land; and, most importantly, improving communication between homeowners and local land management agencies to improve and build trust, particularly since the implementation of fuel treatments and better maintenance of existing treatments needs to occur in the interface between public and private land.

The Three Rivers Fire Safe Council is actively engaged in promoting public education throughout Three Rivers as a means to mitigate wildfire risk. Its website contains links to current fire incident information, warnings and notices issued by the county, fire danger ratings, and notification system sign up links. The CWPP hub site and story map is also a platform for information and links to official sites for active wildfires. The public are reminded to always seek official sources for all active fire information.

The Council also offers various educational resources such as brochures on hardened homes and defensible space, evacuation guides, disaster readiness guides, and home evaluation guides. Additionally, the Three Rivers Fire Safe Council implements local projects such as community chipping days, volunteer crews to assist elderly, disabled and low-income residents with defensible space clearing, and assistance with home ignition zone treatments (Three Rivers Fire Safe Council 2022). The Three Rivers Fire Safe Council has been actively promoting the CWPP during the planning process (Figure 4.8)

The TCFD also carries out many public outreach activities throughout the area, including a juvenile fire-setters program, a smoke alarm distribution and installation program, community first aid and CPR, NFPA Firewatch, Sparky the Dog, and other programs, which pair with public schools at various grade levels (TCFD 2021d), green waste cleanup, go-bag information and materials, and other public workshops. The fire department and fire safe council are both great resources for information and contacts regarding

wildfire mitigation and wildfire prevention. Detailed information regarding public education programs is provided in Appendix A.

CAL FIRE TUU also has a fire prevention program that includes an education element. The education element comprises activities such as yearly school visits (first through third grade), fire prevention floats in community parades, face to face education at the fire stations, collaboration with local Fire Safe Councils, fire prevention signage in key locations, displays at the Tulare County Fair, and participation in other community events (CAL FIRE TUU 2021). Figure 4.9 shows firefighter support and appreciation by community residents during the KNP Complex Fire.

Please see Appendix G for a list of educational resources.

Table 4.4 lists public education and outreach projects recommended for implementation in the planning area.

Figure 4.8. Public meeting with SWCA and the Three Rivers Fire Safe Council.

Figure 4.9. Firefighter support shown by residents, including those in Three Rivers.
Source: SEKI NPs

RECOMMENDATIONS FOR REDUCING STRUCTURAL IGNITABILITY

Table 4.4 provides a list of community-based recommendations to reduce structural ignitability that should be implemented throughout the Three Rivers CWPP planning area. Reduction of structural ignitability depends largely on public education that provides homeowners the information they need to take responsibility for protecting their own properties. A list of action items that individual homeowners can follow is provided below. Carrying out fuels reduction treatments on public land may only be effective in reducing fire risk to some communities; if homeowners fail to provide mitigation efforts on their own land, the risk of home ignition remains high, and firefighter lives are put at risk when they carry out structural defense.

Preparing for wildland fire by creating defensible space around the home is an effective strategy for reducing structural ignitability as discussed under Cohesive Strategy Goal 1: Resilient Landscapes. Studies have shown that burning vegetation beyond 120 feet of a structure is unlikely to ignite that property through radiant heat (Butler and Cohen 1996), but fire bands that travel independently of the flaming front have been known to destroy houses that had not been impacted by direct flame impingement. Hardening the home to prevent ignition from embers, including maintaining vent coverings and other openings, is also strongly advised to protect a home from structural ignitability. Managing the landscape around a structure by removing weeds and debris within a 30-foot radius and keeping the roof and gutters of a home clean are two maintenance measures proven to limit combustible materials that could provide an ember bed and ignite the structure. In essence, reducing structural ignitability and creating defensible space are key for protecting from the potential loss and damage due to intense wildfires such as the recent KNP Complex and Windy fires in and around the planning area.

SRA Fire Safe Regulations & California Fire Code: The 2012 Tulare County General Plan (Tulare County RMA 2012) requires that new development in high or very high fire hazard severity zones be planned and constructed in a way that reduces the risk from fire hazards and meets California Fire Code

and SRA Fire Safe Regulations standards. These policies establish minimum standards for the protection of life and property by increasing the ability of a home/building located in any high fire hazard area to resist the intrusion of flames or embers released by a vegetation fire (Tulare County RMA 2012).

Assembly Bill 38: Assembly Bill 38 (2019) amended sections of the Civil, Government, and Public Resources Codes to set forth a comprehensive wildfire mitigation financial support program, which facilitates cost-effective home/structure hardening and retrofitting to create fire-resistant homes, businesses, and public structures. The amendments require the State Fire Marshal, in consultation with the Director of Forestry and Fire Protection and the Director of Housing and Community Development, to identify building retrofits and hardening measures eligible for financial assistance under the program. Additionally, the amendments require that CAL FIRE identify defensible space, vegetation management, and fuel treatment procedures eligible for financial assistance. Wildfire hazard areas eligible for financial assistance under the program include LRAs situated within very high fire hazard severity zones and SRAs within any fire hazard severity zone (OPR 2020).

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Table 4.4. Recommendations for Fire-Adapted Communities (Structural Ignitability and Public Education and Outreach)

Symbol Key:

- = Aligns with goals from the 2017 Tulare MJHMP
- = Aligns with goals from the 2018 Tulare MJHMP
- = Aligns with goals from the 2021 Tulare Fire Unit Plan
- = Aligns with goals from the California Strategic Fire Plan

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 1	Identify vulnerable populations located in the WUI	H	Ongoing	Prioritize high risk areas	Fire department, HOAs, community leaders	• The FSC needs to identify vulnerable populations (elderly, disabled, low income) who may need additional help to mitigate home hazards and to evacuate during a wildfire. • Seek grant opportunities to support assistance for vulnerable populations, including ability to provide vegetation management and hazardous fuel treatments for vulnerable populations who are limited in their ability to carry out fuel mitigations. • Flag vulnerable home addresses as priority locations for first responders. Build on the ongoing work of Aging in the Community. The County works with this group to help identify vulnerable individuals because fire response may need to vary for those individuals. • Remind the public that they are responsible for self-identifying as a vulnerable member of the population. • Identify homes to be worked on by Team Rubicon • Encourage neighbors helping neighbors. • Address potential foreign language barriers.	Protect life and property of the most vulnerable members of the community.	Spring of 2022	• Annual review of number of actions taken to address vulnerable populations • Monitor grant opportunities to provide long term support.	• Building Resilient Infrastructure and Communities (BRIC) • Firewise Grants • California Department Forestry and Fire Protection (CAL FIRE) Grant Programs • California Climate Investments Fire Prevention Grant Program (CAL FIRE) • California Fire Safe Council Grant Programs • National Urban and Community Forestry Challenge Cost Share Grant Program
FAC # 2	Identify evacuation route fuel treatments adjacent to roads	H		All communities where appropriate. Prioritize high risk areas based on risk assessment and roads analysis (Figures 3.6 & 3.7)	Fire department, GIS, maintenance services	• Identify road segments in the roads analysis that may require road improvements or adjacent treatments to improve protections for safe ingress and egress. • Identify parcel-owners along primary evacuation routes. Engage owners in discussion regarding risk and mitigation actions.	Protect life and lessen high risk fire behavior. Reduce fire behavior along important travel routes used for ingress by emergency vehicles and egress by residents.	Spring of 2022	• Annual maintenance	• BRIC • Fire Management Assistance Grant (FMAG) • National Fire Plan (NFP) • State Farm Good Neighbor Citizenship (GNC) Grants • National Forest Foundation (NFF); Innovative Finance for National Forests Grant Program • Emergency Forest Restoration Program (EFRP) • CAL FIRE Grant Programs
FAC # 3	Create robust program/dashboard to track, maintain, and prioritize wildfire mitigation projects	H		Prioritize high risk areas.	Fire department, FSC, GIS, IT	• Create a program for tracking the completion of wildfire mitigation projects. • Redesign website to make wildfire education more prominent and emphasize the importance of mitigation actions. • Utilize the story map as a one-stop-shop for all wildfire mitigation. • Utilize Survey 123 technology for tracking accomplishments.	Reduce wildfire risk through wildfire mitigation projects in the FSC.	Spring of 2026	• Annual assessment of program success.	• Conservation Innovation Grants (CIG) • Firewise Grants • National Interagency Fire Center (NIFC) • CAL FIRE Grants Programs

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 4	Improve enforcement of Defensible Space Standards	H		Prioritize high risk areas as delineated in the risk assessment	Fire department, HOAs, private landowners	• Work with CAL FIRE and the Tulare County fire department to educate residents about PRC Section 4291-mandatory defensible space requirements (see Appendix A) and the defensible space inspection program carried out by CAL FIRE (LE-100a, see Appendix E) and provide information to ensure residents know what actions need to be taken to pass inspections in SRA and very high fire hazard severity zones in LRAs. • Improve enforcement of the WUI code - the code applies only to new construction and requires that structures meet the parameters of the code to secure building permits. • Ensure all new construction in areas with high or very high fire hazard meet applicable building standards and are designed to minimize risk from fire. • Inspect for water tanks in homes built after 1980. • Discourage construction on slopes in excess of 30% (Adopted from 2018 MJLHMP). • Use education campaign to encourage WUI code actions even for those properties that are not required to adhere to it. • Develop staffing plan to support enforcement and seek funding to implement the plan. • Educate homeowners on real actions that could mitigate their wildfire hazard and risk. • Provide tax incentives for defensible space actions. • Work with insurance companies to determine the potential to provide incentives for defensible space associated with reduced insurance premiums. • Increase green waste pickup/disposal options.	Reduce loss of life and structures through defensible space.	Spring of 2024	• Annual program evaluation and updates as necessary.	• Firewise Grants • CAL FIRE Grant Programs • GNC Grants • FP&S • EPA Environmental Education Grants
FAC# 5	Increase staffing to address wildfire mitigation workload	H		Prioritize understaffed programs that provide the most impact.	Fire department, FSC administration and finance	• Create a full-time position at the County to focus on wildfire mitigation, community relations, community education, coordinating with resident groups and implanting actionable items. Liaise closely with the FSC. • Pursue continuous and repeat interactions with residents.	Reduce wildfire risk through greater capacity in the FSC for wildfire projects.	Spring of 2025	• Annual assessment of capacity needs.	• EMPG • Regional Catastrophic Preparedness (RCP) Grants • Firewise Grants • CAL FIRE Grant Programs
FAC # 6	Improve agency coordination of outreach for both private and public groups	H		Three Rivers	All agencies, insurance brokers	• Agency-coordinated meeting to ensure a consistent message. • Platform for raising cross-boundary issues. ○ Utilize the story map where appropriate for interagency communications and messaging. • Engaging insurance agency in dialogue. • Provide incentives for mitigation actions.	Provide a consistent message regarding wildfire activity, fire prevention goals, actions for homeowners. Reduce redundancy and improve efficiency. Align insurance company requirements with FSC/County codes and ordinances. Possible incentives of homes that have completed wildfire mitigation (AB 38).	Spring of 2025	• Annual agency coordination meeting to assess priorities and action items.	• Firewise grants • California Fire Safe Council Grant Programs • CAL FIRE Grant Programs • RCP • EMPG

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources

FAC # 7	Improve sustainability of mitigation actions by residents	H		Focus on highest risk areas as identified in the risk assessment	All agencies	• Encourage engagement in mitigation actions and sustain engagement.
						• To do this, entities should:
						  ○ Provide recognition and incentives
						  ○ Assist and facilitate actions by providing services for treating and removing slash
						  ○ Identify barriers to engagement and address
						  ○ Work with vendors and industry providers to host raffles
						  ○ Educate industry providers so they can make informed recommendations.
						• Track progress and identify areas requiring support
							Increase sustainability for mitigation actions and combat fatigue amongst residents.	Spring of 2025	• Annual evaluation of program effectiveness and updates as necessary.
									• Accomplishment tracking through the story map.
									• Regularly update content to keep messaging fresh and relevant.
										• BRIC
										• Firewise Grants
										• CAL FIRE Grant Programs EPA Environmental Education Grants
										• National Urban and Community Forestry Challenge Cost Share Grant Program

FAC # 8	Implement Community events focused on populations at risk	H		Focus on highest threat areas as identified in the risk assessment	Fire department, community service groups.	• Regional chipper program. • A community-led day of yard cleanup with fire mitigation in mind may encourage large numbers within the community to carry out mitigation measures and implement defensible space. • Residents would assist elderly, disabled, or vulnerable residents.	Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	Spring of 2025	• Annual review of number of events implemented. • Set goals for next year.	• BRIC • Firewise Grants • CAL FIRE Grant Programs • FP&S • National Urban and Community Forestry Challenge Cost Share Grant Program • GNC Grants

FAC # 9	Increase Firewise/ Ready Set Go! Workshops	H		Private land, HOAs
				Focus on highest threat areas as identified in the risk assessment
					HOAs, fire department	• Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce ignitability of common structural elements.
						  ○ Home assessments conducted in a neighborhood often include groups of neighbors participating with the assessor to learn from each other's homes. Homeowners get a better understanding by viewing a home other than their own and feel more comfortable asking questions as a group.
						  ○ Can be requested by an HOA.
						• Utilize a train-the-trainer model. Develop a team of trained citizens that could perform hazard assessments within their community. Seek funding to pay volunteer fire departments to assist.
						• The FSC can provide home hardening and defensible space assessments.
						• Be sure to clarify that home hazard assessments by volunteers and FSC personnel are different from county and state required inspections.
						• Utilize the LE-100a defensible space assessment form to help educate residents on requirements (Appendix E).
						• Ready, Set, Go! Literature is provided to homeowners during assessments.
							Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	Spring of 2025	• Annual review of number of events implemented.
									• Set goals for next year.
										• BRIC
										• Firewise Grants
										• CAL FIRE Grant Programs
										• FP&S
										• EPA Environmental Education Grants
										• EFRP

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 10	Educate the public on how to mitigate risk and damage from wildfire	H		All communities where appropriate. Prioritize highest threat areas as identified in the risk assessment	Fire department, community development and FSC Information Team, HOAs, private landowners	• Increase education through community training classes as well as YouTube videos on defensible space, fire safe landscaping, structural hardening components, and WUI building construction requirements. • Firesafe Council to engage new homeowners/renters to promote fire education for property residents, even if temporary. • Create wildfire education documents to distribute. • Work with fire departments to create a checklist of what responders look for during triage so the public can see what responders look for. • Create education material on evacuations. • Educate the public on outdated home maintenance, such as updating old electrical systems, to reduce risk of ignition. • Advertise to residents that reflective address markers are still available from CAL FIRE as part of response to Bill 4391. • Focus on events that draw all populations from the region with a focus on populations at risk. • Ensure that all interactions result in follow up engagement by collecting contact information for residents interested in action. • Provide a printed list of mitigation measures to homeowners. Utilize Ready, Set, GO! Literature. Utilize list of actions broken down by cost. • Use existing signage to spread seasonally adjusted fire prevention messages along highways and in public open space areas to reduce human ignitions. • Promote the use of existing electronic signs at firehouses and other locales to display fire prevention information, safety messages, and fire danger ratings linked to safety actions.	Reduce wildfire risk through community action. Protect communities and infrastructure by raising awareness of local citizens and those traveling in the area about actions that can prevent fires.	Spring of 2024	• Yearly updates to materials	• BRIC • Firewise Grants • FP&S • CAL FIRE Grant Programs • EPA Environmental Education Grants

FAC # 11	Develop a youth FSC	H		Three Rivers	FSC	• Initial steps are being taken by the FSC to develop this program, and resources should be sought to continue to support its development. Would be the first program in the state and a great achievement for the FSC.
						• Engage the schools:
						  ○ Fire awareness assembly
						  ○ Integrate fire prevention into the science track
						• Engage college age individuals:
						  ○ Fire awareness seminars or table events
						  ○ Bring in guest speakers during lectures.
						  ○ Inform students on careers related to wildfire.
						• If there is a language barrier and the children speak English, they can share the information with their parents.
							Reduce wildfire risk through community action.
							Initiate fire prevention and mitigation habits at a young age.
								Spring of 2024	• Review status during FSC standing meetings	• Firewise Grants
										• CAL FIRE Grant Programs
										• FP&S
										• California Fire Safe Council Grant Programs
										• Environmental Education Grants

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources

FAC # 12	Identify priority ignition concerns	M		Three Rivers	Public agencies, fire department, Department of Emergency Management	• Utilize fire history data to identify areas with frequent fire starts and develop strategy to reduce incidence of ignitions.
						• Convene a working group to develop strategies to reduce human starts:
						  ○ Education campaign
						  ○ Signage
						  ○ Fire response plans
						  ○ Law enforcement
						  ○ Install long-term fire-pit locations in parks to prevent people from building them in a variety of locations.
						  ○ Education campaign and installation of signage in high-risk areas to address vehicle related starts-dragging chains/catalytic converters.
							Reduce unnecessary ignition through unlawful or irresponsible behavior.	Spring of 2025	• Annual evaluation of priority ignition concerns.
									• 5-year re-run of risk assessment to determine success in mitigating hazards.
									• Review fire history data on a 2-year frequency to monitor trends.
										• BRIC
										• Emergency Management Performance Grant (EMPG)
										• Firewise Grants
										• Fire Prevention and Safety (FP&S) Grants
										• Environmental Protection Agency (EPA) Grant Programs

FAC # 13	Identify wildfire risk reduction through mitigation projects	M		Prioritize high risk areas.	Fire department, community development, GIS, IT	• Support the existing vegetation management program. • Use the risk assessment and identified priority projects in the CWPP for implementation. • Outreach to HOAs; identify existing fuel treatment and assist in planning and prioritizing where new treatments or existing treatments, such as defensible space, would be effective.	Reduce wildfire risk through fuels reduction.	Spring of 2025	• Annual fuels reduction planning coordination.	• BRIC • Hazard Mitigation Grant Program (HMGP)/HMGP – Post Fire • Fire Management Assistance Grant (FMAG) • National Urban and Community Forestry Challenge Cost Share Grant Program • CAL FIRE Grant Programs
FAC # 14	Increase structural hardening: although newer construction is built to current standards, there is a large percentage of construction prior to 2008 and the WUI code that exists within the FSC	M		Prioritize high risk areas as delineated in the risk assessment	Fire department, CAL FIRE, HOAs	• Work with CAL FIRE and the Tulare County fire department to educate residents about PRC Section 4291 revision to require ember-resistant zone within 5 feet of home/structure (see Appendix A). • Continue to develop and adopt the latest building standards and codes. • Retrofit existing structures. • Research and utilize new laws to help with retrofits. • Opportunities for tax breaks to harden your home. • Surveys sent to homeowners to inform the fire department and other groups about public perceptions of risk, as well as priority areas in which to focus efforts. • Firesafe Council to engage new homeowners/renters to promote fire education for property residents. • Open a line of dialogue between the fire department and residents regarding actions they can take to reduce their wildfire risk. Utilize the story map for two-way communication and engagement.	Reduce wildfire risk and loss of structures through home hardening and community education.	Spring of 2027	• Annual updates to standards as necessary.	• BRIC • Firewise Grants • EPA Environmental Education Grants • CAL FIRE Grant Programs
FAC # 15	Seek Firewise Community Certification for Three Rivers	M		Three Rivers	FSC	• Work with Firewise USA and the CA FSC to initiate the process of Firewise certification. • Engage local, county and state stakeholders.	Reduce wildfire risk through community action.	Spring of 2024	• Review status during FSC standing meetings	• Firewise Grants • California Fire Safe Council Grant Programs
FAC # 16	Implement Tulare 2018 MJHMP action: Engage the entire community and develop a County-wide drought response plan to respond to period of prolonged dry weather	M		County-wide	All agencies	• Convene an interagency group of experts to move this planning project along as identified in the MJHMP. • Incorporate modeling of fire behavior under drought scenarios. • Utilize plan to support forest health treatments and emphasize projects that also serve to reduce hazardous fuels.	Improve planning for landscape resilience under a changing climate.	Spring of 2027	• Interagency check-ins to discuss progress of planning	• BRIC • Emergency Conservation Program (ECP) • Environmental Quality Incentives Program (EQIP) • CIG • RCP

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 17	Set up a unified messaging system for fire information	H		County-wide	All agencies	• It is critical to have a single combined message, especially during evacuation and active fires. • The main Public Information Officer is assigned based on the agency lead for the fire. The public needs to understand that messaging may come from different agencies. • Information from the Public Information Officer should be shared by all agencies to avoid confusion. • Public education is needed to direct residents to the official sources for accurate fire information, not the FSC. • Clarify in social media posts that all fire information should be gathered from official sources only. The FSC can rebroadcast but is not always able to provide the most up-to-date information.	Enhance protection of life safety through careful coordination of messaging.	Spring 2023	• Annual updates to approach as needed	• California Fire Safe Council Grant Programs. • Fire Management Assistance Grant (FMAG) • CAL FIRE Grants Program • EPA Environmental Education Grants

Action Items for Homeowners to Reduce Structural Ignitability

Low or No Cost Investment (<$50)	Regularly check fire extinguishers and have a 100-foot hose available to wet perimeter.
	Maintain defensible space for 30 feet around home. Work with neighbors to provide adequate fuels mitigation in the event of overlapping property boundaries.
	Make every effort to keep lawn mowed and green during fire season.
	Screen vents with non-combustible meshing with mesh opening not to exceed nominal ¼-inch size.
	Ensure that house numbers are easily viewed from the street.
	Keep wooden fence perimeters free of dry leaves and combustible materials. If possible, non-combustible material should link the house and the fence.
	Keep gutters free of vegetative litter. Gutters can act as collecting points for fire brands and ashes.
	Store combustible materials (firewood, propane tanks, grills) away from the house; in shed, if available.
	Clear out materials from under decks and/or stacked against the structure. Stack firewood at least 30 feet from the home, if possible.
	Reduce your workload by considering local weather patterns. Because prevailing winds in the area are often from the west-southwest, consider mitigating hazards on the west corner of your property first, then work around to cover the entire area.
	Seal up any gaps in roofing material and enclose gaps that could allow fire brands to enter under the roof tiles or shingles.
	Remove flammable materials from around propane tanks.
Minimal Investment (<$250)	When landscaping in the home ignition zone (HIZ) (approximately 30 feet around the property), select non-combustible plants, lawn furniture, and landscaping material. Combustible plant material like junipers and ornamental conifers should be pruned and kept away from siding. If possible, trees should be planted in islands and no closer than 10 feet to the house. Tree crowns should have a spacing of at least 18 feet when within the HIZ. Vegetation at the greatest distance from the structure and closest to wildland fuels should be carefully trimmed and pruned to reduce ladder fuels, and density should be reduced with approximately 6-foot spacing between trees crowns.
	Box in eaves, attic ventilation, and crawl spaces with non-combustible material.
	Work on mitigating hazards on adjoining structures. Sheds, garages, barns, etc., can act as ignition points to your home.
	Enclose open space underneath permanently located manufactured homes using non-combustible skirting.
	Clear and thin vegetation along driveways and access roads so they can act as a safe evacuation route and allow emergency responders to access the home.
	Purchase or use a National Oceanic and Atmospheric Administration weather alert radio to hear fire weather announcements.

Moderate to High Investment (>$250)	Construct a non-combustible wall or barrier between your property and wildland fuels. This could be particularly effective at mitigating the effect of radiant heat and fire spread where 30 feet of defensible space is not available around the structure.
	Construct or retrofit overhanging projections with heavy timber that is less combustible.
	Replace exterior windows and skylights with tempered glass or multilayered glazed panels.
	Invest in updating your roof to non-combustible construction. Look for materials that have been treated and given a fire-resistant roof classification of Class A. Wood materials are highly combustible unless they have gone through a pressure-impregnation fire-retardant process.
	Construct a gravel turnaround in your driveway to improve access and mobilization of fire responders.
	Treat construction materials with fire-retardant chemicals.
	Install a roof irrigation system.
	Replace wood or vinyl siding with nonflammable materials.
	Relocate propane tanks underground.

COHESIVE STRATEGY GOAL 3: WILDFIRE RESPONSE

Goal 3 of the Cohesive Strategy/Western Regional Action Plan is Wildfire Response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions:

> *"A balanced wildfire response requires integrated pre-fire planning with effective, efficient, and coordinated emergency response. Pre-fire planning helps tailor responses to wildfires across jurisdictions and landscape units that have different uses and management objectives. Improved prediction and understanding of weather, burning conditions, and various contingencies during wildfire events can improve firefighting effectiveness, thereby reducing losses and minimizing risks to firefighter and public health and safety. Wildfire response capability will consider the responsibilities identified in the Federal Response Framework. Local fire districts and municipalities with statutory responsibility for wildland fire response are not fully represented throughout the existing wildland fire governance structure, particularly at the NWCG, NMAC, and GACC levels."* (WRSC 2013:15).

This section provides recommended actions that jurisdictions could undertake to improve wildfire response.

RECOMMENDATIONS FOR IMPROVING FIRE RESPONSE CAPABILITIES

Educating the public so they can reduce dependence on fire departments is essential because these resources are often stretched thin due to limited personnel. Education to enhance community preparedness is a key factor in supporting local fire departments in fire response, particularly educating residents about emergency notifications and evacuation protocols so that residents can safely evacuate an area while emergency responders prepare to protect life and property.

Table 4.5 provides recommendations for improving firefighting capabilities.

Table 4.5. Recommendations for Safe and Effective Wildfire Response

Symbol Key:

- = Aligns with goals from the 2017 Tulare MJHMP
- = Aligns with goals from the 2018 Tulare MJHMP
- = Aligns with goals from the 2021 Tulare Fire Unit Plan
- = Aligns with goals from the California Strategic Fire Plan

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FR # 1	Develop a coordinated approach between the fire department and water district to identify needed improvements to the water distribution system	H		Initially focus on areas of highest wildfire hazard as determined in the risk assessment and areas with limited water pressure or no existing water supply	County fire department	• Initiate a detailed study of feasible locations for water development improvements. • Install hand pumps or other methods independent of the grid for accessing private well water.	Improve fire-fighting response if water is more readily available or closest locations could be identified on a GIS map on a tablet/computer. Alleviates public and agency concern for limited water supply in some WUI areas.	Spring of 2024	• Convene annually • Document number of meetings held • Document number of actions taken	• Firewise Grants • Building Resilient Infrastructure and Communities (BRIC) • California Department of Forestry and Fire Protection (CAL FIRE) Grant Programs • Regional Catastrophic Preparedness (RCP) Grants • Northern California Forests and Watersheds Program • State of CA Grants portal

FR # 2	Develop strategies to enhance safe wildfire response in areas with poor ingress and egress	H		Areas of high risk as delineated by the risk assessment	Fire departments	• Utilize the roads analysis to identify areas requiring road maintenance improvements, new egress points, or development of response plans.
						• Roadway improvements:
						  ○ While increasing roadway width is not feasible in many locations, creating passing areas where possible should be prioritized
						  ○ Grade and maintain roads to reduce hazards to emergency apparatus (potholes and poor surfacing)
						• Identify alternative apparatus for access into narrow areas.
						• Identify potential areas that threaten entrapment of response crews and develop response plans and/or safety zones.
						• Map all weak bridges and develop alternative ingress/egress or response plan.
						• Identify areas with limited all-weather access and develop response plan.
						• Work with HOAs and Community Associations to address locked gates and access concerns.
							Improve fire-fighting response on narrow or sinuous road systems	Spring of 2024	• Update strategies as the developed environment changes.	• The Fire Prevention and Safety Grants (FP&S)
										• BRIC
										• Firewise Grants
										• Hazard Mitigation Grant Program (HMGP)/HMGP – Post Fire
										• RCP Grants

FR # 3	Initiate an annual pre-fire coordinated training/wildland fire drills to improve communication between agencies	H		FSC and vicinity	All agencies	• Develop WUI pre-plans and accompanying evacuation plans for high-risk communities as identified in the risk assessment. • Implement mock evacuations on communities identified as high risk. • Develop protocols to address weaknesses.	Helps to identify resource needs. Helps to enhance fire response.	Spring of 2022	• At annual training set goals and review goals on a 6-month basis.	• FP&S • Assistance to Firefighters Grant (AFG) • RCP • Funding for Fire Departments and First Responders

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources

FR # 4	Develop and coordinate an online comprehensive emergency preparedness, response, and recovery plan for wildfire	H		FSC	Fire department, FSC, County Emergency Management	• Create an online dashboard for use by emergency management agency decision support.
						• Identify various evacuation centers and include details on the dashboard.
						• Dashboard would be created in a Story Map or "Hub" format and would include:
						  ○ Break dashboard into sections of the emergency management cycle: preparedness, response, recovery
						  ○ Identify roles and responsibilities for each agency/partner under each section of the cycle
						  ○ Include BMPs for each section of the cycle
						  ○ Include coordination plan for interagency communications before, during and after an event
						  ○ Include a tracking module to track actions needed and status
						  ○ Include a funding matrix to support implementation of actions
						  ○ Align actions as closely as possible with the County and State HMP
							Improve fire response and readiness	Summer of 2022	• Would be an active and live platform, updated in real time and reviewed on an annual basis	• BRIC
										• CAL FIRE Grant Programs
										• FP&S
										• Firewise Grants
										• RCP

FR # 5	Integrate lessons learned and after-action review contents from the KNP complex fire in the next Three Rivers CWPP update to improve future fire response capabilities	H		FSC and adjacent jurisdictions	All agencies	• When appropriate, convene a CWPP update Core Team. • During the process, integrate the Core Team's lessons learned from the KNP complex and other fires into the CWPP as new practices and recommendations. • Add these lessons learned into the Tulare County Local Hazard Mitigation Plan, the Tulare County CWPP, and the CAL FIRE Tulare Unit Plan.	Enhance wildfire response and intra-agency communication.	Next CWPP update	• Continual assessment of lessons learned post-fire for responders on all levels (municipal, state, federal, etc.)	• Internal budgets

FR # 6	Be proactive in addressing future wildfire challenges with climate change	M		FSC and adjacent jurisdictions	FSC, County, State, Federal	• Convene a working group tasked with the following:
						  ○ Assess impact of climate change on wildfire potential through modeling of fire behavior under various climate scenarios.
						  ○ Establish fuel treatment plans to mitigate climate related influences on wildfire risk in existing vegetation communities.
						  ○ Establish plans and build infrastructure for water supply needs to alleviate future drought emergencies.
							Enhance wildfire response as conditions change.	Spring of 2022	• Meet annually to review plans and assess status of wildfire risk.
									• Re-run the fire behavior analysis to determine change in wildfire risk.
										• BRIC
										• National Urban and Community Forestry Challenge
										• CAL FIRE Grant Programs
										• Leonardo DiCaprio Foundation Grants
										• Environmental Quality Incentives Program (EQIP)
										• Emergency Watershed Protection (EWP) Program
										• Conservation Innovation Grants (CIG)

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FR # 7	In approving new facilities, such as nursing homes, housing for the elderly and other housing for the mentally and physically infirm, to the extent possible, ensure that such facilities are located within reasonable distance of fire and law enforcement stations Identify locations of seniors and disabled persons so that wildfire mitigation, wildfire response, and evacuation information can be provided for them.	M		Three Rivers	County	• Compile database or mailing list of seniors and disabled persons. All persons must self-identify. • Provide wildfire mitigation and response assistance to seniors and disabled community members. • Structure hardening • Creating defensible space • Evacuation planning • Evacuation assistance • Team with Aging in Community to compile database.	Protect at-risk community members		• Update mailing list annually • Meet with senior or disabled community members. • Have a representative community member conduct in-person outreach efforts to seniors or disabled individuals to assess their homes' structural susceptibility to wildfire and emphasize evacuation planning.	• California Fire Safe Council. • BRIC • Firewise Grants • CAL FIRE Grants Program

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POST-FIRE RESPONSE AND REHABILITATION

The recent increase in severe fires has highlighted the numerous complexities of post-fire response. While post-fire response and rehabilitation is not a specific goal of the Cohesive Strategy, it is important to consider given the impact that recovery has on communities after wildfire. Specifically, research indicates that high-severity burn areas may produce erosion and runoff rates 5 to 10 times higher than the rates produced by moderate-severity burn areas (Sierra Nevada Conservancy 2021). Following a fire, heavy rains may result in widespread floods carrying trees, boulders, and soil through canyons, ultimately damaging communities and critical infrastructure. However, significant flooding events in the planning area are rare (Tulare County RMA 2012).

Recent fires that have caused high-severity burns in and nearby the planning area include the Castle Fire and KNP Complex Fire. However, since the areas with high-severity burns have been relatively small, only minor debris flows have occurred. Yet, these small debris flows, and the threat of larger ones, have prompted the closure of recreation and wilderness areas, highways, and roads within the Sequoia NF and the SEKI NPs (NPS 2021f).

There are many facets to post-fire recovery, including but not limited to:

- Ensuring public health and safety—prompt removal of downed and hazard trees, addressing watershed damage, and mitigating potential flooding.
- Rebuilding communities and assessing economic needs—securing the financial resources necessary for communities to rebuild homes, business, and infrastructure.
- Restoring the damaged landscape—restoration of watersheds, soil stabilization, and tree planting.
- Reducing fire risk in the future—identifying hazard areas and implementing mitigation.
- Prioritizing the needs of vulnerable and disadvantaged communities during response and disaster recovery efforts.
- Reducing post-fire recovery time by replanting native species.
- Ensuring fire protection measures enhance sustainability of restoration projects, e.g., introducing prescribed fire to a fire-dependent ecosystem where fire had previously been excluded.
- Retaining downed logs for erosion control and habitat maintenance.
- Evaluating and updating disaster recovery plans every 5 years to respond to changing needs and characteristics of the community.
- Coordinating with planning, housing, health and human services, and other local, regional, or state agencies to develop contingency plans for meeting short-term, temporary housing needs of those displaced during a catastrophic wildfire event. In the event of a large fire, the County Health and Human Services will establish a post-fire task force to support displaced residents or residents who need to address damage to property.
- Incorporating forecasted impacts from climate change intro trends and projections of future risk and consideration of policies to address identified risk.
- Updating codes and ordinances to specify procedures and standards for planning and permitting the reconstruction of buildings destroyed by wildfire.

POST-FIRE REHABILITATION AND RESOURCES

Wildfires that cause extensive damage necessitate dedicated efforts to address post-fire impacts. Following a fire, the primary priority is emergency stabilization to prevent additional damage to life, property, or natural resources. Loss of vegetation increases soil susceptibility to erosion; water runoff may increase and lead to flooding; sediments and debris may be transported downstream and damage properties or saturate reservoirs putting endangered species and water reserves at risk (USFS 2021a). Therefore, soil stabilization work must begin immediately and requires planning as this work may last for up to a year or more. For the most part, rehabilitation efforts should focus on areas not likely to recover naturally from wildfire damage without intervention (USFS 2021a).

The USFS's post-fire emergency stabilization program is called the Burned Area Emergency Response (BAER) program. The goal of the BAER program is to discover post-wildfire threats to human life and safety, property, and critical natural or cultural resources on USFS land and take appropriate actions to mitigate unacceptable risks (USFS 2021b). BAER groups are composed of trained professionals in different fields: soil scientists, engineers, hydrologists, biologists, botanists, archaeologists, and others who quickly assess the burned area and advise emergency stabilization treatments (USFS 2021b).

The Natural Resources Conservation Service (NRCS) Emergency Watershed Protection (EWP) program provides technical and financial services for watershed repair on **public (state and local) and private land**. The goal is reduced flood risk via funding and expert advice regarding land treatments. The EWP program can provide up to 75% of funds; remaining funds can be paid with in-kind volunteer labor (Coalition for the Upper South Platte [CUSP] 2016). This funding is used by the State Emergency Rehabilitation (a multiagency group assembled by the NRCS) to develop specific recovery and treatment plans.

Examples of potential treatments include (USFS 2021b):

- Hillside stabilization (for example, placing bundles of straw parallel to the slope to slow erosion)
- Hazard tree cutting
- Felling trees perpendicular to the slope contour to reduce runoff
- Mulching areas seeded with native vegetation
- Stream enhancements and construction of catchments to control erosion, runoff, and debris flows
- Planting or seeding native species to limit spread of invasive species

The USFS provides a science-based framework to guide post-fire restoration efforts in National Forest land in California. The framework is based on a five-step process that leads to the development of a restoration portfolio that can inform project planning and monitoring (USFS 2021b). The framework is available at: https://www.fs.fed.us/psw/publications/documents/psw_gtr270/psw_gtr270.pdf

A comparison of potential hillside, channel, and road treatments is available at: https://www.afterwildfirenm.org/post-fire-treatments/which-treatment-do-i-use.

Specific Treatment Details

Hillslope Treatments

Cover Applications:

- Dry mulch provides immediate ground cover with mulch to reduce erosion and downstream flow.
- Wet mulch (hydromulch) provides immediate cover to hold moisture and seeds on slopes using a combination of organic fibers, glue, suspension agents, and seeds (most effective on inaccessible slopes).
- Slash spreading trees felled and woody debris spread to provide ground cover and reduce erosion in in burned areas.
- Seeding reduces soil erosion over time with an application of native seed mixtures (most successful in combination with mulching). Breaking up and loosening topsoil to break down the hydrophobic layer on top of the soil is also effective.

Erosion Barrier Applications:

- Erosion control mat: organic mats staked on the soil surface to provide stability for vegetation establishment.
- Log erosion barrier: trees felled perpendicular to the hillslope to slow runoff.
- Fiber rolls (wattles): rolls placed perpendicular to the hillslope to reduce surface flows and reduce erosion.
- Silt fencing: permeable fabric fencing installed parallel to the slope contour to trap sediment as water flows down the hillslope.

Channel Treatments

- Check dam: a small dam built to trap and store sediment in stream channels.
- In-channel tree felling: felling trees in a staggered pattern in a channel to trap debris and sediment.
- Grade stabilizer: structures made of natural materials placed in ephemeral channels for stabilization.
- Stream bank armoring: reinforcing streambanks with natural materials to reduce bank cutting during stream flow.
- Channel deflector: an engineered structure to direct flow away from unstable banks or nearby roads.
- Debris basin: constructed to store large amounts of sediment moving in a stream channel.

Road and Trail Treatments

- Outsloping and rolling dips (water bars) alter the road shape or template to disperse water and reduce erosion.
- Overflow structures protect the road by controlling runoff and diverting stream flow to constructed channels.

- Low water stream crossing: culverts replaced by natural fords to prevent stream diversion and keep water in the natural channel.
- Culvert modification: upgrading culvert size to prevent road damage.
- Debris rack and deflectors: structure placed in a stream channel to collect debris before reaching a culvert.
- Riser pipes filter out debris and allow the passage of water in stream channels.
- Catchment-basin cleanout: using machinery to clean debris and sediment out of stream channels and catchment basins.
- Trail stabilization: constructing water bars and spillways to provide drainage away from the trail surface.

These treatments and descriptions are further detailed at: https://afterwildfirenm.org/post-fire-treatments/treatment-descriptions

For more information about how to install and build treatments, see the Wildfire Restoration Handbook at: https://www.rmfi.org/sites/default/files/hero-content-files/Fire-Restoration-HandbookDraft_2015_2.compressed_0.pdf.

Timber Salvage

Timber harvest on private land is regulated by the California Forest Practice Rules, which provide for the protection of all resources during the harvest process. A private landowner should contact a local Registered Professional Forester, a sawmill, or CAL FIRE for information. Several programs are in place to assist landowners with timber salvage, reforestation, and rehabilitation, including CAL FIRE's California Forest Improvement Plan, and the NRCS's Environmental Quality Incentives Program.

Invasive Species Management and Native Revegetation

Wildfire provides opportunity for many invasive species to dominate the landscape because many of these species thrive on recently burned landscapes. It is imperative that landowners prevent invasive establishment by eradicating weeds early, planting native species, and limiting invasive seed dispersal (CUSP 2016).

Planting native seeds is an economical way to restore a disturbed landscape. Vegetation provides protection against erosion and stabilizes exposed soils. In order to be successful, seeds must be planted during the proper time of year and using correct techniques. Use a native seed mixture with a diversity of species and consider the species' ability to compete with invasive species. Before planting, the seedbed must be prepared with topsoil and by raking to break up the hydrophobic soil layer. If you choose to transplant or plant native species, consider whether the landscape has made a sufficient recovery to ensure the safety of the individuals (CUSP 2016).

COMMUNITY RESPONSE AND RECOVERY

Recovery of the vegetated landscape is often more straightforward than recovery of the human environment. Assessments of the burned landscape are often well-coordinated through the use of interagency crews who are mobilized immediately after a fire to assess the post-fire environment and make recommendations for rehabilitation efforts.

For the community impacted by fire, however, there is often very little planning at the local level to guide their return after the fire. Residents impacted by the fire need assistance making insurance claims; finding temporary accommodation for themselves, pets, and livestock; rebuilding or repairing damaged property; removing debris and burned trees; stabilizing the land for construction; mitigating potential flood damage; repairing infrastructure; reconnecting to utilities; and mitigating impacts to health. Oftentimes, physical impacts can be mitigated over time, but emotional impacts of the loss and change to surroundings are long-lasting and require support and compassion from the community.

After the Fire

Rebuilding and recovery from wildfire can vary greatly across income levels and demographics. Rural areas, low-income neighborhoods, and immigrant communities generally do not have the necessary resources to cover insurance and rebuilding expenses that occur after a fire. Due to this, many of these areas take more time to recover than those with appropriate access to resources. In addition, the occurrence of wildfire can worsen existing mental health conditions and lead to post-traumatic stress (PTS), low self-esteem, and depression for at-risk populations (OPR 2020). Homes, businesses, schools, and places of worship impacted and/or damaged by a wildfire may cause additional emotional distress in community members, especially if there is structural damage. Anniversaries of traumatic wildfire events and environmental factors can also cause emotional distress. Emotional damage could result in temporary or permanent job loss, while structural damage from the wildfire can create depressed economies, which can create community anxiety. Groups most at risk to wildfire include children and teens, older adults, and first responders and recovery workers (Substance Abuse and Mental Health Services Administration [SAMHSA] 2021). Mental health resources in relation to wildfire include SAMHSA, the American Phycological Association, the National Child Traumatic Stress Network, and the UCLA Center for Healthy Climate Solutions.

Returning Home

First and foremost, follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Do not attempt to return to your home until fire personnel have deemed it safe to do so.

When driving, watch for trees, brush, and rock which may have been weakened or loosened by the fire. Be aware of any damage or debris on roads and driveways. Traffic may be delayed, or lanes closed due to firefighter operations. Use extreme caution around trees, power poles, and any other tall objects that may have been weakened by the fire (CAL FIRE 2020b).

Even if the fire did not damage your house, do not expect to return to normal routines immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Request that the fire department or utility companies turn the utilities back on once the area is secured. Similarly, water supply systems may have been damaged; do not drink from the tap until you have been advised that it is safe to do so. Finally, keep a “fire watch”; look for smoke or sparks in houses and other buildings.

Once at home (CAL FIRE 2019b):

- Check the roof and exterior areas for sparks or embers.
- Check grounds for hot spots, smoldering stumps, and vegetation.
- Check for fire damage to your home, turn off all appliances, and make sure the meter is not damaged before turning on the main circuit breaker.

- Check the attic and throughout your house for any hidden burning sparks or embers.
- Do not drink water from the faucet until emergency officials say it is okay, water supply systems can be damaged and become polluted during wildfires.
- Discard any food that has been exposed to heat, smoke, flood water, or soot.
- If you have a propane tank or natural gas, leave valves closed until the supplier or utilities can inspect your system.
- If you have a solar electrical system, this system should be inspected by a licensed technician to verify that the solar panels and electrical wiring are safe for continued operation.
- Consult local experts on the best way to restore and plant your land with fire-safe landscaping.
- Consult local experts and/or a professional forester to inspect the integrity of any tree that has been in contact with fire.
- Contact 911 if any danger is perceived.

Ash contains toxic substances and may be irritating to the eyes, nose, throat, and skin. Ash is harmful to breathe and may trigger asthma attacks. Follow these tips to reduce your exposure to ash (California Department of Public Health 2017):

- Do not allow children to play in ash and wash off children's toys before children play with them.
- Immediately wash any part of your body that touches ash to avoid irritation.
- Wash fruits and vegetables from your garden thoroughly before eating them.
- Keep pets out of ash areas.
- Frequently clean indoor surfaces by wet mopping.
- Wear protective clothing and a respirator when working outside.

Insurance Claims

Your insurance agent is the best source of information for submitting a claim. It is recommended you take photos of your home in preparation of an emergency and keep the photos in a safe place as this will make the insurance claim process easier. Most expenses incurred during the time you are forced to live elsewhere may be reimbursed, so be sure to keep all receipts. Additional items that may be covered are extra transportation costs to and from work or school, telephone installation, furniture rental, extra food costs, and water damage. Do not start any repairs without the approval of your claims adjuster (California Department of Insurance 2021).

Community Safety: Post-Fire Floods and Debris Flows

There are numerous natural hazards after a wildfire. Perhaps most dangerous are potential flash floods and landslides following rainfall in a burned area upstream of a community. Wildfires increase risk of flooding because burned soil is unable to absorb rainfall and it becomes hydrophobic. Factors that contribute to flooding and debris flows are steep slopes, heavy rainfall, weak or loose rock and soil, and improper construction and grading. Even small rainfall can cause a flash flood, transporting debris and damaging homes and other structures. Listen and look for emergency updates, weather reports, and flash flood warnings (California Department of Conservation 2019). Develop an evacuation plan with your family and stay away from waterways, storm channels, and arroyos. Be aware of your risk, pay attention

to weather forecasts, listen to local authorities, and have a household inventory with copies of critical documents (California Department of Water Resources 2021).

Mobilizing Your Community

Wildfires that produce extensive damage require a community-scale response for recovery efforts. The local Emergency Manager will collaborate with state and federal partners to manage disaster response and urgent needs. Still, mobilizing a response and recovery team or a group of teams in a community can function as a vital part of the recovery procedure. Coordinated and informed direction throughout community-level volunteers and all levels of government are necessary for successful recovery (California Silver Jackets Team [California SJT] 2019).

As opposed to wildfire response, post-fire response is not typically managed by a unified state or federal team. Rather, each organization and each tier of government acts on its own authority. This produces a greater demand for coordination at the local level and the sharing of information between organizations to coordinate recovery efforts (California SJT 2019).

Residents throughout California are encouraged to join forces to create local Fire Safe Councils to minimize and prevent wildfire losses. Fire Safe Councils are community-based organizations that mobilize residents to protect their properties, communities, and environments from disastrous wildfires. Fire Safe Councils educate homeowners about community wildfire preparedness activities while collaborating with local fire officials to plan and implement projects that increase the wildfire resilience of their communities (California Fire Safe Council 2021). In 2019, a group of dedicated community volunteers in Three Rivers established the Three Rivers Fire Safe Council, with the mission to “foster fire safety and fire prevention, provide education, and exchange information in the communities of Three Rivers and Kaweah, California.” (Three Rivers Fire Safe Council 2022).

In addition, a community is encouraged to create its own type of a Post-Fire Coordination Group (PFCG) to direct the response to any ensuing post-wildfire natural hazards and aid in determining post-fire mitigation actions. The PFCG should work directly with local, state, or federal agencies, emergency response officials, and others to aid in a coordinated response. Primary duties of the PFCG include coordinating the exchange of information among agencies and the risk assessment, assembling and exchanging geospatial data, assisting public communications, and coordinating with elected officials (California SJT 2019).

Communities are also encouraged to establish a post-fire coordinator. The post-fire coordinator is appointed by the community to assist a coordinated response to a wildfire and to aid the community’s post-fire recovery efforts. The post-fire coordinator is likely to collaborate with local, state, and federal organizations that participate in emergency response and post-fire recovery efforts. It is important that the post-fire coordinator have demonstrated management, internet, and social media skills, community knowledge, and experience with government agencies and programs (California SJT 2019).

The recovery coordinator should become familiar with representatives from local, state, and government agencies that will be helping with coordination or funding of post-fire recovery. The following resources may be helpful for the post-fire and volunteer coordinators (California SJT 2019):

1. Housing
    a. FEMA
    b. Federal Housing Administration
    c. California Department of Housing and Community Development
    d. The Salvation Army

2. Debris Removal
    a. California Department of Resources Recycling and Recovery
    b. USACE
3. Debris Modeling
    a. U.S. Geological Survey
4. Hazardous Waste and Pollution
    a. California Environmental Protection Agency
5. Pets and Livestock
    a. Tulare County Animal Services
    b. American Society for the Prevention of Cruelty to Animals
    c. California Department of Food and Agriculture
6. Food
    a. USDA Supplemental Nutrition Assistance Program
    b. California Department of Social Services, Disaster CalFresh
7. Social Services
    a. California Employment Development Department
    b. FEMA Disaster Unemployment Assistance
    c. U.S. Administration for Children and Families
    d. Office of Access and Functional Needs
    e. California Foundation for Independent Living Centers
8. Farm Rehabilitation
    a. Farm Service Agency
    b. USDA Rural Development Disaster Assistance
    c. NRCS General Environmental Quality Incentives Program Financial Assistance
9. General
    a. The American Red Cross
    b. California Governor's Office of Emergency Services
    c. USFS
    d. NPS
    e. CAL FIRE

Any large wildfire will also involve an Incident Command System (ICS), an appropriately sized team assigned to aid in post-fire recovery. Learn more are https://www.nps.gov/articles/wildland-fire-incident-command-system-levels.htm.

Communication

After a team is assembled and immediate tasks are identified, find the best way to spread information in your community. You may distribute flyers, set up a voicemail box, work to find pets or livestock that have been displaced, develop a mailing list for property owners, hold regular public meetings, etc. It is

important that a long-term communications plan is developed (California SJT 2019). Applying the following steps can aid in successful communication (California SJT 2019):

- Convey post-wildfire hazards to the public.
- Develop and maintain emergency notification systems that allow authorized official to alert residents of emergency situations.
- Public meetings to inform the public about programs and services available in the community.
- Determine the best way to relay information, e.g., phone calls, radio, TV, or social media.
- Find out how emergency response teams, local officials, and volunteers will communicate with the community.

Long-Term Community Recovery

On non-federal land, recovery efforts are the responsibility of local governments and private landowners. Challenges associated with long-term recovery include homes that were severely damaged or were saved but are located in high-severity burn areas. Furthermore, homes saved but located on unstable slopes or in areas in danger of flooding or landslides present a more complicated challenge. Economically, essential businesses that were burned or were otherwise forced to close pose a challenge to communities of all sizes. Given these complications, rebuilding and recovery efforts can last for years, with invasive species control and ecosystem restoration lasting even longer (CUSP 2016). It is critical that a long-term plan is in place and there is sufficient funding and support for all necessary ecosystem and community recovery. To learn about more post-fire recovery resources, visit the After the Flames website here: https://aftertheflames.com/resources/.

Additional resources regarding post-fire return and recovery can be found in Appendix G.

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CHAPTER 5 – MONITORING AND EVALUATION STRATEGY

Developing an action plan and an assessment strategy that identifies roles and responsibilities, funding needs, and timetables for completing highest-priority projects is an important step in organizing the implementation of the Three Rivers CWPP. The previous chapter identifies tentative timelines and monitoring protocols for project recommendations, the details of which are outlined below.

All stakeholders and signatories to this CWPP desire worthwhile outcomes. It is also known that risk reduction work on the ground, for the most part, is often not attainable in a few months—or even years. The amount of money and effort invested in implementing a plan such as this requires that there be a means to describe, quantitatively and/or qualitatively, if the goals and objectives expressed in this plan are being accomplished according to expectations.

Monitoring and reporting contribute to the long-term evaluation of changes in ecosystems, as well as the knowledge base about how natural resource management decisions affect both the environment and the people who live in it. Furthermore, as the CWPP evolves over time, there may be a need to track changes in policy, requirements, stakeholder changes, and levels of preparedness. These can be significant for any future revisions and/or addendums to the CWPP.

It is recommended that project monitoring be a collaborative effort. There are many resources for designing and implementing community based, multi-party monitoring that could support and further inform a basic monitoring program for the CWPP (Egan 2013). Multi-party monitoring involves a diverse group consisting of community members, community-based groups, regional and national interest groups, and public agencies. Using this multi-party approach increases community understanding of the effects of restoration efforts and trust among restoration partners. Multi-party monitoring may be more time consuming due to the collaborative nature of the work; therefore, a clear and concise monitoring plan must be developed.

Table 5.1 Identifies monitoring strategies for various aspects of all categories of CWPP recommendations and the effects of their implementation, both quantifiable and non-quantifiable, for assessing the progress of the CWPP and increase sustainability of projects. It must be emphasized that these strategies are 1) not exhaustive and 2) dependent on available funds and personnel to implement them.

Table 5.1. Recommended Monitoring Strategies

Strategy	Task/Tool	Lead	Remarks
Project tracking system	Online web app to track hazardous fuels projects spatially, integrating wildfire risk layer to show progress towards wildfire hazard and risk reduction. Web app would include attribute tables that outline project details	Core Team	Interactive tool will be easily updated and identify areas that require additional efforts.
Photographic record (documents pre- and post-fuels reduction work, evacuation routes, workshops, classes, field trips, changes in open space, treatment type, etc.)	Establish field global positioning system (GPS) location; photo points of cardinal directions; keep photos protected in archival location	Core Team member	Relatively low cost; repeatable over time; used for programs and tracking objectives
Number of acres treated (by fuel type, treatment method)	GPS/GIS/fire behavior prediction system	Core Team member	Evaluating costs, potential fire behavior
Number of home ignition zones/defensible space treated to reduce structural ignitability	GPS	Homeowner	Structure protection
Number of residents/citizens participating in any CWPP projects and events	Meetings, media interviews, articles	Core Team member	Evaluate culture change objective
Number of homeowner contacts (brochures, flyers, posters, etc.)	Visits, phone	Agency representative	Evaluate objective
Number of jobs created	Contracts and grants	Core Team member	Evaluate local job growth
Education outreach: number, kinds of involvement	Workshops, classes, field trips, signage	Core Team member	Evaluate objectives
Emergency management: changes in agency response capacity	Collaboration	Agency representative	Evaluate mutual aid
Codes and policy changes affecting CWPP	Qualitative	Core Team	CWPP changes
Number of stakeholders	Added or dropped	Core Team	CWPP changes
Wildfire acres burned, human injuries/fatalities, infrastructure loss, environmental damage, suppression, and rehabilitation costs	Wildfire records	Core Team	Compare with 5- or 10-year average

FUELS TREATMENT MONITORING

It is important to evaluate whether fuel treatments have accomplished their defined objectives and whether any unexpected outcomes have occurred.

The strategies outlined in this section consider several variables:

- Do the priorities identified for treatment reflect the goals stated in the plan? Monitoring protocols can help address this question.

- Can there be ecological consequences associated with fuels work? Items to consider include soil movement and/or invasive species encroachment post-treatment. Relatively cost-effective monitoring may help reduce long term costs and consequences.
- Vegetation will grow back. Thus, fuel break maintenance and fuels modification in both the home ignition zone and at the landscape scale require periodic assessment. Monitoring these changes can help decision-makers identify appropriate treatment intervals.

Monitoring for all types of fuels treatment is recommended. For example, in addition to monitoring mechanical treatments, it is important to carry out comprehensive monitoring of burned areas to establish the success of pre-fire fuels reduction treatments on fire behavior, as well as monitoring for ecological impacts, repercussions of burning on wildlife, and effects on soil chemistry and physics. Adaptive management is a term that refers to adjusting future management based on the effects of past management. Monitoring is required to gather the information necessary to inform future management decisions. Economic and legal questions may also be addressed through monitoring. In addition, monitoring activities can provide valuable educational opportunities for students.

The monitoring of each fuels reduction project would be site-specific, and decisions regarding the timeline for monitoring and the type of monitoring to be used would be determined by project. The most important part of choosing a fuels project monitoring program is selecting a method appropriate to the people, place, and type of project. Several levels of monitoring activities meet different objectives, have different levels of time intensity, and are appropriate for different groups of people. They include the following:

Minimum—Level 1: Pre- and Post-project Photographs

Appropriate for many individual homeowners who conduct fuels reduction projects on their properties.

Moderate—Level 2: Multiple Permanent Photo Points

Permanent photo locations are established using rebar or wood posts, global positioning system (GPS)-recorded locations, and photographs taken on a regular basis. Ideally, this process would continue over several years. This approach might be appropriate for more enthusiastic homeowners or for agencies conducting small-scale, general treatments.

High—Level 3: Basic Vegetation Plots

A series of plots can allow monitors to evaluate vegetation characteristics such as species composition, percentage of cover, and frequency. Monitors then can record site characteristics such as slope, aspect, and elevation. Parameters would be assessed pre- and post-treatment. The monitoring agency should establish plot protocols based on the types of vegetation present and the level of detail needed to analyze the management objectives. This method is appropriate for foresters or other personnel monitoring fuel treatments on forested lands.

Intense—Level 4: Basic Vegetation Plus Dead and Downed Fuels Inventory

The protocol for this level would include the vegetation plots described above but would add more details regarding fuel loading. Crown height or canopy closure might be included for live fuels. Dead and downed fuels could be assessed using other methods, such as Brown's transects (Brown 1974), an appropriate photo series (Ottmar et al. 2000), or fire monitoring (Fire Effects Monitoring and

Inventory System [FIREMON]) (Lutes et al. 2016) plots. This method is ideal for foresters or university researchers tracking vegetation changes in forested lands.

CWPP EVALUATION

CWPPs are intended to reduce the risk from wildfire for a community and surrounding environment. However, over time, communities change and expand, vegetation grows back, and forests and wildlands evolve. As such, the risk of wildfire to communities is constantly changing. The plans and methods to reduce risk must be dynamic to keep pace with the changing environment. An evaluation of the CWPP will gather information and identify whether the plans and strategies are on course to meet the desired outcomes or if modifications are needed to meet expectations.

Four general steps can be used to evaluate the CWPP:

1. Identify objectives: What are the goals identified in the plan? How are they reached? Is the plan performing as intended?
    a. Structural ignitability
    b. Fuel treatments
    c. Public education and outreach
    d. Multiagency collaboration
    e. Emergency response
2. Assess the changing environment: How have population characteristics and the wildfire environment changed?
    a. Population change
        i. Increase or decrease
        ii. Demographics
    b. Population settlement patterns
        i. Distribution
        ii. Expansion into the WUI
    c. Vegetation
        i. Fuel quantity and type
        ii. Drought and disease impacts
3. Review action items: Are actions consistent with the plan's objectives?
    a. Check for status, i.e., completed/started/not started
    b. Identify completed work and accomplishments
    c. Identify challenges and limitations
    d. Identify next steps
4. Assess results: What are the outcomes of the action items?
    a. Multiagency collaboration
        i. Who was involved in the development of the CWPP?
        ii. Have partners involved in the development process remained involved in the implementation?

iii. How has the planning process promoted implementation of the CWPP?
iv. Have CWPP partnerships and collaboration had a beneficial impact on the community?

b. Risk assessment
   i. How is the risk assessment utilized to make decisions about fuel treatment priorities?
   ii. Have there been new wildfire-related regulations?
   iii. Are at-risk communities involved in mitigating wildfire risk?
c. Hazardous fuels
   i. How many acres have been treated?
   ii. How many projects are cross-boundary?
   iii. How many residents have participated in creating defensible space?
d. Structural ignitability
   i. Have there been updates to fire codes and ordinances?
   ii. How many structures have been lost to wildfire?
   iii. Has the CWPP increased public awareness of structural ignitability and reduction strategies?
e. Public education and outreach
   i. Has public awareness of wildfire and mitigation strategies increased?
   ii. Have residents been involved in wildfire mitigation activities?
   iii. Has there been public involvement?
   iv. Have vulnerable populations been involved?
f. Emergency response
   i. Has the CWPP been integrated into relevant plans (e.g., hazard mitigation or emergency operations)?
   ii. Is the CWPP congruent with other hazard mitigation planning efforts?
   iii. Has availability and capacity of local fire departments changed since the CWPP was developed?

IMPLEMENTATION

The Three Rivers CWPP makes recommendations for prioritized fuels reduction projects, measures to reduce structural ignitability, and methods by which to carry out public education and outreach. Implementation CWPP projects need to be tailored to the specific project and will be unique to the location depending on available resources and regulations. As aforementioned, on-the-ground implementation of the recommendations in the Three Rivers CWPP planning area will require development of an action plan and assessment strategy for completing each project. This step will identify the roles and responsibilities of the people and agencies involved, as well as funding needs and timetables for completing the highest-priority projects (SAF 2004). Information pertaining to funding is provided in Appendix F.

PROJECT TRACKER

Within the Hub Site is a project tracking system designed to provide real-time updates and the ability for multiagency coordination and collaboration. The project tracker is a great resource for real-time

implementation tracking. The tracking system is available for internal use and comes with the following features:

- Project database
- Project entries and sub-entries into the database
- Funding tracking
- Milestone and goal tracking
- Project constraint/opportunity tracking
- Project progress tracking
- Agency delegation
- Attach images or other files to project records
- Spatially delineated project locations/working areas

Externally, the project tracker holds the ability to display statistics to the public, such as acres treated, dollars spent, or number of meetings held.

TIMELINE FOR UPDATING THE CWPP

The HFRA allows for maximum flexibility in the CWPP planning process, permitting the Core Team to determine the time frame for updating the CWPP. However, it is suggested that a formal revision be made on the fifth anniversary of signing and every 5 years following. The Core Team members are encouraged to meet on an annual basis to review the project list, discuss project successes, and strategize regarding project implementation funding.

ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AALG	Access to Ancestral Lands Grant Opportunity
AFG	Assistance to Firefighters Grants
AMMs	avoidance and minimization measures
ATV	all-terrain vehicle
BAER	Burned Area Emergency Rehabilitation
BLM	Bureau of Land Management
BMP	best management practices
BRIC	Building Resilient Infrastructure and Communities
BTU/ft/sec	British Thermal Units per foot per second
CA FMTF	California Forest Management Task Force
California SJT	California Silver Jackets Team
CalVTP	California Vegetation Treatment Program
CA OES	California Office of Emergency Services
CARB	California Air Resources Board
CAR	communities at risk
CCFMP	California Cooperative Forest Management Plan
CCICC	Central California Interagency Communications Center
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CE	categorical exemption
CEQA	California Environmental Quality Act
ch/hr	chains per hour
CIG	Conservation Innovation Grants
Cohesive Strategy	National Cohesive Wildland Fire Management Strategy
CRS	Congressional Research Service
CUSP	Coalition for the Upper South Platte
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
DEM	digital elevation model
DHS	Department of Homeland Security
EAS	Emergency Alert System
ECP	Emergency Conservation Program
EFRP	Emergency Forest Restoration Program

EIR	Environmental Impact Report
EMPG	Emergency Management Performance Grant
EMS	Emergency Management System
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESRI	Environmental Systems Research Institute
EWP	Emergency Watershed Program
FAC	fire-adapted community
FEB	fir engraver beetles
FEPP	Federal Excess Personal Property (GSA)
FEMA	Federal Emergency Management Agency
FIREMON	Fire Effects Monitoring and Inventory System
FLAME	Federal Land Assistance, Management and Enhancement Act
FMA	Flood Mitigation Assistance
FP&S	Fire Prevention and Safety
FR	Fire Regime
FRA	Federal Responsibility Area
FRI	fire return interval
FSC	Fire Safe Council
FHSZ	fire hazard severity zone
GAID	Geographic Area Interagency Division
GAP	Tribal Environmental General Assistance Program
GIS	geographic information system
GNC	Good Neighbor Citizen
GPS	global positioning system
GWSS	glassy-winged sharpshooter
HFRA	Healthy Forest Restoration Act
HMGP	Hazard Mitigation Grant Program
HVRA	highly valued resource and asset
HIZ	Home Ignition Zone
ICARP	Integrated Climate Adaptation and Resiliency Program
ICS	Incident Command System
IFTDSS	Interagency Fuel Treatment Decision Support System
ISO	International Standards Organization
JPA	Joint Powers Agreement

KWFM	Kaweah Wildland Fire Module
LRA	Local Responsibility Area
MAA	mutual aid agreement
MPB	mountain pine beetle
MFI	mean fire interval
MJLHMP	Multi-Jurisdictional Local Hazard Mitigation Plan
MND	mitigated negative declaration
ND	negative declaration
NEPA	National Environmental Policy Act
NFF	National Forest Foundation
NFP	National Fire Plan
NFPA	National Fire Protection Association
NIFC	National Interagency Fire Center
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
OES	Office of Emergency Services
OSCC	Southern California Geographic Coordination Center (Operations Southern California)
PFCG	Post-Fire Coordination Group
PDM	pre-disaster mitigation
PERI	Public Entity Risk Institute
PPE	personal protective equipment
RAWS	remote automated weather station
RCP	Regional Catastrophic Preparedness
RFA	Rural Fire Assistance
RMA	Resource Management Agency
SAF	Society of American Foresters
SAFER	Staffing for Adequate Fire and Emergency Response
SAMHSA	Substance Abuse and Mental Health Services Administration
SFP	Strategic Fire Plan
SRA	State Responsibility Area
SE	statutory exemption
SEKI NPs	Sequoia and Kings Canyon National Parks
Sequoia NF	Sequoia National Forest
SHPO	State Historic Preservation Office

SWCA	SWCA Environmental Consultants
TCAS	Tulare County Animal Services
TCFD	Tulare County Fire Department
CAL FIRE TUU	Tulare Unit
UCF	Urban and Community Forestry
ULI	Urban Land Institute
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFA	U.S. Fire Administration
USFS	U.S. Forest Service
VAR	value at risk
VCC	Vegetation Condition Class
VDEP	Vegetation Departure
VLB	velvet longhorned beetle
WFDSS	Wildland Fire Decision Support System
WiRē	Wildfire Research Center
WTB	walnut twig beetle
WUI	wildland urban interface

GLOSSARY

Aspect: Cardinal direction toward which a slope faces in relation to the sun (NWCG 2021b).

Active Crown Fire: A crown fire in which the entire fuel complex is involved in flame but the crowning phase remains dependent on heat released from surface fuel for continued spread. An active crown fire presents a solid wall of flame from the surface through the canopy fuel layers. Flames appear to emanate from the canopy as a whole rather than from individual trees within the canopy. Active crown fires are one of several types of crown fire and are contrasted with **passive crown fires**, which are less vigorous types of crown fire that do not emit continuous, solid flames from the canopy (SWCA).

Available Canopy Fuel: The mass of canopy fuel per unit area consumed in a crown fire. There is no post-frontal combustion in canopy fuels, so only fine canopy fuels are consumed. It is assumed that only the foliage and a small fraction of the branchwood is available (Wooten 2021).

Available Fuel: The total mass of ground, surface, and canopy fuel per unit area available to be consumed by a fire, including fuels consumed in postfrontal combustion of duff, organic soils, and large woody fuels (Wooten 2021).

Backfiring: Intentionally setting fire to fuels inside a control line to contain a fire (Wooten 2021).

Biomass: Organic material. Also refers to the weight of organic material (e.g., biomass roots, branches, needles, and leaves) within a given ecosystem (Wooten 2021).

Burn Severity: A qualitative assessment of the heat pulse directed toward the ground during a fire. Burn severity relates to soil heating, large fuel and duff consumption, consumption of the litter and organic layer beneath trees and isolated shrubs, and mortality of buried plant parts (SWCA).

Canopy: The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result (SWCA).

Chain: Unit of measure in land survey, equal to 66 feet (20 meters) (80 chains equal 1 mile). Commonly used to report fire perimeters and other fireline distances. Popular in fire management because of its convenience in calculating acreage (example: 10 square chains equal 1 acre) (New Mexico Future Farmers of America 2021).

Climate Adaptation: Adaptation is an adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (OPR 2020).

Climate Change: A change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (OPR 2020).

Community Assessment: An analysis designed to identify factors that increase the potential and/or severity of undesirable fire outcomes in wildland urban interface communities (SWCA).

Communities at Risk: Defined by the HFRA as “Wildland-Urban Interface Communities within the vicinity of federal lands that are at high risk from wildfire.”

- CAL FIRE expanded on this definition for California to include all communities (regardless of distance from federal lands) for which a significant threat to human life or property exists as a result of a wildland fire event. California uses the following three factors to determine at-risk communities: 1) high fuel hazard, 2) probability of a fire, and 3) proximity of intermingled wildland fuels and urban environments that are near fire threats (OPR 2020).

Community Emergency Response Team (CERT): The CERT program educates volunteers about disaster preparedness for the hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT offers a consistent, nationwide approach to volunteer training and organization that professional responders can rely on during disaster situations, allowing them to focus on more complex tasks (Ready 2021).

Community Wildfire Protection Plan (CWPP): A planning document that seeks to reduce the threat to life and property from wildfire by identifying and mitigating wildfire hazards to communities and infrastructure located in the WUI. Developed from the HFRA, a CWPP addresses issues such as wildfire response, hazard mitigation, community preparedness, and structure protection (SWCA).

Conditional Surface Fire: A potential type of fire in which conditions for sustained active crown fire spread are met but conditions for crown fire initiation are not. If the fire begins as a surface fire, it is expected to remain so. If it begins as an active crown fire in an adjacent stand, it may continue to spread as an active crown fire (Wooten 2021).

Contain: A tactical point at which a fire's spread is stopped by and within specific containment features, constructed or natural; also, the result of stopping a fire's spread so that no further spread is expected under foreseeable conditions. For reporting purposes, the time and date of containment. This term no longer has a strategic meaning in federal wildland fire policy (Wooten 2021).

Control: To construct a fireline or use natural features to surround a fire and any control spot fires and reduce a fire’s burning potential to a point that it no longer threatens further spread or resource damage under foreseeable conditions. For reporting purposes, the time and date of control should be noted. This term no longer has a strategic meaning in federal wildland fire policy (Wooten 2021).

Cover type: The type of vegetation (or lack of it) growing in an area, based on cover type minimum and maximum percent cover of the dominant species, species group or non-living land cover (such as water, rock, etc.). The cover type defines both a qualitative aspect (the dominant cover type) as well as a quantitative aspect (the abundance of the predominant features of that cover type) (Wooten 2021).

Creeping Fire: A low-intensity fire with a negligible rate of spread (Wooten 2021).

Crown Fire: A fire that advances at great speed from crown to crown in tree canopies, often well in advance of the fire on the ground (National Geographic 2021).

Defensible Space: An area around a structure where fuels and vegetation are modified, cleared, or reduced to slow the spread of wildfire toward or from a structure. The design and distance of the defensible space is based on fuels, topography, and the design/materials used in the construction of the structure (SWCA).

- In California, PRC Section 4291, “defensible space” refers to a 100-foot perimeter around a structure in which vegetation (fuels) must be maintained in order to reduce the likelihood of ignition. This space may extend beyond property lines, or 100 feet as required by state law as well as local ordinances, rules, and regulations (OPR 2020).

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil (SWCA).

Ecosystem: An interacting natural system including all the component organisms together with the abiotic environment and processes affecting them (SWCA).

Environmental Conditions: The part of the fire environment that undergoes short-term changes: weather, which is most commonly manifest as windspeed, and dead fuel moisture content (Wooten 2021).

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area. When escape routes deviate from a defined physical path, they should be clearly marked (flagged) (SWCA).

Evacuation: The temporary movement of people and their possessions from locations threatened by wildfire (SWCA).

Federal Responsibility Area (FRA): A term specific to California, designating areas where the federal government is responsible for fire response efforts. These areas include lands under federal ownership (OPR 2020).

Fire-Adapted Community: A fire-adapted community collaborates to identify its wildfire risk and works collectively on actionable steps to reduce its risk of loss. This work protects property and increases the safety of firefighters and residents (USFA 2021b).

Fire Behavior: The manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather, and topography (Fire Research and Management Exchange System 2021).

Fire Break: An area where vegetation and organic matter are removed down to mineral soil (SWCA).

Fire Environment: The characteristics of a site that influence fire behavior. In fire modeling, the fire environment is described by surface and canopy fuel characteristics, windspeed and direction, relative humidity, and slope steepness (Wooten 2021).

Fire Frequency: A broad measure of the rate of fire occurrence in a particular area. For historical analyses, fire frequency is often expressed using the fire return interval calculation. For modern-era analyses, where data on timing and size of fires are recorded, fire frequency is often best expressed using fire rotation (SWCA)

Fire Hazard: Fire hazard is the potential fire behavior or fire intensity in an area, given the type(s) of fuel present, in both the natural and built environment, and their combustibility (OPR 2020).

Fire Hazard Severity Zone (FHSZ): FHSZs are defined based on vegetation, topography, and weather (temperature, humidity and wind), and represents the likelihood of an area burning over a 30- to 50-year time period without considering modifications such as fuel reduction efforts. In California, CAL FIRE maintains FHSZ data for the entire state. There are three classes of fire hazard severity ratings within FHSZs: moderate, high, and very high (OPR 2020).

Fire History: The chronological record of the occurrence of fire in an ecosystem or at a specific site. The fire history of an area may inform planners and residents about the level of wildfire hazard in that area (SWCA).

Fire Intensity: A general term relating to the heat energy released in a fire (SWCA).

Fireline Intensity: Amount of heat release per unit time per unit length of fire front. Numerically, the product of the heat of combustion, quantity of fuel consumed per unit area in the fire front, and the rate of spread of a fire, expressed in kilowatts per minute (SWCA). This expression is commonly used to describe the power of wildland fires, but it does not necessarily follow that the severity, defined as the vegetation mortality, will be correspondingly high (Wooten 2021).

Fire Prevention: Activities such as public education, community outreach, planning, building code enforcement, engineering (construction standards), and reduction of fuel hazards that are intended to reduce the incidence of unwanted human-caused wildfires and the risks they pose to life, property, or resources (OPR 2020).

Fire Regime: A measure of the general pattern of fire frequency and severity typical to a particular area or type of landscape: The regime can include other metrics of the fire, including seasonality and typical fire size, as well as a measure of the pattern of variability in characteristics (SWCA).

Fire Regime Condition Class: Condition classes are a function of the degree of fire regime condition class departure from historical fire regimes resulting in alterations of key ecosystem components such as composition structural stage, stand age, and canopy closure (Wooten 2021).

Fire Return Interval: Number of years (interval) between two successive fires in a designated area (SWCA).

Fire Severity: A qualitative measure of the immediate effects of fire on the fire severity ecosystem. It relates to the extent of mortality and survival of plant and animal life both aboveground and belowground and to loss of organic matter. It is determined by heat released aboveground and belowground. Fire Severity is dependent on intensity and residence dependent of the burn. For trees, severity is often measured as percentage of basal area removed. An intense fire may not necessarily be severe (Wooten 2021).

Fire Risk: “Risk” takes into account the intensity and likelihood of a fire event to occur as well as the chance, whether high or low, that a hazard such as a wildfire will cause harm. Fire risk can be determined by identifying the susceptibility of a value or asset to the potential direct or indirect impacts of wildfire hazard events (OPR 2020).

Flammability: The relative ease with which fuels ignite and burn regardless of the quantity of the fuels (SWCA).

Flame Length: The length of flames in the propagating fire front measured along the slant of the flame from the midpoint of its base to its tip. It is mathematically related to fireline intensity and tree crown scorch height (Wooten 2021).

Foliar Moisture Content: Moisture content (dry weight basis) of live foliage, expressed as a percent. Effective foliar moisture content incorporates the moisture content of other canopy fuels such as lichen, dead foliage, and live and dead branchwood (Wooten 2021).

Forest Fire: Uncontrolled burning of a woodland area (National Geographic 2021).

Fuel Break: A natural or human-made change in fuel characteristics that affects fire behavior so that fires burning into them can be more readily controlled (NWCG 2021c).

Fuel Complex: The combination of ground, surface, and canopy fuel strata (Wooten 2021).

Fuel Condition: Relative flammability of fuel as determined by fuel type and environmental conditions (SWCA).

Fuel Continuity: A qualitative description of the distribution of fuel both horizontally and vertically. Continuous fuels readily support fire spread. The larger the fuel discontinuity, the greater the fire intensity required for fire spread (Wooten 2021).

Fuel Loading: The volume of fuel in a given area generally expressed in tons per acre (SWCA). Dead woody fuel loadings are commonly described for small material in diameter classes of 0 to 0.25, 0.25 to 1, and 1 to 3 inches and for large material greater than 3 inches (Wooten 2021).

Fuel Management/Fuel Reduction: Manipulation or removal of fuels to reduce the likelihood of ignition and to reduce potential damage in case of a wildfire. Fuel reduction methods include prescribed fire, mechanical treatments (mowing, chopping), herbicides, biomass removal (thinning or harvesting or trees, harvesting of pine straw), and grazing. Fuel management techniques may sometimes be combined for greater effect (SWCA).

Fuel Model: A set of surface fuel bed characteristics (load and surface-area-to-fuel model volume-ratio by size class, heat content, and depth) organized for input to a fire model (Wooten 2021).

Fuel Modification: The manipulation or removal of fuels (i.e., combustible biomass such as wood, leaves, grass, or other vegetation) to reduce the likelihood of igniting and to reduce fire intensity. Fuel modification activities may include lopping, chipping, crushing, piling, and burning, including prescribed burning. These activities may be performed using mechanical treatments or by hand crews. Herbicides and prescribed herbivory (grazing) may also be used in some cases. Fuel modification may also sometimes be referred to as “vegetation treatment” (OPR 2020).

Fuel Moisture Content: The percent or fraction of fuel moisture content weight (dry) of fuel. It is the most important fuel property controlling flammability. In living plants, it is physiologically bound. Its daily fluctuations vary considerably by species but are usually above 80% to 100%. As plants mature, moisture content decreases. When herbaceous plants cure, their moisture content responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity, and precipitation (Wooten 2021).

Fuel Treatment: The manipulation or removal of fuels to minimize the probability of ignition and/or to reduce potential damage and resistance to fire suppression activities (NWCG 2021d). Synonymous with fuel modification.

Grazing: There are two types of grazing: 1) traditional grazing, and 2) targeted grazing. Traditional grazing refers to cattle that are managed in extensive pastures to produce meat. Targeted grazing involves having livestock graze at a specific density for a given period of time for the purpose of managing vegetation. Even though both kinds of grazing manage fuel loading in rangeland and forested land, targeted grazing is different in that its sole purpose is to manage fuels. Targeted grazing is done by a variety of livestock species such as sheep, goats, or cows (UCANR 2019).

Ground Fire: Fire that burns organic matter in the soil, or humus; usually does not appear at the surface (National Geographic 2021).

Ground Fuels: Fuels that lie beneath surface fuels, such as organic soils, duff, decomposing litter, buried logs, roots, and the below-surface portion of stumps (Wooten 2021).

Hazard: A “hazard” can be defined generally as an event that could cause harm or damage to human health, safety, or property (OPR 2020).

Hazardous Areas: Those wildland areas where the combination of vegetation, topography, weather, and the threat of fire to life and property create difficult and dangerous problems (SWCA).

Hazardous Fuels: A fuel complex defined by type, arrangement, volume, condition, and location that poses a threat of ignition and resistance to fire suppression (NWCG 2021e).

Hazardous Fuels Reduction: Any strategy that reduces the amount of flammable material in a fire-prone ecosystem. Two common strategies are mechanical thinning and controlled burning (Wooten 2021).

Hazard Reduction: Any treatment that reduces the threat of ignition and spread of fire (SWCA).

Highly Valued Resources and Assets: Landscape features that are influenced positively and/or negatively by fire. Resources are naturally occurring, while assets are human made (IFTDSS 2021).

Ignition: The action of setting something on fire or starting to burn (SWCA).

Incident: An occurrence or event, either natural or human-caused, that requires an emergency response to prevent loss of life or damage to property or natural resources (Wooten 2021).

Influence Zone: An area that, with respect to wildland and urban fire, has a set of conditions that facilitate the opportunity for fire to burn from wildland fuels to the home and or structure ignition zone (NWCG 2021a).

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire (SWCA).

Invasive Species: An introduced, nonnative organism (disease, parasite, plant, or animal) that begins to spread or expand its range from the site of its original introduction and that has the potential to cause harm to the environment, the economy, or to human health (USGS 2021b).

Ladder Fuels: Fuels that provide vertical continuity allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease (SWCA).

Litter: Recently fallen plant material that is only partially decomposed and is still discernible (SWCA).

Local Responsibility Area (LRA): A term specific to California, designating an area where the local government is responsible for wildfire protection. LRAs include incorporated cities, cultivated agricultural land, and portions of the desert. LRA fire protection is typically provided by city fire departments, fire protection districts, counties, and CAL FIRE under contract to local government (OPR 2020).

Manual Treatments: Felling and piling of fuels done by hand. The volume of material generated from a manual fuel treatment is typically too small to warrant a biomass sale; therefore, collected material is disposed of by burning or chipping. The work can be performed by either a single individual or a large organized crew with powered equipment (UCANR 2021b).

Mechanized Treatments: Mechanical treatments pulverize large continuous patches of fuel to reduce the volume and continuity of material. Mechanical treatments can be applied as either mastication or chipping treatments. Both treatments shred woody material, but mastication leaves residue on-site while chipping collects the particles for transportation off-site. Similar to hand treatments, mechanical treatments can target specific areas and vegetation while excluding areas of concern. In addition, mechanical treatment is easily scalable to large areas (>30 acres) with little added cost (UCANR 2021c).

Mitigation: Action that moderates the severity of a fire hazard or risk (SWCA).

Mutual Aid: Assistance in firefighting or investigation by fire agencies, regardless of jurisdictional boundaries (NWCG 2021f).

Native Revegetation: The process of replanting and rebuilding the soil of disturbed land (e.g., burned) with native plant species (USDA 2005).

Native Species: A species that evolved naturally in the habitat, ecosystem, or region as determined by climate, soil, and biotic factors (USDA 2005).

National Cohesive Strategy: The National Cohesive Wildland Fire Management Strategy is a strategic push to work collaboratively among all stakeholders and across all landscapes, using best science, to make meaningful progress toward three goals:

- Resilient Landscapes
- Fire-Adapted Communities
- Safe and Effective Wildfire Response

Vision: To safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, to live with wildland fire (Forests and Rangelands 2021).

Overstory: That portion of the trees in a forest that forms the upper or uppermost layer (SWCA).

Passive Crown Fire: A type of crown fire in which the crowns of individual trees or small groups of trees burn but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fire encompasses a wide range of crown fire behavior, from occasional torching of isolated trees to nearly active crown fire. Passive crown fire is also called torching or candling. A fire in the crowns of the trees in which trees or groups of trees torch, ignited by the passing front of the fire. The torching trees reinforce the spread rate, but these fires are not significantly different from surface different (SWCA).

Prescribed Burning: Any fire ignited by management actions under specific, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. Usually, a written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition (USFS 2021c).

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, rate of forward spread of the fire front, or rate of increase in an area, depending on the intended use of the information. Usually, it is expressed in chains or acres per hour for a specific period in the fire's history (NWCG 2021g).

Resilience: Resilience is the capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience (OPR 2020).

Response: Movement of an individual firefighting resource from its assigned standby location to another location or to an incident in reaction to dispatch orders or to a reported alarm (SWCA).

Safety Element: One of the seven mandatory elements of a local general plan (a jurisdictional plan that forms the foundation for future development), the safety element must identify hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and entitlement permits. The element should contain general hazard and risk reduction strategies and policies supporting hazard mitigation measures (OPR 2020).

Slash: Debris left after logging, pruning, thinning, or brush cutting. Slash includes logs, chips, bark, branches, stumps, and broken trees or brush that may be fuel for a wildfire (SWCA).

Slope Percent: The ratio between the amount of vertical rise of a slope and horizontal distance as expressed as a percentage; 100 feet of rise to 100 feet of horizontal distance equals 100 percent (NWCG 2021h).

State Responsibility Area (SRA): A term specific to California, designating areas where the state has financial responsibility for wildland fire protection. Incorporated cities and land under federal ownership are not included in the SRA. Lands under federal ownership are in the FRA (OPR 2020).

Suppression: The most aggressive fire protection strategy, suppression leads to the total extinguishment of a fire (SWCA).

Surface Fire: A fire that typically burns only surface litter and undergrowth (National Geographic 2021).

Surface Fuel: Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low-stature living plants (SWCA).

Structural Ignitability: The ability of structures (such as homes or fences) to catch fire (SWCA).

Topography: The arrangement of the natural and artificial physical features of an area (SWCA).

Total Fuel Load: The mass of fuel per unit area that could possibly be consumed in a hypothetical fire of the highest intensity in the driest fuels (Wooten 2021).

Tree Crown: The primary and secondary branches growing out from the main stem, together with twigs and foliage (SWCA).

Understory: Low-growing vegetation (herbaceous, brush, or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the overstory (SWCA).

Understory Fire: A fire burning in the understory, more intense than a surface fire with flame lengths of 1 to 3 meters (Wooten 2021).

Values and Assets at Risk: The elements of a community or natural area considered valuable by an individual or community that could be negatively impacted by a wildfire or wildfire operations. These values can vary by community and can include public and private assets (natural and human-made), such as homes, specific structures, water supply, power grids, natural and cultural resources, and community infrastructure, as well as other economic, environmental, and social values (OPR 2020).

Vulnerable Community: Vulnerable communities experience heightened risk and increased sensitivity to natural hazard and climate change impacts and have less capacity and fewer resources to cope with, adapt to, or recover from the impacts of natural hazards and increasingly severe hazard events because of climate change. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality (OPR 2020).

Wildfire: A “wildfire” can be generally defined as any unplanned fire in a “wildland” area or in the WUI (OPR 2020).

Wildfire Exposure: During fire suppression activities, an exposure is any area/property that is threatened by the initial fire, but in the National Fire Incident Reporting System, a reportable exposure is any fire that is caused by another fire, i.e., a fire resulting from another fire outside that building, structure, or vehicle, or a fire that extends to an outside property from a building, structure, or vehicle (USFA 2020).

Wildfire Influence Zone: A wildland area with susceptible vegetation up to 1.5 miles from the interface or intermix WUI (OPR 2020).

Wildland: Those unincorporated areas covered wholly or in part by trees, brush, grass, or other flammable vegetation (OPR 2020).

Wildland Fire: Fire that occurs in the wildland as the result of an unplanned ignition (OPR 2020).

Wildland Fuels (aka fuels): Fuel is the material that is burning. It can be any kind of combustible material, especially petroleum-based products, and wildland fuels. For a wildland fire, it is usually live or dead plant material but can also include artificial materials such as houses, sheds, fences, pipelines, and trash piles. In terms of vegetation, there are six wildland fuel types (Fuel Type: An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specified weather conditions.) The six wildland fuel types are (NWCG 2021j):

- Grass
- Shrub
- Grass-Shrub
- Timber Litter
- Timber-Understory
- Slash-Blowdown

Wildland Urban Interface (WUI): The WUI is the zone of transition between unoccupied land and human development. It is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels (USFA 2021a). In the absence of a CWPP, Section 101 (16) of the HFRA defines the wildland urban interface as " (I) an area extending ½ mile from the boundary of an at-risk community; (II) an area within 1 ½ miles of the boundary of an at-risk community, including any land that (1) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (2) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (3) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; (III) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community." A CWPP offers the opportunity to establish a localized definition and boundary for the WUI (USFS 2021a).

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APPENDIX A:

Community and CWPP Background Information

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Figures

Tables

GOAL OF A COMMUNITY WILDFIRE PROTECTION PLAN

The goal of a CWPP is to enable local communities to improve their wildfire-mitigation capacity, while working with government agencies to identify high fire risk areas and prioritize areas for mitigation, fire suppression, and emergency preparedness. Another goal of a CWPP is to enhance public awareness by helping residents better understand the natural- and human-caused risk of wildland fires that threaten lives, safety, and the local economy. The minimum requirements for a CWPP, as stated in the Healthy Forests Restoration Act (HFRA), are:

Collaboration: Local and state government representatives, in consultation with federal agencies or other interested groups, must collaboratively develop a CWPP (SAF 2004).

Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuels reduction and treatments and recommend the types and methods of treatment that will protect one or more communities at risk (CARs) and their essential infrastructures (SAF 2004).

Treatments of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan (SAF 2004).

PLANNING PROCESS

The SAF, in collaboration with the National Association of Counties and the National Association of State Foresters, developed a guide entitled *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (SAF 2004) to provide communities with a clear process in developing a CWPP. The guide outlines eight steps for developing a CWPP and has been followed in preparing the Three Rivers CWPP:

Step One: Convene Decision-makers. Form a Core Team made up of representatives from the appropriate local governments, local fire authorities, and state agencies responsible for forest management.

Step Two: Involve Federal Agencies. Identify and engage local federal representatives, and contact and involve other land management agencies as appropriate.

Step Three: Engage Interested Parties. Contact and encourage active involvement in plan development from a broad range of interested organizations and stakeholders.

Step Four: Establish a Community Base Map. Work with partners to establish a base map(s) defining the community's wildland urban interface (WUI) and showing inhabited areas at risk, wildland areas that contain critical human infrastructure, and wildland areas at risk for large-scale fire disturbance.

Step Five: Develop a Community Risk Assessment. Work with partners to develop a community risk assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other values at risk; and local preparedness capability. Rate the level of risk for each factor and incorporate this information into the base map as appropriate.

Step Six: Establish Community Priorities and Recommendations. Use the base map and community risk assessment to facilitate a collaborative community discussion that leads to the identification of local priorities for treating fuels, reducing structural ignitability, and other issues of interest, such as improving fire response capability. Clearly indicate whether priority projects are directly related to the protection of communities and essential infrastructure or to reducing wildfire risks to other community values.

Step Seven: Develop an Action Plan and Assessment Strategy. Consider developing a detailed implementation strategy to accompany the CWPP as well as a monitoring plan that will ensure its long-term success.

Step Eight: Finalize Community Wildfire Protection Plan. Finalize the CWPP and communicate the results to community and key partners.

FIRE MANAGEMENT POLICY

The primary responsibility for WUI fire prevention and protection lies with property owners and state and local governments. Property owners must comply with existing state statutes and local regulations. These primary responsibilities should be carried out in partnership with the federal government and private sector areas. The current federal fire policy states that protection priorities are 1) life, 2) property, and 3) natural resources. These priorities often limit flexibility in the decision-making process, especially when a wildland fire occurs within the WUI.

LEGISLATIVE DIRECTION

MUNICIPAL DIRECTION

County Fire Code

Three Rivers falls within Tulare County and therefore operates based on the Tulare County Code. The Tulare County Municipal Code contains the Fire Code of the County and is found in Chapter 15, Section 7-15-1115. The Fire Code of the County is adapted from the 2019 California Fire Code, as well as the 2018 International Fire Code, and amended as appropriate to suit the needs of the County. This section is cited as “Adoption of California Fire Code, Title 24, Part 9” and referred to as the California Fire Code. The Fire Code is effective within the boundaries of the County, including private land. Implementation, administration, and enforcement of the provisions of the Fire Code are carried out by the TCFD (Tulare County 2021).

Additional information on the fire code is available at https://www.codepublishing.com/CA/TulareCounty/#!/html/TulareCounty07/TulareCounty0715.html

County Fire Hazardous Weeds and Rubbish Ordinance

The Tulare County Code contains the Fire Hazardous Weeds and Rubbish Ordinance (Chapter 11, Section 4-11-1000). The ordinance operates with the purpose to protect the land, fields, lots, buildings, and homes within Tulare County from fire, which may spread from one property to another. The ordinance states, “It is the duty of every owner of private property within the unincorporated areas of Tulare County to prevent a nuisance (Weeds, grass, rank growths and combustible rubbish growing or accumulating upon private property which do, or will when dry, create a fire hazard and which by virtue thereof constitute a danger to neighboring property or the health or welfare of residents of the vicinity are

hereby declared to constitute a public nuisance which may be abated in accordance with the provisions of this Chapter) from arising on, or existing upon, his or her property" (Tulare County 2021).

More information regarding the Hazardous Weed and Rubbish Ordinance is provided here: 4-11. Fire Hazardous Weeds and Rubbish (codepublishing.com)

State Direction

The 2021 California Wildfire and Forest Resilience Action Plan recognizes that California faces continued and urgent threats from catastrophic wildfire. The purpose of this plan is to provide a foundation for supporting healthy, resilient, and fire-adapted forests. The plan is organized into four overarching goals that break down into sub-goals and their correlated action items. The goals/strategies specific to wildfire include:

- **Increase Fuel Breaks:** Reduce the risk of wildfire and slow fire spread within the WUI.
- **Protect Wildfire-Prone Homes and Neighborhoods:** Expand and extend defensible space programs.
- **Improve Utility-Related Wildfire Risk:** Ensure electrical corporations comply with wildfire regulations.
- **Create Fire-Safe Roadways**: Ensure emergency evacuation routes have buffers.

Like the 2014 Cohesive Strategy, California's 2019 Strategic Plan, California's Wildfire and Forest Resilience Action Plan, and FEMA Disaster Mitigation Act of 2000 all mandate community-based planning efforts with full stakeholder participation, coordination, project identification, prioritization, funding review, and multiagency cooperation. In compliance with Title 1 of the HFRA, a CWPP must be mutually agreed upon by the local government, local fire departments, and the state agency responsible for forest management. As outlined in the HFRA, this CWPP is developed in consultation with interested parties and the federal agencies managing land surrounding the at-risk communities. See Figure A.1 for an overview of California's wildfire regulatory environment.

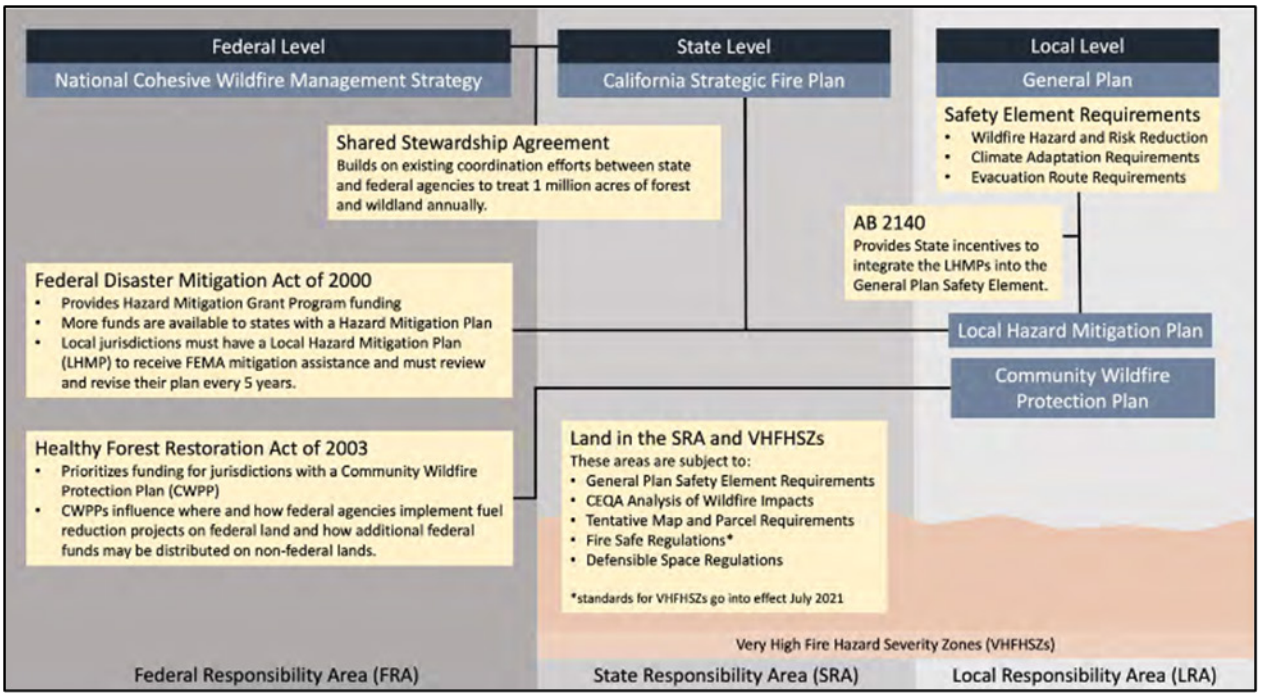

Figure A.1. California's wildfire regulatory framework. Source: OPR (2020)

STATE DIRECTION

California Bills and Regulations

Assembly Bill 1823: This CWPP is in alignment with the requirement stipulated by Assembly Bill 1823 (2019). The bill requires that, on or before July 1, 2022, the State Board of Forestry and Fire Protection develop criteria for and maintain a "Fire Risk Reduction Community" list of local agencies located in a State Responsibility Area (SRA) or a very high hazard severity zone that meet best practices for local fire planning. The existing law requires the State Board to consider specific factors when developing the criteria for the list, including recently developed or updated CWPPs (OPR 2020).

Senate Bill 1241: Senate Bill 1241 (2012) revised the safety element stipulations in state law to instruct all cities and counties whose planning area is within the SRA or a very high fire hazard severity zone (FHSZ) to address and include specific information concerning wildfire hazards and risk, as well as strategies and policies to address and minimize unreasonable risks associated with wildfire. The specific requirements are codified in Chapter 311 of the bill. As a result, CAL FIRE maintains FHSZ maps and data for the entire state. Three classes of fire hazard severity classifications exist: moderate, high, and very high. Fire hazard severity considers the amount of vegetation, temperature, wind, humidity, and topography, and represents the likelihood of an area burning over a 30- to 50-year interval (OPR 2020).

Senate Bill 379: Senate Bill 379 (2015) amended Government Code Section 65302(g)(4) to require that all general plans in California address climate change adaptation and resilience as part of the safety portion of the plan. This amendment requires local jurisdictions to add this change as part of the next revision to their local hazard mitigation plan or, if a local hazard mitigation plan has not been adopted, the safety element must be reviewed and updated to include applicable climate adaptation and resilience strategies (OPR 2020). The CWPP should be integrated into the Safety Element of the City General Plan during the next scheduled revision.

Senate Bill 246: As established by Senate Bill 246 in 2015, the Integrated Climate Adaptation and Resiliency Program (ICARP) is the leading program responsible for coordinating response to climate change impacts on a local, regional, and state scale. ICARP utilizes the Adaptation Clearing House, an online database of climate resources, and coordinates with the Technical Advisory Council to aid in facilitation of resiliency efforts. ORP recommends that climate change–related safety updates be made in alignment with ICARP vision, principals, definitions, and wildfire requirements where applicable (OPR 2020).

PRC Section 4291: Public Resources Code Section 4291 details mandatory defensible space requirements for any person who owns, leases, controls, operates, or maintains a building in an SRA or very high FHSZ within a Local Responsibility Area (LRA). The requirements include, but are not limited to, 100 feet of defensible space around homes, removal of vegetation debris from the perimeter and the roof of homes/structures, and removal of vegetation from chimneys or stovepipes. This code was updated in January 2021 to require an ember-resistant zone within 5 feet of a home/structure on or before January 1, 2023.

Assembly Bill 38: Assembly Bill 38 (2019) amended sections of the Civil, Government, and Public Resources Codes to set forth a comprehensive wildfire mitigation financial support program, which facilitates cost-effective home/structure hardening and retrofitting to create fire-resistant homes, businesses, and public structures. The amendments require the State Fire Marshal, in consultation with the Director of Forestry and Fire Protection and the Director of Housing and Community Development, to identify building retrofits and hardening measures eligible for financial assistance under the program. Additionally, the amendments require that CAL FIRE identify defensible space, vegetation management, and fuel treatment procedures eligible for financial assistance. Wildfire hazard areas eligible for financial assistance under the program include LRAs situated within very high FHSZs and SRAs within any FHSZ (OPR 2020).

FEDERAL DIRECTION

In response to a landmark fire season in 2000, the National Fire Plan (NFP) was established to develop a collaborative approach among various governmental agencies to actively respond to severe wildland fires and ensure sufficient firefighting capacity for the future. The NFP was followed by a report in 2001 entitled *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: A 10-year Comprehensive Strategy*, which was updated in 2002 to include an implementation plan. This plan was updated once more in 2006, with a similar focus on using a collaborative framework for restoring fire-adapted ecosystems, reducing hazardous fuels, mitigating risks to communities, providing economic benefits, and improving fire prevention and suppression strategies. The 2006 implementation plan also emphasizes information sharing and monitoring of accomplishments and forest conditions, a long-term commitment to maintaining the essential resources for implementation, a landscape-level vision for restoration of fire-adapted ecosystems, the importance of using fire as a management tool, and continued improvements to collaboration efforts (Forests and Rangelands 2006). Progress reports and lessons learned reports for community fire prevention are provided annually.

In 2003, the U.S. Congress recognized widespread declining forest health by passing the HFRA, and President Bush signed the act into law (Public Law 108–148, 2003). The HFRA was revised in 2009 to address changes to funding and provide a renewed focus on wildfire mitigation (H.R. 4233 - Healthy Forest Restoration Amendments Act of 2009). The HFRA expedites the development and implementation of hazardous fuels reduction projects on federal land and emphasizes the need for federal agencies to work collaboratively with communities. A key component of the HFRA is the development of Community Wildlife Protection Plans (CWPPs), which facilitates the collaboration between federal agencies and

communities in order to develop hazardous fuels reduction projects and place priority on treatment areas identified by communities in a CWPP.

A CWPP also allows communities to establish their own definition of the WUI, which is used to delineate priority areas for treatment. In addition, priority is placed upon municipal watersheds, critical wildlife habitat, and areas impacted by windthrow, insects, and disease. Communities with an established CWPP are given priority for funding of hazardous fuels reduction projects carried out in accordance with the HFRA.

In 2014, the final stage of the development of a national cohesive strategy for wildfire was developed: *The National Strategy: The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy* (Forests and Rangelands 2014). The national strategy takes a holistic approach to the future of wildfire management:

To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.

- **Restore and maintain landscapes**: Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- **Fire-adapted communities**: Human populations and infrastructure can withstand a wildfire without loss of life and property.
- **Wildfire response**: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions. (Forests and Rangelands 2014:3)

PAST PLANNING EFFORTS

LOCAL

There are several existing documents relating to fire management in the planning area. This CWPP is meant to supplement and not replace any other existing plans. See Chapter 2 for information on agency fire management planning and the growing use of spatial fire planning and decision support tools.

Disaster Preparedness Guide: In 2011, the Tulare County Office of Emergency Services (Tulare County OES) released the Disaster Preparedness Guide (Tulare County OES 2011). The objective of the guide is to prepare Tulare County and its residents for human-caused or natural disasters. The guide provides a series of preventive action steps for a range of disasters, including wildfire preparedness. Regarding wildfire preparedness, the guide recommends completing a fire risk assessment, prioritizing home preparation (e.g., buffer zones, fire-resistant materials, and clearing debris), and preparing for evacuation (e.g., knowledge of evacuation routes, keeping roadways clear, and wearing protective clothing) (Tulare County OES 2011).

Tulare County General Plan: In 2012, the Tulare County Resource Management Agency (Tulare County RMA) produced the Tulare County General plan (General Plan), in compliance with state law (Government Code 65300). The General Plan is a comprehensive guidance document that directs future physical development in Tulare County (Tulare County RMA 2012). The General Plan addresses seven mandatory topics. Included in these topics is the safety topic, which establishes policies to protect the public from risks associated with natural and human-caused hazards, e.g., wildfire hazards. The threat of wildfire is deemed “very high” for the Three Rivers community by the Tulare County RMA (2012).

Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan: In 2018, the Tulare County OES published the Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP). The purpose of the MJLHMP is to assess human-caused and natural risks to county communities, and to reduce the potential effects of the hazards by establishing mitigation strategies (Tulare County OES 2018). Community and hazard profiles; hazard identification, analysis, and assessments; risk assessments; mitigation and adaptation strategies; and monitoring procedures are all outlined within the plan. In addition, the plan also provides hazard analysis and characterization, risk profile, and specific mitigation strategies for each city within the county. According to the MJLHMP, Three Rivers is designated as a very high fire severity zone (Tulare County OES 2018). Fuels reduction, prescribed burning, and increased fuel breaks are recommended to reduce fire risk within the county. In addition, the plan lists a goal of pre-determining fire suppression strategies through updating GIS maps and utilizing fire history and fire behavior models (Tulare County OES 2018). The 2022 Three Rivers CWPP aids in accomplishing this goal.

Tulare Unit Strategic Fire Plan: In 2021, the CAL FIRE Tulare Unit (CAL FIRE TUU) released the Tulare Unit Strategic Fire Plan (SFP). The SFP was collectively developed by city, county, state, and federal agencies. The goal of the SFP is to identify and prioritize pre-fire and post-fire management strategies intended to minimize the loss of values at risk. Fire prevention strategies include pre-fire engineering, information and education, community engagement, enforcement of California's forestry and fire laws, vegetation management, fire control road maintenance, and updated attack plans supported by GIS technology (CAL FIRE TUU 2021). According to the plan, Three Rivers is recognized at both the state and national level for increased fire risk; therefore, developing a CWPP for the Three Rivers community is listed as a goal in the plan. In addition, fuel reduction projects along roadways to improve response capabilities and removing trees killed by insect and disease are specifically recommended for the Three Rivers area (CAL FIRE TUU 2021).

Climate Action Plan: In 2018, Mitchell Air Quality Consulting prepared the Tulare County Climate Action Plan 2018 Update. The purpose of the plan is to direct Tulare County actions to minimize greenhouse gas emissions and adjust to the potential impacts of climate change. The plan offers various adaptation strategies devised to reduce greenhouse gas emissions, including the use of renewable energy to power buildings, water conservation, land use improvements, waste reduction programs, and improving access to sustainable transportation modes. The plan also suggests strategic fuels reductions to minimize the size of fires and the carbon they emit. Tulare County, through the plan update, has created objectives and strategies that improve the resiliency of the county when challenged by climate change hazards and protect populations susceptible to climate change effects (Mitchell Air Quality Consulting 2018).

STATE

Strategic Fire Plan for California: In 2018, CAL FIRE, along with the State Board of Forestry and Fire Protection, developed the Strategic Fire Plan for California (CAL FIRE 2018b). The plan was developed to create a more wildfire resistant environment and community, to increase the understanding of wildfires, and increase cooperation amongst local, state, federal, tribal, and private partnerships. Goals outlined within the plan include identifying natural resources at risk, integrating fire and fuels management tactics with landowners, and implementing post-fire assessments and programs (CAL FIRE 2018b).

California State Hazard Mitigation Plan: In 2018 the California Office of Emergency Services (CA OES) released the latest California State Hazard Mitigation Plan. The intention of the plan was to provide a current update of all past and potential hazards and disasters within California and outline mitigation strategies, risk reduction methods, goals, objectives, strategies, and priorities (CA OES 2018). Mitigation

strategies recommended include strengthening interagency coordination, incorporating climate change into future planning efforts, and establishing a mitigation registry (CA OES 2018).

Fire Hazard Planning Technical Advisory: In 2020, the Fire Hazard Planning Technical Advisory was updated. This plan is part of the General Plan Technical Advice Series. The plan was developed with the goal of reducing fire risk, increasing resilience, and providing a planning framework specifically for fire hazards (OPR 2020). The plan provides an overview of risks and fire hazards to communities within California, fire hazard planning guidance, state and federal policy background, and example policies. Regarding fire planning guidance, the plan recommends implementing public outreach with the community, performing fire hazard and risk assessments, and implementing policy aligned with these goals (OPR 2020).

California Cooperative Forest Management Plan: In 2020 the California Cooperative Forest Management Plan was developed to be used by CAL FIRE, the USFS, and the Natural Resources Conservation Service. This plan is more of a template for fire management plans. The plan outlines topics that should be discussed while planning for fires, such as road systems, property history and conditions, wildlife, water resources, and others (CAL FIRE 2020c).

California's Forests and Rangelands 2017 Assessment: In 2017, CAL FIRE published California's Forests and Rangelands 2017 Assessment. CAL FIRE's Fire and Resource Assessment Program evaluates the amount and size of California's forests and rangelands and analyzes their conditions to establish management and regulatory guidelines. The assessment is used to delineate priority landscapes that aid in focusing investments and other programs to ameliorate issues. The goal of the assessment is to meet both state and federal mandates for natural resource inventories and planning (CAL FIRE 2018a).

Community Wildfire Prevention & Mitigation Report: In 2019 CAL FIRE published the Community Wildfire Prevention & Mitigation Report in response to Executive Order N-05-19, which directs CAL FIRE and other state agencies to recommend administrative, regulatory, and policy changes to prevent and mitigate wildfires. The order stresses taking necessary actions to protect vulnerable populations and to identify backlogs in fuels treatments projects. CAL FIRE identified 35 priority projects that could be implemented right away to reduce public safety risk for over 200 communities. Potential projects included removal of dead trees, vegetation clearing, creation of ingress and egress paths, and creation of fuel breaks and community defensible spaces (CAL FIRE 2019c).

California's Wildfire and Forest Resilience Action Plan: In 2021 the California Forest Management Task Force (CA FMTF) developed California's Wildfire and Forest Resilience Action Plan (CA FMTF 2021a). The purpose of the plan was to sustain economic strength of the forests, improve forest health and resilience, and increase the level of fire safety within communities. The plan is broken up into four major goals and strategies to achieve said goals (CA FMTF 2021a). The goals include increasing the pace and scale of forest health projects, strengthening the protection of communities, managing the forest to achieve the state's economic and environmental goals, and driving innovation while measuring progress. Strategies for increasing community fire safety include increasing fuel breaks, creating fire-safe roadways, and supporting community risk reduction (CA FMTF 2021a).

Wildfire and Forest Resilience Task Force Organizational Charter: In 2021 the California Forest Management Task Force developed the Wildfire and Forest Resilience Task Force Organizational Charter. The charter was created to provide a framework for accomplishing goals and actions within the 2021 California Wildfire and Forest Resilience Action Plan (CA FMTF 2021b). The deliverables will be distributed amongst five working groups: Forest Management; Wildfire Adapted Communities; Regional Frameworks; Communications; and Monitoring, Reporting, and Assessment (CA FMTF 2021b).

Vegetation Management Program: In addition to the Strategic Fire Plan, CAL FIRE operates a Vegetation Management Program that focuses on addressing resource management and wildfire fuel hazards within SRA lands (CAL FIRE 2021e). The program has three management objectives with various sub-goals. The management objectives are the reduction of conflagration of fires, optimization of soil and water productivity, and the protection and improvement of intrinsic floral and faunal species (CAL FIRE 2021e).

California Vegetation Treatment Program: In addition to planning documents, the State of California operates the California Vegetation Treatment Program (CalVTP). This program was developed by the Board of Forestry and Fire Protection to create healthy fire regimes, reduce hazardous vegetation that increases wildfire risk, and reduce risk within communities. Prescribed burning, prescribed herbivory, herbicides, mechanical treatments, and manual treatments are used for vegetation management. In addition, you can visit the CalVTP Implementation Database to find current and approved projects. To learn more about this program, visit the following URL: https://bof.fire.ca.gov/projects-and-programs/calvtp/

FEDERAL

National Park Service

In 2006 the NPS published the Final General Management Plan. The purpose of the plan is to provide actions and alternatives for land management in SEKI NPs (NPS 2006). The plan includes suggested actions and alternatives for fire management and planning; however, a specific fire management plan, the Fire and Fuels Management Plan, is in development. The new plan will be based on fire history and recent research and will employ a prescribed fire plan that mimics the natural fire regime of the Sierra Nevada ecosystem (NPS 2006).

U.S Army Corps of Engineers

The Lake Kaweah Dam and Reservoir, which sits in the western fringe of Three Rivers, are owned and managed by the U.S. Army Corps of Engineers (USACE), Sacramento District. The dam is a water conservation and flood risk mitigation project that serves as a regulating structure on the Kaweah River. At full capacity, the lake holds around 185,000 acre-feet of water. All the water stored in the reservoir is used for agricultural purposes; in particular, supplying irrigation water to the southern Central Valley. In addition, the dam also serves as a hydropower facility. Although there is no existing land management plan for the dam, the USACE manages the public water and land for recreational opportunities and wildlife habitat (USACE 2021). A future wildfire may impact the functioning of the dam due to potential post-fire debris flows and sedimentation.

U.S. Forest Service

The existing guiding document is the Revised Draft Land Management Plan for the Sequoia National Forest (NF) (USFS 2019b). The Draft Plan satisfies the National Land Management Act of 1976 and directs all fire management activities in the forest, among other things. However, the plan is in the draft phase and the USFS expects to release the final plan late 2022). The new plan considers the altered forest conditions from the 2020 fire season and includes goals such as reducing the risk of catastrophic wildfires and improving ecosystem health (USFS 2021d).

Bureau of Land Management

The Bureau of Land Management (BLM) does not have a general fire management plan; however, the BLM collaborates with several federal, state, and local organizations to develop and implement wildland fire programs. For instance, the BLM's fuels management program directs a wide range of active management vegetation treatments using mechanical, biological, and chemical tools, and prescribed fire. The program consists of creating fuel breaks, reducing fuel loads, reducing fire risk near communities, targeted grazing, and herbicide to break fire-grass cycles. Fuels treatments are planned and implemented jointly with other BLM programs, and with federal, state, local, and non-governmental collaborators (BLM 2021).

There are 2 Wilderness Study Areas (Sheep Ridge and Case Mountain) owned and managed by the BLM adjacent to the planning area. Sheep Ridge is to the north and Case Mountain is to the east of Three Rivers. On these lands, manipulation of vegetation through mechanical treatment, chemical application, or prescribed fire is usually not allowed. However, during emergencies, vegetation may be manipulated when wildfires threaten non-federal land and there is no practical alternative (BLM 2012).

PUBLIC LAND MANAGEMENT

LAND MANAGEMENT STRATEGIES

In 2020, California and the federal government signed an agreement of the shared stewardship for California forests and rangelands. The agreement sets many goals for the State of California and the federal government to accomplish together (California Office of the Governor 2020).These goals include; treating at least 1 million acres of California lands per year to reduce the risk of wildfires, developing a 20-year cooperative forest management plan which will outline projects and priorities, encouraging and increasing the use of sustainable land management practices such as prescribed fire, increase the forest management workforce and in turn increase the pace and scale of forest management, and prioritizing forest health benefits such as carbon sequestration and healthy watersheds. Funding for this agreement will be provided from the Great American Outdoors Act (California Office of the Governor 2020).

Forest managers in the region are addressing land management objectives through the use of prescribed fire, mechanical, and manual treatments to promote more resilient forest lands. Private, state, and federal lands are interspersed creating a matrix of land ownership, which is often a hurdle to implementation of landscape level treatments. By working with private landowners, forest managers are enhancing landscape-scale efforts to create more resilient forest communities.

State Land

Between 2020 and 2021, utility companies in California expected to spend approximately 11 billion dollars on wildfire risk mitigation after the record breaking 2020 fire season. The funds are being spent on annual wildfire mitigation plans which include mitigation recommendations and strategies. Some of the activities expected to be implemented include ensuring proper vegetation clearance around utility infrastructure, system hardening, and increased equipment inspection and repair (Balaraman 2021).

In California, CAL FIRE maintains FHSZ data for the entire state. There are three classes of fire hazard severity ratings within FHSZs: moderate, high, and very high (OPR 2020). FHSZs are defined based on vegetation, topography, and weather, and represent the probability of the area burning and potential fire behavior in the area. Nearly all the planning area is composed of very high FHSZs, which are present throughout the community (CAL FIRE 2021g).

Federal Land

Sequoia and Kings Canyon National Parks

The SEKI NPs cover a combined area of 1,353 square miles, with elevations ranging from 1,300 feet in the foothills to 14,491 feet at the summit of Mount Whitney, located next to the Sierra Nevada range. The forest comprises land in Tulare and Fresno Counties (NPS 2021g).

The Final General Management Plan is the guiding policy document for land management in SEKI NPs. A new Fire and Fuels Management Plan is in development, it will be based on current research and science, as well as updated national policies. However, in the event of conflicts of policy gaps, the Final General Management Plan will supplant the Fire and Fuels Management Plan (NPS 2006).

The NPS works closely with neighboring entities to develop cross-boundary landscape projects focused on landscape resiliency and forest health (Figure A.2). For example, the KWFM uses prescribed fire and mechanical fuels treatments to "maintain fire's role as a natural ecological process for wildland fire management and incident operations (NPS 2019a)." Additionally, Engine 72 employs prescribed fire to meet the objectives of the parks' fire ecology program (NPS 2019b).

Figure A.2. Fuels treatments within the Sequoia & Kings Canyon National Parks.
Source: NPS. https://www.nps.gov/seki/learn/nature/crew-91.htm and https://home.nps.gov/seki/learn/nature/engine-72.htm

Sequoia National Forest

While not within the planning area, the Sequoia NF may impact Three Rivers in the event of a large fire. The Sequoia NF covers an area of 1.1 million acres and is situated primarily in Tulare County. The forest takes its name from the giant sequoia, which grows in the forest's lower elevations. The forest hosts a diversity of landscapes, including fast-moving rivers, waterfalls, glacier-carved canyons, and granite monoliths. Elevations throughout the forest range from 790 feet in the Lower Kern River Valley to 12,432 feet in the Golden Trout Wilderness (USFS 2019b).

The Sequoia NF is managed by the USFS, and the guiding document is the Revised Draft Land Management Plan for the Sequoia National Forest (USFS 2019b). The Draft Plan divides the forest into seven management areas and nine designated areas. Management areas are managed according to the purpose of the specified area, e.g., wildlife habitat. Designated areas are composed of areas or characteristics that have been identified to keep a particular purpose or feature, e.g., research natural areas. In addition, the USFS has created four Strategic Fire Management Zones within the forest (USFS 2019b):

- **Community Wildfire Protection Zone**: This zone is composed of locations where communities and private lands could be at elevated risk of damage from wildfire, particularly where ample fuels exist. Priorities for this zone include identifying and using community buffer areas to implement strategic fuel treatments near structures and access points. In this zone, wildfires are suppressed under most fuel and weather conditions because of the elevated risk to public safety and the potential economic loss presented by a wildfire.
- **General Wildfire Protection Zone**: This zone consists of locations where wildfire threatens natural resources and/or community values. Wildfires in this area may adversely impact natural resources due to the condition of the ecosystem and natural fire regime. Wildfires that commence in this area have the potential to spread to the Community Wildfire Protection Zone. Priorities in this zone include hazardous fuel reduction and targeted ecological restoration.
- **Wildfire Restoration Zone**: This zone contains locations where existing conditions pose a moderate risk of wildfire damage to a particular natural resource. Generally, wildfires that begin in this zone present a low to moderate threat to communities under typical fire season conditions. Priorities in this zone include ecological restoration.
- **Wildfire Maintenance Zone**: This zone is made up of locations where wildfire presents a minor threat to communities under average fire season conditions and where the ecosystem benefits from wildland fires. Priorities in this zone include the implementation of prescribed fire for ecological restoration and to accomplish resource goals.

In 2020, the USFS partnered with the Mule Deer Foundation, Great Basin Institute, and National Wild Turkey Federation to boost forest health and wildlife habitat while minimizing wildfire risk following the significant tree mortality event brought upon by prolonged drought and bark beetle outbreaks. The project is called the Eshom Ecological Restoration Project and is in the Hume Lake Ranger District within the Giant Sequoia National Monument in the Sequoia NF. The USFS and its partners aim to restore over 5,000 acres of forest, state, and private land using prescribed burning, pile and burn, mastication, biomass removal, and reforestation to enhance forest health and wildlife habitat as well as reduce fuels near private properties (USFS 2020).

MUTUAL AID OR SHARED STEWARDSHIP AGREEMENTS

The Tulare County General Plan states that it is the county's goal to participate in local, state, and federal mutual aid systems. Specifically, in situations that necessitate effective provision of emergency services (Tulare County RMA 2012).

In 2020, the State of California and the U.S. Forest Service (USFS) signed a shared stewardship agreement to commit to collaborative forest management and set landscape scale priorities. The shared stewardship agreement includes a commitment to coordinate and share tools, processes, and innovative approaches in respect to fire management. You can find the stewardship agreement here: https://www.gov.ca.gov/wp-content/uploads/2020/08/8.12.20-CA-Shared-Stewardship-MOU.pdf

LOCATION AND GEOGRAPHY

Three Rivers has an area of 44.5 square miles and is situated to the northwest of the city of Visalia, in the Kaweah River Canyon. To the northwest of Three Rivers is the SEKI NPs. To the east of the project site is the Sierra Nevada range and the Sequoia NF. The main transportation corridors are Highway 198 and South Fork Drive. Local access roads include narrow, winding roads, and one-lane gravel roads.

Three Rivers is primarily composed of privately owned land. Public land in Three Rivers is managed by the state, BLM, and NPS (Table A.1).

Table A.1. Breakdown of Land Ownership in Three Rivers

Land Ownership	Square Miles	Percentage of the Area
Private	35.4	99.76%
State	0.06	0.17%
National Park Service	0.026	0.07%

ROADS AND TRANSPORTATION

The main access route to Three Rivers is Highway 198, which converts into Sierra Drive near Lake Kaweah. Highway 245 intersects Highway 198 at the southwestern end of Three Rivers and provides access to Fresno County. Highway 198 originates in the vicinity of Three Rivers, and intersects Visalia, to connect to Interstate 5 to the west. Highway 65 intersects Highway 198 near the southwestern terminus of Three Rivers and connects Tulare County with Kern County. Highway 190 runs parallel to Highway 198 and provides local access to Sequoia NF. Within Three Rivers, South Fork Drive runs through nearly the entire length of Three Rivers in a north–south orientation. Other roads in the vicinity of Three Rivers consist of narrow, winding roads, including maintained two-lane roads, and some one-lane gravel roads (Figure A.3).

Please see Chapter 3 to view the evacuation route risk analysis.

Figure A.3. Photograph showing the steep grade and unsurfaced road surface of a WUI community

TOPOGRAPHY

Three Rivers, which is situated in foothills and mountainous regions, is topographically varied. The area is marked by oak woodland forest and foothills (Figure A.4). Elevations in the surrounding area range from 1,000 feet above sea level at the river-basin to 14,500 feet above sea level at Mt. Whitney, the highest peak in the contiguous United States (Tulare County OES 2018). Topography varies from rolling foothills above the Central Valley to steep river basins along the Kaweah River. Extensive ridges and mountains are divided by canyons, small ravines, and valleys (CAL FIRE TUU 2021).

Figure A.4. Typical landscape in Three Rivers, showing mountains, oaks, and chaparral vegetation.

POPULATION

The following information is drawn primarily from U.S. census data (U.S. Census Bureau 2021). In 2019, the population estimate of Three Rivers was 2,053 persons, and there were 1,302 housing units. Three Rivers has a population density of 46 people per square mile.

RECREATION

Outdoor recreation is extremely popular in and around the planning area. The SEKI NPs, Sequoia NF, and the Sheep Ridge and Case Mountain Wilderness Study Areas attract millions of visitors to the area. Camping, hiking, water and snow skiing, fishing, and boating are popular on public land.

During peak seasons and large events, a significant number of people can congregate in relatively small areas, which results in large populations potentially needing to evacuate should an emergency occur. For instance, the SEKI NPs alone had nearly 2 million visitors in 2019 (Figure A.5) (NPS 2021h).

Figure A.5. Visitors viewing General Sherman tree in Sequoia National Park.

Source: Flickr: https://live.staticflickr.com/3850/14821612674_d9ec6eab9b_b.jpg

CLIMATE AND WEATHER PATTERNS

The Three Rivers region displays a mid-elevation temperate Mediterranean climate, typical of the Sierra Nevada foothills. Winters are generally cool and wet, while summers and hot and dry. Climate conditions vary spatially across the landscape depending on topographic factors such as slope, aspect, and elevation (National Oceanic and Atmospheric Administration [NOAA] 2022). Winds are typically diurnal and upslope around 10 a.m. and switch to downslope shortly before sunset. The winds can have speeds exceeding 10 mph and tend to significantly affect fire behavior (CAL FIRE TUU 2021).

Table A.2. Climate Summaries for Weather Stations in the Planning Area

			Mean Annual Temperature (°F)		
Station	Period of Record	Total Mean Annual Precipitation (Inches)	Max	Min	Mean Annual
Three Rivers Edison	1991–2020	22.52	76.7	48.4	62.5
Ash Mountain	1991–2020	24.99	75.5	51.5	63.5

July is typically the hottest month of the year in the planning area, with average July maximum temperatures ranging from 97.1 ºF at the Ash Mountain weather station to 97.4 ºF at the Three Rivers Edison weather station. December is usually the coldest month, with average December minimum temperatures ranging from 35.4 ºF at the Three Rivers weather station to 38.0 ºF at the Ash Mountain weather station (NOAA 2022). Mean annual temperatures vary throughout the planning area due to its spatially heterogenous terrain. North-facing slopes are generally cooler than south-facing slopes, and temperature generally decreases with increasing elevation.

The Three Rivers location receives a moderate amount of precipitation, reflective of Sierra Nevada foothills Mediterranean climate. Annual precipitation totals range from 22.52 inches at the Three Rivers weather station to 24.99 inches at the Ash Mountain weather station. Winter months are usually cool and wet with ample precipitation, whereas the months of December, January, February, and March receive approximately 70% of the annual precipitation. The summer months of July, August, and September are hot and dry with infrequent precipitation and receive only approximately 1% of the annual precipitation. Precipitation is also dependent on elevation, with high-elevation sites generally receiving more precipitation than low-elevation sites.

Monthly climate normals (30-year averages) for The Three Rivers region are graphed by weather stations below (Figures A.6 and A.7).

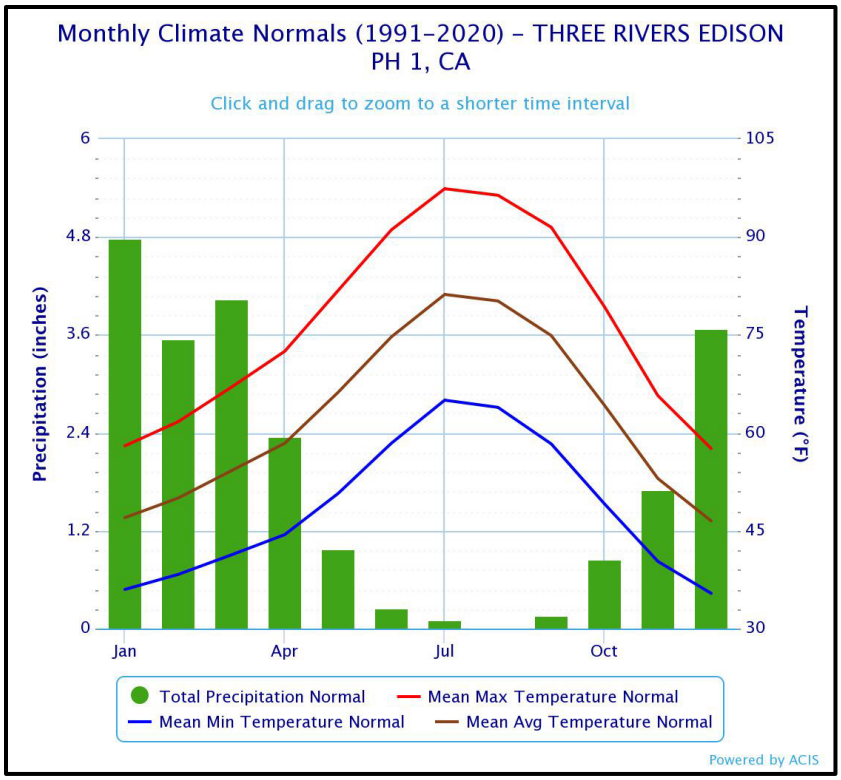

Figure A.6. Monthly climate normals for the Three Rivers Edison weather station for 1991–2020.

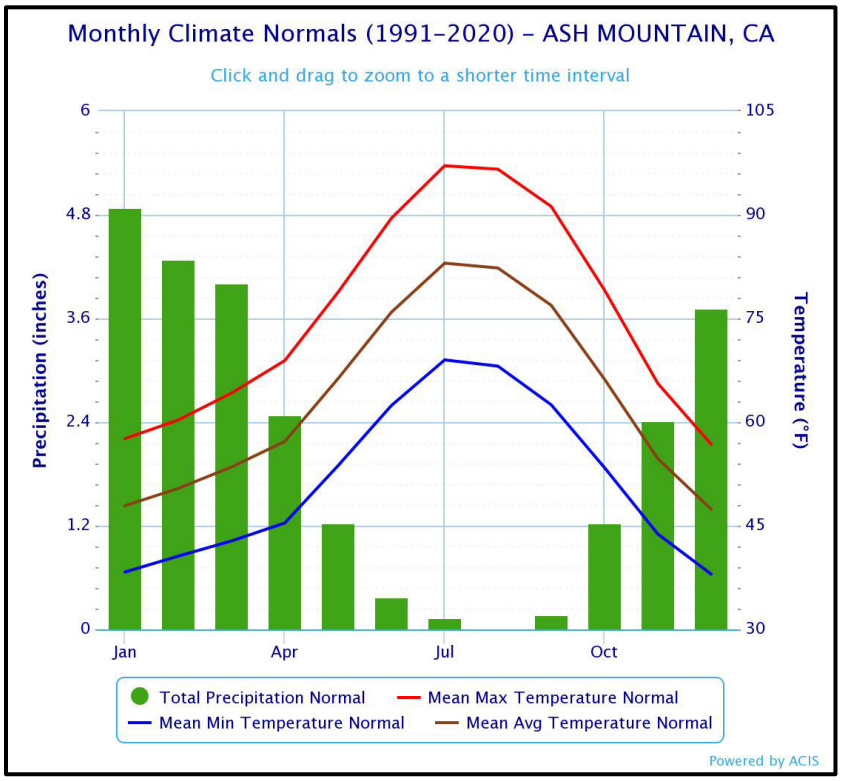

Figure A.7. Monthly climate normals for the Ash Mountain weather station for 1991–2020.

VEGETATION AND LAND COVER

Vegetation zones within Three Rivers are primarily a function of elevation, slope, aspect, substrate, and associated climatic regimes. However, since the planning area is relatively small, vegetation composition is moderately uniform (Figure A.8).

Dominant vegetation types within the planning area are described based on a large spatial scale and represent the overall community structure that will play a general role in fire occurrence and behavior. Although the vegetation types are outlined and described for the entire area in this plan, site-specific evaluations of the vegetative composition and structure in each area of focus should be taken into consideration when planning fuels treatments.

The major vegetation types in Three Rivers listed in Table A.3 were sourced from the USFS CALVEG product and are described below the table in more detail using the NatureServe United States Ecological Systems categories. Other types of land cover (e.g., agricultural and developed) also exist in a very small percentage of the area and are not described in more detail as they do not play a significant role in fire behavior.

Table A.3. Major Vegetation Types within Three Rivers

Existing Vegetation Type	Square Miles	Percent
Temperate & Boreal Forest & Woodland Subclass	17.04	96.43%
Temperate & Boreal Grassland & Shrubland Subclass	0.63	3.57%

Source: USFS CALVEG https://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192

TEMPERATE & BOREAL FOREST & WOODLAND SUBCLASS

The most common forested community consists of temperate and boreal forest and woodlands. This ecological system occurs in a broad range of climactic conditions, from warm-temperate to very cold subarctic conditions. Tree species diversity is typically low in temperate forests and woodlands. Temperate and boreal forest and woodlands is generally dominated by broad-leaved deciduous and needle-leaved trees, with some broad-leaved evergreens in warmer environments. Trees usually range in height from 10 to 30 meters (NatureServe 2020a).

TEMPERATE & BOREAL GRASSLAND & SHRUBLAND SUBCLASS

Most of the vegetation in the Three Rivers consists primarily of temperate and boreal grassland and shrubland communities. These types of communities occur in areas of moderately wet to dry Mediterranean climates. Grasslands and shrublands within the area are composed almost entirely of mesomorphic (plants which are neither adapted to particularly dry nor particularly wet environments) grasses and shrubs but may also include scattered trees. The grassland and shrubland communities vary from open grasslands to dense bunch or sod grasses, usually scattered with trees and shrubs, to low open to dense shrublands and soft chaparral scrub (NatureServe 2020b).

Additional information regarding vegetation can be found under Fire Regimes.

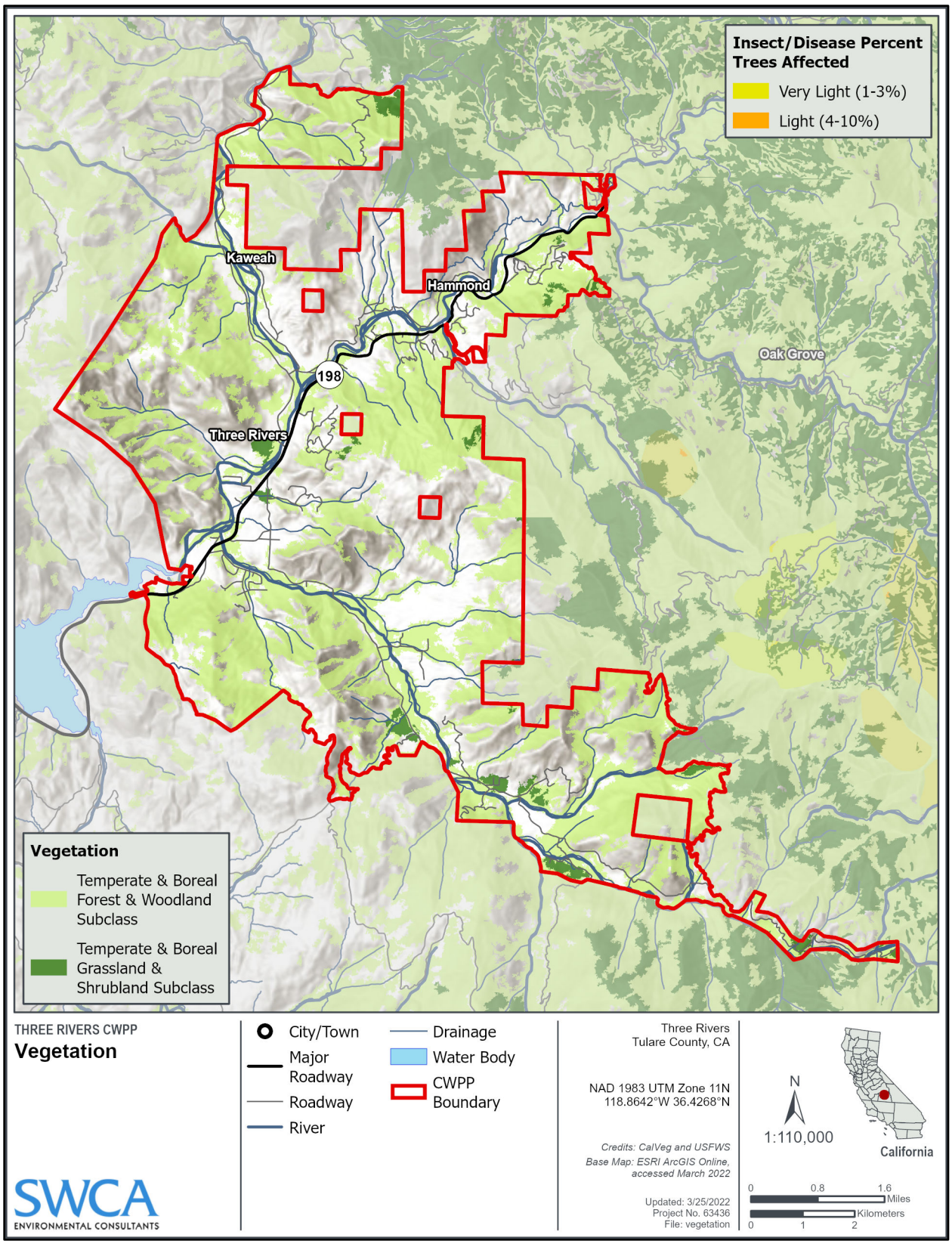

Figure A.8. Three Rivers existing vegetation cover.

FOREST HEALTH CONSIDERATIONS

INSECTS

Native insect epidemics within plant communities are usually part of a natural disturbance cycle similar to wildfire. They are often cyclic in nature and are usually followed by the natural succession of vegetation over time. Of primary interest are those that attack tree species because of the implications for fire management.

In addition to native insect epidemics, exotic pests also pose a significant threat to forest ecosystems. Invasive species are organisms that are introduced into an area beyond their natural range and become pests in the new environment. They are also referred to as exotic pests, alien, nonnative, or introduced pests. The majority of introductions have been unintentional and accidental. Having evolved in a different environment, these invasive species may have few natural enemies in their new locations, which can often lead to rapid population increases that can out-compete native species for resources.
The introduction of exotic pests is likely to cause economic, environmental, and agricultural harm as well as harm to human health (CDFA 2021b). In general, traits of invasive species include fast growth, rapid reproduction, rapid adaptability, tolerating a wide range of environmental conditions, and utilizing a variety of different foods (CDFA 2021b).

Insect epidemics in California forests continue to persist. In 2019, USFS's annual aerial survey showed tree mortality in 2.2 million acres out of 41 million acres that were surveyed. Tree mortality is strongly correlated with extreme and prolonged drought and subsequent bark beetle attacks (USFS 2019a). Stands of trees that have been killed by insects have varying degrees of associated fire danger depending on the time lapse following an insect attack and structure of the dead fuels that remain. However, forests with a large degree of mortality following an insect attack have the potential to experience extremely high fire danger, especially if a large degree of needle cover remains in the canopy. Moreover, areas with a high load of dead trees present a highly hazardous environment for firefighters and thus limit or preclude initial attack efforts. For example, firefighters had severely limited access to the early-stage perimeter of the 2021 Colony Fire in the SEKI NPs due to the high quantity of dead trees in the area (personal communication, Andrew Cremers 2022).

Insects that have infested or have the potential to infect the forests within and around the CWPP planning area are discussed below.

Mountain Pine Beetle *(Dendroctonus ponderosae*): the adult mountain pine beetle (MPB) is 0.25 inch long, dark brown to black in color, and cylindrically shaped. They are native to the western United States, and traditional hosts include lodgepole, ponderosa, coulter, knobcone, western white, sugar, and whitebark pines. MPB is the most aggressive, persistent, and destructive bark beetle in the western United States. In addition, MPB have been reported on lodgepole pine in SEKI NPs. These insects target weak or damaged trees, attacking one or multiple at a time. Damage from these beetles is conspicuous: pitch tubes are observed at the point of attack. Outbreaks can escalate quickly, killing 80% of trees in a stand. Drought seasons can increase the severity of MPB infestations as the drought weakens the trees and the beetles are most active during drought season (USFS 2011).

Western Bark Beetle (*Phloeosinus punctatus*): western bark beetles are tiny, around 1.5 mm, reddish black and shiny beetles that bore through the outer bark and into the phloem of the branches and main stems of host trees. Western bark beetle primarily attacks cedar trees but have also been infecting giant sequoias. In fact, beetle kill in giant sequoias is a novel occurrence, which is associated with increased

temperatures and drought (NPS 2019c). In 2015, around 2,215,000 total trees (mostly cedar) were estimated to have been killed by western bark beetle in the Sequoia NF (USFS 2015).

Glassy-Winged Sharpshooter *(Homalodisca vitripennis):* the glassy-winged sharpshooter (GWSS) was introduced from the southeastern United States as eggs on nursery stock and was first observed in Orange and Ventura Counties in California in 1989. However, they have spread further north and are now found in Tulare County. GWSS have a large plant-host range and are particularly abundant on citrus. Females lay egg masses, in groups of 8 to 12, under the leaf surface of young, fully developed leaves. GWSS feed on plants through straw-like mouthparts inserted into the xylem tissue. Since nutrients are diluted in xylem fluid, GWSS must feed on large volumes to meet nutritional needs. Therefore, this invasive pest produces plentiful excreta and are a social nuisance as the excreta rains down. In addition to being a social nuisance, GWSS has the capacity to acquire and spread the bacterial plant pathogen *Xylella fastidiosa*. Different strains of this pathogen induce grave diseases in many agricultural and ornamental plants. The best known of these ailments is Pierce's disease of grapevines. Other crops at risk include alfalfa and almonds as well as ornamental and fruit trees (University of California Riverside [UCR] 2021).

Velvet longhorned beetle (*Trichoferus campestris):* the velvet longhorned beetle (VLB) is native to Asia and Russia, but now has an extended geographic range across Europe and North America—it has been introduced to the southern San Joaquin Valley and has been recorded in Tulare, Fresno, Los Angeles, Riverside, and San Bernardino Counties. The VLB has a wide host range, affecting over 40 genera of coniferous and broadleaf plants. VLB lays eggs under bark of trees and the larvae tunnel into and feed on the cambium and xylem. Symptoms of larval feeding in trees include yellowing or thinning of the crown. It is most commonly a pest of orchards and forests; target trees include birch, mulberry, fir, apple, pine, walnut, oak, cherry, peach, maple, grape, and beech. However, the VLB is not known to rapidly kill trees, but it may affect fruit yield and tree longevity (CDFA 2021c).

Fir Engraver Beetle *(Scolytus ventralis):* the fir engraver beetle (FEB) is native to California. Adult FEBs are black, shiny, and around 4 mm long. Larvae are white, legless grubs with body morphology akin to adults. The beetle is responsible for increasing tree mortality in the southern Sierra Nevada Range (SEKI NPs); in 2019, the SEKI NPs had approximately 2 dead trees per acre. Trees may be killed singly or in groups. FEB infestation causes topkill, dead branches, discoloration, and dead patches of cambium (California Forest Pest Council 2019).

Walnut Twig Beetle (*Pityophthorus juglandis*): the walnut twig beetles (WTB) is tiny, about 1.5 mm, reddish-brown bark beetles that bore through the outer bark and into the phloem of the branches and main stems of walnut trees. Larvae are white, c-shaped, and found in the phloem. The insect is present throughout California walnut orchards and in black walnut trees, including English walnut orchards in and near Three Rivers and Tulare County. In addition to the physical damage from boring and feeding, the twig beetle is also a vector of a pathogenic fungus, *Geosmithia morbida*. Fungal spores are carried on the surface of the beetle's wing covers. As beetles bore through the bark, the spores are transferred to the phloem. The fungal infection causes cankers that surround the gallery system. Numerous cankers may overlap and girdle branches and main scaffolds, leading to crown decline. Eventually, it is likely that colonization by twig beetle and subsequent infection by the pathogenic fungus will kill the tree (UCANR 2021d).

DISEASES

Diseases of trees, such as parasitic plants, fungi, and bacteria, can also affect forests in and around the planning area. These diseases impact forest systems by degrading the productivity and health of the

forest. Some of the more common forest diseases that are found in the area are described below. Trees that are killed by disease have the similar potential to increase fire hazards.

Thousand Canker Disease is caused by a pathogenic fungus (*Geosmithia morbida*). The fungus is transferred via an insect vector, the walnut twig beetle (*Pityophthorus juglandis*). In was first reported in 2008, in urban and suburban black walnut plantings in California. However, the disease has been reported in commercial black walnut and English walnut orchards, including some in the vicinity of Three Rivers. It is believed that initial infection may start off tree decline and mortality; the disease was associated with widespread mortality of black walnut in Colorado (UCANR 2021e).

White Pine Blister Rust (*Cronartium ribicola*). White pine blister rust is a nonnative disease caused by a fungus that first arrived in America in the early twentieth century from Asia and Europe. All western U.S. species of five-needle white pines are threatened by the invasive pathogen, including pines found in the Sequoia National Park (NPS 2021c). The complex life history of the fungus ultimately results in a lethal infestation of the host tree. The branch and stem canker that result from infestation can result in top kill, branch die-back, and eventually tree mortality.

PHYSIOLOGICAL STRESS

As climate change progresses, rising temperatures, prolonged growing seasons, and increased spatial and temporal variation in water availability are having considerable effects on tree physiology and health. When trees experience extreme water stress during periods of prolonged and/or intense drought considerable tree mortality can occur due to physiological stress alone (Anderegg et al. 2015; McDowell 2011). Usually, these die offs are occurring due to either one of or a combination of two physiological pressures. One, hydraulic failure – this is more common and occurs when a tree's water column (its xylem) is no longer able to transport water to its leaves due to the column embolizing under extreme tension. Two, carbon starvation – this occurs when a tree consumes more sugars than it photosynthesizes due to limited photosynthesis during prolonged drought (Adams et al. 2009; McDowell 2011; Venturas et al, 2020). During periods of extreme drought, such as the drought observed from 2012 to 2016 in the Sierra Nevada, physiological stress can significantly contribute to tree mortality (Byer and Jin 2017). Furthermore, these phycological stresses also interact with forest pathogens and wildfire to increase the likelihood of tree mortality during prolonged drought (Lauder et al. 2019; California Office of Environmental Health Hazard Assessment 2019).

WILDLIFE

Vegetation management treatments are commonly applied around Three Rivers to benefit habitat for general wildlife species or game habitat. Most native wildlife species found in the region evolved with a frequent fire regime.

THREATENED AND ENDANGERED SPECIES

The Three Rivers CWPP planning area is home to multiple threatened and endangered species. Within the area's state, private, and federal land, federally listed endangered animals include the Pacific fisher, Sierra Nevada bighorn sheep, San Joaquin kit fox, mountain yellow-legged frog, and California condor. Federally listed threatened animals include the California red-legged frog, California tiger salamander, Yosemite toad, and delta smelt (NPS 2021i; U.S. Fish and Wildlife Service 2022). Various federally listed plants such as the Springville clarkia also occur in the area.

Treatments on federal land would be subject to NEPA and associated analysis of impacts to these species. Treatments in areas that may impact threatened and endangered species would require application of certain mitigation measures to prevent degradation to habitat. As an example of a mitigation measure, fuels treatment activities on federal lands may be subject to restrictions according to limited operating periods. Limited operating periods decrease the time frame for which fuels treatment activities may occur.

FIRE REGIMES

Fires are characterized by their intensity, the frequency at which they occur, the season in which they occur, their spatial pattern or extent, and their type. Combined, these attributes describe the fire regime.

In order to classify, prioritize, and plan for fuels treatments across a fire management region, methods have been developed to stratify the landscape into fire regimes based on physiographic and ecological characteristics.

OAK WOODLANDS

Oak woodlands in the planning area comprise blue oak, usually interspersed with black, live, and scrub oaks, as well as buckeye trees. Oak woodlands typically mix with annual grasslands or valley oak woodlands at lower elevations and pine woodlands at higher elevations (CAL FIRE TUU 2021). Oaks are also prominent members in chaparral communities. Normally, these woodlands consist of scattered trees, however, the canopy can be nearly closed in high-quality environments. The understory is usually composed of annual grassland vegetation (California Department of Fish and Game 1999). Fire plays an important role in foothill oak woodland ecosystems; enhanced oak recruitment and sprout growth are typically noted after a fire (Standiford et al. 2012). However, oak survival is largely dependent on tree species, location, fire frequency, adjacent vegetation types, and fire severity. Generally, oak trees are adapted to moderate-frequency, low-intensity fires, not the high-frequency, high-severity fires recorded in recent times. In communities where oak is associated with chaparral and grassland, fire may spread quickly through the shrub canopy; if fire intensity is high and trees are in a closed stand, the fire may spread through large lateral branches or the crown (Steinberg 2002).

CHAPARRAL

Chaparral communities in Three Rivers are found at elevations between 500 and 2,000 feet and consist of several species, including scrub oak, poison-oak, chamise, and manzanita (CAL FIRE TUU 2021). A few species, particularly chamise—the most widespread of chaparral shrubs—have needle-thin leaves which enhances its flammability. In addition, most of the shrubs associated with chaparral vegetation, including manzanita and chamise, have characteristics that increase their flammability. They typically grow quickly, generate plentiful fine, dead branches, and have leaves with high resin content (oils) (Abrahamson 2014). When chaparral communities burn, fire spreads through the shrub canopy, typically resulting in a stand-replacement crown fire (Abrahamson 2014). According to Abrahamson (2014), the estimated historical fire-return intervals for chaparral communities with common manzanita range from 30 to 125 years. However, fires now occur more frequently in southern California chaparral environments because of human encroachment into wildlands. Although chaparral vegetation is fire-adapted and regrows quickly after fire, either from underground seeds or sprouting from stem bases, altered fire regimes may adversely impact the regenerative cycles of chaparral species. The repetition of fires at short intervals (<10 years) that kill juvenile plants before they produce seed can decrease populations of shrub species that usually follow fire disturbances. Additionally, invasive grasses frequently colonize

chaparral stands that are in recovery and persist until the shrubs close the canopy; however, if fire occurs during the grass succession phase, competition from chaparral shrub species is reduced and can allow grass seeds to survive and propagate a cycle of more frequent fires and decreased shrub cover (USFS 2021e).

RIPARIAN COMMUNITIES

Riparian vegetation in the planning area contains sycamore trees and is usually mixed with brush, black and live oaks, and buckeye trees (CAL FIRE TUU 2021). Lowland riparian environments in many regions of California have been altered extensively by human utilization. As a result of these modifications, species composition and spatial dimensions of riparian plant communities have changed. In most cases, native riparian vegetation has been eliminated completely. Studies suggest that fire frequency and severity are increasing in many riparian environments where nonnative plants constitute a significant part of the plant community (Webb et al. 2019). Native riparian trees such as sycamores, willows, and cottonwoods typically do not recover well from high-intensity crown fires; contrarily, invasives such as saltcedar, giant reed, and Russian olive recover quickly from even the highest-intensity fires (UCANR 2009). Nonnative vegetation alters fuel properties such as flammability and continuity, and fuel loading, which leads to increased fire risk. Giant reed is the most common nonnative plant in riparian habitats of southern California; it grows high and dense and becomes dry and highly flammable in the fall. Fires in these riparian areas are typically extensive and severe, and fire spreads easily from the surface into the canopies of the tallest native trees (UCANR 2009). Giant reed has been detected in the Sequoia National Park, although in small, scattered populations (NPS 2020c).

MIXED CONIFER

Mixed conifer communities in the Three Rivers vicinity usually start at elevations of 3,500 feet and consist of several species of conifers. Prominent members include fir, cedar, and pines. In lower elevations, mixed conifer vegetation mixes with scattered oaks and brush (CAL FIRE TUU 2021). Historical fire regimes in mixed conifer communities were marked by frequent, low- to moderate-severity fires. Historic average fire return intervals in mixed conifer forests ranged from 11 to 16 years (seventeenth to mid-nineteenth century) (USFS 2018). Fires in these ecosystems were usually low severity surface fires; large, high severity fires were infrequent. However, in recent times, the fires have been more frequent and severe. Contemporary fires are burning at higher severities than they did historically (30%–35% high severity burn vs. 3%–15%) (USFS 2018). The changes in fire regimes have been attributed to human settlement patterns and centuries of fire suppression. The principal carriers of fire in this community are surface fuels and litter (e.g., fallen tree needles) (USFS 2018). However, extreme fire weather conditions, in conjunction with dense stands, can result in fire spreading to the canopy to produce a crown fire.

RISK ASSESSMENT COMPONENTS

FIRE BEHAVIOR MODELS

LANDFIRE

LANDFIRE is a national remote sensing project that provides land managers a data source for all inputs needed for FARSITE, FlamMap, and other fire behavior models. The database is managed by the USFS and the U.S. Department of the Interior and is widely used throughout the United States for land management planning. More information can be obtained from http://www.landfire.gov.

FARSITE

FARSITE is a computer model based on Rothermel's spread equations (Rothermel 1983); the model also incorporates crown fire models. FARSITE uses spatial data on fuels, canopy cover, crown bulk density, canopy base height, canopy height, aspect, slope, elevation, wind, and weather to model fire behavior across a landscape. FARSITE is a spatial and temporal fire behavior model. FARSITE is used to generate fuel moisture and landscape files as inputs for FlamMap. Information on fire behavior models can be obtained from http://www.fire.org.

FlamMap

Like FARSITE, FlamMap uses a spatial component for its inputs but only provides fire behavior predictions for a single set of weather inputs. In essence, FlamMap gives fire behavior predictions across a landscape for a snapshot of time; however, FlamMap does not predict fire spread across the landscape. FlamMap has been used for the Three Rivers CWPP to predict fire behavior across the landscape under extreme (97% worst case) weather scenarios. For this CWPP assessment, the model was run within the Interagency Fuel Treatment Decision Support System (IFTDSS 2021) modeling platform.

FIRE BEHAVIOR MODEL INPUTS

Fuels

The fuels in the planning area are classified using Scott and Burgan's (2005) Standard Fire Behavior Fuel Model classification system. This classification system is based on the Rothermel surface fire spread equations, and each vegetation and litter type is broken down into 40 fuel models.

The general classification of fuels is by fire-carrying fuel type (Scott and Burgan 2005):

(NB) Non-burnable
(GR) Grass
(GS) Grass-Shrub
(SH) Shrub
(TU) Timber-Understory
(TL) Timber Litter
(SB) Slash-Blowdown

Table A.4 provides a description of each fuel type.

Table A.4. Fuel Model Classification for Three Rivers CWPP Planning Area

1.	**Nearly pure grass and/or forb type (Grass)**
i.	**GR1:** Grass is short, patchy, and possibly heavily grazed. Spread rate is moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (0.40 ton/acre).
ii.	**GR2:** Moderately coarse continuous grass, average depth about 1 foot. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (1.10 tons/acre).
iii.	**GR3:** Very coarse grass, average depth 2 feet. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet).

2.	**Mixture of grass and shrub, up to about 50% shrub cover (Grass-Shrub)**
i.	**GS1:** Shrubs are about 1 foot high, low grass load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet); fine fuel load (1.35 tons/acre).
ii.	**GS2:** Shrubs are 1–3 feet high, moderate grass load. Spread rate high (20–50 chains/hour); flame length moderate (4–8 feet); fine fuel load (2.1 tons/acre).
3.	**Shrubs cover at least 50% of the site; grass sparse to non-existent (Shrub)**
i.	**SH2:** Moderate fuel load (higher than SH1), depth about 1 foot, no grass fuels present. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (5.2 tons/acre).
ii.	**SH3:** Moderate shrub load. Fuel bed depth 2–3 feet. Spread rate low (2–5 chains/hour), flame length low (1–4 feet).
iii.	**SH5:** Heavy shrub load. Fuel bed depth 4–6 feet. Spread rate very high (50–150 chains/hour), flame length very high (12–25 feet).
iv.	**SH7:** Very heavy shrub load, possibly with pine overstory. Fuel bed depth 4–6 feet. Spread rate high (20–50 chains/hour); flame length very high (12–25 feet).
4.	**Grass or shrubs mixed with litter from forest canopy (Timber-Understory)**
i.	**TU1:** Fuel bed is low load of grass and/or shrub with litter. Spread rate low (2–5 chains/hour); flame length low (1–4 feet); fine fuel load (1.3 tons/acre).
ii.	**TU2:** Moderate litter load with shrub component. Spread rate moderate (5-20 chains/hour); flame length low (1-4 feet).
iii.	**TU3:** Moderate litter load with grass and shrub components. Spread rate high (20-50 chains/hour); flame length moderate (4-8 feet).
iv.	**TU5:** Fuel bed high load conifer with shrub understory. Spread rate moderate (5–20 chains/hour); flame length moderate (4–8 feet).
5.	**Dead and downed woody fuel (litter) beneath a forest canopy (Timber Litter)**
i.	**TL2:** Low load, compact. Spread rate very low (0–2 chains/hour); flame length very low (0–1 foot).
ii.	**TL3:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot); fine fuel load (0.5 ton/acre).
iii.	**TL4:** Moderate load. Spread rate very slow (0–2 chains/hour); flame length low (1–4 foot).
iv.	**TL5:** High load conifer litter. Spread rate slow (2–5 chains/hour); flame length low (1–4 foot).
v.	**TL6:** Moderate load. Spread rate moderate (5–20 chains/hour); flame length low (1–4 foot).
vi.	**TL8:** Long needle litter; long needle fuel. Spread rate moderate (5–20 chains/hour); flame length low (1–4 feet).
vii.	**TL9:** Very high load fluffy dead and downed fuel littler. Spread rate moderate (5–20 chains/hour); flame length moderate (4–8 feet).

6.	Insufficient wildland fuel to carry wildland fire under any condition (Non-burnable)
i.	**NB1:** Urban or suburban development; insufficient wildland fuel to carry wildland fire.
ii.	**NB8:** Open water.
iii.	**NB9:** Bare ground.

Notes: Based on Scott and Burgan's (2005) 40 Fuel Model System.

Map B.1 in Appendix B illustrates the fuels classification throughout the planning area.

Following the 2021 summer wildfires, the fuel model layer was calibrated in order to reflect the composition of residual fuels in the burn areas. The fuel calibration utilized the post-fire fuel succession process described by Davis et al. (2009), developed specifically for Yosemite National Park and SEKI NPs. Rapid Assessment of Vegetation Condition after Wildfire (RAVG) basal loss area data were acquired for fire perimeters that were from 2017 to 2021 and above 1,000 acres. For areas with over 50% basal loss, all timber fuels were calibrated to a GS1 to indicate the fuel load of the area for the next 10 years of recovery, as projected by Davis et al. (2009).

Topography

Topography is important in determining fire behavior. Steepness of slope, aspect (direction the slope faces), elevation, and landscape features can all affect fuels, local weather (by channeling winds and affecting local temperatures), and rate of spread of wildfire. There are some steep slopes in the planning area that would influence fire behavior and spread.

Weather

Of the three fire behavior components, weather is the most likely to fluctuate. Accurately predicting fire weather remains a challenge for forecasters. As winds and rising temperatures dry fuels in the spring and summer, conditions can deteriorate rapidly, creating an environment that is susceptible to wildland fire. Fine fuels (grass and leaf litter) can cure rapidly, making them highly flammable in as little as 1 hour following light precipitation. Low live fuel moistures of shrubs and trees can significantly contribute to fire behavior in the form of crowning and torching. With a high wind, grass fires can spread rapidly, engulfing communities, often with limited warning for evacuation. The creation of defensible space is of vital importance in protecting communities from this type of fire. For instance, a carefully constructed fuel break placed in an appropriate location could protect homes or possibly an entire community from fire. This type of defensible space can also provide safer conditions for firefighters, improving their ability to suppress fire and protect life and property.

One of the critical inputs for FlamMap are the fuel moisture files. The initial run of the risk assessment utilized the IFTDSS Auto 97th modeling parameters, which integrate historic fire weather data from nearby RAW stations. The SWCA Team noted that some of those weather parameters were mild compared with conditions observed during the summer 2021 fires. Therefore, the risk assessment was revised using more extreme live and dead fuel moistures to better align with extreme conditions.

FIRE BEHAVIOR MODEL OUTPUTS

The following is a discussion of the fire behavior outputs from FlamMap.

Flame Length

Map B.2 in Appendix B illustrates the flame length classifications for the planning area. Flame lengths are determined by fuels, weather, and topography. Flame length is a particularly important component of the risk assessment because it relates to potential crown fire (particularly important in timber areas) and suppression tactics. Direct attack by hand lines is usually limited to flame lengths less than 4 feet. In excess of 4 feet, indirect suppression is the dominant tactic. Suppression using engines and heavy equipment will move from direct to indirect with flame lengths in excess of 8 feet.

Flame lengths across the planning area range from 0 to more than 25 feet. The highest flame lengths are associated with the timber fuels found in the higher elevations of the planning area.

Following fuel calibration in burn areas post-summer 2021, the flame length was reduced slightly as areas previously classified as timber fuels were calibrated to a grass-shrub fuel for at least the next 10 years.

Fireline Intensity

Map B.3 in Appendix B illustrates the predicted fireline intensity throughout the planning area. Fireline intensity describes the rate of energy released by the flaming front and is measured in British thermal units per foot, per second (Btu/ft/sec). This is an accurate measure of intensity and is used for planning suppression activities. The expected fireline intensity throughout the planning area is similar in pattern to predicted flame length, as fireline intensity is a function of flame length.

Fireline intensity across the planning area ranges from 0 Btu/ft/sec to over 6,175 Btu/ft/sec.

The pattern for fireline intensity is similar to flame length in that intensities range from low (less than 100 Btu/ft/sec) through moderate (100–500 Btu/ft/sec) high and extreme intensity (greater than 1000 Btu/ft/sec), which tend to be associated with areas dominated by tall shrub and timber fuel loads. Fireline intensity impacts the strategies that fire responders can use to suppress the fire, with intensities over 1000 Btu/ft/sec too severe for direct attack by hand or engine crews.

Following fuel calibration in burn areas post-summer 2021, the fireline intensity was reduced slightly as areas previously classified as timber fuels were calibrated to a grass-shrub fuel for at least the next 10 years.

Rate of Spread

Map B.4 in Appendix B illustrates the rate of spread classifications for the planning area.

Low rates of spread are associated with timber dominated areas, while moderate and high rates of spread are associated with grass and shrub fuels. Rate of spread is also influenced by slope and topography (Figure A.9).

The rates of spread in the planning area range from 0 to 2 chains/hour to over 150 chains/hour.

Following fuel calibration in burn areas post-summer 2021, the rate of spread was increased slightly as areas previously classified as timber fuels were calibrated to a grass-shrub fuel for at least the next 10 years. Grass-shrub fuels generally exhibit higher rates of spread than timber fuels.

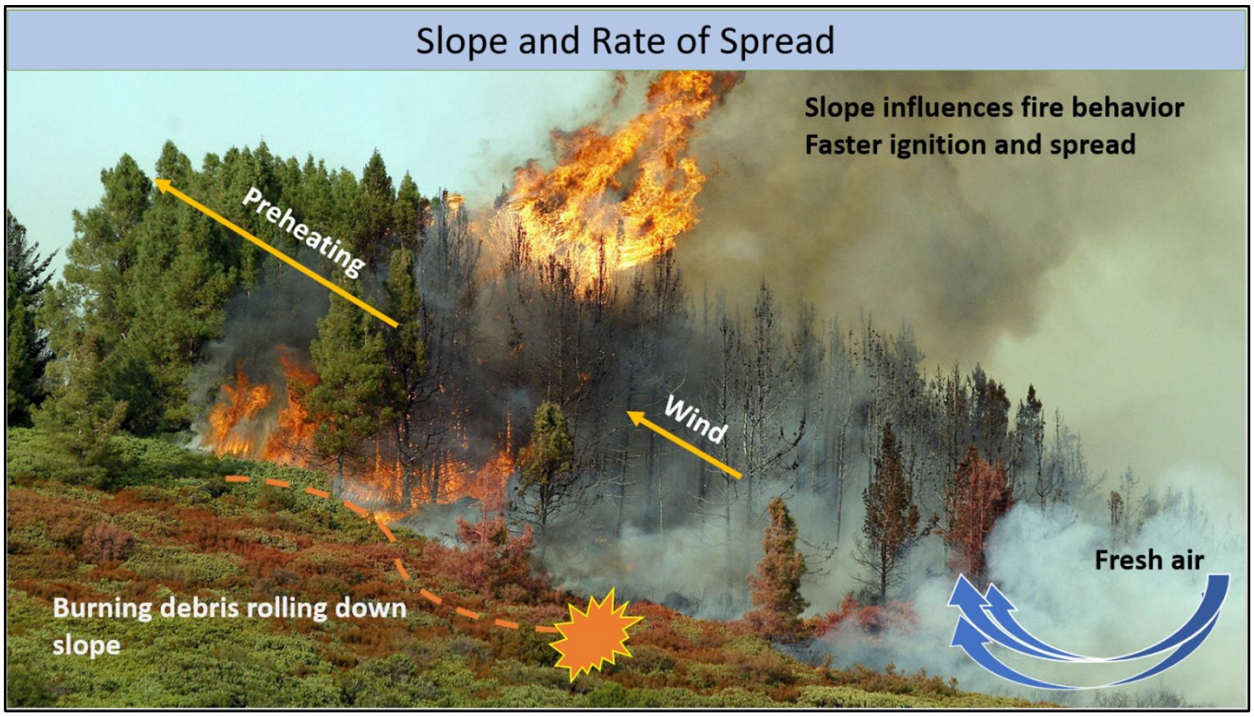

Figure A.9. Effect of topography on fire behavior.

Crown Fire Potential

Map B.5 in Appendix B illustrates the range of crown fire activity from surface fire (in grass-dominated areas) to passive and active crown fire (in timber-dominated fuels). In post-burn areas that suffered canopy loss, timber fuels may take several years to decades to reestablish, and therefore, crown fire activity would be mitigated in these areas in the immediate future.

Fire History

Figure 2.6 in Chapter 2 illustrates the fire history for the planning area. These perimeters have been provided by the USFS and CAL FIRE, and these perimeters show the location of fires within the planning area from 1921 to 2021. The fire history map is used to provide information on areas where human-ignited fires are prevalent and hence could be more prone to fire in the future and where there is a higher density of lightning ignitions due to topographic conditions and receptive forest fuels.

COMPOSITE RISK-HAZARD ASSESSMENT MODEL

All data used in the Risk-Hazard Assessment have been processed using ESRI ArcGIS Desktop and the ESRI Spatial Analyst Extension. Information on these programs can be found at http://www.esri.com. Data have been gathered from all relevant agencies, and the most current data have been used.

All fire parameter datasets have been converted to a raster format (a common GIS data format comprising a grid of cells or pixels, with each pixel containing a single value). The cell size for the data is 30 × 30 meters (98 × 98 feet). Each of the original cell values have been reclassified with a new value between 1 and 4, based on the significance of the data (1 = lowest, 4 = highest). Prior to running the models on the reclassified datasets, each of the input parameters have been weighted; that is, they are assigned a percentage value reflecting that parameter's importance in the model. We used the weighted sum raster overlay geoprocessing tool to stack each geographically aligned dataset and evaluate an

output value derived from each cell value of the overlaid dataset in combination with the weighted assessment. In a Weighted Sum Model, the weighted values of each cell from each parameter dataset are added together so that the resulting dataset contains cells with summed values of all the parameters. This method ensures that the model resolution is maintained in the results and thus provides finer detail and range of values for denoting fire risk.

Composite Risk-Hazard Assessment Modeling Process

Our Composite Risk-Hazard Assessments comprise multiple inputs, which can be grouped into three categories: hazard, threat, and values. The result is a raster data layer that weighs and sums those inputs to determine risk. Datasets in the hazard category include historical weather data, topography, and vegetation and fuel regimes. Datasets in the threat category include fire history points and perimeters. The values category includes the WUI, distance from fire station, and natural, cultural, and socioeconomic assets datasets.

As shown in Figure A.10 with the elements in the black shaded box, we began by using the IFTDSS (2021) application to prepare a landscape file for the planning area. This landscape file compiles multiple LANDFIRE datasets, including fuels (calibrated to recent fires), slope, elevation, and aspect, into one layer that can then be used to develop fire behavior outputs. We then edited the fuels model to match the more precise local datasets and used the edited fuels and landscape file to create custom fire behavior outputs.

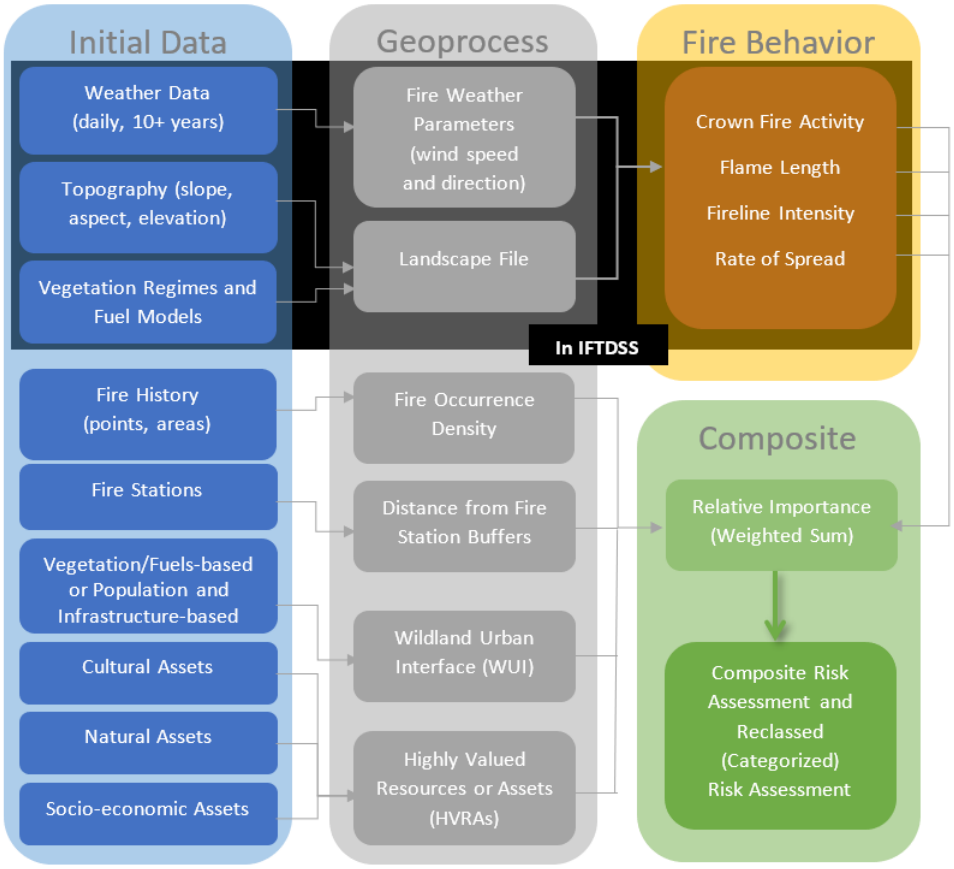

Figure A.10. Composite Risk-Hazard Assessment breakdown.

Next, in Esri ArcGIS Pro, we processed the fire history, fire station, WUI, and HVRA datasets to merge and create buffers where appropriate and converted the layers to rasters with the same spatial extent and resolution as the IFTDSS fire behavior outputs (30-meter cell size).

Last, we used ArcGIS Pro to run a weighted sum raster process to add all the inputs together. We assigned weights for input layers, based on feedback from the Core Team on the importance that each layer should contribute to the Composite Risk-Hazard Assessment (Figure 3.2). While weighted sum composite rasters can be better for describing more detailed variations in risk, they can be overwhelming and difficult to understand, so we also created a reclassified raster from the weighted sum composite, using the natural breaks (Jenks) method, with four categories of low, medium, high, and extreme risk.

As described previously, the risk assessment was re-run to accommodate fuel model calibration following the 2021 fires.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

LOCAL AND STATE PROGRAMS

Three Rivers Fire Safe Council

Three Rivers Fire Safe Council (FSC) was established in 2019 by community volunteers to promote fire safety and prevention, provide education, and exchange information in the community. The FSC website houses current fire information, warning and notices administered by the county, fire danger ratings, and notification system sign up links. Disaster preparedness information, external resources (such as links to CAL FIRE), and scheduled events are also included on the site. In addition, the Council offers various educational resources such as brochures on hardened homes and defensible space, evacuation guides, disaster readiness guides, and home evaluation guides. Furthermore, the FSC implements local projects such as community chipping days, volunteer crews to assist elderly, disabled and low-income residents with defensible space clearing, and assistance with home ignition zone treatments (Three Rivers Fire Safe Council 2022).

You can visit the FSC webpage here: https://www.3rfsc.org/

Tulare County Fire Department

The TCFD has a Fire Prevention Bureau that is responsible for fire prevention. One of the components of fire prevention is education. Public fire education programs are delivered to the public that will educate the general public, high-risk groups, children, the elderly, and non-English speakers. Programs include NFPA Firewatch, a smoke alarm distribution and installation program, juvenile fire-setters, Sparky the Dog, community first aid and CPR, and other programs that partner with public schools at different grade levels. This would also include programs that are offered at community events such as the county fair (TCFD 2021d).

California Department of Forestry and Fire Protection (CALFIRE)

CAL FIRE is an all-risk emergency services provider that specializes in wildfire response. CAL FIRE is responsible for wildfire response on all California SRA lands except for six counties (Kern, Los Angeles, Marin, Orange, Santa Barbara, and Ventura). In addition, CAL FIRE provides a plethora of fire education resources to ensure Californians are prepared for wildfire. These educational materials include but are not limited to:

- CAL FIRE Fire and Emergency Response Guide
- California Fire Plan Overview
- CAL FIRE Cooperative Emergency Response
- Ready Set Go! Wildfire Action Plan
- Are You Ready? Defensible Space and Home Hardening
- Are You Set? Wildfire Preparedness
- Defensible Space Guide
- Before, During, and After a Wildfire

NATIONAL PROGRAMS

Ready, Set, Go!

The Ready, Set, Go! Program, which is managed by the International Association of Fire Chiefs, was launched in 2011 at the WUI conference. The program seeks to develop and improve the dialogue between fire departments and residents, providing teaching for residents who live in high-risk wildfire areas—and the WUI—on how to best prepare themselves and their properties against fire threats (International Association of Fire Chiefs 2021).

The tenets of Ready, Set, Go! as included on the website (http://www.wildlandfirersg.org) are:

> **Ready –** Take personal responsibility and prepare long before the threat of a wildland fire so your home is ready in case of a fire. Create defensible space by clearing brush away from your home. Use fire-resistant landscaping and harden your home with fire-safe construction measures. Assemble emergency supplies and belongings in a safe place. Plan escape routes and ensure all those residing within the home know the plan of action.
>
> **Set –** Pack your emergency items. Stay aware of the latest news and information on the fire from local media, your local fire department, and public safety.
>
> **Go –** Follow your personal wildland fire action plan. Doing so will not only support your safety but will allow firefighters to best maneuver resources to combat the fire.

Parameters for developing defensible space around a home are described in the *County Ready, Set, Go Guide*. Three zones for defensible space actions are described and illustrated in Chapter 4.

National Fire Protection Association

The NFPA is a global non-profit organization devoted to eliminating death, injury, property, and economic loss due to fire, electrical, and related hazards. Its 300 codes and standards are designed to minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation around the world.

The NFPA develops easy-to-use educational programs, tools, and resources for all ages and audiences, including Fire Prevention Week, an annual campaign that addresses a specific fire safety theme. The NFPA's Firewise Communities program (NFPA - Firewise USA®) encourages local solutions for wildfire safety by involving homeowners, community leaders, planners, developers, firefighters, and others in the effort to protect people and property from wildfire risks.

The NFPA is a premier resource for fire data analysis, research, and analysis. The Fire Analysis and Research division conducts investigations of fire incidents and produces a wide range of annual reports and special studies on all aspects of the nation's fire problem.

National Interagency Fire Center

The NIFC provides a wide array of fire resources and services. The National Interagency Coordination Center offers communication assistance to over 32,000 firefighters and 50 major events at one given time (NIFC 2021c). The Predictive Services Group creates wildfire forecasts and predictions from fuel and weather data. The NIFC has a Remote Automated Weather Base with over 2,000 weather stations that help inform the Predictive Services Group. The National Wildfire Coordinating Group, which is nested under the NIFC, provides operational coordination to federal, state, local, tribal, and territorial partners (NIFC 2021c). The NIFC also has a training branch where training curriculums are developed to be used across the nation. For those too young to participate in the standard trainings, the NIFC offers FireWorks, an educational program designed for kids K-12. The program teaches children topics such as wildland fire science, ecosystem fluctuations, human interaction on the environment, and other environmental science topics (NIFC 2021d). The NIFC also provides public education resources such as the following (NIFC 2021e):

- Wildfire Readiness – Home
- Wildfire Readiness – Business
- Wildfire Readiness – Farm and Ranch
- Weekend Wildfire Preparedness
- What to Do if a Wildfire is Approaching
- Wildfire Risk – Community
- Prepare and Protect Your Home
- Prepare Your Community
- One Less Spark, One Less Wildfire
- Only You Can Prevent Wildfires

U.S. Fire Administration's WUI Toolkit

The U.S. Fire Administration (USFA) is an entity of the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) that aids in the preparation for and response to fire. Their WUI toolkit consists of a list of websites and other information regarding risk assessment, public outreach, and community training.

Find the toolkit here: Wildland urban interface fire training (fema.gov).

Wildfire Research Center

Wildfire Research Center (WiRē) is a non-profit organization that works with local wildfire services to achieve community-tailored pathways which reduce risk to wildfire while simultaneously promoting pathways to fire adaptation. WiRē's mission states that fire adaptation is "about living with fire", while "creating safe and resilient communities that reduce wildfire risk on their properties before a fire, and supporting effective response when fires threaten a community." WiRē states that wildfire is an integral

component of many ecosystems, and that fire must be allowed, when safe, as to ensure the health of forests. Core to WiRē's approach are four main concepts. One, residents are critical actors in the wildland-urban interface wildfire problem. Two, action is central to adaptation. Three, people and their decisions are complex. Finally, four, decisions are not made in a vacuum. To achieve its goals and serve communities, WiRē will typically conduct a "rapid wildfire risk assessment," which assesses what contributes to wildfire risk, such as, building materials, vegetation near homes, background fuels, local topography, and access to emergency fire services. Additionally, they also conduct "social surveys", which assess residents' perceptions about wildfire, wildfire risk, risk mitigation behavior, and assess their willingness towards taking action to reduce wildfire risk.

For more information, please visit https://wildfireresearchcenter.org/.

APPENDIX B:

Additional Mapping

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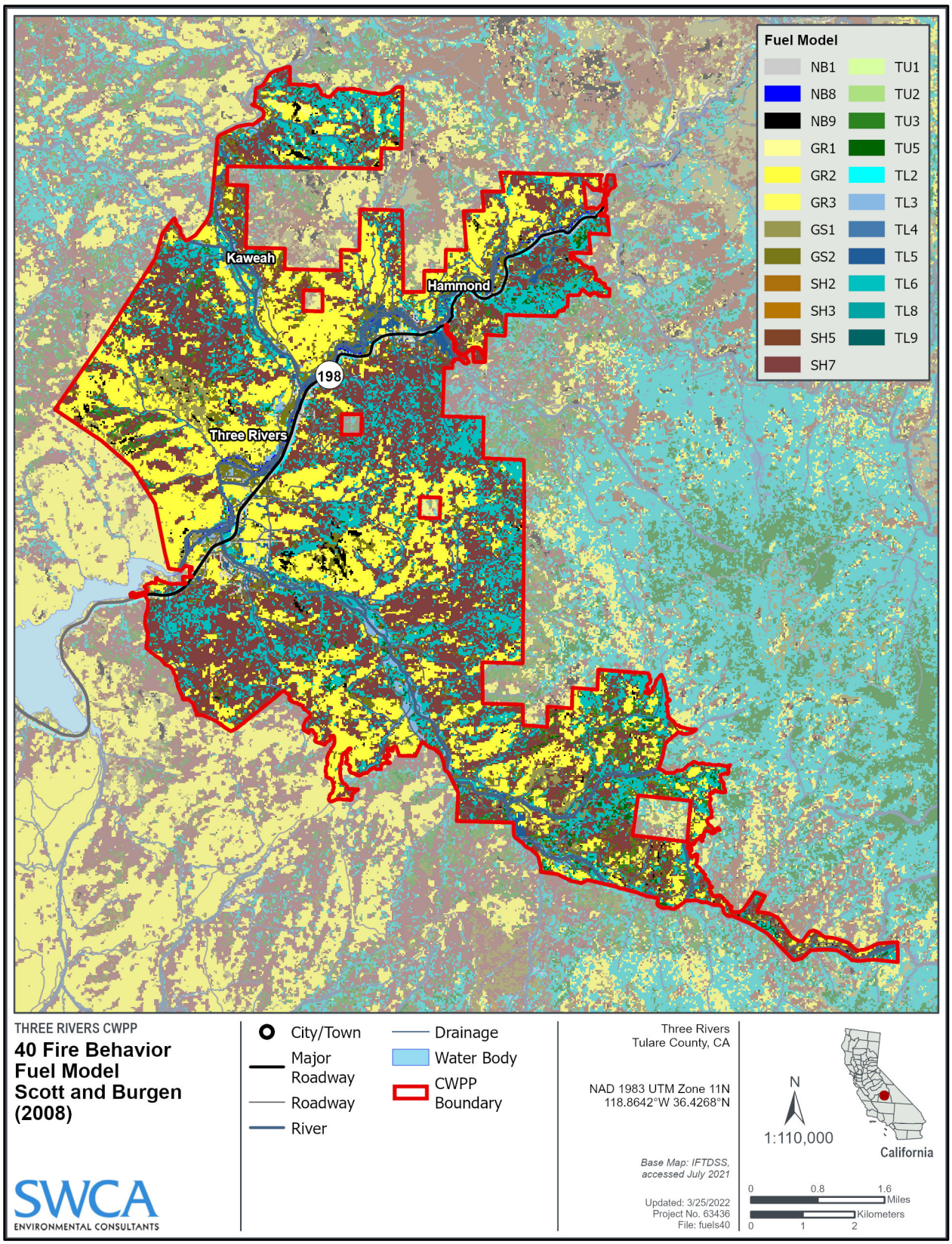
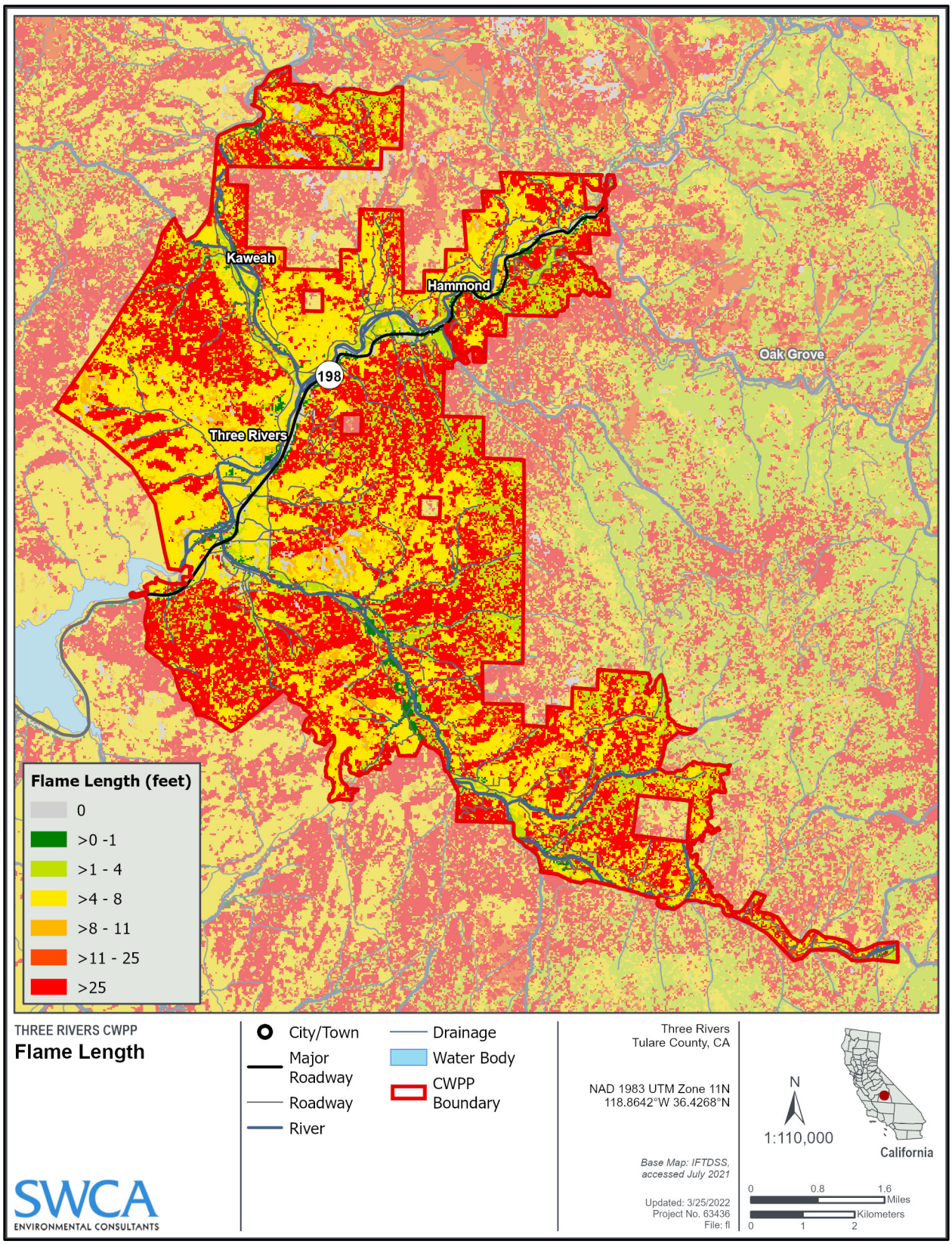
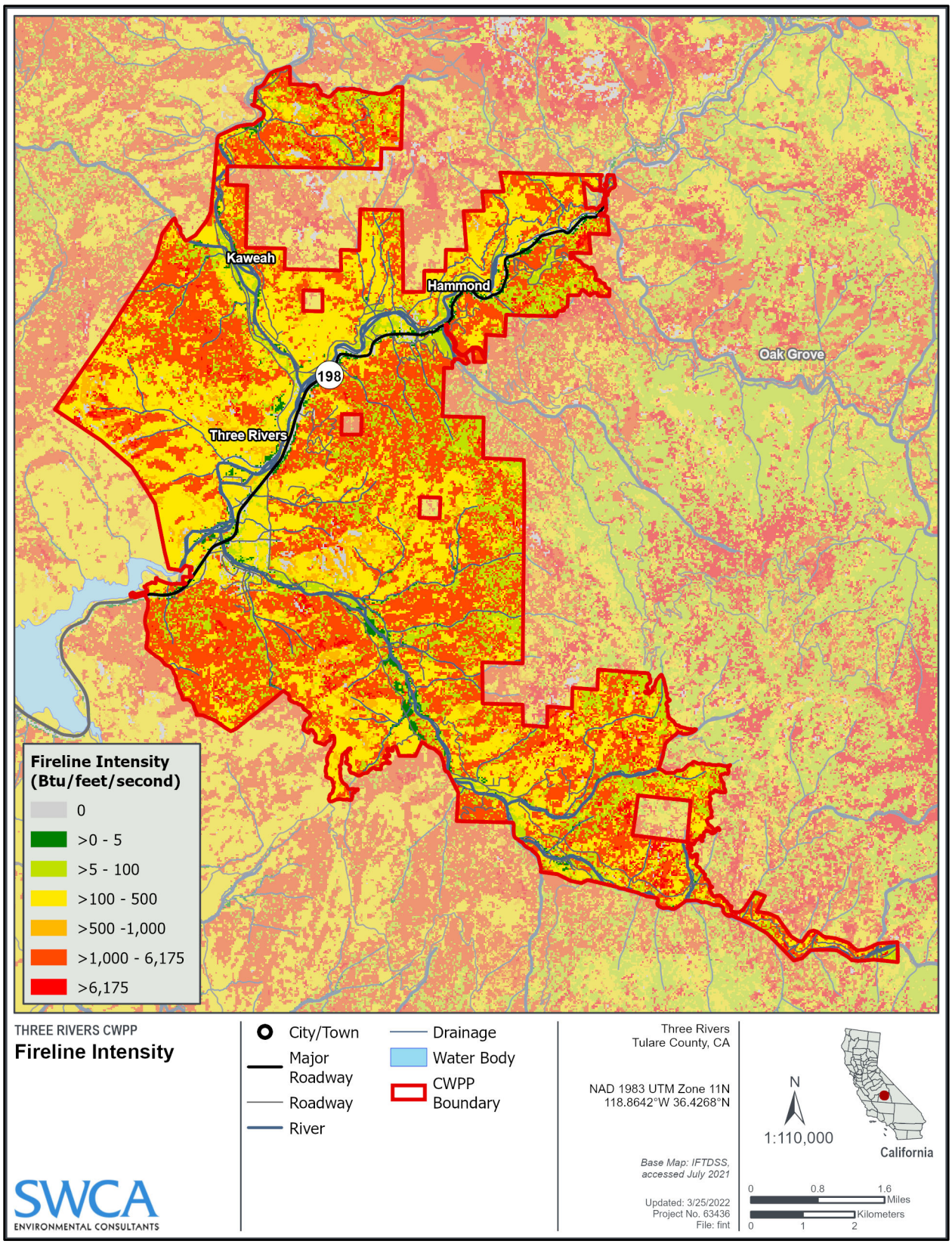


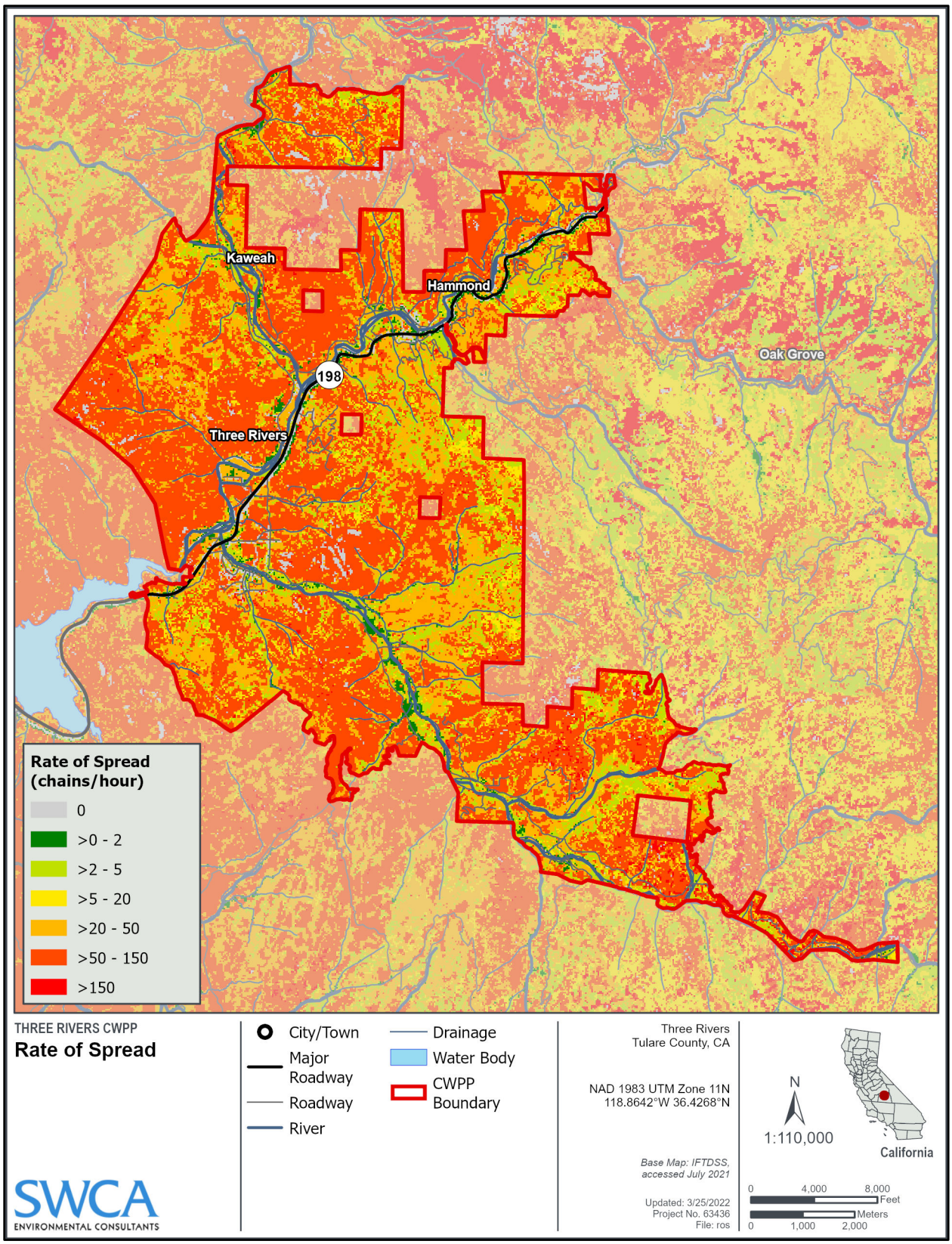
Map B.1. Scott and Burgan 40 Fire Behavior Fuel Models.



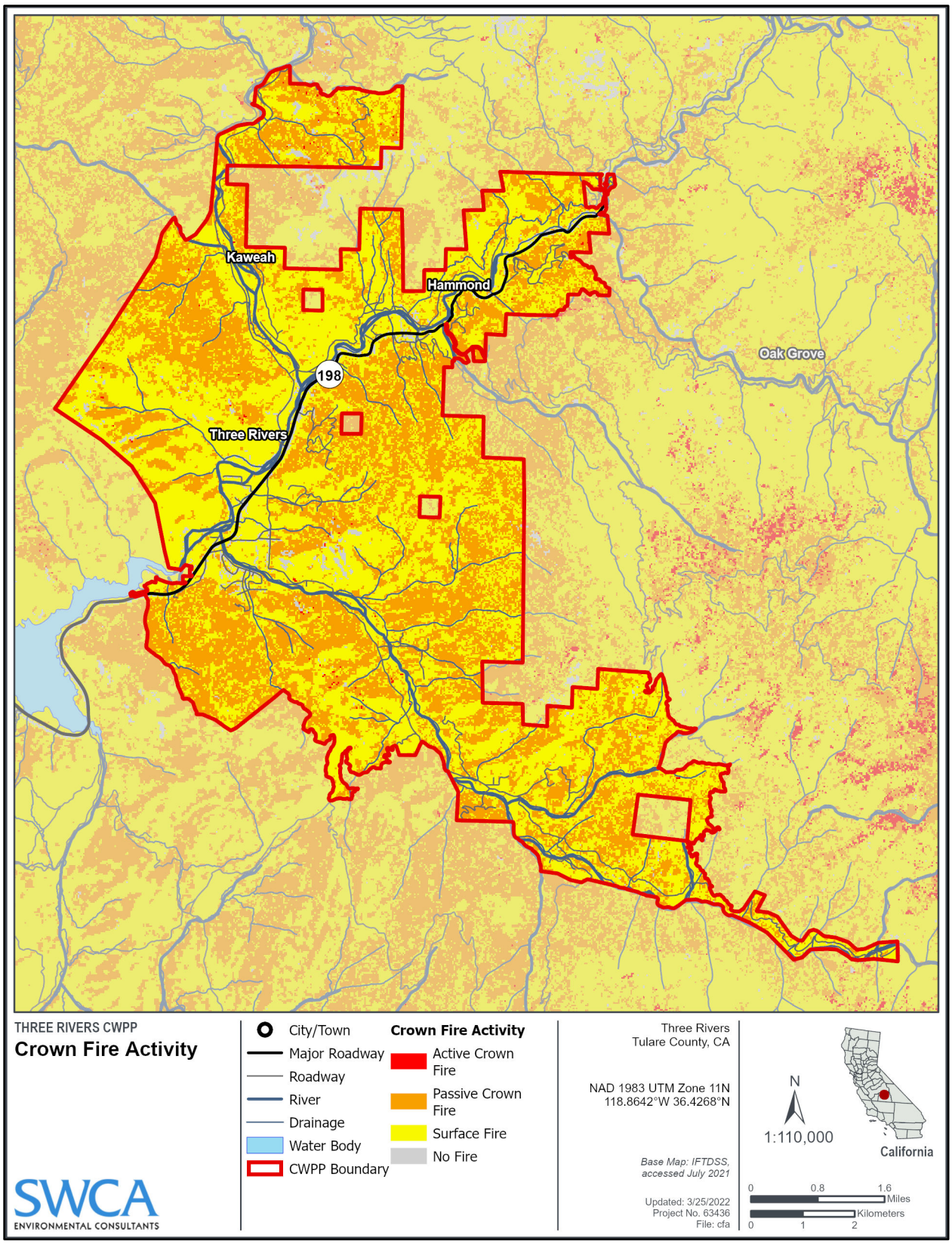
Map B.2. Risk assessment inputs: flame length.



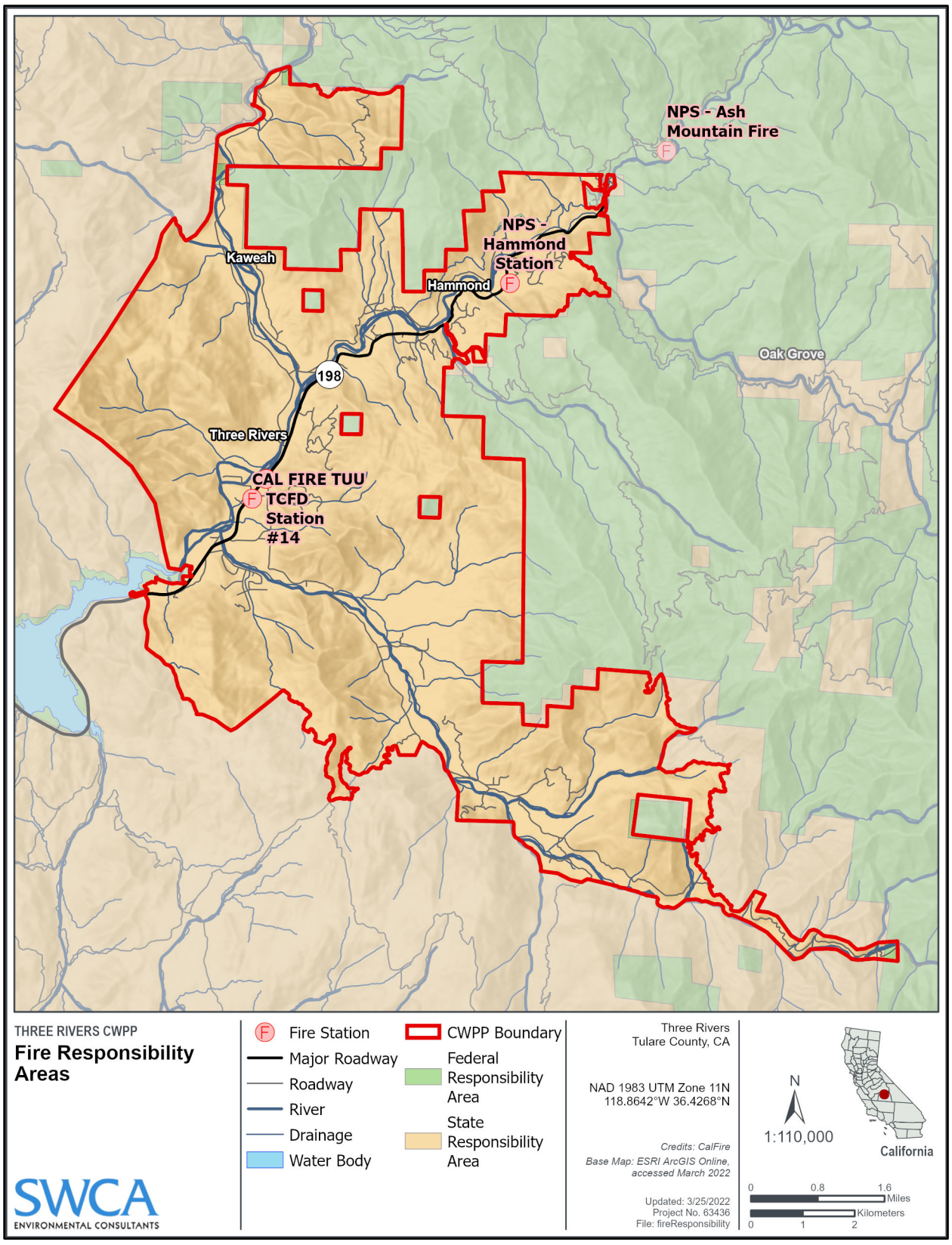
Map B.3. Risk assessment inputs: fireline intensity.



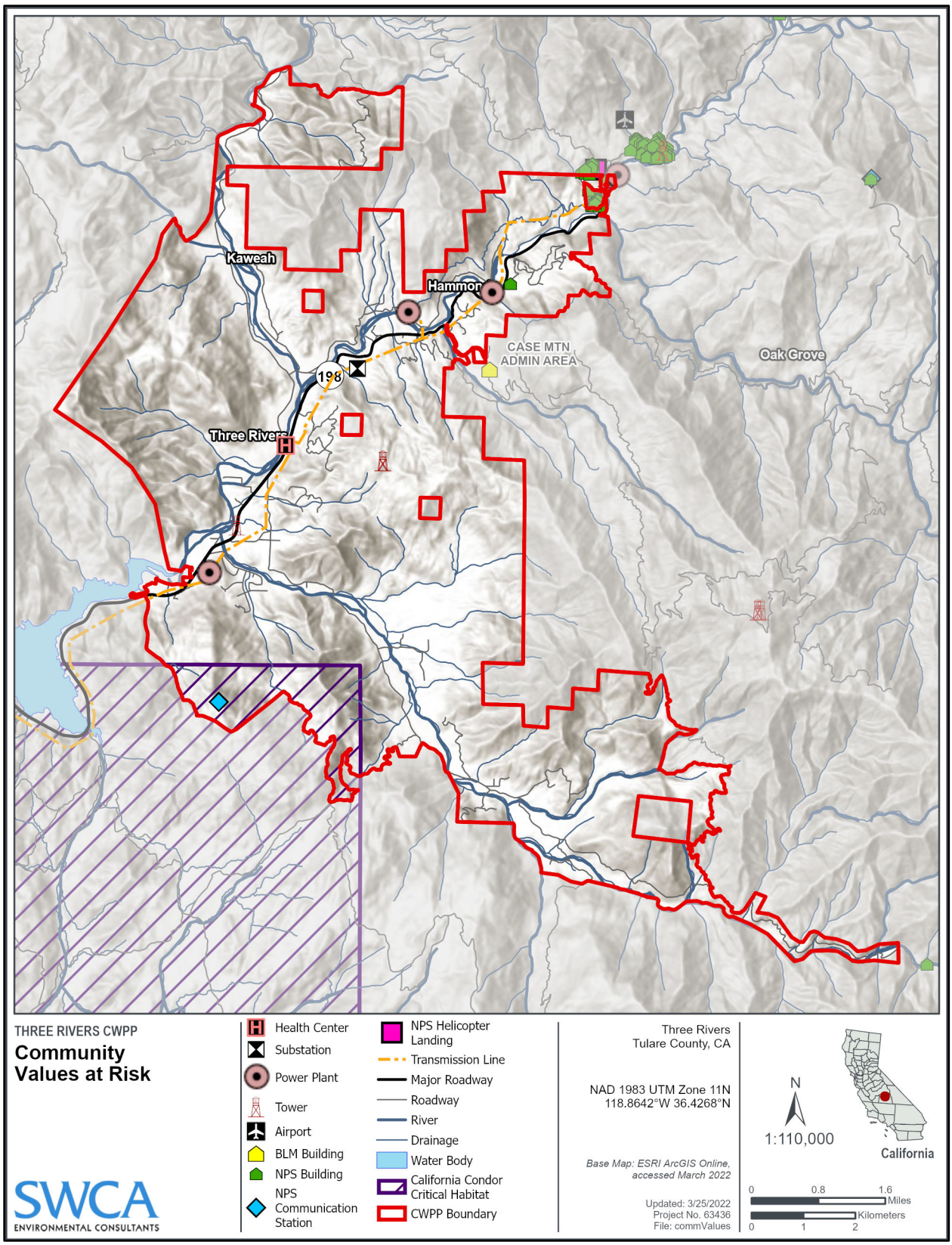
Map B.4. Risk assessment inputs: rate of spread.



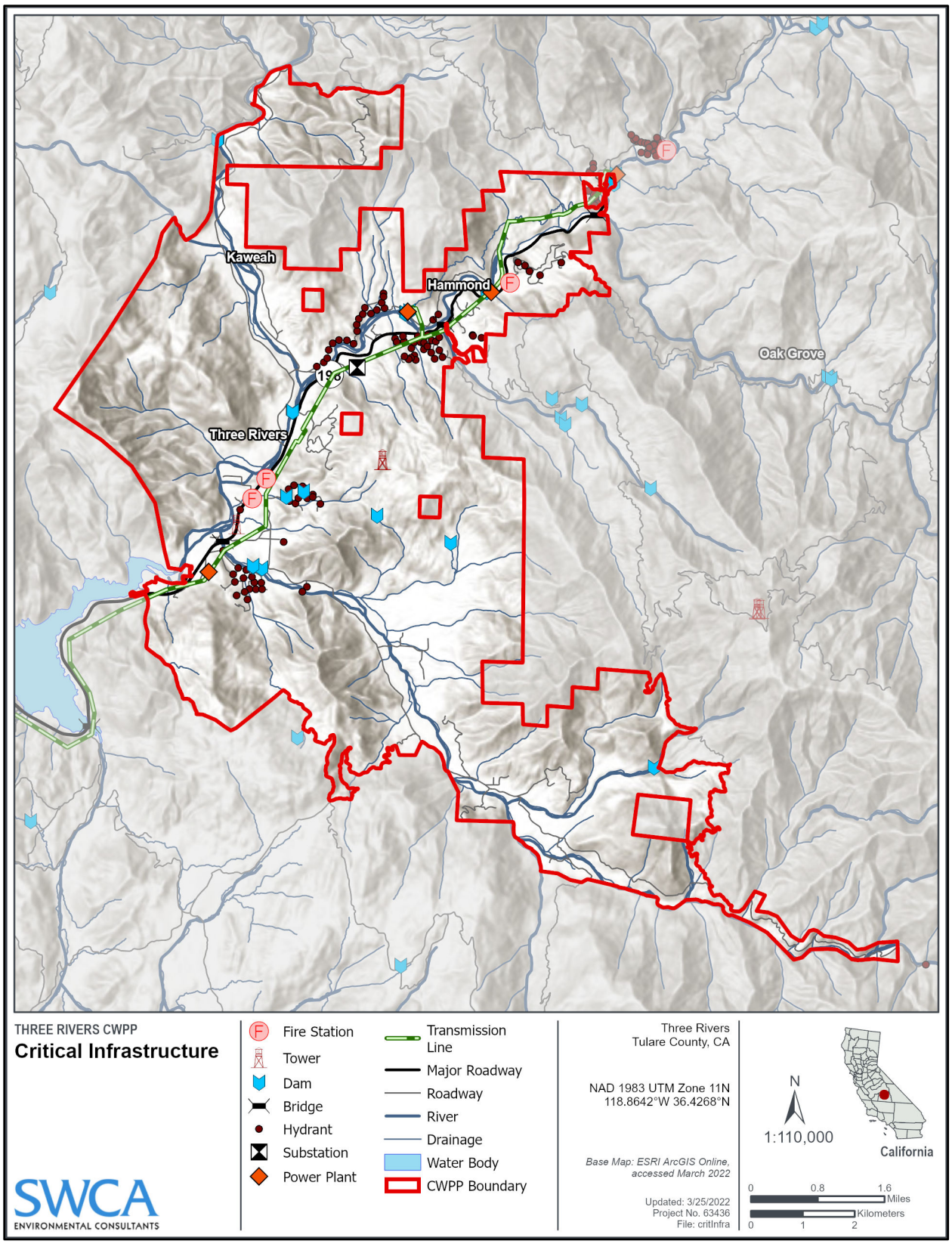
Map B.5. Risk assessment inputs: crown fire activity.



Map B.6. Fire responsibility areas.



Map B.7. Community values at risk.



Map B.8. Critical infrastructure.

APPENDIX C:

Core Team List

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Name	Organization
Steve LaMar	Three Rivers Fire Safe Council
Steve Katz	Three Rivers Fire Safe Council
Esther Huecker	Three Rivers Fire Safe Council
Elizabeth LaMar	Three Rivers Fire Safe Council
Jeff McLaughlin	Tulare County Fire Department
Andrew Lockman	Tulare County Emergency Management
David Shy	CALFIRE
Ryan Pack	CALFIRE
Angel Prieto	USFS – Sequoia National Forest
Ryan Edmonson	Bureau of Land Management – Bakersfield field office
Mike Theune	Sequoia & Kings Canyon National Parks
Andrew Cremers	Sequoia & Kings Canyon National Parks
Phil Deffenbaugh	USACE, Lake Kaweah Reservoir
Brian Thoburn	Southern California Edison
Kyle Stark	Tulare County Sheriff's Department
Sargent Joe Armstrong	Tulare County Sheriff's Dept
Kevin Riggi	Tulare County Fire Department
Jon Wight	CAL FIRE
Victoria Amato	SWCA Environmental Consultants
Arianna Porter	SWCA Environmental Consultants
Breanna Plucinski	SWCA Environmental Consultants
Montiel Ayala	SWCA Environmental Consultants
Liz Hitzfelder	SWCA Environmental Consultants
Chris Bockey	SWCA Environmental Consultants

For additional information *on this project, please contact Project Manager, Victoria Amato, at* *vamato@swca.com*.

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APPENDIX D:

Community Descriptions and Hazard Ratings

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THREE RIVERS FIRE SAFE COUNCIL
WILDLAND URBAN INTERFACE COMMUNITIES

COMMUNITY ASSESSMENT SUMMARIES

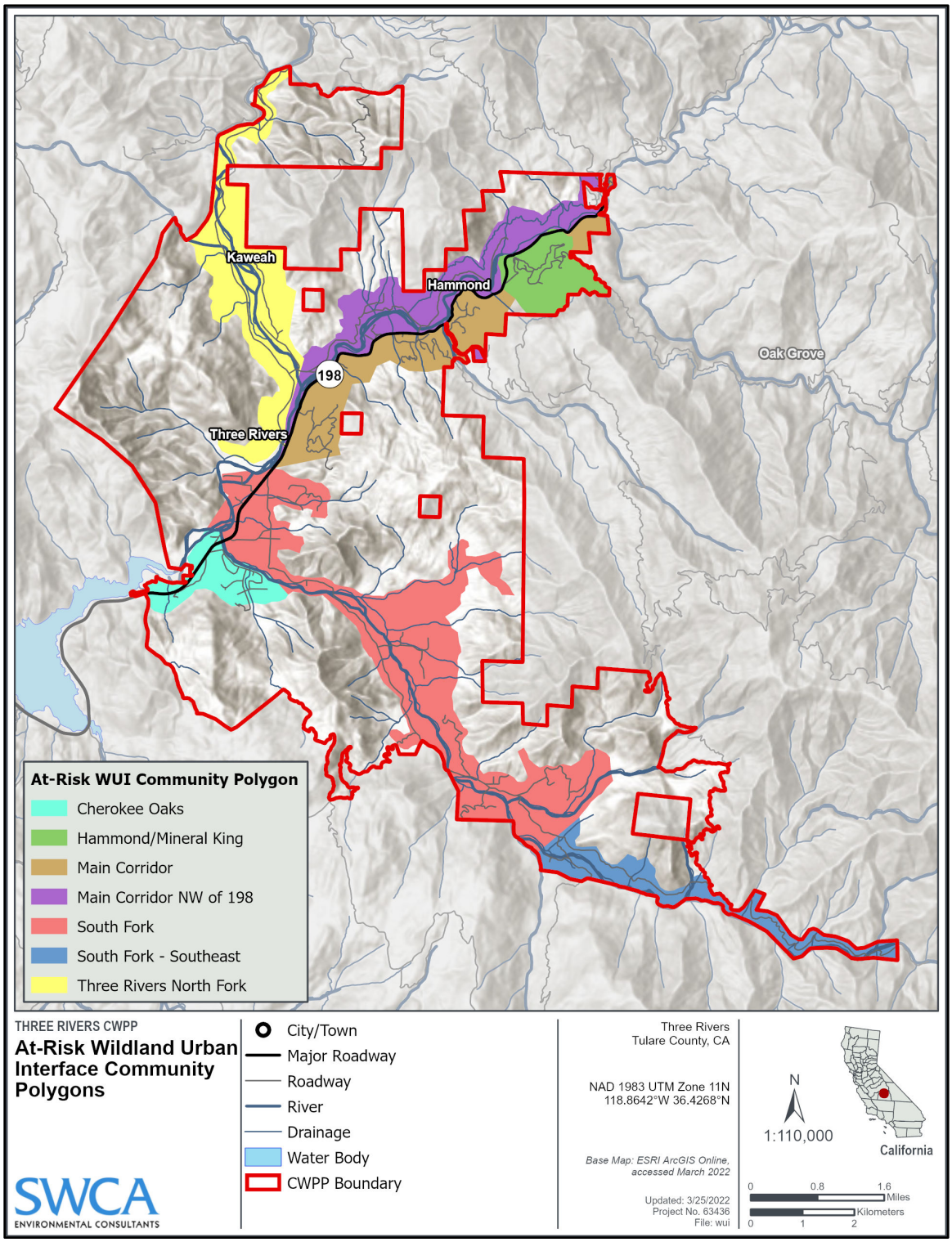


Figure D.1. Three Rivers Fire Safe Council CWPP polygon delineations.

THREE RIVERS NORTH FORK SUMMARY STATISTICS

Polygon/Community: Three Rivers North Fork **Building Count:** 269

Land Area (*mi.²*): 2.3 **Building Density (building units/ *mi.²*):** 117.5

Percent of Polygon by Modeled Wildfire Risk

Low	Moderate	High	Extreme
19.4	29.9	28.5	22.2

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), and National Park Service (NPS) Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 1

Wildland Engines

	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Port-A-Tanks: 2*
*2 total within CAL FIRE TUU

Portable Pumps: 2*
*CAL FIRE TUU has an additional 9, TCFD has an additional 8

Dist. From Fire Station
0-0.5 (mi.): 5%
0.5-1.0 (mi.): 9%
1.0-1.5 (mi.): 8%
>1.5 (mi.): 78%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Ingress/egress: surfaced highway runs the length of the polygon
- Street signs: visible and reflective
- Slope: very variable topography but majority of homes are situated at base of slope
- Good wildfire mitigation signage throughout

Negative Attributes (High Scores)

- Ingress/egress: one road in and out
- Ingress/egress: turnarounds along road are limited
- Ingress/egress: very narrow and windy road in places
- Building construction: combustible; mixture of building types and roofing materials
- Deck and fencing: combustible materials

1144 Survey Summary

Positive Attributes (Low Scores)

- Organized response: fire department close to community; CAL FIRE, County, and NPS
- Previous fire occurrence: low
- Separation of adjacent structures; good, large plots; agricultural land provides good separation between homes

Negative Attributes (High Scores)

- Water source: water tanks; no inspection to ensure supply for suppression
- Utility placement: propane and electric are aboveground
- Building setback: some homes have a limited setback from the slope
- Weather: potential for severe weather is high (warm and dry)
- Vegetation: oak overstory with grass understory; grass is deep in areas and extremely dry during summer months; some tree mortality that could contribute to fuel hazard

Values at Risk

- Residential properties
- Agricultural values: orchards, livestock, small holdings
- Tourism values: guest houses
- Communication towers
- Historic structures
- Post office
- Watershed values/river

NFPA 1144 Final Rating

Community Polygon Name	Total Score
Three Rivers North Fork	100 (High)

Suggested Mitigations/Actions

Summary of mitigation needs based on field assessments

- Increase road access – install fuel breaks and response vehicle turnouts along narrow roads
- Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways
- Install firebreaks around all aboveground utility tanks with a 15-foot buffer
- Upgrade water sources and/or routinely inspect water supplies for suppression
- Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening
- Remove dead trees that pose immediate hazards
- Continue fire road maintenance (CAL FIRE TUU)

Figure D.2. Values at risk, including agricultural land, are spotted throughout the polygon. Many homes have limited defensible space. Source: Google.

CHEROKEE OAKS SUMMARY STATISTICS

Polygon: Cherokee Oaks **Building Count:** 234

Land Area (*mi.²*): 0.8 **Building Density (building units/ *mi.²*):** 306.3

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
28.9	34.3	17.5	19.3

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), NPS Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 2

Wildland Engines

	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Port-A-Tanks: 2* (*2 total within CAL FIRE TUU)
Portable Pumps: 2* (*CAL FIRE TUU has an additional 9

Dist. From Fire Station
0-0.5 (mi.): 0%
0.5-1.0 (mi.): 34%
1.0-1.5 (mi.): 48%
>1.5 (mi.): 18%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs: visible and reflective
- Previous fire occurrence: low
- Available fire protection: nearby fire station and other resources

Negative Attributes (High Scores)

- Ingress/egress: one major route in and out of the polygon; steep, narrow, and windy roads in places; confusing configuration of neighborhood roads for out-of-town responders
- Road conditions: slow response, narrow in places
- Fire access: road width may impede fire apparatus access in place; limited turnarounds for longer fire trucks

1144 Survey Summary

Positive Attributes (Low Scores)	Negative Attributes (High Scores)
	• Vegetation type: mixture of timber understory and timber litter surrounding some homes • Defensible space: limited, small lots, harder to maintain defensible space • Building construction: mixed, largely combustible • Deck and fencing: combustible materials • Water source: limited; some water tanks, one hydrant • Utility placement: propane and electric both aboveground • Topography: some mid-slope homes; nearby canyons provide potential for severe fire behavior • Roofing materials: vary widely

Values at Risk

- Residential properties
- Agricultural values
- Tourism values: attractions, guest houses, etc.
- Solar farm

NFPA 1144 Final Rating

Polygon Name	Total Score
Cherokee Oaks	127 (Extreme)

Suggested Mitigations/Actions

Summary of mitigation needs based on field assessments

- Fire Safe Council to provide a community specific workshop to discuss defensible space and tips for maintaining good clearance around homes
- Increase road access – install fuel breaks and response vehicle turnouts along narrow roads
- Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways
- Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening
- Install firebreaks around all aboveground utility tanks with a 15-foot buffer
- Upgrade water sources and/or routinely inspect water supplies for suppression
- Continue fire road maintenance (CAL FIRE TUU)

Figure D.3. Some homes are surrounded by vegetation with a confusing road layout for out-of-town responders. Many homes have limited defensible space between structures and fuels due to small lot sizes. Homes on the southern edge back to open space. Source: Google.

MAIN CORRIDOR – NORTHWEST OF HIGHWAY 198 SUMMARY STATISTICS

Polygon: Main Corridor - NW of 198 **Building Count:** 335

Land Area (*mi.²*): 1.9 **Building Density (building units/ *mi.²*):** 177.2

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
25.8	34.7	29.5	10.1

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), NPS Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 2

Wildland Engines

	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Port-A-Tanks: 2* (*2 total within CAL FIRE TUU)
Portable Pumps: 2* (*CAL FIRE TUU has an additional 9

Dist. From Fire Station
0-0.5 (mi.): 13%
0.5-1.0 (mi.): 33%
1.0-1.5 (mi.): 27%
>1.5 (mi.): 28%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs: visible and reflective
- Previous fire occurrence: low
- Available fire protection: nearby fire station and other resources
- Ingress/egress: two or more roads in and out; surfaced highway along the length of the polygon
- Topography: most homes are located in the river valley

Negative Attributes (High Scores)

- Road conditions: side roads are narrow and steep in places
- Fire access: limited turnarounds for longer fire trucks, narrow and rough roads in places
- Vegetation type: timber and grass mixture, with shrub fuels surrounding some homes
- Defensible space: limited; on smaller lots, it can be difficult to maintain defensible space

1144 Survey Summary	
Positive Attributes (Low Scores)	Negative Attributes (High Scores)
• Fuels: riparian fuels are most common, with lower combustibility	• Building construction: mixed; largely combustible • Deck and fencing: combustible materials • Water source: some hydrants; no inspection of water tanks to ensure supply for suppression • Utility placement: both propane and electric are aboveground • Roofing materials: various materials

Values at Risk
• Residential properties • Agricultural/livestock values • Tourism values: attractions, guest houses, etc. • SCE plant • Riparian ecosystem

NFPA 1144 Final Rating	
Polygon Name	Total Score
Main Corridor- NW of 198	87 (High)

Suggested Mitigations/Actions

Summary of mitigation needs based on field assessments

- Fire Safe Council to provide a community specific workshop to discuss defensible space and tips for maintaining good clearance around homes
- Increase road access – install fuel breaks and response vehicle turnouts along narrow roads
- Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways
- Install firebreaks around all aboveground utility tanks with a 15-foot buffer
- Upgrade water sources and/or routinely inspect water supplies for suppression
- Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening
- Continue fire road maintenance (CAL FIRE TUU)

Figure D.4. Some homes are surrounded by vegetation and have limited defensible space between structures and fuels. Red markings are project WUI boundaries. Source: Google.

SOUTH FORK – SOUTHEAST SUMMARY STATISTICS

Polygon: South Fork - Southeast **Building Count:** 46

Land Area (*mi.²*): 1.1 **Building Density (building units/ *mi.²*):** 40.2

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
9.9	24.6	27.7	37.8

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), NPS Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 2

Wildland Engines

	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Port-A-Tanks: 2*
*2 total within CAL FIRE TUU

Portable Pumps: 2*
*CAL FIRE TUU has an additional 9

Dist. From Fire Station
0-0.5 (mi.): 0%
0.5-1.0 (mi.): 0%
1.0-1.5 (mi.): 0%
>1.5 (mi.): 100%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs: visible and reflective
- Defensible space: large lots with open vegetation in places
- Utility pole resilience: some have been replaced with fire-resistant materials
- Low population density

Negative Attributes (High Scores)

- Ingress/egress: one major route in and out of the polygon; steep and narrow, with blind corners in places
- Road conditions: slow response; narrow in places
- Fire access: narrow roads in places, limited turnarounds for longer fire trucks,
- Fire protection: some areas more than 5 miles from a station

1144 Survey Summary	
Positive Attributes (Low Scores)	Negative Attributes (High Scores)
	• Vegetation type: timber and grass mixture, with shrub fuels surrounding some homes; large expanses of wildland fuels surround the polygon • Building construction: mixed, largely combustible; many homes built on stilts with exposure to flame impingement underneath • Deck and fencing: combustible materials • Water source: limited; no inspection of water tanks to ensure supply for suppression • Utility placement: both propane and electric are aboveground. • Topography: many mid-slope homes; nearby steep canyons provide potential for severe fire behavior; variable aspects • Roofing materials: vary widely • Fire occurrence history: burn scars evident from recent fires

Values at Risk
• Residential properties • Agricultural/livestock values • Ecological reserve • Riparian values • Tourism: entrance to Sequoia National Park

NFPA 1144 Final Rating	
Polygon Name	Total Score
South Fork – southeast	112 (Extreme)

Suggested Mitigations/Actions
Summary of mitigation needs based on field assessments
• Install firebreaks around all aboveground utility tanks with a 15-foot buffer • Increase road access – install fuel breaks and response vehicle turnouts along narrow roads • Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways • Upgrade water sources and/or routinely inspect water supplies for suppression • Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening • Continue fire road maintenance (CAL FIRE TUU) • Fire Safe Council to target residents in isolated and remote areas to promote the development of family emergency preparedness plans for early evacuation

Figure D.5. One major route in and out of the polygon, which is narrow, steep, and rough in places. Red markings are project WUI boundaries. Source: Google.

HAMMOND/MINERAL KING SUMMARY STATISTICS

Polygon: Hammond/Mineral King **Building Count:** 88

Land Area (*mi.²*): 0.8 **Building Density (building units/ *mi.²*):** 111.4

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
43.9	14.5	33.7	7.8

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), NPS Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 2

Wildland Engines

	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Port-A-Tanks: 2*
*2 total within CAL FIRE TUU

Portable Pumps: 2*
*CAL FIRE TUU has an additional 9

Dist. From Fire Station
0-0.5 (mi.): 46%
0.5-1.0 (mi.): 49%
1.0-1.5 (mi.): 4%
>1.5 (mi.): 1%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs: visible and reflective
- Previous fire occurrence: low
- Available fire protection: nearby fire station and other resources

Negative Attributes (High Scores)

- Ingress/egress: one major route in and out of the polygon; steep, narrow, and windy roads in places
- Water source: limited hydrants; no inspection of water tanks to ensure supply for suppression
- Road conditions: slow response; narrow, rough, and steep in places
- Fire access: narrow roads in places; limited turnarounds for longer fire trucks; confusing road configuration for out-of-town responders

1144 Survey Summary	
Positive Attributes (Low Scores)	Negative Attributes (High Scores) • Vegetation type: timber and grass mixture, with shrub fuels surrounding some homes; large expanse of wildland fuels south of the polygon • Defensible space: limited vegetation clearance around homes; many structures close together • Building construction: mixed, largely combustible • Deck and fencing: combustible • Utility placement: propane and electric both aboveground • Topography: many mid-slope homes; nearby canyons provide potential for severe fire behavior • Roofing materials: vary widely

Values at Risk
• Residential properties • Agricultural/livestock values • ACEC preserve

NFPA 1144 Final Rating	
Polygon Name	Total Score
Hammond/Mineral King	123 (Extreme)

Suggested Mitigations/Actions

Summary of mitigation needs based on field assessments

- Install firebreaks around all aboveground utility tanks with a 15-foot buffer
- Fire Safe Council to provide a community specific workshop to discuss defensible space and tips for maintaining good clearance around homes
- Increase road access – install fuel breaks and response vehicle turnouts along narrow roads
- Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways
- Upgrade water sources and/or routinely inspect water supplies for suppression
- Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening
- Continue fire road maintenance (CAL FIRE TUU)
- Fire Safe Council to target residents in isolated and remote areas to promote the development of family emergency preparedness plans for early evacuation

Figure D.6. Houses have limited defensible space, and road layout is confusing for out-of-town responders. Red markings are project WUI boundaries. Source: Google.

MAIN CORRIDOR SUMMARY STATISTICS

Polygon: Main Corridor **Population Count:** 265

Land Area (*mi.²*): 1.7 **Building Density (building units/ *mi.²*):** 154.1

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
22.9	19.9	25.3	31.9

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), NPS Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 2

Wildland Engines

	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Port-A-Tanks: 2*
*2 total within CAL FIRE TUU

Portable Pumps: 2*
*CAL FIRE TUU has an additional 9

Dist. From Fire Station
0-0.5 (mi.): 11%
0.5-1.0 (mi.): 37%
1.0-1.5 (mi.): 36%
>1.5 (mi.): 16%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs: visible and reflective
- Previous fire occurrence: low
- Available fire protection: nearby fire station and other resources
- Road conditions: driveways are primarily short when compared with others in the community

Negative Attributes (High Scores)

- Ingress/egress: one major route in and out of the polygon; steep and narrow in places
- Road conditions: slow response; narrow in places in neighborhoods
- Fire access: narrow roads in places; limited turnarounds for longer fire trucks

1144 Survey Summary

Positive Attributes (Low Scores)	Negative Attributes (High Scores)
	• Vegetation type: mixture of shrub and tall grass surrounding homes • Defensible space: limited; small lots; harder to maintain defensible space • Building construction: mixed, largely combustible • Deck and fencing: combustible materials • Water source: limited; no inspection of water tanks to ensure supply for suppression • Utility placement: both propane and electric are aboveground • Topography; some mid-slope homes; variable slopes and aspects • Roofing materials: vary widely

Values at Risk

- Residential properties
- Agricultural/livestock values
- Tourism values: attractions, guest houses, etc.

NFPA 1144 Final Rating

Polygon Name	Total Score
Main Corridor	101 (High)

Suggested Mitigations/Actions

Summary of mitigation needs based on field assessments

- Install firebreaks around all aboveground utility tanks with a 15-foot buffer
- Increase road access – install fuel breaks and response vehicle turnouts along narrow roads
- Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways
- Fire Safe Council to provide a community specific workshop to discuss defensible space and tips for maintaining good clearance around homes
- Upgrade water sources and/or routinely inspect water supplies for suppression
- Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening
- Continue fire road maintenance (CAL FIRE TUU)

Figure D.7. Houses have limited defensible space on small lots, and structures are built in close proximity. Red markings are project WUI boundaries. Source: Google.

SOUTH FORK SUMMARY STATISTICS

Polygon: South Fork
Land Area (*mi.²*): 4.8
Building Count: 354
Building Density (building units/ *mi.²*): 73.3

Percent of Town by Modeled Wildfire Risk

Low	Moderate	High	Extreme
22.9	21.7	22.9	32.6

Fire Station Statistics

Fire stations: **TCFD Station #14 Three Rivers, Three Rivers (CAL FIRE TUU), NPS Hammond**

Full-time Firefighters: 12-13†
Seasonal firefighters: 10†
On-call Firefighters: 2
Volunteer Firefighters: 0

Water Tender
Type 1: 0
Type 2: 0
Type 3: 0

Structure Engines
Type 1: 0
Type 2: 2

Port-A-Tanks: 2*
*2 total within CAL FIRE TUU

Portable Pumps: 2*
*CAL FIRE TUU has an additional 9

Wildland Engines	Standard	Brush Breaker
Type 3:	3	0
Type 4:	0	0
Type 5:	0	0
Type 6:	1	0
Type 7:	0	0

Dist. From Fire Station
0-0.5 (mi.): 13%
0.5-1.0 (mi.): 9%
1.0-1.5 (mi.): 3%
>1.5 (mi.): 75%

†The NPS Hammond fire station contributes 6 permanent firefighters (about 8 months per year) and 10 seasonal firefighters (about 6 months per year).
†CAL FIRE TUU contributes 3-4 full-time firefighters
†TCFD contributes 3 full-time firefighters and 2 on-call firefighters

Current Fire and Fuel Management Programs and Plans

- Tulare Unit Strategic Fire Plan (CAL FIRE TUU)
- Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan

1144 Survey Summary

Positive Attributes (Low Scores)

- Street signs: visible and reflective
- Topography: most homes in river valley and away from slopes
- Previous fire occurrence: low to moderate
- Defensible space: larger lots, structures are farther apart than in other neighborhoods
- Utility pole resilience: some have been replaced with fire-resistant materials

Negative Attributes (High Scores)

- Ingress/egress: one major route in and out of the polygon; narrow roads in places with blind corners
- Road conditions: slow response, narrow in places; some homes have longer driveways
- Fire protection resources: further from a fire station than other neighborhoods in Three Rivers
- Fire access: limited turnarounds for longer fire trucks

1144 Survey Summary

Positive Attributes (Low Scores)	Negative Attributes (High Scores)
• Vegetation type: mostly riparian vegetation surrounding homes (less flammable)	• Vegetation type: tall grass and dry shrubs • Building construction: mixed; largely combustible • Deck and fencing: combustible materials • Water source: no inspection of water tanks to ensure supply for suppression • Utility placement: both propane and electric are aboveground • Topography: mixed aspects and slope steepness • Roofing materials: vary widely

Values at Risk

- Residential properties
- Agricultural/livestock values
- Riparian values

NFPA 1144 Final Rating

Polygon Name	Total Score
South Fork	111 (High)

Suggested Mitigations/Actions

Summary of mitigation needs based on field assessments

- Install firebreaks around all aboveground utility tanks with a 15-foot buffer
- Increase road access – install fuel breaks and response vehicle turnouts along narrow roads
- Increase fuel free buffers on both sides of roads that are likely to cause entrapment. Remove or prune trees that impede the roadways
- Upgrade water sources and/or routinely inspect water supplies for suppression
- Fire Safe Council to provide a community specific workshop to discuss structural ignitability and tips for home hardening
- Continue fire road maintenance (CAL FIRE TUU)

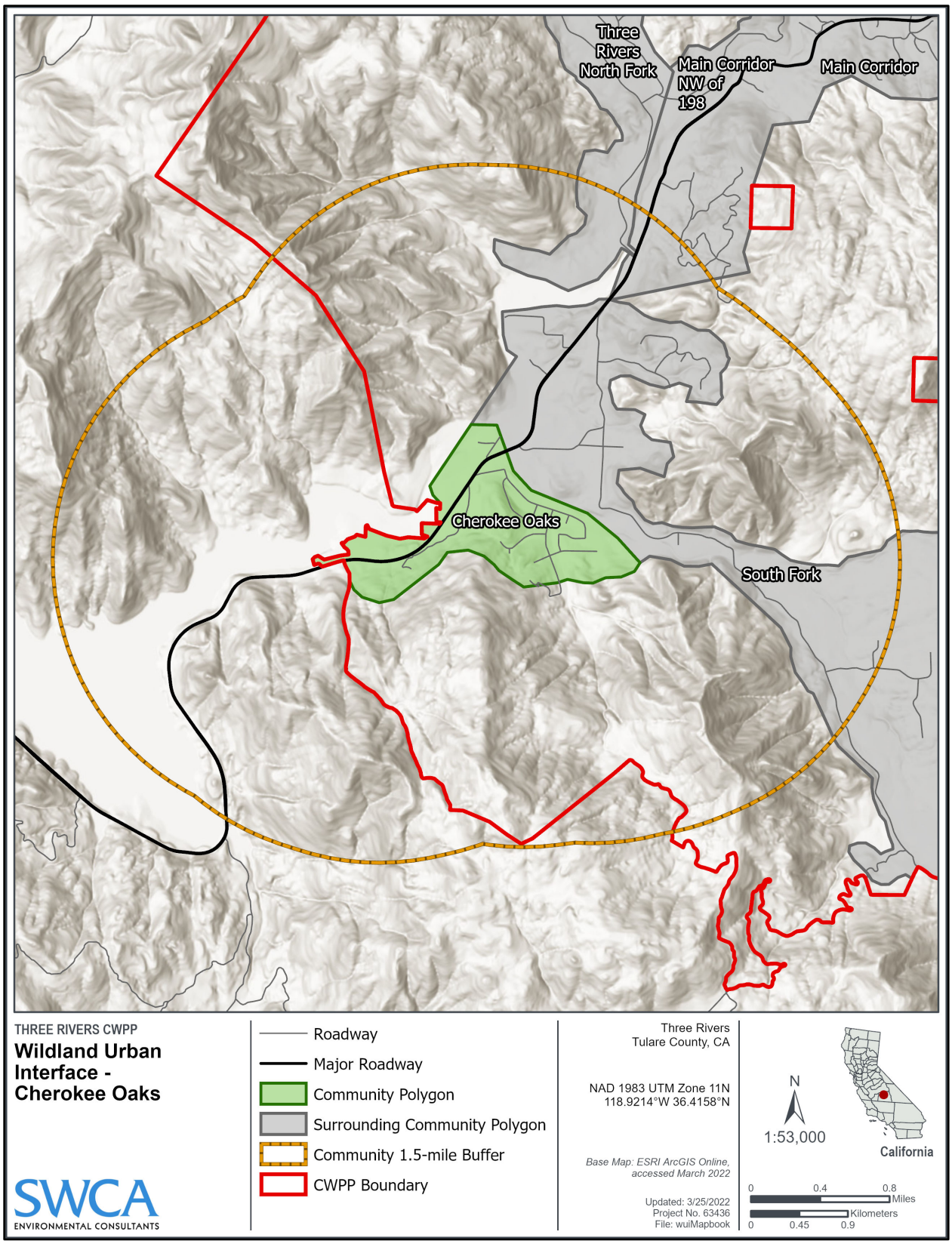
Figure D.8. Larger lot sizes with structures that are further apart and closer to more moist riparian vegetation. One road in and out of polygon. Red markings are project WUI boundaries. Source: Google.

1.5-MILE WUI BUFFERS

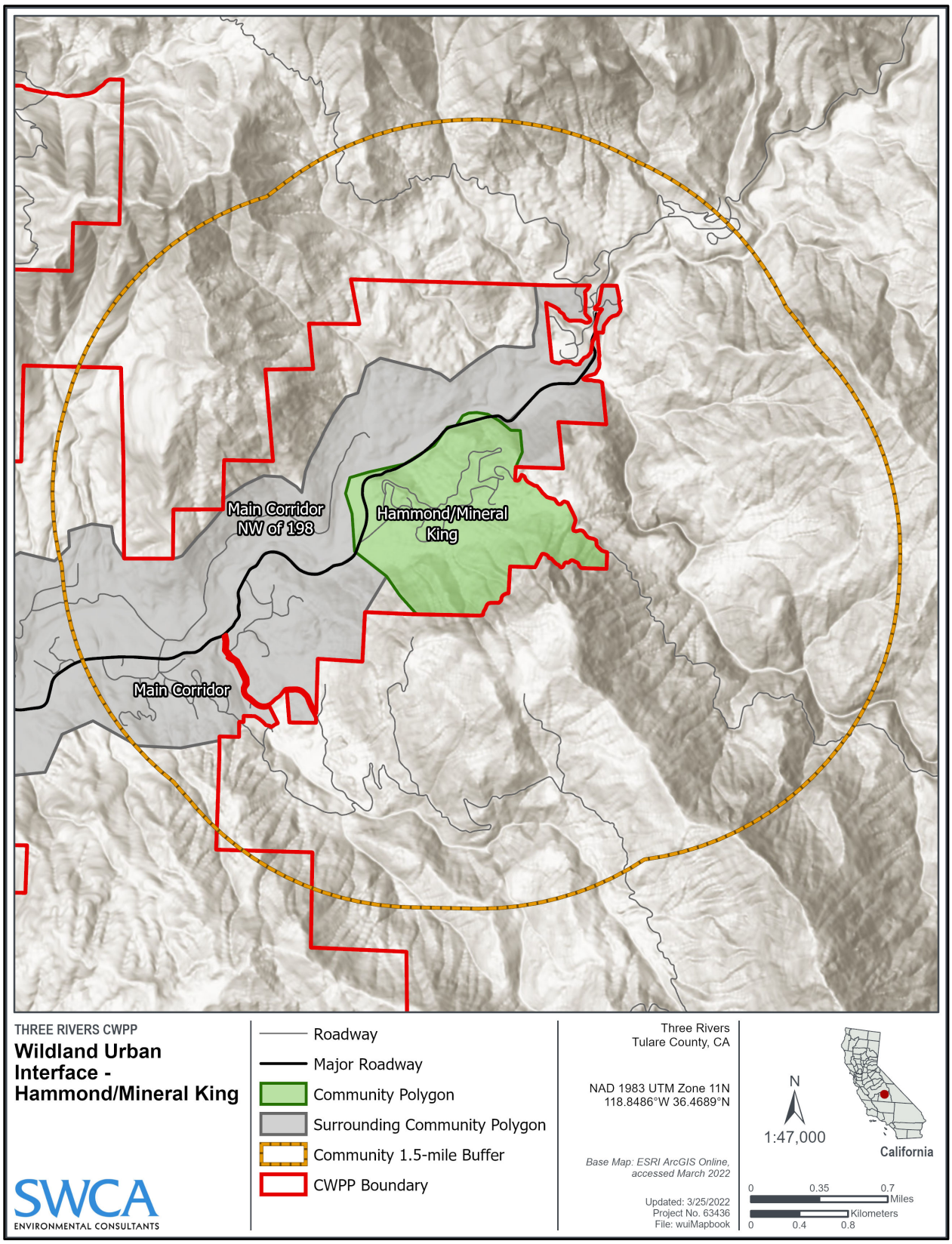
According to the HFRA, the WUI can be defined by a CWPP. In this CWPP, the WUI is defined as an area extending 1.5 miles from the boundary of an at-risk community. *

The following maps represent the WUI boundaries for each community, which were delineated by the Core Team and visited in the field during the NFPA assessments. The 1.5-mile buffer represents an area where WUI fuel treatments should be considered in order to provide additional protection to the community from potential wildfire spread. In some cases, the WUI may extend beyond the 1.5-mile area to meet a strategic suppression point or topographic feature to enhance protection, as dictated by land management agencies.

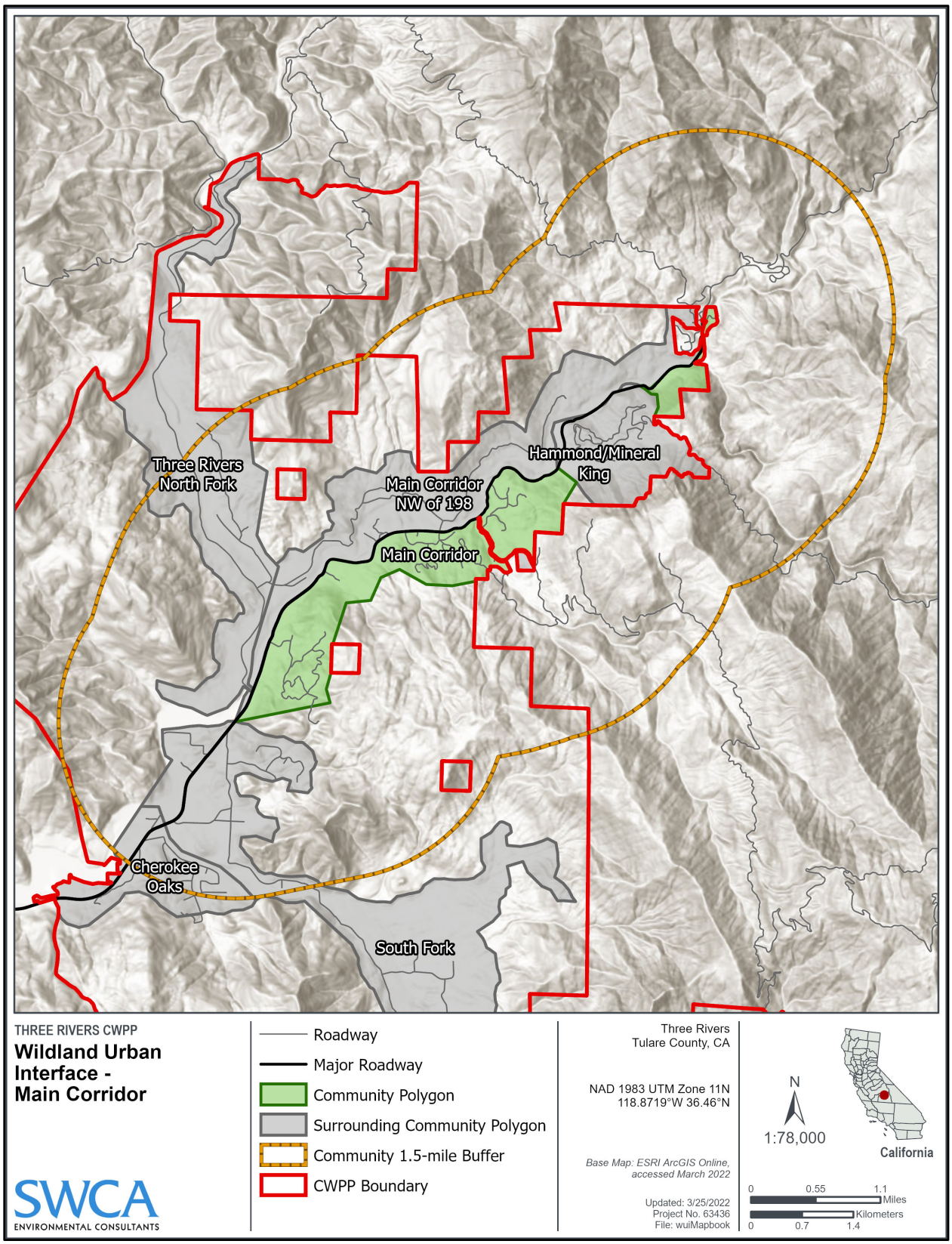
*The maps use different scales to provide detail, but all buffer distances are the same (1.5 mile).



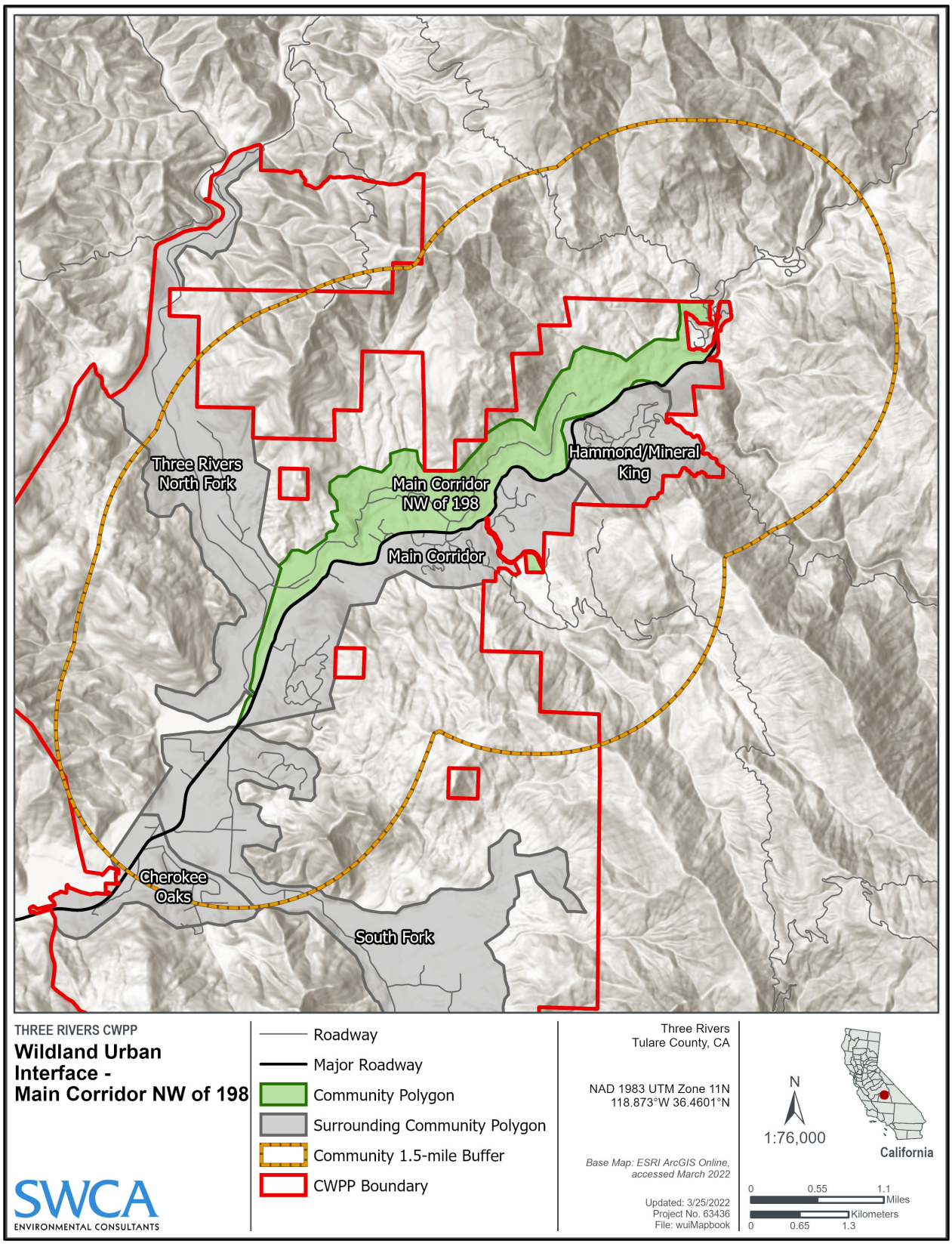
Map D.1. WUI community: Cherokee Oaks



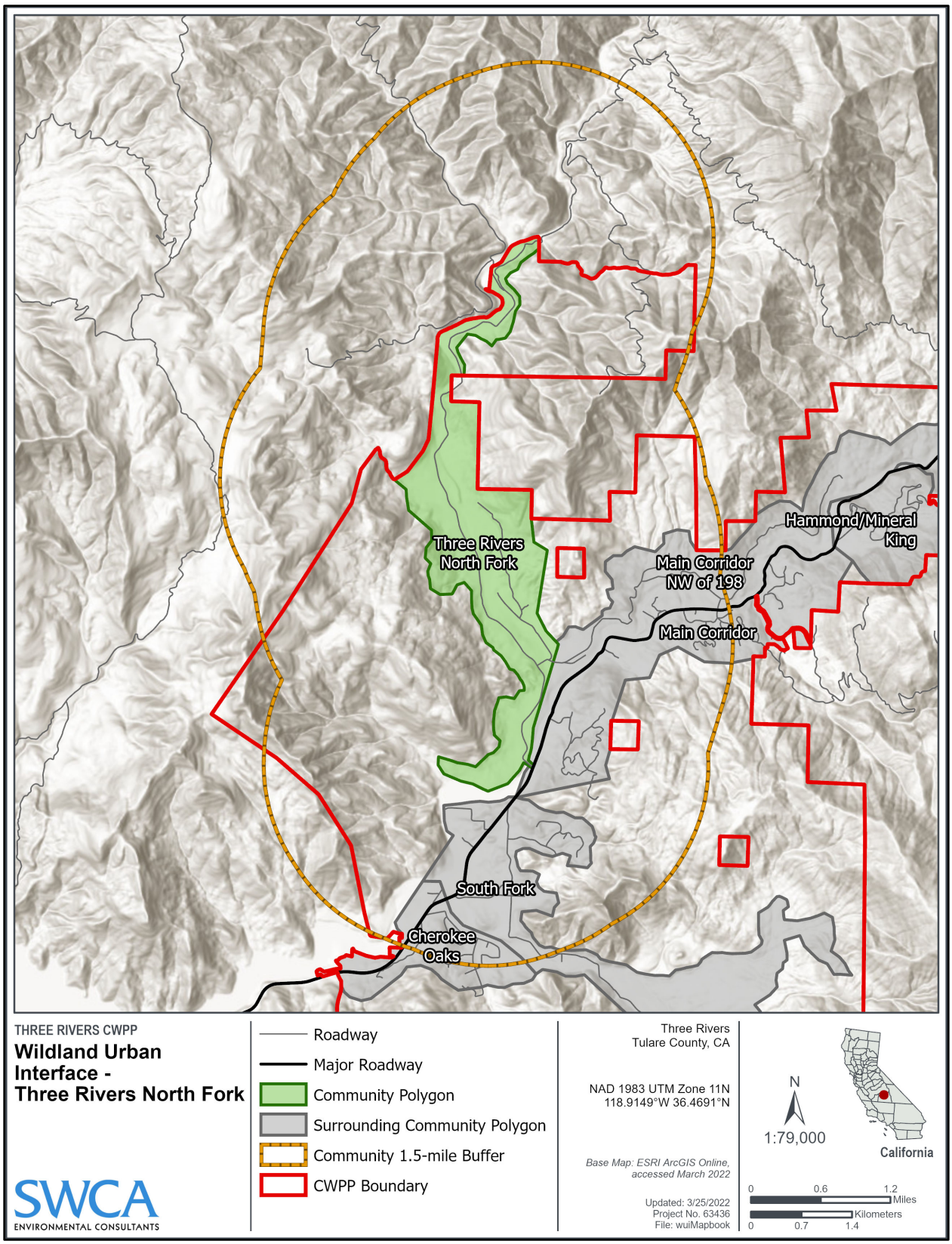
Map D.2. WUI community: Hammond/Mineral King



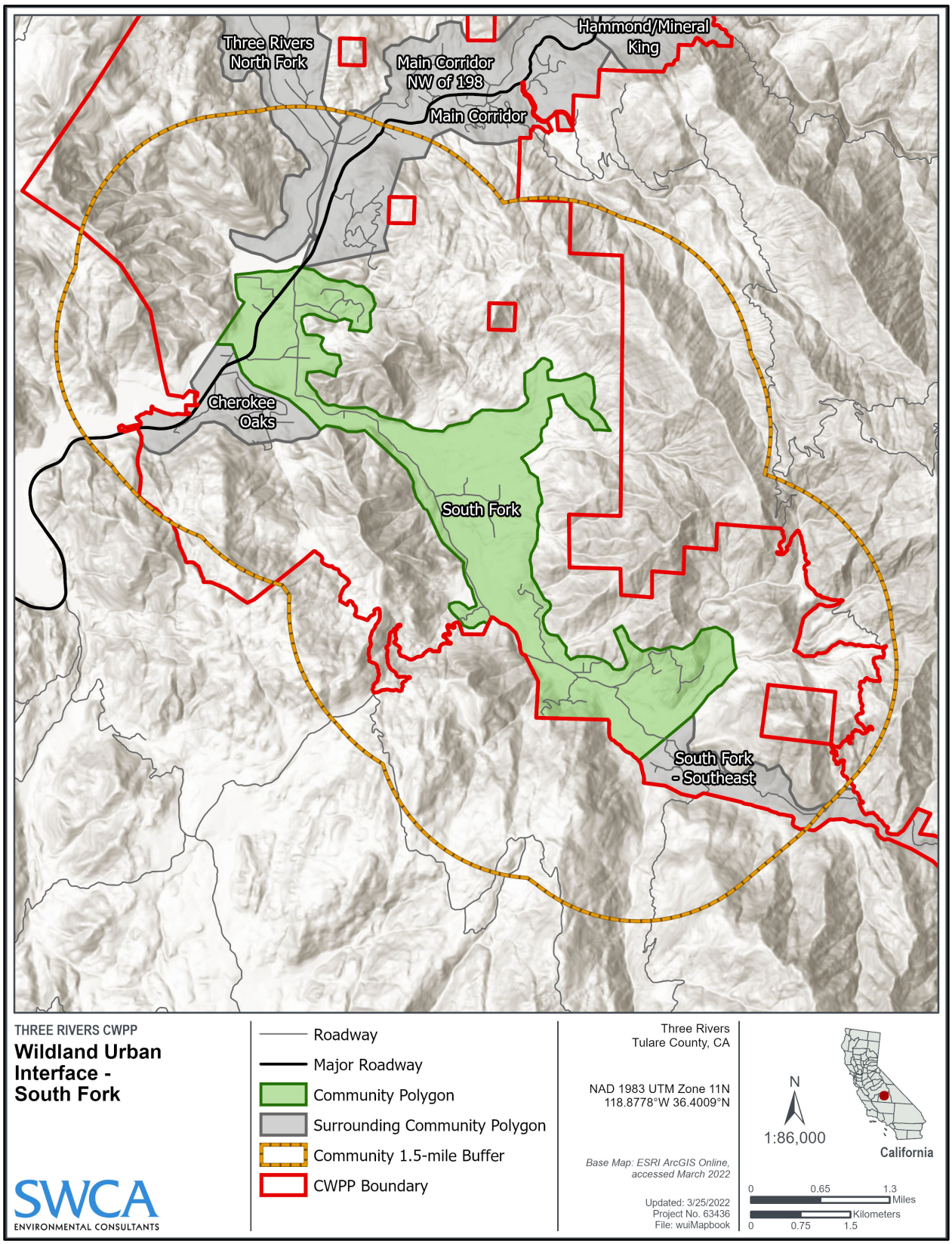
Map D.3. WUI community: main corridor



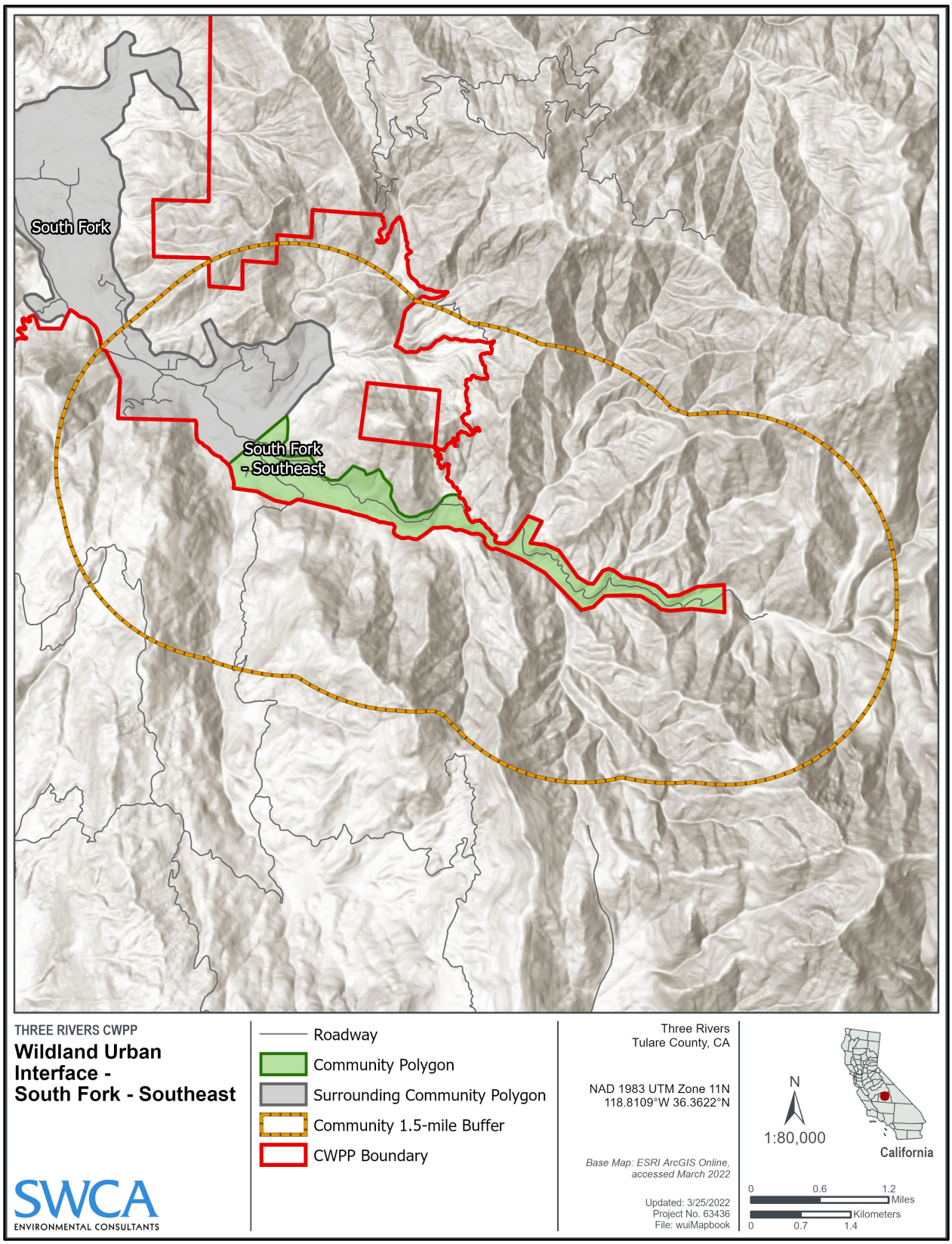
Map D.4. WUI community: main corridor northwest of Highway 198



Map D.5. WUI community: Three Rivers North Fork



Map D.6. WUI community: South Fork



Map D.7. WUI community: South Fork - southeast

APPENDIX E:

Assessment Forms

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1144 NATIONAL FIRE PROTECTION ASSOCIATION ASSESSMENT FORM

SWCA Wildfire Risk Assessment		
Community		**Notes:**
Surveyor		
Survey Date/Time		

Means of Access	
Ingress and Egress	
2 or more roads in and out score | 0	
1 road in and out | 7	
Road Width	
> 24 ft | 0	
> 20 ft < 24 ft | 2	
< 20 ft | 4	
Road Conditions	
Surfaced road, grade < 5% | 0	
Surfaced road, grade > 5% | 2	
Non-surfaced road, grade < 5% | 2	
Non-surfaced road, grade > 5% | 5	
Other than all season | 7	
Fire Access	
< 300 ft with turnaround | 0	
> 300 ft with turnaround | 2	
< 300 ft with no turnaround | 4	
> 300 ft with no turnaround | 5	
Street Signs	
Present – reflective | 0	
Present – non-reflective | 2	
Not present | 5	
Notes:	

Vegetation (Fuel Models)	
Predominant Vegetation	
Primary Predominant Vegetation	
Non-Burnable (NB) Score | 2	
Grass (GR) Score | 5	
Grass-Shrub (GS) Score | 10	
Shrub (SH) Score | 15	
Timber-Understory (TU) Score | 20	
Timber-Litter (TL) Score | 25	

Slash-Blow (TU) Score | 30	
Notes:	

Defensible Space	
> 100 ft around structure | 1	
> 70 ft < 100 ft around structure | 3	
> 30 ft < 70 ft around structure | 10	
< 30 ft around structure | 25	
Topography Within 300 ft of Structures	
Slope	
< 9% | 1	
10% to 20% | 4	
21% to 30% | 7	
31% to 40% | 8	
>41% | 10	
Additional Rating Factors (rate all that apply)	
Topographic features | 1-5	
History of high fire occurrence | 1-5	
Severe fire weather potential | 1-5	
Separation of adjacent structures | 1-5	
Notes:	
Roofing Assembly	
Roofing	
Class A - metal roof, clay/concrete tiles, slate, asphalt shingles | 0	
Class B - pressure treated composite shakes and shingles | 3	
Class C - untreated wood shingle, plywood, particle board | 15	
Unrated - Extremely poor roofing conditions | 25	
Notes:	
Building Construction	
Siding Materials (predominant)	
Non-combustible (brick/concrete) | 5	
Fire Resistive (stucco/adobe) | 10	
Combustible (wood or vinyl) | 12	
Deck and fencing (predominant)	
No deck or fence/non-combustible | 0	
Combustible deck and fence | 5	

Building Set-Back	
> 30 ft to slope | 1	
< 30 ft to slope | 5	
Notes:	

Available Fire Protection	
Water Sources	
Water Source? | yes/no	
Water Source Type | hydrant, water tank, other	
Other Water Source	
Water Source Score | Hydrant = 1 Water Tank = 3	
Organized Response	
Station < 5 mi from community | 1	
Station > 5 mi from community | 3	
Notes:	
Placement of Gas and Electric Utilities	
Both underground | 0	
One above, one below | 3	
Both above ground | 5	
Values at Risk Observations	
Forest Health Observations	
Land Use Observations	
Misc Observations	

Total				
Hazard Rating Scale	**<40 Low**	**>40 Moderate**	**>70 High**	**>112 Extreme**

DEFENSIBLE SPACE INSPECTION FORM

State of California
Department of Forestry and Fire Protection
CAL FIRE
LE-100a (3/17)

Date: _____

NOTICE OF DEFENSIBLE SPACE INSPECTION

A fire department representative has inspected your property for fire hazards.
You are hereby notified to correct the violation(s) indicated below. Failure to correct these violations may result in a citation and fine.

OWNER/TENANT:	INSPECTION ADDRESS:		
INSPECTOR NAME:	CONTACT NUMBER:	Inspection No. 1 2 3	No Violations Observed ☐

CHECKED BOXES INDICATE VIOLATIONS

Zone 1 / Within 30 feet of all structures or to the property line (Refer to illustration below):

- ☐ **A.** Remove all branches within 10 feet of any chimney or stovepipe outlet, pursuant to PRC § 4291(a)(4) and 14 CCR § 1299.03(a)(2).
- ☐ **B.** Remove leaves, needles or other vegetation on roofs, gutters, decks, porches, stairways, etc. pursuant to PRC § 4291 (a)(6) and 14 CCR § 1299.03(a)(1).
- ☐ **C.** Remove all dead and dying trees, branches and shrubs, or other plants adjacent to or overhanging buildings, pursuant to PRC § 4291 (a)(5) and 14 CCR § 1299.03(a)(2).
- ☐ **D.** Remove all dead and dying grass, plants, shrubs, trees, branches, leaves, weeds and needles, pursuant to 14 CCR § 1299.03(a)(1).
- ☐ **E.** Remove or separate live flammable ground cover and shrubs, pursuant to PRC § 4291(a)(1) and BOF General Guidelines item1.
- ☐ **F.** Remove flammable vegetation and items that could catch fire which are adjacent to, or below, combustible decks, balconies, and stairs, pursuant to 14 CCR § 1299.03(a)(4).
- ☐ **G.** Relocate exposed wood piles outside of Zone1 unless completely covered in a fire-resistant material, pursuant to 14 CCR § 1299.03(a)(3).

Zone 2 / Within 30–100 feet of all structures or to the property line (Refer to illustration below):

- ☐ **H.** Cut annual grasses and forbs down to a maximum height of 4 inches, pursuant to 14 CCR § 1299.03(b)(2)(B).
- ☐ **I.** Remove fuels in accordance with the Fuel Separation or Continuous Tree Canopy guidelines (see back), pursuant to BOF General Guidelines item 4.
- ☐ **J.** All exposed woodpiles must have a minimum of 10 feet clearance, down to bare mineral soil, in all directions, pursuant to 14 CCR § 1299.03(b)(2)(C).
- ☐ **K.** Dead and dying woody surface fuels and aerial fuels shall be removed. Loose surface litter, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches, shall be permitted to a maximum depth of 3 inches, pursuant to 14 CCR § 1299.03(b)(2)(A).

Defensible and Reduced Fuel Zone / Within 100 feet of all structures or to the property line (Refer to illustration below):

- ☐ **L.** Logs or stumps embedded in the soil must be removed or isolated from other vegetation, pursuant to BOF General Guidelines item 3.

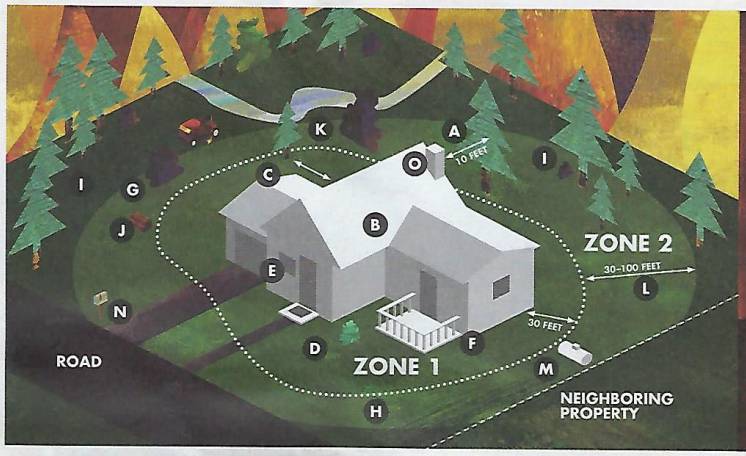
Other Requirements:

- ☐ **M.** Outbuildings and Liquid Propane Gas (LPG) storage tanks shall have 10 feet of clearance to bare mineral soil and no flammable vegetation for an additional 10 feet around their exterior, pursuant to 14 CCR § 1299.03(c)(1).
- ☐ **N.** Address numbers shall be displayed in contrasting colors (4" min. size) and readable from the street or access road, pursuant to 2016 CFC § 505.1.
- ☐ **O.** Equip chimney or stovepipe openings with a metal screen having openings between 3/8 inch and 1/2 inch, pursuant to 2016 CBC § 2113.9.2.

COMMENTS:

LEARN MORE:

IMPORTANT **All violations marked must be addressed by the owner/tenant. A re-inspection of the property will occur on or after** _____



KNOW THE LAW
BE FIRE SMART

100 feet of Defensible Space is required under the Public Resources Code (PRC) 4291. California Building Code Chapter 7A requires certain construction materials and methods for homes in wildland areas. Be sure to contact your local fire department for additional requirements to ensure your home is compliant with the law.

READYFORWILDFIRE.ORG/THELAW

PRC § 4119. The department, or its duly authorized agent, shall enforce the state forest and fire laws. The department may inspect all properties, except the interior of dwellings, subject to the state forest and fire laws, for the purpose of ascertaining compliance with such laws.

APPENDIX F:

Funding Sources

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FUNDING RESOURCES

The following section provides information on federal, state, and private funding opportunities for conducting wildfire mitigation projects.

FEDERAL FUNDING INFORMATION

Source: 2022 Infrastructure Investments and Jobs Act

Agency: Multiple

Website: https://www.congress.gov/bill/117th-congress/house-bill/3684

Description: The Infrastructure Investments and Jobs Act allocated funding through various departments for infrastructure projects including, but not limited to, roads, bridges, and major projects; passenger and freight rail; highway and pedestrian safety; public transit; broadband; ports and waterways; airports; water infrastructure; power and grid reliability and resiliency; resiliency, including funding for coastal resiliency, ecosystem restoration, and weatherization; clean school buses and ferries; electric vehicle charging; addressing legacy pollution by cleaning up Brownfield and Superfund sites and reclaiming abandoned mines; and Western Water Infrastructure.

Section 40803 addresses wildfire risk reduction, section 40804 deals with ecosystem restoration, section 40806 handles the establishment of fuel breaks in forests and other wildland vegetation, and section 70302 addresses reforestation. To learn more about the Act, please see the guidebook located here: https://www.whitehouse.gov/wp-content/uploads/2022/01/BUILDING-A-BETTER-AMERICA_FINAL.pdf?msclkid=48f8f465b51911ec85e010228d808d4d.

Source: Access to Ancestral Lands Grant Opportunity (AALG)

Agency: First Nations Development Institute

Website: Home | First Nations Development Institute

Description: For more than 41 years, First Nations Development Institute (First Nations), a Native-led 501(c)(3) nonprofit organization, has worked to strengthen American Indian economies to support healthy Native communities by investing in and creating innovative institutions and models that strengthen asset control and support economic development for American Indian people and their communities. First Nations began its national grantmaking program in 1993. Through mid-year 2021, First Nations has successfully managed 2,276 grants totaling more than $46 million to tribal and community institutions across Indian Country. The California Tribal Fund was created to support California-based, California-Native-led nonprofits and tribal programs in controlling and protecting their food systems, water, languages, traditional ecological knowledge, and land. Currently, the fund is operated as a project of First Nations Development Institute. You can find more information on the AALG here: Access to Ancestral Lands Grant Opportunity | First Nations Development Institute

Source: Building Resilient Infrastructure and Communities (BRIC) Grant Program

Agency: Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA)

Website: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Description: BRIC will supports states, local communities, tribes, and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. You can find more information on the BRIC program here: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Source: Hazard Mitigation Grant Program (HMGP)

Agency: FEMA

Website: https://www.fema.gov/grants/mitigation/hazard-mitigation

Description: The HMGP provides funding to state, local, tribal, or territorial governments (and individuals or businesses if the community applies on their behalf) to rebuild with the intentions to mitigate future losses due to potential disasters. This grant program is available after a presidentially declared disaster.

Source: Hazard Mitigation Grant Program (HMGP) – Post Fire

Agency: FEMA

Website: https://www.fema.gov/grants/mitigation/post-fire

Description: The HMGP Post Fire grant program provides assistance to communities for the purpose of implementing hazard mitigation measures *following* a wildfire. Mitigation measures may include:

- Soil stabilization
- Flood diversion
- Reforestation

Source: Flood Mitigation Assistance (FMA) Grant

Agency: FEMA

Website: https://www.fema.gov/grants/mitigation/floods

Description: The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program. FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project.

Source: Emergency Management Performance Grant (EMPG)

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/emergency-management-performance

Description: The EMPG program provides funding to state, local, tribal, and territorial emergency management agencies with the overall goal of creating a safe and resilient nation. The two main objectives of the program are 1) closing capability gaps that are identified in the state or territory's most recent Stakeholder Preparedness Review (SPR); and 2) building or sustaining those capabilities that are identified as high priority through the Threat and Hazard Identification and Risk Assessment (THIRA)/SPR process and other relevant information sources. The grant recipient and

Regional Administrator must come to an agreement on program priorities, which are crafted based on National, State, and regional priorities.

Source: Fire Management Assistance Grant (FMAG)

Agency: FEMA

Website: https://www.fema.gov/assistance/public/fire-management-assistance

Description: Fire Management Assistance is available to state, local, and tribal governments for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a state submits a request for assistance to the FEMA Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours. Before a grant can be awarded, a state must demonstrate that total eligible costs for the declared fire meet or exceed either the individual fire cost threshold, which applies to single fires, or the cumulative fire cost threshold, which recognizes numerous smaller fires burning throughout a state.

Source: Regional Catastrophic Preparedness Grant

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/regional-catastrophic

Description: The Regional Catastrophic Preparedness Grant program provides funding to increase collaboration and capacity in regard to catastrophic incident response and preparation.

Source: Emergency Forest Restoration Program (EFRP)

Agency: USDA Farm Service Agency (FSA)

Website: Emergency Forest Restoration Program (EFRP) (usda.gov)

Description: The Emergency Forest Restoration Program (EFRP) helps the owners of non-industrial private forests restore forest health damaged by natural disasters. The EFRP does this by authorizing payments to owners of private forests to restore disaster damaged forests. The local FSA County Committee implements EFRP for all disasters with the exceptions of drought and insect infestations. Eligible practices may include debris removal, such as down or damaged trees; site preparation, planting materials, and labor to replant forest stand; restoration of forestland roads, fire lanes, fuel breaks, or erosion-control structures; fencing, tree shelters; wildlife enhancement.

To be eligible for EFRP, the land must have existing tree cover; and be owned by any nonindustrial private individual, group, association, corporation, or other private legal entity.

Source: Emergency Conservation Program (ECP)

Agency: USDA Farm Service Agency (FSA)

Website: Emergency Conservation Program (usda.gov)

Description: The Emergency Conservation Program (ECP) helps farmers and ranchers to repair damage to farmlands caused by natural disasters and to help put in place methods for water conservation during severe drought. The ECP does this by giving ranchers and farmers funding and assistance to repair the damaged farmland or to install methods for water conservation. The grant could be used for restoring conservation structures (waterways, diversion ditches, buried irrigation mainlines, and permanently installed ditching system).

Source: Environmental Quality Incentives Program (EQIP)

Agency: National Resource Conservation Service (NRCS)

Website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/co/programs/financial/eqip/

Description: The Environmental Quality Incentives Program (EQIP) is a voluntary program authorized under the Agricultural Act of 2014 (2014 Farm Bill) that helps producers install measures to protect soil, water, plant, wildlife, and other natural resources while ensuring sustainable production on their farms, ranches, and working forest lands.

Source: Emergency Watershed Protection (EWP) Program

Agency: National Resource Conservation Service (NRCS)

Website: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/

Description: The program offers technical and financial assistance to help local communities relieve imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters that impair a watershed.

Eligible sponsors include cities, counties, towns, conservation districts, or any federally recognized Native American tribe or tribal organization. Interested public and private landowners can apply for EWP Program recovery assistance through one of those sponsors.

EWP Program covers the following activities.

- Debris removal from stream channels, road culverts, and bridges
- Reshape and protect eroded streambanks
- Correct damaged drainage facilities
- Establish vegetative cover on critically eroded lands
- Repair levees and structures
- Repair conservation practices

Source: Funding for Fire Departments and First Responders

Agency: DHS, U.S. Fire Administration

Website: https://www.usfa.fema.gov/grants/

Description: Includes grants and general information on financial assistance for fire departments and first responders. Programs include the Assistance to Firefighters Grant Program, Reimbursement for Firefighting on Federal Property, State Fire Training Systems Grants, and National Fire Academy Training Assistance.

Source: Tribal Environmental General Assistance Program (GAP)

Agency: Environmental Protection Agency (EPA)

Website: https://www.epa.gov/tribal-pacific-sw/epa-region-9-tribal-environmental-gap-funding

Description: Funding under this program is used to aid Native American tribes in establishing and implementing their own reservation-specific environmental protection programs. To find out more about this funding opportunity please contact Tribal Branch Manager, Jeremy Bauer, at bauer.jeremy@epa.gov.

Source: Specific EPA Grant Programs

Agency: Environmental Protection Agency (EPA)

Website: https://www.epa.gov/tribal-pacific-sw/epa-region-9-tribal-environmental-gap-funding

Description: Various grant programs are listed under this site. Listed below are examples of grants offered:

- Multipurpose Grants to States and Tribes: https://www.epa.gov/grants/multipurpose-grants-states-and-tribes
- Environmental Education Grants: https://www.epa.gov/education/grants
- Environmental Justice Grants: https://www.epa.gov/environmentaljustice/environmental-justice-grants-funding-and-technical-assistance

Source: Conservation Innovation Grants (CIG)

Agency: National Resource Conservation Service

Website: https://www.nrcs.usda.gov/wps/portal/nrcs/site/ca/home/

Description: CIG State Component. CIG is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program (EQIP) funds are used to award competitive grants to non-federal governmental or nongovernmental organizations, tribes, or individuals. CIG enables the Natural Resources Conservation Service (NRCS) to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with federal, state, and local regulations. The NRCS administers the CIG program. The CIG requires a 50/50 match between the agency and the applicant. The CIG has two funding components: national and state. Funding sources are available for water resources, soil resources, atmospheric resources, and grazing land and forest health.

Source: Urban and Community Forestry (UCF) Program, National Urban and Community Forestry Challenge Cost Share Grant Program

Agency: U.S. Forest Service (USFS)

Website: https://www.fs.usda.gov/managing-land/urban-forests/ucf

Description: USFS funding will provide for Urban and Community Forestry Programs that work with local communities to establish climate-resilient tree species to promote long-term forest health.

The other initiative behind this program is to promote and carry out disaster risk mitigation activities, with priority given to environmental justice communities. For more information, contact a USFS Regional Program Manager.

Source: Catalog of Federal Funding Sources; Land Resources

Agency: Multiple

Website: https://ofmpub.epa.gov/apex/wfc/f?p=165:512:6483383318137:::512::

Description: The Land Finance Clearing House is a catalogue of Federal funding sources for all things land related.

Examples of the types of grants found at this site are:

- Forest and Woodlands Resource Management Grant: https://sam.gov/fal/a798ad78cac749639b48270db3e86fdc/view?index=cfda&page=2&organization_id=100011100
- Environmental Education Grant: https://www.epa.gov/education/grants
- Public Assistance Grant Program: https://www.fema.gov/assistance/public
- Hazard Mitigation Grant: https://www.fema.gov/grants/mitigation/hazard-mitigation

Source: Catalog of Federal Funding Sources; Water Resources

Agency: Multiple

Website: https://ofmpub.epa.gov/apex/wfc/f?p=165:12:6483383318137:::12::

Description: The Water Finance Clearing House is a catalogue of Federal funding sources for all things water related.

Examples of the types of grants found at this site are:

- Water Conservation Field Services Program: https://www.usbr.gov/waterconservation/
- California Community Development Block Grant: Community Development Block Grant (CDBG) - California Grants Portal
- California Clean Water State Revolving Fund Program (CWSRF): https://www.waterboards.ca.gov/water_issues/programs/grants_loans/srf/index.html

Source: Firewise Grants

Agency: Multiple

Website: http://www.firewise.org

Description: Many different Firewise Communities activities are available to help homes and whole neighborhoods become safer from wildfire without significant expense. Community cleanup days, awareness events, and other cooperative activities can often be successfully accomplished through partnerships among neighbors, local businesses, and local fire departments at little or no cost.

The kind of help you need will depend on who you are, where you are, and what you want to do. Among the different activities that individuals and neighborhoods can undertake, the following often benefit from seed funding or additional assistance from an outside source:

- Thinning/pruning/tree removal/clearing on private property—particularly on very large, densely wooded properties
- Retrofit of home roofing or siding to non-combustible materials
- Managing private forest
- Community slash pickup or chipping
- Creation or improvement of access/egress roads
- Improvement of water supply for firefighting
- Public education activities throughout the community or region

Source: The National Fire Plan (NFP) Grants

Agency: U.S. Department of the Interior and USDA

Website: http://www.forestsandrangelands.gov/

Description: Many states are using funds from the NFP to provide funds through a cost-share with residents to help them reduce the wildfire risk to their private property. These actions are usually in the form of thinning or pruning trees, shrubs, and other vegetation and/or clearing the slash and debris from this kind of work. Opportunities are available for rural, state, and volunteer fire assistance.

Source: Staffing for Adequate Fire and Emergency Response (SAFER) Grants

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters/safer

Description: The purpose of SAFER grants is to help fire departments increase the number of frontline firefighters. The goal is for fire departments to increase their staffing and deployment capabilities and ultimately attain 24-hour staffing, thus ensuring that their communities have adequate protection from fire and fire-related hazards. The SAFER grants support two specific activities: 1) hiring of firefighters and 2) recruitment and retention of volunteer firefighters. The hiring of firefighters activity provides grants to pay for part of the salaries of newly hired firefighters over the five-year program.

Source: The Fire Prevention and Safety (FP&S) Grants

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters/safety-awards#:~:text=Awards%20%20%20%20Organization%20%20%20,%20%20%241%2C499%2C957%20%2016%20more%20rows%20

Description: FP&S offers support to projects that enhance the safety of the public and firefighters who may be exposed to fire and related hazards. The primary goal is to target high risk populations and mitigate high incidences of death and injury. The objectives of the FP&S Program are to provide critically needed resources to carryout fire prevention education and training, fire code enforcement, fire/arson investigation, firefighter safety and health programming, prevention efforts, and research and development. In fiscal year 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include firefighter safety research and development.

Source: GSA-Federal Excess Personal Property (FEPP)

Agency: USFS

Website: https://gsaxcess.gov/

Description: The Federal Excess Personal Property (FEPP) program refers to USFS-owned property that is on loan to State Foresters for the purpose of wildland and rural firefighting. Most of the property originally belonged to the Department of Defense (DoD). Once acquired by the USFS, it is loaned to State Cooperators for firefighting purposes. The property is then loaned to the State Forester, who may then place it with local departments to improve local fire programs. State Foresters and the USFS have mutually participated in the FEPP program since 1956.

Source: Assistance to Firefighters Grants (AFG)

Agency: FEMA

Website: https://www.fema.gov/grants/preparedness/firefighters.

Description: The AFG program provides resources to assist fire departments in attaining critical resources such as training and equipment.

STATE FUNDING INFORMATION

Source: CAL FIRE Grant Programs

Agency: CAL FIRE

Website: https://www.fire.ca.gov/grants/

Description: The CAL FIRE Grant Program offers a range of forest-related grants with differing scopes and funding details. Some of the Grants include:

- Forest Health Grants: https://www.fire.ca.gov/grants/forest-health-grants/
- California Forest Improvement Program: https://www.fire.ca.gov/grants/california-forest-improvement-program-cfip/
- Fire Prevention Grants Program: https://www.fire.ca.gov/grants/fire-prevention-grants/
    - This grant program offers funding for hazardous fuels reduction, wildfire prevention planning, and wildfire prevention education
- Urban and Community Forestry Grant Programs: https://www.fire.ca.gov/grants/urban-and-community-forestry-grant-programs/
- Wildfire Resilience and Forestry Assistance Grant- Prop 68: https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/wildfire-resilience/
- California Climate Investments Fire Prevention Grant Program: https://www.fire.ca.gov/grants/fire-prevention-grants/

Source: California Fire Safe Council Grant Programs

Agency: California Fire Safe Council

Website: https://cafiresafecouncil.org/grants-and-funding/apply-for-a-grant/

Description: The California Fire Safe Council provides a range of Federal, State, and Private funding sources in addition to administering the USFS State Fire Assistance (SFA) Grant Programs.

Source: California Environmental Protection Agency (EPA) Loans and Grants

Agency: Multiple

Website: https://calepa.ca.gov/loansgrants/

Description: The California EPA Loans and Grants hosts a wide variety of EPA grants specifically for California. While these funding sources may not tie directly to fuel management or fire recovery, there is a wide array of funding opportunities for water and air resources which are directly impacted by wildfire.

Source: Northern California Forests and Watersheds Program

Agency: Multiple

Website: https://www.nfwf.org/programs/northern-california-forests-and-watersheds

Description: The National Fish and Wildlife Foundation and USFS have partnered to restore and enhance National Forests and watersheds affected by wildfires in northern California. This program will administer an initial $6 million in grants to projects that increase wildfire resiliency for northern California National Forests and watersheds.

Source: Adaptation Clearinghouse

Agency: Multiple

Website: https://resilientca.org/

Description: This resource has numerous wildfire-related resources such as funding opportunities, assessments, case studies, educational materials, data and tools, example plans and strategies, and additional policy guidance.

Source: State of California's Grants Portal

Agency: Multiple

Website: https://www.grants.ca.gov/

Description: The California Grants Portal helps users identify the latest grants that could support fire hazard planning or related implementation efforts that support wildfire risk mitigation, fuels management, and other related projects.

Source: California Air Resources Board Funding Wizard

Agency: Multiple

Website: https://fundingwizard.arb.ca.gov/web/

Description: The Funding Wizard aggregates current federal, state, regional, private, and other funding opportunities for environmental and sustainability projects.

PRIVATE FUNDING INFORMATION

Source: State Farm Good Neighbor Citizenship (GNC) Grants

Agency: State Farm

Website: https://www.statefarm.com/about-us/corporate-responsibility/community-grants/good-neighbor-citizenship-grants

Description: State Farm funding is directed at:

- Auto and roadway safety
- Teen driver education
- Home safety and fire prevention
- Disaster preparedness
- Disaster recovery

Source: The Urban Land Institute (ULI)

Website: http://www.uli.org

Description: ULI is a 501(c)(3) nonprofit research and education organization supported by its members. The institute has more than 22,000 members worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. The mission of the ULI is to provide responsible leadership in the use of land to enhance the total environment. ULI and the ULI Foundation have instituted Community Action Grants that could be used for Firewise Communities activities. Applicants must be ULI members or part of a ULI District Council. Contact actiongrants@uli.org or review the web page to find your District Council and the application information.

Source: Environmental Systems Research Institute (ESRI)

Website: http://www.esri.com/grants

Description: ESRI is a privately held firm and the world's largest research and development organization dedicated to geographic information systems. ESRI provides free software, hardware, and training bundles under ESRI-sponsored Grants that include such activities as conservation, education, and sustainable development, and posts related non-ESRI grant opportunities under such categories as agriculture, education, environment, fire, public safety, and more. You can register on the website to receive updates on grant opportunities.

Source: National Forest Foundation (NFF); Innovative Finance for National Forests Grant Program

Website: https://www.nationalforests.org/grant-programs/innovative-finance-for-national-forests-grant-program

Description: The Innovative Finance for National Forests Grant Program aims to bring in non-USFS funds to increase forest resilience. There are three main topics for funding: Wildfire Resilience and Recovery, Sustainable Recreation Access and Infrastructure, and Watershed Health. In addition, three types of projects are funded. Pilot Programs with on-the-ground implementation, Scaling Projects to deliver backlogs of unfunded work, and Research and Development to provide to new forest information.

Source: StEPP Foundation

Website: https://steppfoundation.org/

Description: StEPP is a 501(c)(3) organization dedicated to helping organizations realize their vision of a clean and safe environment by matching projects with funders nationwide. The StEPP Foundation provides project oversight to enhance the success of projects, increasing the number of energy efficiency, clean energy, and pollution prevention projects implemented at the local, state, and national levels for the benefit of the public. The website includes an online project submittal system and a Request for Proposals page.

Source: Matching Awards Program

Agency: National Forest Foundation (NFF)

Website: https://www.nationalforests.org/grant-programs/map

Description: The NFF is soliciting proposals for its Matching Awards Program (MAP) to provide funds for direct on-the-ground projects benefitting America's National Forests and Grasslands. By pairing federal funds provided through a cooperative agreement with the USFS with non-federal dollars raised by award recipients, MAP measurably multiplies the resources available to implement stewardship projects that benefit the National Forest System.

Source: Patagonia Environmental Grants and Support

Agency: Patagonia

Website: https://www.patagonia.com/how-we-fund/

Description: Patagonia supports innovative work that addresses the root causes of the environmental crisis and seeks to protect both the environment and affected communities. Patagonia focuses on places where they have built connections through outdoor recreation and through their network of retail stores, nationally and internationally.

Source: Leonardo DiCaprio Foundation Grants

Agency: Leonardo DiCaprio Foundation

Website: https://www.rewild.org/

Description: The foundation supports projects around the world that build climate resiliency, protect vulnerable wildlife, and restore balance to threatened ecosystems and communities.

Source: U.S. Endowment for Forestry and Communities

Agency: U.S. Environmental Protection Agency, NRCS, USFS, U.S. Department of Defense, U.S. Economic Development Agency

Website: https://www.usendowment.org/

Description: As the nation's largest public charity dedicated to keeping our working forests working and ensuring their bounty for current and future generations, the Endowment deploys the creativity and power of markets to advance their mission: The Endowment works collaboratively with partners in the public and private sectors to advance systemic, transformative and sustainable change for the health and vitality of the nation's working forests and forest-reliant communities.

OTHER FUNDING INFORMATION

The following resources may also provide helpful information for funding opportunities:

- Western Forestry Leadership Coalition: https://www.thewflc.org/
- USDA Information Center: https://www.nal.usda.gov/main/information-centers
- USFS Fire Management website: http://www.fs.fed.us/fire/
- Insurance Services Office Mitigation Online (town fire ratings): http://www.isomitigation.com/
- National Fire Protection Association (NIFC): http://www.nfpa.org
- National Interagency Fire Center (NIFC), Joint Fire Science Program: https://www.nifc.gov/programs/joint-fire-science-program
- Department of Homeland Security U.S. Fire Administration: https://www.usfa.fema.gov/index.html

APPENDIX G:

Homeowner Resources

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THREE RIVERS CWPP HOMEOWNERS GUIDE

This guide has been developed to address site-specific information on wildfire for the Three Rivers communities. This guide 1) suggests specific measures that can be taken by homeowners to reduce structure ignitability and 2) enhances overall preparedness in the planning area by consolidating preparedness information from several local agencies and departments.

BEFORE THE FIRE—PROTECTION AND PREVENTION

REDUCING STRUCTURE IGNITABILITY

Structural Materials

Roofing—The more fire-resistant the roofing material, the better. The roof is the portion of a house most vulnerable to ignition by falling embers, known as firebrands. Metal roofs afford the best protection against ignition from falling embers. Slate or tile roofs are also non-combustible, and Class-A asphalt shingles are recommended as well. The most dangerous type of roofing material is wood shingles. Removing debris from roof gutters and downspouts at least twice per year will help to prevent fire, along with keeping them functioning properly.

Siding—Non-combustible materials are ideal for the home exterior. Preferred materials include stucco, cement, block, brick, and masonry.

Windows—Double-pane windows are most resistant to heat and flames. Smaller windows tend to hold up better within their frames than larger windows. Tempered glass is best, particularly for skylights, because it will not melt as plastic will.

Fencing and trellises—Any structure attached to the house should be considered part of the house. A wood fence or trellis can carry fire to your home siding or roof. Consider using nonflammable materials or use a protective barrier such as metal or masonry between the fence and the house.

If you are designing a new home or remodeling your existing one, do it with fire safety as a primary concern. Use nonflammable or fire-resistant materials and have the exterior wood treated with UL-approved fire-retardant chemicals. More information on fire-resistant construction can be found at http://www.firewise.org.

SCREEN OFF THE AREA BENEATH DECKS AND PORCHES

The area below an aboveground deck or porch can become a trap for burning embers or debris, increasing the chances of the fire transferring to your home. Screen off the area using screening with openings no larger than one-half inch. Keep the area behind the screen free of all leaves and debris.

FIREWOOD, KINDLING, AND OTHER FLAMMABLES

Although convenient, stacked firewood on or below a wooden deck adds fuel that can feed a fire close to your home. Be sure to move all wood away from the home during fire season. Stack all firewood uphill, at least 30 feet and preferably 100 feet from your home.

When storing flammable materials such as paint, solvents, or gasoline, always store them in approved safety containers away from any sources of ignition such as hot water tanks or furnaces. The fumes from highly volatile liquids can travel a great distance after they turn into a gas. If possible, store the containers in a safe, separate location away from the main house.

CHIMNEYS AND FIREPLACE FLUES

Inspect your chimney and damper at least twice per year and have the chimney cleaned every year before first use. Have the spark arrestor inspected and confirm that it meets the latest safety code. Your local fire department will have the latest edition of National Fire Prevention Code 211 covering spark arrestors. Make sure to clear away dead limbs from within 15 feet of chimneys and stovepipes

FIREPLACE AND WOODSTOVE ASHES

Never take ashes from the fireplace and put them into the garbage or dump them on the ground. Even in winter, one hot ember can quickly start a grass fire. Instead, place ashes in a metal container, and as an extra precaution, soak them with water. Cover the container with its metal cover and place it in a safe location for a couple of days. Then either dispose of the cold ash with other garbage or bury the ash residue in the earth and cover it with at least 6 inches of mineral soil.

PROPANE TANKS

Your propane tank has many hundreds of gallons of highly flammable liquid that could become an explosive incendiary source in the event of a fire. It should be located at least 30 feet from any structure. Keep all flammables at least 10 feet from your tank. Learn how to turn the tank off and on. In the event of a fire, you should turn the gas off at the tank before evacuating, if safety and time allow.

SMOKE ALARMS

A functioning smoke alarm can help warn you of a fire in or around your home. Install smoke alarms on every level of your residence. Test and clean smoke alarms once a month and replace batteries at least once a year. Replace smoke alarms once every 10 years.

FIRE-SAFE BEHAVIOR

- If you smoke, always use an ashtray in your car and at home.
- Store and use flammable liquids properly.
- Keep doors and windows clear as escape routes in each room.

DEFENSIBLE SPACE

The removal of dense, flammable foliage from the area immediately surrounding the house reduces the risk of structure ignition and allows firefighters access to protect the home. Pruning and limbing trees along with the selective removal of trees and shrubs is recommended to create a minimum defensible space area of 30 feet. Steep slopes require increased defensible space because fire can travel quickly uphill.

Within the minimum 30-foot safety zone, plants should be limited to fire-resistant trees and shrubs. Focus on fuel breaks such as concrete patios, walkways, rock gardens, and irrigated garden or grass areas within this zone. Use mulch sparingly within the safety zone, and focus use in areas that will be watered

regularly. In areas such as turnarounds and driveways, nonflammable materials such as gravel are much better than wood chips or pine needles.

Vegetative debris such as dead grasses or leaves provide important erosion protection for soil but also may carry a surface fire. It is simply not feasible to remove all the vegetative debris from around your property. However, it is a good idea to remove any accumulations within the safety zone and extending out as far as possible. This is particularly important if leaves tend to build up alongside your house or outbuildings. Removing dead vegetation and leaves and exposing bare mineral soil are recommended in a 2-foot-wide perimeter along the foundation of the house. Also, be sure to regularly remove all dead vegetative matter including grasses, flowers, and leaf litter surrounding your home and any debris from gutters, especially during summer months. Mow the lawn regularly and promptly dispose of the cuttings properly. If possible, maintain a green lawn for 30 feet around your home.

All trees within the safety zone should have lower limbs removed to a height of 6–10 feet. Remove any branches within 15 feet of your chimney or overhanging any part of your roof. Ladder fuels are short shrubs or trees growing under the eaves of the house or under larger trees. Ladder fuels carry fire from the ground level onto the house or into the tree canopy. Be sure to remove all ladder fuels within the safety zone first. The removal of ladder fuels within about 100 feet of the house will help to limit the risk of crown fire around your home. More information about defensible space is provided at http://www.firewise.org.

FIRE RETARDANTS

For homeowners who would like home protection beyond defensible space and fire-resistant structural materials, fire-retardant gels and foams are available. These materials are sold with various types of equipment for applying the material to the home. They are like the substances applied by firefighters in advance of wildfire to prevent ignition of homes. Different products have different timelines for application and effectiveness. The amount of product needed is based on the size of the home, and prices may vary based on the application tools. Prices range from a few hundred to a few thousand dollars. An online search for "fire blocking gel" or "home firefighting" will provide a list of product vendors. Residents should research and consider environmental impacts of chemicals.

ADDRESS POSTING

Locating individual homes is one of the most difficult tasks facing emergency responders. Every home should have the address clearly posted with numbers at least three inches high. The colors of the address posting should be contrasting or reflective. The address should be posted so that it is visible to cars approaching from either direction.

ACCESS

Unfortunately, limited access may prevent firefighters from reaching many homes in the planning area. Many of the access problems occur at the property line and can be improved by homeowners. First, make sure that emergency responders can get in your gate. This may be important not only during a fire but also to allow access during any other type of emergency response. If you will be gone for long periods during fire season, make sure a neighbor has access, and ask them to leave your gate open in the event of a wildfire in the area.

Ideally, gates should swing inward. A chain or padlock can be easily cut with large bolt cutters, but large automatic gates can prevent entry. Special emergency access red boxes with keys are sold by many gate companies but are not recommended by emergency services. The keys are difficult to keep track of and may not be available to the specific personnel that arrive at your home. An alternative offered by some

manufacturers is a device that opens the gate in response to sirens. This option is preferred by firefighters but may be difficult or expensive to obtain.

Beyond your gate, make sure your driveway is uncluttered and at least 12 feet wide. The slope should be less than 10%. Trim any overhanging branches to allow at least 13.5 feet of overhead clearance. Also make sure that any overhead lines are at least 14 feet above the ground. If any lines are hanging too low, contact the appropriate phone, cable, or power company to find out how to address the situation.

If possible, consider a turnaround within your property at least 45 feet wide. This is especially important if your driveway is more than 300 feet in length. Even small fire engines have a hard time turning around and cannot safely enter areas where the only means of escape is by backing out. Any bridges must be designed with the capacity to hold the weight of a fire engine.

NEIGHBORHOOD COMMUNICATION

It is important to talk to your neighbors about the possibility of wildfire in your community. Assume that you will not be able to return home when a fire breaks out and may have to rely on your neighbors for information and assistance. Unfortunately, it sometimes takes tragedy to get people talking to each other. Don't wait for disaster to strike. Strong communication can improve the response and safety of every member of the community.

PHONE TREES

Many neighborhoods use phone trees to keep each other informed of emergencies within and around the community. The primary criticism is that the failure to reach one person high on the tree can cause a breakdown of the system. However, if you have willing and able neighbors, particularly those that are at home during the day, the creation of a well-planned phone tree can often alert residents to the occurrence of a wildfire more quickly than media channels. Talk to your neighborhood association about the possibility of designing an effective phone tree.

NEIGHBORS IN NEED OF ASSISTANCE

Ask mobility-impaired neighbors if they have notified emergency responders of their specific needs. It is also a good idea for willing neighbors to commit to evacuating a mobility-impaired resident in the event of an emergency. Make sure that a line of communication is in place to verify the evacuation.

ABSENTEE OWNERS

Absentee owners are often not in communication with their neighbors. If a home near you is unoccupied for large portions of the year, try to get contact information for the owners from other neighbors or your neighborhood association. Your neighbors would probably appreciate notification in the event of an emergency. Also, you may want to contact them to suggest that they move their woodpile or make sure that the propane line to the house is turned off.

HOUSEHOLD EMERGENCY PLAN

A household emergency plan does not take much time to develop and will be invaluable in helping your family deal with an emergency safely and calmly. One of the fundamental issues in the event of any type of emergency is communication. Be sure to keep the phone numbers of neighbors with you rather than at home.

It is a good idea to have an out of state contact, such as a family member. When disaster strikes locally, it is often easier to make outgoing calls to a different area code than local calls. Make sure everyone in the family has the contact phone number and understands why they need to check in with that person in the event of an emergency. Also, designate a meeting place for your family. Having an established meeting site helps to ensure that family members know where to go, even if they can't communicate by phone.

CHILDREN

Local schools have policies for evacuation of students during school hours. Contact the school to get information on how the process would take place and where the children would likely go.

The time between when the children arrive home from school and when you return home from work is the most important time frame that you must address. Fire officials must clear residential areas of occupants to protect lives and to allow access for fire engines and water drops from airplanes or helicopters. If your area is evacuated, blockades may prevent you from returning home to collect your children. It is crucial to have a plan with a neighbor for them to pick up your children if evacuation is necessary.

PETS AND LIVESTOCK

Some basic questions about pets and livestock involve whether you can evacuate the animals yourself and where you would take them. Planning for the worst-case scenario may save your animals.
An estimated 90% of pets left behind in an emergency do not survive. Don't expect emergency service personnel to prioritize your pets in an emergency. Put plans in place to protect your furry family members.

PETS

Assemble a pet disaster supply kit and keep it handy. The kit should contain a 3-day supply of food and water, bowls, a litter box for cats, and a manual can opener if necessary. It is also important to have extra medication and medical records for each pet. The kit should contain a leash for each dog and a carrier for each cat. Carriers of some kind should be ready for birds and exotic pets. In case your pet must be left at a kennel or with a friend, also include an information packet that describes medical conditions, feeding instructions, and behavioral problems. A photo of each pet will help to put the right instructions with the right pet.

In the event of a wildfire you may be prevented from returning home for your animals. Talk to your neighbors and develop a buddy system in case you or your neighbors are not home when fire threatens. Make sure your neighbor has a key and understands what to do with your pets should they need to be evacuated.

If you and your pets were evacuated, where would you go? Contact friends and family in advance to ask whether they would be willing to care for your pets. Contact hotels and motels in the area to find out which ones accept pets. Boarding kennels may also be an option. Make sure your pets' vaccinations are up to date if you plan to board them.

Once you have evacuated your pets, continue to provide for their safety by keeping them cool and hydrated. Try to get your pets to an indoor location rather than leaving them in the car.
Do not leave your pets in your vehicle without providing shade and water. It is not necessary to give your pets water while you are driving but be sure to offer water as soon as you reach your destination.

LIVESTOCK

Getting livestock out of harm's way during a wildfire is not easy. You may not be able or allowed to return home to rescue your stock during a wildfire evacuation. Talk to your neighbors about how you intend to deal with an evacuation. If livestock are encountered by emergency responders, they will be released and allowed to escape the fire on their own. Make sure your livestock have some sort of identification. Ideally, your contact information should be included on a halter tag or ear tag so that you could be reached if your animal is encountered.

If you plan to evacuate your livestock, have a plan in place for a destination. Talk to other livestock owners in the area to find out whether they would be willing to board your stock in the event of an emergency. Often in large-scale emergencies, special accommodations can be made at fair and rodeo grounds, but personal arrangements may allow you to respond more quickly and efficiently.

If you do not own a trailer for your horses or other livestock, talk to a neighbor who does. Find out whether they would be willing to assist in the evacuation of your animals. If you do own a trailer, make sure it is in working condition with good, inflated tires and functioning signal lights. Keep in mind that even horses that are accustomed to a trailer may be difficult to load during an emergency. Practicing may be a good idea to make sure your animals are as comfortable as possible when being loaded into the trailer.

HOUSE AND PROPERTY

Insurance companies suggest that you make a video that scans each room of your house to help document and recall all items within your home. This video can make replacement of your property much easier in the unfortunate event of a large insurance claim. See more information on insurance claims in the "After the Fire" section below.

PERSONAL ITEMS

During fire season, items you would want to take with you during an evacuation should be kept in one readily accessible location. As an extra precaution, it may be a good idea to store irreplaceable mementos or heirlooms away from your home during fire season.

It is important to make copies of all of your important household paperwork, such as birth certificates, titles, and so forth. Store them away from your home, such as in a safe deposit box. Important documents can also be protected in a designated firesafe storage box within your home.

IN THE EVENT OF A FIRE

NOTIFICATION

In the event of a wildfire, announcements from the local Emergency Management office will be broadcast over local radio and television stations. Media notification may be in the form of news reports or the Emergency Alert System (EAS). On television, the emergency management message will scroll across the top of the screen on local channels. The notice is not broadcast on non-local satellite and cable channels.

One good way to stay informed about wildfire is to use a National Oceanic and Atmospheric Administration weather alert radio. The radios can be purchased at most stores that carry small appliances, such as Target, Walmart, or Amazon. The radio comes with instructions for the required

programming to tune the radio to your local frequency. The programming also determines the types of events for which you want to be alerted. The weather alert radio can be used for any type of large incident (weather, wildfire, hazardous materials, etc.), depending on how it is programmed. Local fire personnel can assist with programming if needed.

WHEN FIRE THREATENS

Before an evacuation order is given for your community, there are several steps you can take to make your escape easier and to provide for protection of your home. When evaluating what to do as fire threatens, the most important guideline is: **DO NOT JEOPARDIZE YOUR LIFE.**

Back your car into the garage or park it in an open space facing the direction of escape. Shut the car doors and roll up the windows. Place all valuables that you want to take with you in the vehicle. Leave the keys in the ignition or in another easily accessible location. Open your gate.

Close all windows, doors, vents, interior doors, and garage doors. Disconnect automatic garage openers. Leave exterior doors unlocked. Move furniture away from windows and sliding glass doors. If you have lightweight curtains, remove them. Heavy curtains, drapes, and blinds should be closed. Leave a light on in each room.

Turn off the propane tank or shut off gas at the meter. Turn off pilot lights on appliances and furnaces.

Move firewood and flammable patio furniture away from the house or into the garage.

Connect garden hoses to all available outdoor faucets and make sure they are in a conspicuous place. Turn the water on to "charge," or fill your hoses and then shut off the water.

Place a ladder up against the side of the home, opposite the direction of the approaching fire, to allow firefighters easy access to your roof.

EVACUATION

When evacuation is ordered, you need to go ***immediately***. Evacuation not only protects lives; it also helps to protect property. Some roads are too narrow for two-way traffic, especially with fire engines. Fire trucks often can't get into an area until the residents are out. Also, arguably the most important tool in the WUI toolbox is aerial attack. Airplanes and helicopters can be used to drop water or retardant to help limit the spread of the fire, but these resources cannot be used until the area has been cleared of civilians.

Expect emergency managers to designate a check-out location for evacuees. This process helps to ensure that everyone is accounted for and informs emergency personnel as to who may be remaining in the community. Every resident should check out at the designated location before proceeding to any established family meeting spot.

A light-colored sheet closed in the front door serves as a signal to emergency responders that your family has safely left. This signal saves firefighters precious time, as it takes 12–15 minutes per house to knock on each door and inform residents of the evacuation.

AFTER THE FIRE

RETURNING HOME

First and foremost, follow the advice and recommendations of emergency management agencies, fire departments, utility companies, and local aid organizations regarding activities following the wildfire. Do not attempt to return to your home until fire personnel have deemed it safe to do so.

Even if the fire did not damage your house, do not expect to return to business as usual immediately. Expect that utility infrastructure may have been damaged and repairs may be necessary. When you return to your home, check for hazards, such as gas or water leaks and electrical shorts. Turn off damaged utilities if you did not do so previously. Have the fire department or utility companies turn the utilities back on once the area is secured.

INSURANCE CLAIMS

Your insurance agent is your best source of information as to the actions you must take in order to submit a claim. Here are some things to keep in mind. Your insurance claim process will be much easier if you photographed your home and valuable possessions before the fire and kept the photographs in a safe place away from your home. Most if not all of the expenses incurred during the time you are forced to live outside your home could be reimbursable. These could include, for instance, mileage driven, lodging, and meals. Keep all records and receipts. Don't start any repairs or rebuilding without the approval of your claims adjuster. Beware of predatory contractors looking to take advantage of anxious homeowners wanting to rebuild as quickly as possible. Consider all contracts very carefully, take your time to decide, and contact your insurance agent with any questions. If it appears to be a large loss, consider whether you should hire a public adjuster that is licensed by the state department of insurance who will represent and advocate for you as the policyholder in appraising and negotiating the claimant's insurance claim to ensure you get the best outcome and recovery from your insurance company. Most public adjusters charge a small percentage of the settlement that is set by the state and primarily they appraise the damage, prepare an estimate and other claim documentation, read the policy of insurance to determine coverages, and negotiate with the insurance company's claims handler.

POST-FIRE REHABILITATION

Homes that may have been saved in the fire may still be at risk from flooding and debris flows. Burned Area Emergency Rehabilitation (BAER) teams are professionals who work to mitigate the effects of post-fire flooding and erosion. These teams often work with limited budgets and manpower. Homeowners can assist the process by implementing treatments on their own properties as well as volunteering on burned public lands to help reduce the threat to valuable resources. Volunteers can assist BAER team members by planting seeds or trees, hand mulching, or helping to construct straw-bale check dams in small drainages.

Volunteers can help protect roads and culverts by conducting storm patrols during storm events. These efforts dramatically reduce the costs of such work as installing trash racks, removing culverts, and re-routing roads.

Community volunteers can also help scientists to better understand the dynamics of the burned area by monitoring rain gauges and monitoring the efficacy of the installed BAER treatments.

ADDITIONAL LINKS AND RESOURCES

THREE RIVERS FIRE SAFE COUNCIL

- Fire Safe Council Home page: https://www.3rfsc.org/
- Disaster preparedness: https://www.3rfsc.org/listos-california/
- Disaster Ready Guide: https://www.listoscalifornia.org/wp-content/uploads/2020/07/508_LIS_DRG_19pp_1_45_EN_50520.pdf

- Listos (Ready) California: https://www.listoscalifornia.org/
  - Choose from English, Chinese, Filipino, Korean, Spanish, or Vietnamese to view wildfire preparedness information
- Scheduled events: https://www.3rfsc.org/calendar/
- Additional resources: https://www.3rfsc.org/resources/

TULARE COUNTY

- Fire Related Links & Resources: https://tularecounty.ca.gov/fire/info-and-forms/fire-related-links-resources/
- Disaster Guide: https://oes.tularecounty.ca.gov/oes/preparedness/disaster-guide/
- Emergencies Webpage: https://tularecounty.ca.gov/emergencies/
  - Within this webpage are evacuation warnings, post-fire guides, disaster preparedness tips and tricks, and more

CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION (CAL FIRE)

Home and Fuels Management

- Homeowners Checklist; How to Make Your Home Fire Safe: https://www.lakeshastina.com/Docs_PDFs/Checklist.pdf
- Hardening Your Home: https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/hardening-your-home/
- Home Hardening Toolkit: https://www.readyforwildfire.org/campaign-toolkits/home-hardening-toolkit/
- Defensible Space: https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/
- Defensible Space Toolkit: https://www.readyforwildfire.org/campaign-toolkits/defensible-space-toolkit/
- Fire-Resistant Landscaping: https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/fire-resistant-landscaping/
- What Property Owners Need to Know to Reduce Wildfire Risk Each Season: https://www.readyforwildfire.org/forest-health/seasonal-actions/
- Prescribed Fire Toolkit: https://www.readyforwildfire.org/campaign-toolkits/prescribed-fires-toolkit/

Preparing for Wildfire

- Wildfire Action Plan: https://www.readyforwildfire.org/prepare-for-wildfire/get-set/wildfire-action-plan/
- How to Prepare to Evacuate From a Wildfire: https://www.readyforwildfire.org/prepare-for-wildfire/get-set/prepare-your-family/
- Pre-Evacuation Preparation Steps: https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/pre-evacuation-preparation-steps/

- Evacuation Steps: https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/evacuation-steps/
- Animal Evacuation: https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/animal-evacuation/
- GO! Evacuation Guide: https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/
- GO! Evacuation Toolkit: https://www.readyforwildfire.org/campaign-toolkits/go-evacuation-toolkit/
- Emergency Supply Kit: https://www.readyforwildfire.org/prepare-for-wildfire/get-set/emergency-supply-kit/
- Insurance Preparedness: https://www.readyforwildfire.org/prepare-for-wildfire/get-set/insurance-preparedness/
- Power Outage Information: https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/power-outage-information/
- What To Do If Trapped: https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/what-to-do-if-trapped/

Preventing Wildfire

- Equipment Use: https://www.readyforwildfire.org/prevent-wildfire/equipment-use/
- Debris Burning: https://www.readyforwildfire.org/prevent-wildfire/debris-burning/
- Vehicle Use: https://www.readyforwildfire.org/prevent-wildfire/vehicle-use/
- Campfire Safety: https://www.readyforwildfire.org/prevent-wildfire/campfire-safety/
- Target Shooting Safety: https://www.readyforwildfire.org/prevent-wildfire/target-shooting-safety/
- One Less Spark, One Less Wildfire Toolkit: https://www.readyforwildfire.org/prevent-wildfire/one-less-spark-campaign/
- Forest Health: https://www.readyforwildfire.org/forest-health/
- Forest Health Toolkit: https://www.readyforwildfire.org/campaign-toolkits/forest-health-toolkit/

After the Fire

- Returning Home After a Wildfire: https://www.readyforwildfire.org/post-wildfire/
- What to Expect After a Wildfire: https://www.readyforwildfire.org/post-wildfire/after-a-wildfire/
- Immediate Safety: https://www.readyforwildfire.org/post-wildfire/returning-home/
- Rebuilding, Mobilizing Your Community: https://www.readyforwildfire.org/post-wildfire/rebuilding/
- Who Can Help? https://www.readyforwildfire.org/post-wildfire/who-can-help/

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

Protecting Your Home

- Understanding the Wildfire Threat to Homes: https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/Fire-Break/Blog-Posts/2020/12/08/Interactive-online-resource-helps-build-understanding-of-wildfire-risks

- Preparing Homes for Wildfire: https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Preparing-homes-for-wildfire
- If your Home Doesn't Ignite, It Can't Burn: https://www.youtube.com/watch?v=RqKFDDBGd5o
- Wildfire Community Preparedness Day Toolkit: https://go.nfpa.org/l/14662/2022-01-11/8j6nqh
- How do Homes Burn in a Wildfire? https://www.youtube.com/watch?v=3QthynXympI
- 5 Key Areas Around the Home You Must Examine When Assessing Wildfire Risk: https://www.youtube.com/watch?v=MIUQVL3BvVg
- Your Home and Wildfire, Choices That Make a Difference: https://www.youtube.com/watch?v=pfbEcMeYFFA
- 10 Safety Tips: https://www.nfpa.org/-/media/Files/Public-Education/Resources/Safety-tip-sheets/WildfireRiskReductionSafetyTips.pdf?utm_source=hootsuite&utm_medium=&utm_term=&utm_content=&utm_campaign=
- Home Hardening Fact Sheets: https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA/Firewise-USA-Resources/Research-Fact-Sheet-Series

Preparation and Evacuation

- Wildfire Preparedness Tips: https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Wildfire-safety-tips
- Wildfire Preparedness for Household Pets: https://www.nfpa.org//-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionPetsChecklist.pdf
- Wildfire Preparedness for Horses and Livestock: https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionHorseChecklist.ashx
- Backpack Emergency GO! Kit: https://www.nfpa.org/-/media/Files/Public-Education/Campaigns/TakeAction/TakeActionBackPackGoKit.ashx
- Instructor Guide; The ability to identifying, analyzing, and using relevant situational information about topographic features can help predict wildland fire behavior is the responsibility of everyone on the fireline: https://www.nwcg.gov/sites/default/files/training/docs/s-190-ig04.pdf
- Outthink a Wildfire; Wildfire Action Policies: https://www.nfpa.org/wildfirepolicy

INTERNATIONAL ASSOCIATION OF FIRE CHIEFS (IAFC):

- Ready, Set, Go!: https://www.wildlandfirersg.org/s/?language=en_US
- Are You Wildfire Ready? https://www.wildlandfirersg.org/s/are-you-wildfire-ready?language=en_US
- What is the WUI? https://www.wildlandfirersg.org/s/iafc2/what-is-the-wildland-urban-interface-20Y3m0000004Ee8EAE?language=en_US
- Firewise Plant Materials: https://www.emnrd.nm.gov/sfd/wp-content/uploads/sites/4/FireWisePlantMaterialsNMSU.pdf
- Seed Mixes to Reduce Wildfire Hazard: https://www.emnrd.nm.gov/sfd/wp-content/uploads/sites/4/Wui_grassmix.pdf

- Creating Defensible Space Zones: https://www.emnrd.nm.gov/sfd/wp-content/uploads/sites/4/Wui_defzone.pdf
- Ember Awareness Checklist: https://www.emnrd.nm.gov/sfd/wp-content/uploads/sites/4/Ember-Awareness-Checklist_NMForestryDivision.doc.pdf

MISC.

- Non-Renewals for California Homeowners: https://strongerca.com/wp-content/uploads/2021/06/Non-renewals-for-CA-Homeowners.pdf
- Mass Tree Mortality, Fuels, and Fire: A Guide for Sierra Nevada Forest Landowners: https://anrcatalog.ucanr.edu/pdf/8683.pdf
- Stronger California Tax Fact sheet: https://strongerca.com/non-renewal/
    - While property insurance frequently acts as the largest financial safety net in the event of an emergency, many California homeowners are being denied home insurance renewal options in areas deemed high risk, where they would need a financial safety net the most. Finding home insurance with adequate coverage at an affordable price can be challenging.
      An insurance trade coalition in California, Stronger California, produced a fact sheet to help homeowners understand their coverages under California law and connect homeowners with resources to find new insurance.
- Instructor Guide (S-190 Unit 4: Topography): The ability to identifying, analyzing, and using relevant situational information about topographic features can help predict wildland fire behavior is the responsibility of everyone on the fireline: https://www.nwcg.gov/sites/default/files/training/docs/s-190-ig04.pdf
- WiRē; Wildfire Research, an interdisciplinary collaboration on community adaptability to wildland fire: https://wildfireresearchcenter.org/
- Wildfire Ready App:
    - App Store: https://apps.apple.com/us/app/wildfire-ready-virtual/id1540773278?msclkid=4eac0069a71411ecb26fa03c0b08eba2
    - Google Play: https://play.google.com/store/apps/details?id=com.BaltiVirtual.Wildfire&gl=US&msclkid=4eabc8f6a71411ecbfe27aa64cd6d835

APPENDIX H:

Community Outreach

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PUBLIC OUTREACH

Table H.1 presents examples of the public outreach completed as part of the CWPP development. Online resources were used to provide information to the public and solicit feedback. A public meeting occurred in person and on Facebook Livestream on August 21, 2021. Figures H.1 through H.11 show examples of online posts and public involvement.

Table H.1. Public Outreach Resources

Resource Description	Location	Figure Number(s)	Date Published
Fire Safety Fair Announcement*	Facebook	H.1	7/28/21
Public Meeting Announcement	Facebook	H.2	8/8/21
Public Meeting Reminder	Facebook	H.3	8/16/21
Public Meeting Reminder with Alternate Attendance Options	Facebook	H.4	8/18/21
Community Survey	ArcGIS Hub Site	H.5	8/18/21
Public Meeting Reminder	Facebook	H.5	8/20/21
Public Meeting Recorded Video	Facebook	H.6	8/21/21
Public Meeting Live Stream	Facebook	N/A	8/21/21
Risk Assessment for Public Viewing	Facebook	H.7	8/27/21
Story Map Announcement	Facebook	H.8	9/16/21
Public Meeting	Community Presbyterian Church	H.9-H.11	8/21/21
Public Story Map	ArcGIS Hub Site (https://three-rivers-cwpp-swcagis.hub.arcgis.com/)	H.8, H.12-H.15	9/16/21

*The Fire Safety Fair was organized and implemented by the FSC. It was not a direct outcome of the CWPP project, but helped to educate the public during the ongoing CWPP project.

Figure H.1. Fire safety fair announcement.

Figure H.2. Public meeting announcement.

Figure H.3. Public meeting reminder.

Figure H.4. Public meeting reminder with alternate participation options.

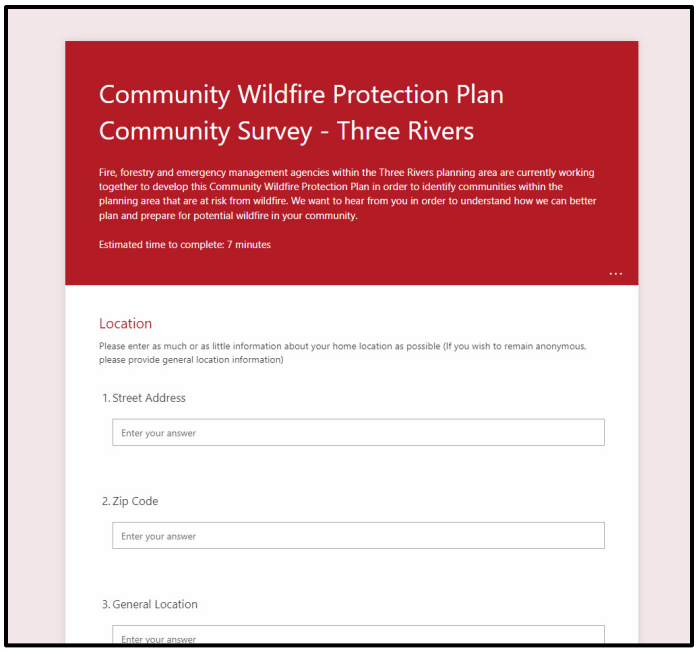

Figure H.5. CWPP community survey.

Figure H.6. Public meeting reminder.

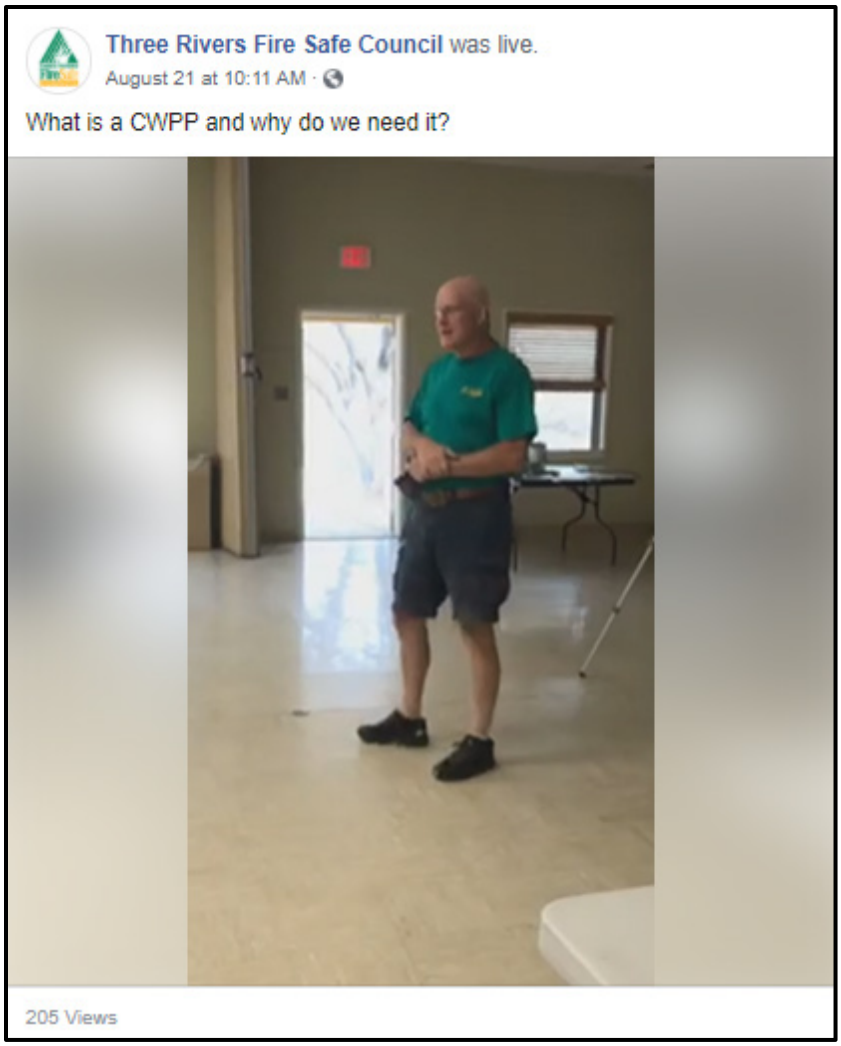

Figure H.7. Public meeting video.

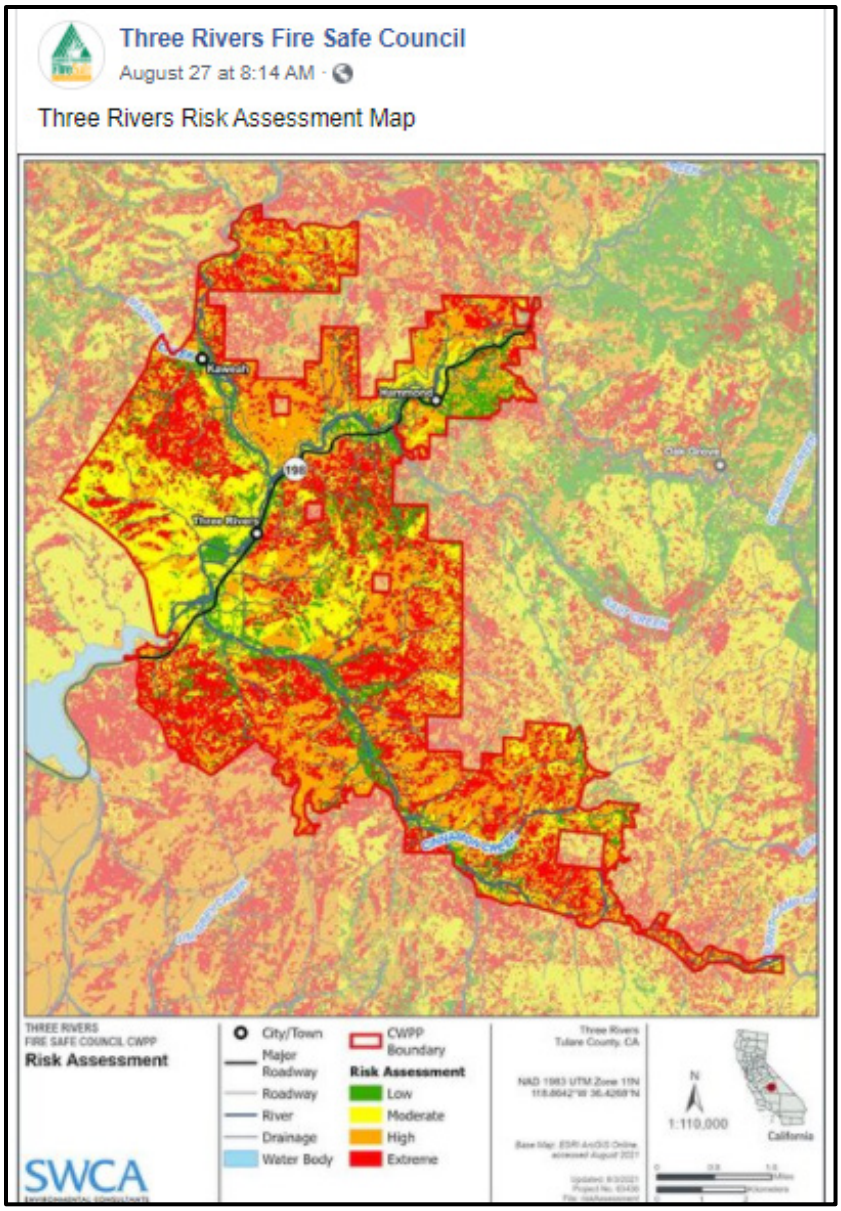

Figure H.8. Risk assessment map draft shared for public viewing.

Figure H.9. CWPP story map announcement.

Figure H.10. Public outreach event table in Three Rivers.

Figure H.11. Public outreach event table in Three Rivers.

Figure H.12. Public outreach event in Three Rivers.

A CWPP story map (online content, link in Table H.1) was developed to bolster engagement with the public. The story map provides opportunities for both information sharing and gathering between the public and the Core Team. The story map has several tabs, each demonstrating information from various chapters in the CWPP document. The introductory and navigation tabs present the purpose of the story map, project history, instructions for navigating the content, and the National Cohesive Wildland Fire Management Strategy framework (Figure H.13). Next, the public involvement tab invites viewers to view outreach materials and lists any scheduled events. The fire environment, fire planning and decision support, WUI hazard and risk assessment, values at risk, mitigation strategies, monitoring and evaluation strategies, post-fire recovery, and homeowner resources tabs present the bulk of the CWPP content (Figures H.14 and H.15). These tabs introduce the WUI concept, fire regimes and fire history in the planning area, information regarding fire planning and response, values at risk from wildfire, specific planning area regions with high versus low risk, wildfire mitigation actions, post-fire recovery information, and monitoring strategies for applied treatments among other important topics.

The story map also links the viewer to the CWPP document and contact information. The figures below (H.13–H.16) demonstrate the spatial information that is conveyed through the story map. Each map is interactive, with several clickable layers providing information on numerous aspects of wildfire, including but not limited to communities in high-risk areas, vegetation and fuels, current mitigation projects, and fire behavior.

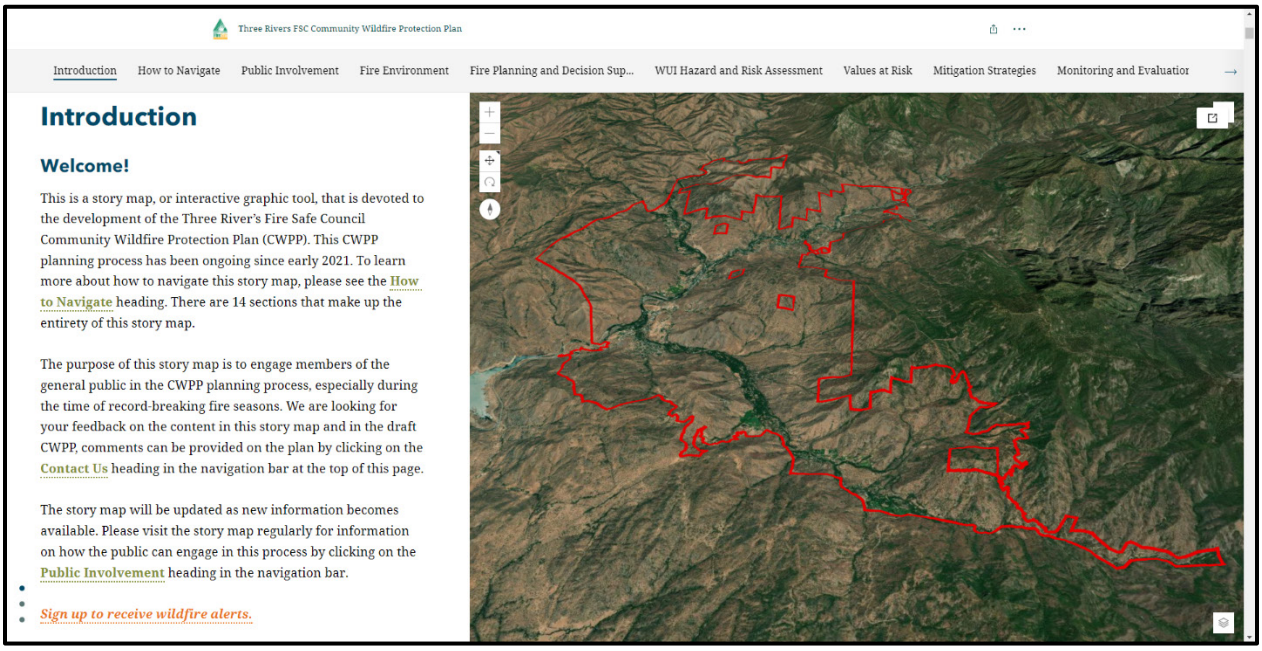

Figure H.13. CWPP story map introduction tab sample.

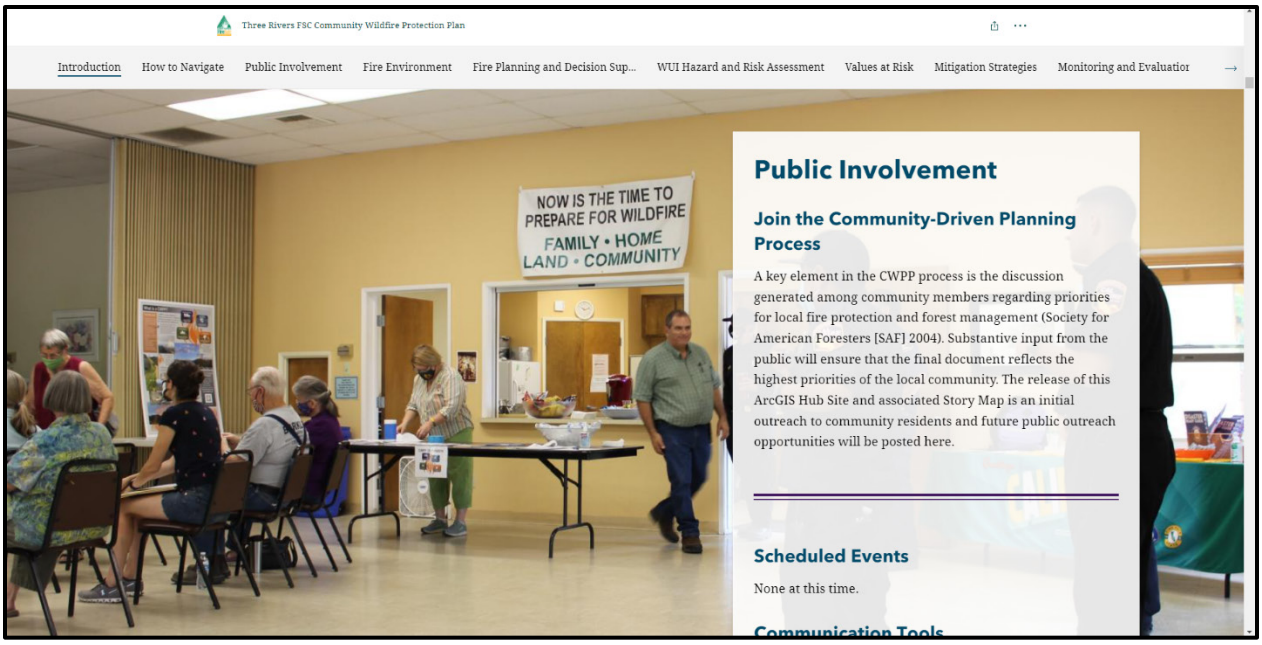

Figure H.14. CWPP story map public involvement tab sample.

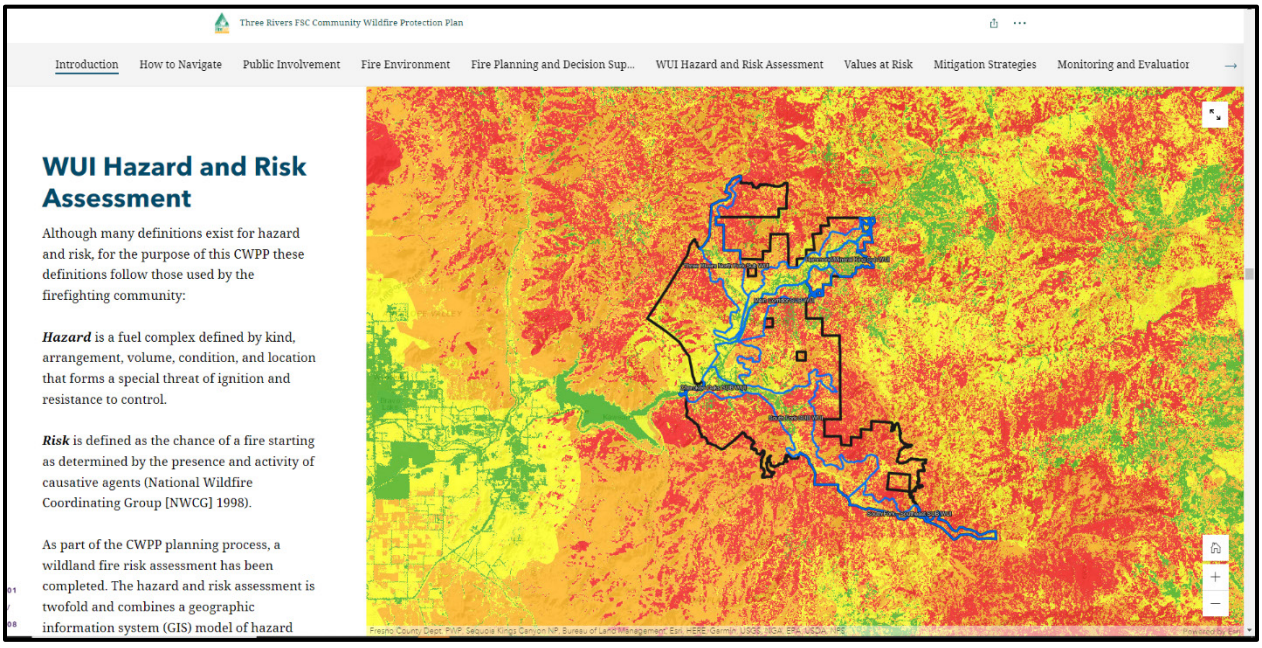

Figure H.15. Story map WUI hazard and risk assessment tab sample.

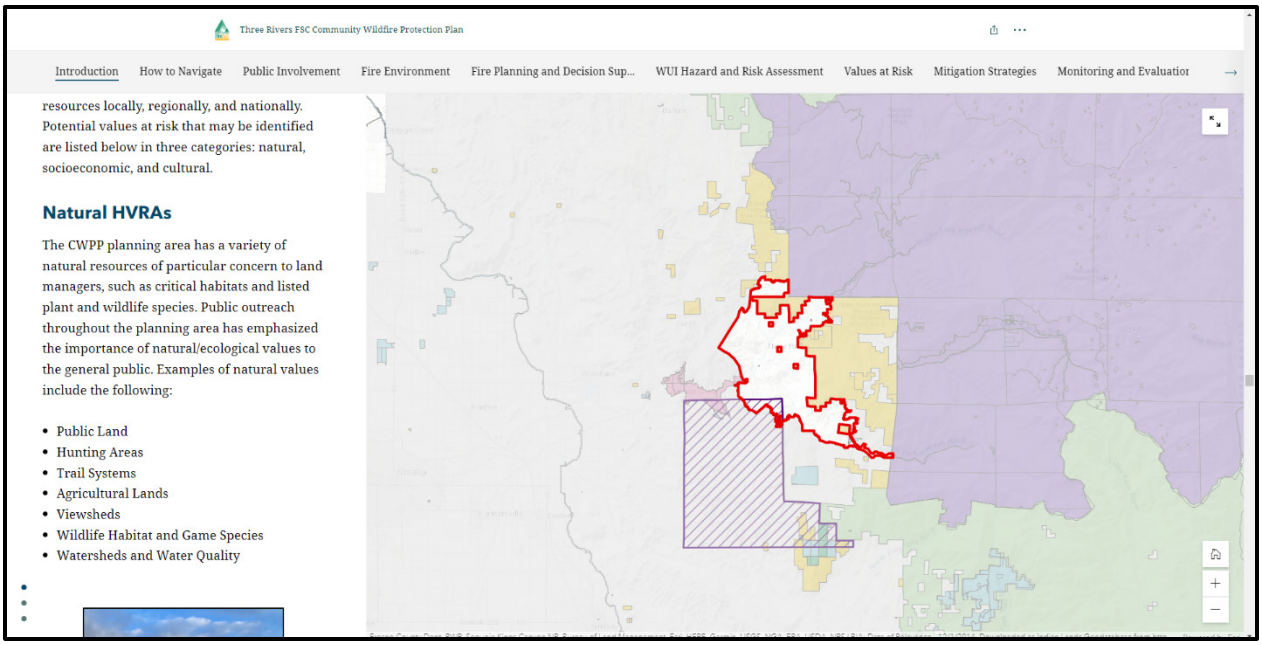

Figure H.16. Story map values at risk tab sample.

The story map tool allowed the project team to assess the number of views per day. Figure H.17 shows the average number of views per day and related graphical information. The number of views from March 15, 2022 (when the story map was transferred to Tulare County) through April 14, 2022, was 226, and the average number of views per day was just over 7 (see Figure H.17).

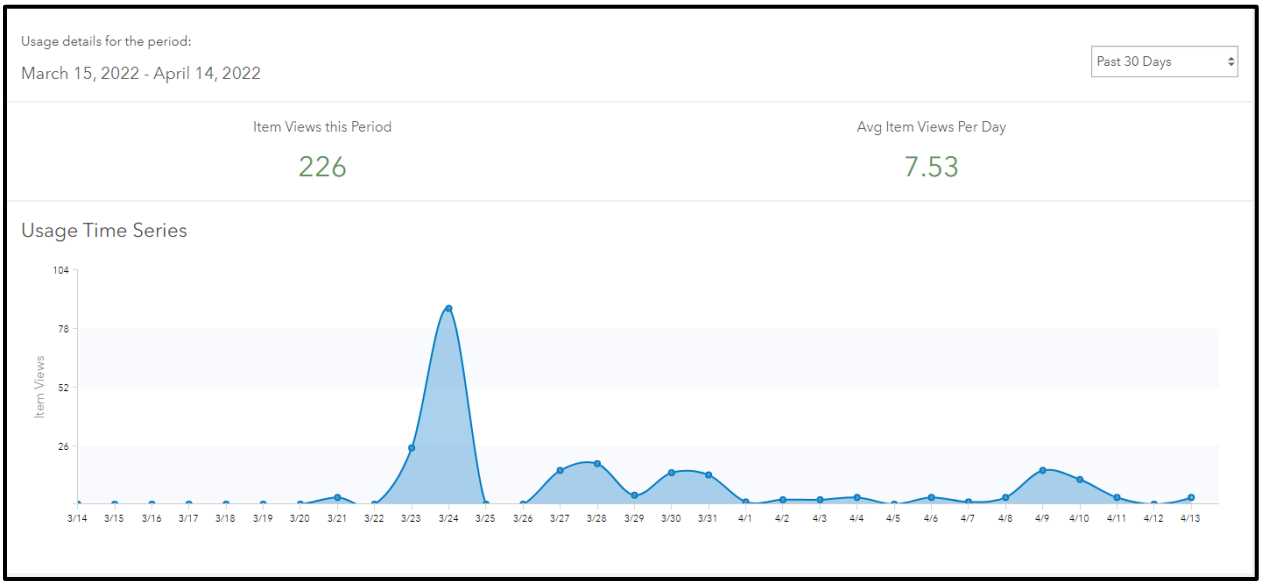

Figure H.17. Story map views from March 15 through April 14, 2022.

COMMUNITY SURVEY

Community Wildfire Protection Plan Community Survey - Three Rivers

Fire, forestry and emergency management agencies within the Three Rivers planning area are currently working together to develop this Community Wildfire Protection Plan in order to identify communities within the planning area that are at risk from wildfire. We want to hear from you in order to understand how we can better plan and prepare for potential wildfire in your community.

Estimated time to complete: 7 minutes

Location

Please enter as much or as little information about your home location as possible (If you wish to remain anonymous, please provide general location information)

1. Street Address

2. Zip Code

3. General Location

3/31/2022

Housing and Community

4. How would you rate your house in terms of risk from wildfire? (Consider the proximity of your house to tracts of undeveloped land, vegetated land, emergency response and access)

- ○ Low
- ○ Medium
- ○ High

5. My home is vulnerable to wildfire because of..... (Select top 2 choices)

- ☐ Surrounding fuels on your property - (i.e., live and dead trees, shrubs, grass, wood piles).
- ☐ Surrounding fuels on neighboring property - (i.e., dense vegetation, wood piles, dead and downed trees.
- ☐ Building materials - (i.e., wood shingles, clap board siding, wooden decks, wood fences).
- ☐ Lack of water supply - (i.e., dependence on well water, far from hydrant).
- ☐ Accessibility challenges - (i.e., long narrow driveway, dead end road, can a fire truck easily access your property?)
- ☐ Ignition sources from neighboring areas - (i.e., pit fires, camp fires, disposal of cigarette butts from trails or roads).

6. How prepared is your community for a large wildfire? (Select one)

- ○ Poorly Prepared
- ○ Moderately Prepared
- ○ Well Prepared

3/31/2022

7. Rate the following actions in their importance to making the community better prepared for wildfire (Please RANK 1-5; 1 is most important).

Clean up live and dead vegetation and yard debris around homes by individual property owners.

Better firefighting equipment.

Improved water supply – (i.e., expansion of public water systems, increased number of hydrants, and installation of wells).

Fuel treatments on public lands to reduce the amount of live and dead vegetation available to burn in a fire.

Community education on wildfire prevention and awareness.

8. My biggest challenge to making my home fire safe is.... (Please RANK 1-4; 1 is most important).

Time

Financial burden of carrying out risk-reducing or fire prevention actions and maintaining clearance.

Not knowing what to do.

There is no challenge, I think my home is already safe.

3/31/2022

9. I would be most interested in funding to help me and my community with…. (Please RANK from 1- 7; 1 is most important)

Green waste disposal - (i.e., removal of leaves, branches, wood from cleared areas).

Home wildfire hazard assessments.

Wildfire prevention education.

Timber/fuel treatments on private land.

Timber/fuel treatments on public land.

Water supply development - (i.e., extend public water systems, add additional hydrants, install fire wells, and acquire portable water supplies).

Funding for fire departments - (i.e., to secure additional apparatus/equipment, fund training, fund additional staff).

10. Are you currently using prescribed fire to treat your property?

- ◯ Yes
- ◯ No
- ◯ No, but I am interested in learning more.

11. Name any community resources you would most like to see prioritized for protection from wildfire (e.g., natural areas, cultural sites, municipal infrastructure, and recreation sites).

3/31/2022

12. Any other comments?

3/31/2022

COMMUNITY SURVEY FINDINGS

A total of 44 responses were tallied for the community survey. Survey highlights are summarized below (percentages have been rounded to the nearest whole number):

Survey Question: “I would be most interested in funding to help me and my community with…”

- 34% of respondents listed “Green waste disposal” as their first choice.
- 23% voted for “Timber/fuel treatments on private land” as the first choice.
- 23% selected “Home wildfire hazard assessments” as the first choice.
- 13% selected “Funding for Fire Departments”

Survey Question: “How would you rate your house in terms of risk from wildfire?”

- 32% of respondents said “High”
- 48% of respondents said “Medium”
- 20% of respondents said “Low”

Survey Question: “My home is vulnerable to wildfire because of…”

- 52% of respondents said “Surrounding fuels on neighboring property”
- 19% said “Building materials”
- 12% said “Lack of water supply”
- 12% said “Accessibility challenges”

Survey Question: “How prepared is your community for a large wildfire?”

- 59% of respondents said “Moderately prepared”
- 25% said “Poorly prepared”
- 16% said “Well prepared”

Survey Question: “Rate the following actions in their importance to making the community better prepared for wildfire”

- 51% of respondents said “Clean up live and dead vegetation and yard debris around homes by individual property owners”
- 26% said “Fuel treatments on public lands to reduce the amount of live and dead vegetation available to burn in a fire”
- 9% said “Better firefighting equipment”

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APPENDIX I:

Project Recommendations

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Table I.1. Recommendations for Creating Resilient Landscapes (Hazardous Fuels Reduction)

Symbol Key:

- = Aligns with goals from the 2017 Tulare MJHMP
- = Aligns with goals from the 2018 Tulare MJHMP
- = Aligns with goals from the 2021 Tulare Fire Unit Plan
- = Aligns with goals from the California Strategic Fire Plan

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources
HFR # 1	Implement strategic fuel treatments to provide road buffers	H	Ongoing	Highest risk roadways as identified in the risk assessment. Priority: see road hazard analysis in Chapter 3.	Three Rivers Fire Safe Council (FSC), County, State, Interstate	Road right of way (ROW) vegetation improvements: • Annual spring maintenance of ROW • Treat surface fuels for a minimum 10-foot buffer and up to 30 feet where possible • Trim fuels (limbing-up timber) to allow safe passage of emergency vehicles • Control for invasive species that may contribute to rapid fire spread (i.e., weeds and grasses). • Utilize CalVTP to expedite treatments (Figure 4.3).	Provides for safe and effective wildfire response capabilities Creates a strategic fuel break along roadways to create potential firebreak	Spring of 2022	• Regular maintenance needed to ensure the roads are drivable for emergency response vehicles	• Hazard Mitigation Grant Program (HMGP)/HMGP – Post Fire • Building Resilient Infrastructure and Communities (BRIC) • Firewise Grants • National Fire Plan (NFP) Grants • California Department of Forestry and Fire Protection (CAL FIRE) Grant Programs • Emergency Forest Restoration Program (EFRP) • National Forest Foundation (NFF); Innovative Finance for National Forests Grant Program

HFR # 2	Enhance existing fire breaks and potential fire containment features	H		Highest risk areas as identified in the risk assessment:
				Priority: see risk assessment in Chapter 3.
					FSC, County, State, Federal	• Increase fire breaks to double as access within the WUI or difficult to access areas and look for opportunities to widen some public trails to better serve as fuel breaks/fire access roads.
						  ○ Encourage clearance of an additional width when possible.
						• Create additional buffer zones between existing development and the forest, ensuring fire suppression access. Maintain existing fire breaks and buffers (Figure 4.1).
						• Fuel break prescriptions should be site specific depending on the fuel type, topography, soils, and adjacent land management practices.
						  ○ The prescriptions will incorporate the use of best management practices for habitat protection (i.e., protection of vulnerable species and habitat and prevention of invasive species).
						• Work with adjacent landowners to develop internal capacity to help enhance fire access through road and trail improvements on those lands.
						• Utilize CalVTP to expedite treatments (Figure 4.3).
							Protect life and property by mitigating fuels, providing defensible space for firefighters protecting structures.
							Create a fuel arrangement unlikely to support crown fire.
							Ensure the protection of vulnerable ecosystems and values at risk.
							Strategic placement of fuel breaks will help to limit the spread of wildland fire and increase access to difficult areas.
								Spring of 2024	• Regular maintenance needed to ensure the fuel break remains clear of vegetation.
									• Monitor for invasive species.
									• Continued management of fire breaks maintained by grazing, brush breaking, controlled burns.
										• BRIC
										• Firewise Grants
										• NFP
										• CAL FIRE Grant Programs
										• EFRP
										• NFF; Innovative Finance for National Forests Grant Program

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources
HFR # 3	Increase capacity to complete and maintain needed hazardous fuels projects across multiple jurisdictions	H		FSC and adjacent county, state, and federal lands (public and private)	Local, State, Federal	• Collaboratively identify vegetation and fuels management needs based on the risk assessment. • Develop equipment needs to accomplish work (including maintenance) and seek funding for purchase. • Create an educational tool for land /property owners re: various methods, techniques, and cost for various fuel treatments. • Cultivate and support partnerships with various agencies, NGOs, and volunteer groups to support implementation of projects. • Utilize drone technology to identify areas of high hazard • Support the implementation and maintenance of defensible space inspections around structures (Goal adopted from CA Strategic Plan) • Utilize CalVTP to expedite treatments (Figure 4.3).	Create resilient landscapes and address potential for extreme wildfire behavior in and around the WUI. Create and maintain accountability with local landowners.	Spring of 2024	• Set up a standing multi-agency meeting every fall to review accomplishments and address future needs	• GSA Federal Excess Personal Property (FEPP) • Firewise Grants • BRIC • HMGP/HMGP – Post Fire • CAL FIRE Grant Programs • Regional Catastrophic Preparedness (RCP) Grants
HFR # 4	Implement CEQA and CalVTP training for select Tulare County staff	H		Tulare County	Fire Department, partnering agencies	• Require select personnel (those working on project implementation and permitting) to complete CEQA and/or CalVTP training • https://bof.fire.ca.gov/projects-and-programs/calvtp/	Increase the level of project preparation/permitting that can be completed in-house.		Designate specific roles that will need to complete the training. • Update qualifications annually or as needed to maintain the certification	• Internal budgets
HFR # 5	Protect rare species habitats	H		FSC and adjacent county, state, and federal lands (public and private) Kaweah ACEC Ecological Reserve (South Fork)	Local, State, Federal	• Work with land management agencies to develop fuel treatments that serve as habitat improvements.	Balance the reduction of hazardous fuels with the protection of highly sensitive resources.	Spring of 2023	• Monitor accomplishments in addressing species protections while reducing wildfire risk.	• Environmental Quality Incentives Program (EQIP) • Northern California Forests and Watersheds Program • BLM Forest and Woodlands Resource Management • CAL FIRE Grant Programs • Leonardo DiCaprio Foundation Grants
HFR # 6	Work with local HOAs to develop fuel break measures and associated access improvements for increased community protection	H		FSC Prioritize highest risk areas as identified in the risk assessment.	FSC/Private	• To assure defensible space in WUI will be maintained, require property owners to establish sufficient structure clearance around all structures.	Create resilient landscapes and address potential for extreme wildfire behavior in and around communities. Create and maintain accountability with local landowners.	Spring of 2024	• Carry out a 2-year review of accomplishments in improving defensible space. • Repeat NFPA1144 assessments every 5 years to document improvements in defensible space.	• BRIC • National Urban and Community Forestry Challenge Cost Share Grant Program • Firewise Grants • State Farm Good Neighbor Citizenship (GNC) Grants • NFP • Fire Management Assistance Grant (FMAG)

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources

HFR # 7	Focus on mitigation measures within areas of high exposure potential	H		Prioritize highest risk areas as identified in the risk assessment.	State and Local	• Utilize the fire behavior modeling completed for the CWPP to identify areas that would burn with uncharacteristically high flame lengths and rapid rates of spread, to mitigate fire behavior and provide for areas where fire responders could more safely suppress future wildfire.
						• Map all existing structures within very high fire hazard severity zones that do not conform to current fire code standards and identify mitigation needs.
						• Form collaborative relationships to aid in implementation of mitigation efforts.
						• Focus on following treatments:
						  ○ Removing ladder fuels to reduce extreme fire behavior, intensity, and rates of spread.
						  ○ Carryout understory vegetation management to minimize surface to canopy continuity.
						  ○ Treat small patches of land tucked into residential areas.
						  ○ Create mosaic of vegetation types and stand ages to reduce vertical continuity of vegetation to limit fire spread.
						  ○ Prepare to treat fine fuels that establish in fuel treatment areas.
						  ○ Preferentially treat hazardous fuel types first- e.g., chapparal.
							Assess hazard mitigation opportunities to protect values at risk within areas of highest exposure potential.
							Consider a full tool kit of mitigation measures.
								Spring of 2024	• Carry out a 2-year review of accomplishments in reducing hazardous fuels.
									• Calibrate fuel model based on treatment effectiveness at altering fuel loading.
									• Re-run fire behavior modeling after 5 years to quantify impacts of treatment on fire behavior potential.
										• BRIC
										• HMGP/HMGP – Post Fire
										• FMAG
										• RCP
										• National Urban and Community Forestry Challenge Cost Share Grant Program
										• CAL FIRE Grant Programs

HFR # 8	Integrate wildfire management with meeting other resource management objectives	H		State and Public Lands	BLM, NPS, USFS, County, FSC	• Leverage the information from the development of the CWPP and the MJHMP to combine fuel reduction and habitat restoration projects. • Incorporate native species habitat needs in restoration and recovery efforts. • Maximize funding sources through integrating fuel projects with other land management goals, including ecological restoration, habitat improvements and recreation.	Restore degraded landscapes to build a more resilient fire environment.	Spring of 2027	• Carry out a 2-year review of accomplishments in reducing hazardous fuels and success at meeting other resource management objectives.	• EQIP • BLM Forest and Woodlands Resource Management • CAL FIRE Grant Programs • Northern California Forests and Watersheds Program • Leonardo DiCaprio Foundation Grants
HFR # 9	Firewise treatments on individual properties/structures	H		Three Rivers	FSC	• Conduct Firewise Community-based assessments of individual homes. • The professional assessment would help identify the most critical actions that an individual could take. Assessments could also include marking trees and shrubs suggested for removal.	Reduce risk of home ignitions. Empower homeowners to take the most effective actions. Allow funding to address a larger number of homes.	Spring of 2024	• Conduct on-site inspections with owners; identify and mark trees or shrubs for removal within the 100-foot safety zone. • Develop a community task force to carry out assessments of properties.	• Firewise Grants • Urban Land Institute (ULI) Grants • GNC Grants • NFP • CAL FIRE Grant Programs
HFR # 10	Pursue actions to enhance, facilitate and fund burned area recovery in both the short- and long-term.	H		Burn areas from 2021 fires.	Land management agency responsible for burned area	• Convene a post-fire restoration working group. • Implement the 2018 MJHMP action- Develop burn area recovery plans that incorporate strategic fire safe measures developed during the fire suppression, such as access roads, fire lines, safety zones, fuel breaks, and helispots. • Convene land management agencies to discuss recovery across boundaries. • Work with academic institutions to identify research projects for long term recovery and restoration. • Carry out post fire monitoring to document impacts to soils, vegetation, hydrology and infrastructure and develop restoration measures.	Restore degraded landscapes across jurisdictions to protect values at risk from post-fire effects.	Within three quarters of 2022	• Monthly meetings of participants until actions are identified and solidified. • Bi-annual review of accomplishments. • Annual reports with monitoring summaries.	• Emergency Watershed Protection (EWP) Program • HMGP/HMGP – Post Fire • CAL FIRE Grant Programs • Northern California Forests and Watersheds Program • GNC Grants

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/Maintenance Requirements	Funding Sources
HFR # 11	Support fuel reduction efforts on private property by addressing green waste management.	H		Three Rivers	FSC	• Implement the 2018 MJHMP action: Develop a debris management plan • Increase opportunities for green waste processing- more frequent chipper day events. • Provide curbside collection service once or twice a year.	Support residents in taking responsibility for their own fire mitigation actions.	Spring of 2024	• Annual review of Debris Management Plan goals and accomplishments.	• NFP • Firewise Grants • CAL FIRE Grant Programs • EFRP • GNC Grants • State of CA Grants Portal
HFR # 12	Implement Priority #1, Highway 198 Fuels Reduction and North Fork Drive Fuels Reduction from the 2021 Tulare Fire Unit Plan	H		Three Rivers	CAL FIRE, FSC, CALTRANS	• Fuels reduction along Highway 198 and North Fork Drive through the community of Three Rivers. • North Fork Drive remains a priority for CAL FIRE until the fuel reduction is complete in that area. The County continues to pursue funding to implement projects.	Open the primary escape routes for the community and tourists in the area.	Ongoing	• Ensure that a maintenance schedule is included in all fuel management planning and funding pursuits.	• HMGP/HMGP – Post Fire • BRIC • Firewise Grants • NFP • CAL FIRE Grant Programs • State of CA Grants Portal
HFR # 13	Increase use of prescribed burning where appropriate	M		Sequoia National Forest, Sequoia National Park BLM	NPS, BLM, USFS	• Continue prescribed fire program to provide hazardous fuel reduction to serve as community protection and promote forest health. • Utilize prescribed burn planning that follows agency and regulator protocols. • Closely follow plan prescriptions. • Utilize prescribed burn program to provide training for local fire department personnel and volunteers. • Emphasize the benefits of prescribed fire as part of educational outreach (both targeted at local residents, tourists and absentee homeowners). Focus on smoke impacts from prescribed fire compared with wildfire and ecological benefit of frequent fire in these forest fire regimes.	Protect communities and infrastructure by reducing fuel loads. Increase capacity and training for fire departments.	Spring of 2027	• Carry out inventory each year of number and acreage of prescribed fire completed. • Collaboratively set goals for upcoming year. • Establish training needs and funding.	• Forest Health Grants (CAL FIRE) • BLM Forest and Woodlands Resource Management • RCP • State of CA Grants Portal
HFR # 14	Establish fire defense strategies (such as fire ignition resistant areas) that provide adequate fire protection without dependency on fire resources (both air and ground) and could serve as safety zones for the public or emergency support personnel	M		Three Rivers	County	• If possible, delineate shelter in place locations. • Formal delineation of safety zones is largely dependent on fire location and jurisdiction. However, suitable locations that could be assigned in the event residents cannot evacuate include Lion Club Roping Arena, the school, the Memorial Building, and Slick Rock Recreation Area. • Pre-defined areas may require a land use agreement. • When evac orders are given CAL FIRE will direct people to a shelter. • Emphasize that homeowners need to make their homes resilient in the event of shelter in place. • Temporary places for shelter could include green pasture/irrigated lands.	Increase protection of life safety.	Spring of 2024	• Annual review of status.	• CAL FIRE Grant Programs • State of CA Grants Portal

Table I.2. Recommendations for Fire-Adapted Communities (Structural Ignitability and Public Education and Outreach)

Symbol Key:

- = Aligns with goals from the 2017 Tulare MJHMP
- = Aligns with goals from the 2018 Tulare MJHMP
- = Aligns with goals from the 2021 Tulare Fire Unit Plan
- = Aligns with goals from the California Strategic Fire Plan

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 1	Identify vulnerable populations located in the WUI	H	Ongoing	Prioritize high risk areas	Fire department, HOAs, community leaders	• The FSC needs to identify vulnerable populations (elderly, disabled, low income) who may need additional help to mitigate home hazards and to evacuate during a wildfire. • Seek grant opportunities to support assistance for vulnerable populations, including ability to provide vegetation management and hazardous fuel treatments for vulnerable populations who are limited in their ability to carry out fuel mitigations. • Flag vulnerable home addresses as priority locations for first responders. Build on the ongoing work of Aging in the Community. The County works with this group to help identify vulnerable individuals because fire response may need to vary for those individuals. • Remind the public that they are responsible for self-identifying as a vulnerable member of the population. • Identify homes to be worked on by Team Rubicon • Encourage neighbors helping neighbors. • Address potential foreign language barriers.	Protect life and property of the most vulnerable members of the community.	Spring of 2022	• Annual review of number of actions taken to address vulnerable populations • Monitor grant opportunities to provide long term support.	• Building Resilient Infrastructure and Communities (BRIC) • Firewise Grants • California Department Forestry and Fire Protection (CAL FIRE) Grant Programs • California Climate Investments Fire Prevention Grant Program (CAL FIRE) • California Fire Safe Council Grant Programs • National Urban and Community Forestry Challenge Cost Share Grant Program
FAC # 2	Identify evacuation route fuel treatments adjacent to roads	H		All communities where appropriate. Prioritize high risk areas based on risk assessment and roads analysis (Figures 3.6 & 3.7)	Fire department, GIS, maintenance services	• Identify road segments in the roads analysis that may require road improvements or adjacent treatments to improve protections for safe ingress and egress. • Identify parcel-owners along primary evacuation routes. Engage owners in discussion regarding risk and mitigation actions.	Protect life and lessen high risk fire behavior. Reduce fire behavior along important travel routes used for ingress by emergency vehicles and egress by residents.	Spring of 2022	• Annual maintenance	• BRIC • Fire Management Assistance Grant (FMAG) • National Fire Plan (NFP) • State Farm Good Neighbor Citizenship (GNC) Grants • National Forest Foundation (NFF); Innovative Finance for National Forests Grant Program • Emergency Forest Restoration Program (EFRP) • CAL FIRE Grant Programs
FAC # 3	Create robust program/dashboard to track, maintain, and prioritize wildfire mitigation projects	H		Prioritize high risk areas.	Fire department, FSC, GIS, IT	• Create a program for tracking the completion of wildfire mitigation projects. • Redesign website to make wildfire education more prominent and emphasize the importance of mitigation actions. • Utilize the story map as a one-stop-shop for all wildfire mitigation. • Utilize Survey 123 technology for tracking accomplishments.	Reduce wildfire risk through wildfire mitigation projects in the FSC.	Spring of 2026	• Annual assessment of program success.	• Conservation Innovation Grants (CIG) • Firewise Grants • National Interagency Fire Center (NIFC) • CAL FIRE Grants Programs

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 4	Improve enforcement of Defensible Space Standards	H		Prioritize high risk areas as delineated in the risk assessment	Fire department, HOAs, private landowners	• Work with CAL FIRE and the Tulare County fire department to educate residents about PRC Section 4291-mandatory defensible space requirements (see Appendix A) and the defensible space inspection program carried out by CAL FIRE (LE-100a, see Appendix E) and provide information to ensure residents know what actions need to be taken to pass inspections in SRA and very high fire hazard severity zones in LRAs. • Improve enforcement of the WUI code - the code applies only to new construction and requires that structures meet the parameters of the code to secure building permits. • Ensure all new construction in areas with high or very high fire hazard meet applicable building standards and are designed to minimize risk from fire. • Inspect for water tanks in homes built after 1980. • Discourage construction on slopes in excess of 30% (Adopted from 2018 MJLHMP). • Use education campaign to encourage WUI code actions even for those properties that are not required to adhere to it. • Develop staffing plan to support enforcement and seek funding to implement the plan. • Educate homeowners on real actions that could mitigate their wildfire hazard and risk. • Provide tax incentives for defensible space actions. • Work with insurance companies to determine the potential to provide incentives for defensible space associated with reduced insurance premiums. • Increase green waste pickup/disposal options.	Reduce loss of life and structures through defensible space.	Spring of 2024	• Annual program evaluation and updates as necessary.	• Firewise Grants • CAL FIRE Grant Programs • GNC Grants • FP&S • EPA Environmental Education Grants
FAC# 5	Increase staffing to address wildfire mitigation workload	H		Prioritize understaffed programs that provide the most impact.	Fire department, FSC administration and finance	• Create a full-time position at the County to focus on wildfire mitigation, community relations, community education, coordinating with resident groups and implanting actionable items. Liaise closely with the FSC. • Pursue continuous and repeat interactions with residents.	Reduce wildfire risk through greater capacity in the FSC for wildfire projects.	Spring of 2025	• Annual assessment of capacity needs.	• EMPG • Regional Catastrophic Preparedness (RCP) Grants • Firewise Grants • CAL FIRE Grant Programs
FAC # 6	Improve agency coordination of outreach for both private and public groups	H		Three Rivers	All agencies, insurance brokers	• Agency-coordinated meeting to ensure a consistent message. • Platform for raising cross-boundary issues. ○ Utilize the story map where appropriate for interagency communications and messaging. • Engaging insurance agency in dialogue. • Provide incentives for mitigation actions.	Provide a consistent message regarding wildfire activity, fire prevention goals, actions for homeowners. Reduce redundancy and improve efficiency. Align insurance company requirements with FSC/County codes and ordinances. Possible incentives of homes that have completed wildfire mitigation (AB 38).	Spring of 2025	• Annual agency coordination meeting to assess priorities and action items.	• Firewise grants • California Fire Safe Council Grant Programs • CAL FIRE Grant Programs • RCP • EMPG

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources

FAC # 7	Improve sustainability of mitigation actions by residents	H		Focus on highest risk areas as identified in the risk assessment	All agencies	• Encourage engagement in mitigation actions and sustain engagement.
						• To do this, entities should:
						  ○ Provide recognition and incentives
						  ○ Assist and facilitate actions by providing services for treating and removing slash
						  ○ Identify barriers to engagement and address
						  ○ Work with vendors and industry providers to host raffles
						  ○ Educate industry providers so they can make informed recommendations.
						• Track progress and identify areas requiring support
							Increase sustainability for mitigation actions and combat fatigue amongst residents.	Spring of 2025	• Annual evaluation of program effectiveness and updates as necessary.
									• Accomplishment tracking through the story map.
									• Regularly update content to keep messaging fresh and relevant.
										• BRIC
										• Firewise Grants
										• CAL FIRE Grant Programs EPA Environmental Education Grants
										• National Urban and Community Forestry Challenge Cost Share Grant Program

FAC # 8	Implement Community events focused on populations at risk	H		Focus on highest threat areas as identified in the risk assessment	Fire department, community service groups.	• Regional chipper program. • A community-led day of yard cleanup with fire mitigation in mind may encourage large numbers within the community to carry out mitigation measures and implement defensible space. • Residents would assist elderly, disabled, or vulnerable residents.	Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	Spring of 2025	• Annual review of number of events implemented. • Set goals for next year.	• BRIC • Firewise Grants • CAL FIRE Grant Programs • FP&S • National Urban and Community Forestry Challenge Cost Share Grant Program • GNC Grants

FAC # 9	Increase Firewise/ Ready Set Go! Workshops	H		Private land, HOAs
				Focus on highest threat areas as identified in the risk assessment
					HOAs, fire department	• Offer hands-on workshops to highlight individual home vulnerabilities and how-to techniques to reduce ignitability of common structural elements.
						  ○ Home assessments conducted in a neighborhood often include groups of neighbors participating with the assessor to learn from each other's homes. Homeowners get a better understanding by viewing a home other than their own and feel more comfortable asking questions as a group.
						  ○ Can be requested by an HOA.
						• Utilize a train-the-trainer model. Develop a team of trained citizens that could perform hazard assessments within their community. Seek funding to pay volunteer fire departments to assist.
						• The FSC can provide home hardening and defensible space assessments.
						• Be sure to clarify that home hazard assessments by volunteers and FSC personnel are different from county and state required inspections.
						• Utilize the LE-100a defensible space assessment form to help educate residents on requirements (Appendix E).
						• Ready, Set, Go! Literature is provided to homeowners during assessments.
							Reduce wildfire risk through greater adoption of Firewise and structure hardening measures.	Spring of 2025	• Annual review of number of events implemented.
									• Set goals for next year.
										• BRIC
										• Firewise Grants
										• CAL FIRE Grant Programs
										• FP&S
										• EPA Environmental Education Grants
										• EFRP

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 10	Educate the public on how to mitigate risk and damage from wildfire	H		All communities where appropriate. Prioritize highest threat areas as identified in the risk assessment	Fire department, community development and FSC Information Team, HOAs, private landowners	• Increase education through community training classes as well as YouTube videos on defensible space, fire safe landscaping, structural hardening components, and WUI building construction requirements. • Firesafe Council to engage new homeowners/renters to promote fire education for property residents, even if temporary. • Create wildfire education documents to distribute. • Work with fire departments to create a checklist of what responders look for during triage so the public can see what responders look for. • Create education material on evacuations. • Educate the public on outdated home maintenance, such as updating old electrical systems, to reduce risk of ignition. • Advertise to residents that reflective address markers are still available from CAL FIRE as part of response to Bill 4391. • Focus on events that draw all populations from the region with a focus on populations at risk. • Ensure that all interactions result in follow up engagement by collecting contact information for residents interested in action. • Provide a printed list of mitigation measures to homeowners. Utilize Ready, Set, GO! Literature. Utilize list of actions broken down by cost. • Use existing signage to spread seasonally adjusted fire prevention messages along highways and in public open space areas to reduce human ignitions. • Promote the use of existing electronic signs at firehouses and other locales to display fire prevention information, safety messages, and fire danger ratings linked to safety actions.	Reduce wildfire risk through community action. Protect communities and infrastructure by raising awareness of local citizens and those traveling in the area about actions that can prevent fires.	Spring of 2024	• Yearly updates to materials	• BRIC • Firewise Grants • FP&S • CAL FIRE Grant Programs • EPA Environmental Education Grants

FAC # 11	Develop a youth FSC	H		Three Rivers	FSC	• Initial steps are being taken by the FSC to develop this program, and resources should be sought to continue to support its development. Would be the first program in the state and a great achievement for the FSC.
						• Engage the schools:
						  ○ Fire awareness assembly
						  ○ Integrate fire prevention into the science track
						• Engage college age individuals:
						  ○ Fire awareness seminars or table events
						  ○ Bring in guest speakers during lectures.
						  ○ Inform students on careers related to wildfire.
						• If there is a language barrier and the children speak English, they can share the information with their parents.
							Reduce wildfire risk through community action.
							Initiate fire prevention and mitigation habits at a young age.
								Spring of 2024	• Review status during FSC standing meetings	• Firewise Grants
										• CAL FIRE Grant Programs
										• FP&S
										• California Fire Safe Council Grant Programs
										• Environmental Education Grants

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources

FAC # 12	Identify priority ignition concerns	M		Three Rivers	Public agencies, fire department, Department of Emergency Management	• Utilize fire history data to identify areas with frequent fire starts and develop strategy to reduce incidence of ignitions.
						• Convene a working group to develop strategies to reduce human starts:
						  ○ Education campaign
						  ○ Signage
						  ○ Fire response plans
						  ○ Law enforcement
						  ○ Install long-term fire-pit locations in parks to prevent people from building them in a variety of locations.
						  ○ Education campaign and installation of signage in high-risk areas to address vehicle related starts-dragging chains/catalytic converters.
							Reduce unnecessary ignition through unlawful or irresponsible behavior.	Spring of 2025	• Annual evaluation of priority ignition concerns.
									• 5-year re-run of risk assessment to determine success in mitigating hazards.
									• Review fire history data on a 2-year frequency to monitor trends.
										• BRIC
										• Emergency Management Performance Grant (EMPG)
										• Firewise Grants
										• Fire Prevention and Safety (FP&S) Grants
										• Environmental Protection Agency (EPA) Grant Programs

FAC # 13	Identify wildfire risk reduction through mitigation projects	M		Prioritize high risk areas.	Fire department, community development, GIS, IT	• Support the existing vegetation management program. • Use the risk assessment and identified priority projects in the CWPP for implementation. • Outreach to HOAs; identify existing fuel treatment and assist in planning and prioritizing where new treatments or existing treatments, such as defensible space, would be effective.	Reduce wildfire risk through fuels reduction.	Spring of 2025	• Annual fuels reduction planning coordination.	• BRIC • Hazard Mitigation Grant Program (HMGP)/HMGP – Post Fire • Fire Management Assistance Grant (FMAG) • National Urban and Community Forestry Challenge Cost Share Grant Program • CAL FIRE Grant Programs
FAC # 14	Increase structural hardening: although newer construction is built to current standards, there is a large percentage of construction prior to 2008 and the WUI code that exists within the FSC	M		Prioritize high risk areas as delineated in the risk assessment	Fire department, CAL FIRE, HOAs	• Work with CAL FIRE and the Tulare County fire department to educate residents about PRC Section 4291 revision to require ember-resistant zone within 5 feet of home/structure (see Appendix A). • Continue to develop and adopt the latest building standards and codes. • Retrofit existing structures. • Research and utilize new laws to help with retrofits. • Opportunities for tax breaks to harden your home. • Surveys sent to homeowners to inform the fire department and other groups about public perceptions of risk, as well as priority areas in which to focus efforts. • Firesafe Council to engage new homeowners/renters to promote fire education for property residents. • Open a line of dialogue between the fire department and residents regarding actions they can take to reduce their wildfire risk. Utilize the story map for two-way communication and engagement.	Reduce wildfire risk and loss of structures through home hardening and community education.	Spring of 2027	• Annual updates to standards as necessary.	• BRIC • Firewise Grants • EPA Environmental Education Grants • CAL FIRE Grant Programs
FAC # 15	Seek Firewise Community Certification for Three Rivers	M		Three Rivers	FSC	• Work with Firewise USA and the CA FSC to initiate the process of Firewise certification. • Engage local, county and state stakeholders.	Reduce wildfire risk through community action.	Spring of 2024	• Review status during FSC standing meetings	• Firewise Grants • California Fire Safe Council Grant Programs
FAC # 16	Implement Tulare 2018 MJHMP action: Engage the entire community and develop a County-wide drought response plan to respond to period of prolonged dry weather	M		County-wide	All agencies	• Convene an interagency group of experts to move this planning project along as identified in the MJHMP. • Incorporate modeling of fire behavior under drought scenarios. • Utilize plan to support forest health treatments and emphasize projects that also serve to reduce hazardous fuels.	Improve planning for landscape resilience under a changing climate.	Spring of 2027	• Interagency check-ins to discuss progress of planning	• BRIC • Emergency Conservation Program (ECP) • Environmental Quality Incentives Program (EQIP) • CIG • RCP

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FAC # 17	Set up a unified messaging system for fire information	H		County-wide	All agencies	• It is critical to have a single combined message, especially during evacuation and active fires. • The main Public Information Officer is assigned based on the agency lead for the fire. The public needs to understand that messaging may come from different agencies. • Information from the Public Information Officer should be shared by all agencies to avoid confusion. • Public education is needed to direct residents to the official sources for accurate fire information, not the FSC. • Clarify in social media posts that all fire information should be gathered from official sources only. The FSC can rebroadcast but is not always able to provide the most up-to-date information.	Enhance protection of life safety through careful coordination of messaging.	Spring 2023	• Annual updates to approach as needed	• California Fire Safe Council Grant Programs. • Fire Management Assistance Grant (FMAG) • CAL FIRE Grants Program • EPA Environmental Education Grants

Table I.3. Recommendations for Safe and Effective Wildfire Response

Symbol Key:

- = Aligns with goals from the 2017 Tulare MJHMP
- = Aligns with goals from the 2018 Tulare MJHMP
- = Aligns with goals from the 2021 Tulare Fire Unit Plan
- = Aligns with goals from the California Strategic Fire Plan

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FR # 1	Develop a coordinated approach between the fire department and water district to identify needed improvements to the water distribution system	H		Initially focus on areas of highest wildfire hazard as determined in the risk assessment and areas with limited water pressure or no existing water supply	County fire department	• Initiate a detailed study of feasible locations for water development improvements. • Install hand pumps or other methods independent of the grid for accessing private well water.	Improve fire-fighting response if water is more readily available or closest locations could be identified on a GIS map on a tablet/computer. Alleviates public and agency concern for limited water supply in some WUI areas.	Spring of 2024	• Convene annually • Document number of meetings held • Document number of actions taken	• Firewise Grants • Building Resilient Infrastructure and Communities (BRIC) • California Department of Forestry and Fire Protection (CAL FIRE) Grant Programs • Regional Catastrophic Preparedness (RCP) Grants • Northern California Forests and Watersheds Program • State of CA Grants portal

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources

FR # 2	Develop strategies to enhance safe wildfire response in areas with poor ingress and egress	H		Areas of high risk as delineated by the risk assessment	Fire departments	• Utilize the roads analysis to identify areas requiring road maintenance improvements, new egress points, or development of response plans.
						• Roadway improvements:
						  ○ While increasing roadway width is not feasible in many locations, creating passing areas where possible should be prioritized
						  ○ Grade and maintain roads to reduce hazards to emergency apparatus (potholes and poor surfacing)
						• Identify alternative apparatus for access into narrow areas.
						• Identify potential areas that threaten entrapment of response crews and develop response plans and/or safety zones.
						• Map all weak bridges and develop alternative ingress/egress or response plan.
						• Identify areas with limited all-weather access and develop response plan.
						• Work with HOAs and Community Associations to address locked gates and access concerns.
							Improve fire-fighting response on narrow or sinuous road systems	Spring of 2024	• Update strategies as the developed environment changes.	• The Fire Prevention and Safety Grants (FP&S)
										• BRIC
										• Firewise Grants
										• Hazard Mitigation Grant Program (HMGP)/HMGP – Post Fire
										• RCP Grants

FR # 3	Initiate an annual pre-fire coordinated training/wildland fire drills to improve communication between agencies	H		FSC and vicinity	All agencies	• Develop WUI pre-plans and accompanying evacuation plans for high-risk communities as identified in the risk assessment. • Implement mock evacuations on communities identified as high risk. • Develop protocols to address weaknesses.	Helps to identify resource needs. Helps to enhance fire response.	Spring of 2022	• At annual training set goals and review goals on a 6-month basis.	• FP&S • Assistance to Firefighters Grant (AFG) • RCP • Funding for Fire Departments and First Responders

FR # 4	Develop and coordinate an online comprehensive emergency preparedness, response, and recovery plan for wildfire	H		FSC	Fire department, FSC, County Emergency Management	• Create an online dashboard for use by emergency management agency decision support.
						• Identify various evacuation centers and include details on the dashboard.
						• Dashboard would be created in a Story Map or “Hub” format and would include:
						  ○ Break dashboard into sections of the emergency management cycle: preparedness, response, recovery
						  ○ Identify roles and responsibilities for each agency/partner under each section of the cycle
						  ○ Include BMPs for each section of the cycle
						  ○ Include coordination plan for interagency communications before, during and after an event
						  ○ Include a tracking module to track actions needed and status
						  ○ Include a funding matrix to support implementation of actions
						  ○ Align actions as closely as possible with the County and State HMP
							Improve fire response and readiness	Summer of 2022	• Would be an active and live platform, updated in real time and reviewed on an annual basis	• BRIC
										• CAL FIRE Grant Programs
										• FP&S
										• Firewise Grants
										• RCP

Project ID	Project Description	Priority (HML)	Status	Location	Land Ownership/ Lead Agency	Methodology/Approach	Serves To	Timeline for Action	Monitoring/ Maintenance Requirements	Funding Sources
FR # 5	Integrate lessons learned and after-action review contents from the KNP complex fire in the next Three Rivers CWPP update to improve future fire response capabilities	H		FSC and adjacent jurisdictions	All agencies	• When appropriate, convene a CWPP update Core Team. • During the process, integrate the Core Team's lessons learned from the KNP complex and other fires into the CWPP as new practices and recommendations. • Add these lessons learned into the Tulare County Local Hazard Mitigation Plan, the Tulare County CWPP, and the CAL FIRE Tulare Unit Plan.	Enhance wildfire response and intra-agency communication.	Next CWPP update	• Continual assessment of lessons learned post-fire for responders on all levels (municipal, state, federal, etc.)	• Internal budgets

FR # 6	Be proactive in addressing future wildfire challenges with climate change	M		FSC and adjacent jurisdictions	FSC, County, State, Federal	• Convene a working group tasked with the following:
						  ○ Assess impact of climate change on wildfire potential through modeling of fire behavior under various climate scenarios.
						  ○ Establish fuel treatment plans to mitigate climate related influences on wildfire risk in existing vegetation communities.
						  ○ Establish plans and build infrastructure for water supply needs to alleviate future drought emergencies.
							Enhance wildfire response as conditions change.	Spring of 2022	• Meet annually to review plans and assess status of wildfire risk.
									• Re-run the fire behavior analysis to determine change in wildfire risk.
										• BRIC
										• National Urban and Community Forestry Challenge
										• CAL FIRE Grant Programs
										• Leonardo DiCaprio Foundation Grants
										• Environmental Quality Incentives Program (EQIP)
										• Emergency Watershed Protection (EWP) Program
										• Conservation Innovation Grants (CIG)

FR # 7	In approving new facilities, such as nursing homes, housing for the elderly and other housing for the mentally and physically infirm, to the extent possible, ensure that such facilities are located within reasonable distance of fire and law enforcement stations Identify locations of seniors and disabled persons so that wildfire mitigation, wildfire response, and evacuation information can be provided for them.	M		Three Rivers	County	• Compile database or mailing list of seniors and disabled persons. All persons must self-identify. • Provide wildfire mitigation and response assistance to seniors and disabled community members. • Structure hardening • Creating defensible space • Evacuation planning • Evacuation assistance • Team with Aging in Community to compile database.	Protect at-risk community members		• Update mailing list annually • Meet with senior or disabled community members. • Have a representative community member conduct in-person outreach efforts to seniors or disabled individuals to assess their homes' structural susceptibility to wildfire and emphasize evacuation planning.	• California Fire Safe Council. • BRIC • Firewise Grants • CAL FIRE Grants Program

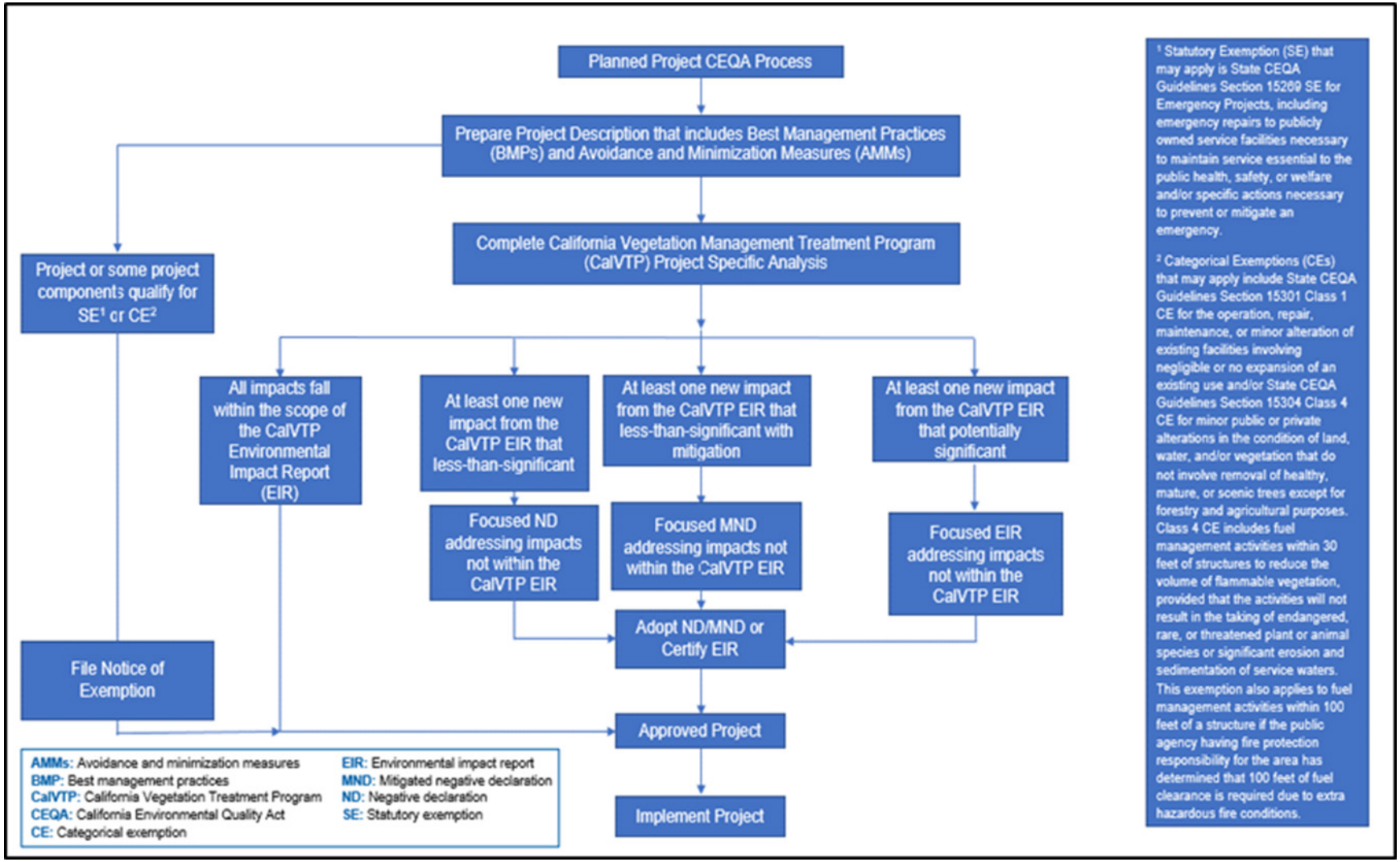

Figure I.1. CEQA process for CalVTP implementation.